UNITED
MOTOR WORKS (SIAM)
PUBLIC COMPANY LIMITED

ROYPOW

$LiFePO_4$ Batteries

for Material Handling Equipments

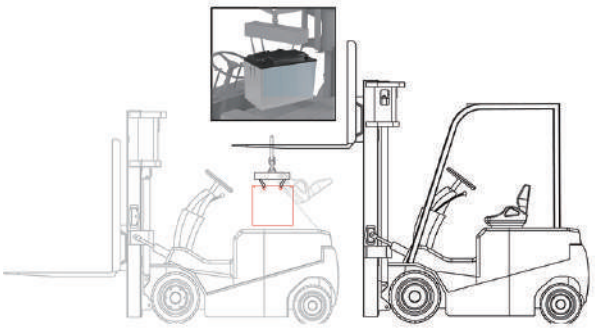
Drop-in lithium-ion
for lead-acid
alternatives

LI-ION
technology

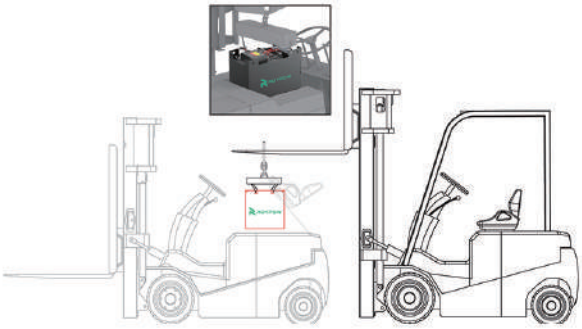
Drop-In Replacement for Lead-Acid Batteries

Replacement Steps

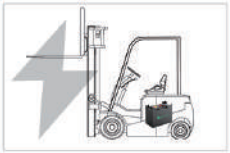
01 Take out the lead-acid battery



02 Install the lithium battery and connect all the wires



03 Start up and charge



04 Recycle the lead-acid battery

LiFePO 4 Batteries VS Lead-Acid Batteries

Comparison	LiFePO 4 Battery	Lead-Acid Battery
Charging time	About 2 hours	About 8 to 10 hours
Duration	Over 6 hours	About 4 to 5 hours
Cycle Life	3,500+	300 - 500
Maintenance	No daily or weekly maintenance	Requires daily or weekly maintenance
Battery management	Built-in BMS	No
Operation costs	Electricity bill	Costs In electrlcity, water filling, battery replacements, and maintenance
Effect on environments	Eco-friendly	Harmful lead, dilute sulfuric acid, hydrogen

About Lithium Battery Chemistries and Main Components

Cobalt	Applicable to mobile devices. With safety issues such as thermal runaway.
Nickel	High capacity. With safety issues.
Manganese	Applicable to vehicles. With high safety and low cost.
Ternary Lithium	Three materials: Co/Ni/Mn. With high capacity and high energy density.
Titanic Acid	With high safety, long lifespan but high cost and low energy density.
Lithium Polymer	Applicable to smartphones and drones. With light weight and high level of shape flexibility.
LiFePO 4	Safest, most common chemistry in use today, since 1986. Long lifespan and low cost of ownership.

LI-ION technology CE RoHS

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.

Benefits of Lithium-ion Batteries

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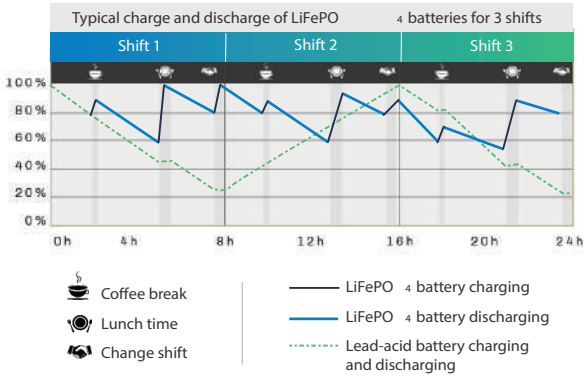
Lead-acid	LiFePO 4 battery		
3 years design life	up to 10 years design life	**Longer life** 3 to 4 times lead-acid lifespan	✓ Reduces overall battery investment ✓ Eco-friendly ✓ Minimize the need for spares
Frequent maintenance	No maintenance	**0 maintenance** no need for regular filling of distilled water and electrolyte	✓ No regular filling of distilled water ✓ Saving costs on labor and maintenance ✓ Less unplanned downtime and improved productivity ✓ No frequent battery replacements
1-2 years warranty	5 years warranty	**Extended warranty** bring you peace of mind	✓ Durable and reliable ✓ Reduces maintenance and labor costs ✓ Quality guarantee

Reduce Downtime, Increase Equipment Availability

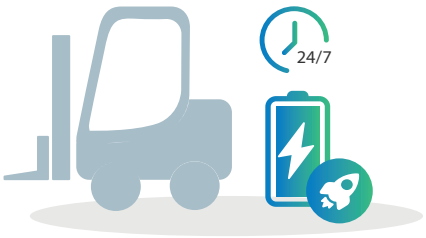
In day-to-day operations, the battery can be charged even during short breaks, such as taking a rest or changing shifts, effectively increasing productivity.

- 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

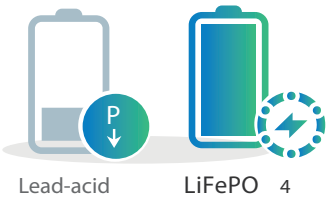
Why choose LiFePO4 batteries for Forklifts?

TThere 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 Forklifts.

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 Forklifts.

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.

Upgraded Forklift Power Solution

ROYPOW

Safer, Performs Better and Costs Less!

CONSISTENT POWER

- Stable performance
- Support opportunity charge & fast charge
- No frequent battery replacements

SAFE OPERATION

- High-quality, automotive-grade components
- High thermal and chemical stability
- Built-in BMS protections

COST-EFFECTIVE

- Zero maintenance
- Up to 10 years design life
- ＞3,500 cycle life
- 5 years extended warranty

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

Specifications

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Model	Nominal Voltage	Nominal Capacity	Nominal Energy	Cycle Life	Dimensions (L*W*H)	Weight lbs. (kg)	Charge Current	Continuous Discharge Current	Peak Discharge Current	Casing Material	IP Rating
24 V System											
F24160	25.6 V	160 Ah	4.10 kWh	>3,500 times	24.57 x 8.27 x 24.69 inch (624 x 210 x 627 mm)	198.42 lbs (90 kg)	50 A	160 A	480 A (30 S)	Steel	IP65
F24105		105 Ah	2.69 kWh		24.57 x 8.27 x 24.69 inch (624 x 210 x 627 mm)	198.42 lbs (90 kg)	80 A	105 A	350 A (30 S)		
F24210		210 Ah	5.38 kWh		24.57 x 8.27 x 24.69 inch (624 x 210 x 627 mm)	220.46 lbs (100 kg)	105 A	210 A	420 A (30 S)		
F24280		280 Ah	7.17 kWh		24.57 x 8.27 x 24.69 inch (624 x 210 x 627 mm)	242.5 lbs (110 kg)	140 A	280 A	500 A (30 S)		
F 24315		315 Ah	8.06 kWh		25.59 x 13.78 x 18.50 inch (650 x 350 x 470 mm)	286.60 lbs (130 kg)	157 A	315 A	500 A (30 S)		
F24420		420 Ah	10.75 kWh		31.50 x 13.78 x 18.50 inch (800 x 350 x 470 mm)	352.74 lbs (160 kg)	200 A	420 A	500 A (30 S)		
		420 Ah	10.75 kWh		27.76 x 12.80 x 23.23 inch (705 x 325 x 590 mm)	496.04 lbs (225 kg)	200 A	420 A	500 A (30 S)		
F24560		560 Ah	14.34 kWh		30.71 x 16.73 x 18.50 inch (780 x 425 x 470 mm)	396.83 lbs (180 kg)	200 A	420 A	700 A (30 S)		
F24608		608 Ah	15.56 kWh		33.46 x 13.78 x 26.38 inch (850 x 350 x 670 mm)	462.97 lbs (210 kg)	200 A	420 A	700 A (30 S)		
36 V System											
F36560	38.4 V	560 Ah	21.504 kWh	>3,500 times	30.71 x 16.73 x 22.44 inch (780 x 425 x 570 mm)	617.29 lbs (280 kg)	200 A	420 A	700 A (30 S)	Steel	IP65
		560 Ah	21.504 kWh		31.50 x 29.92 x 13.78 inch (800 x 760 x 350 mm)	551.16 lbs (250 kg)	200 A	420 A	700 A (30 S)		
F36608		608 Ah	23.35 kWh		30.71 x 16.73 x 22.44 inch (780 x 425 x 570 mm)	617.29 lbs (280 kg)	200 A	420 A	700 A (30 S)		
		608 Ah	23.35 kWh		31.50 x 24.61 x 16.54 inch (800 x 625 x 420 mm)	551.16 lbs (250 kg)	200 A	420 A	700 A (30 S)		
F36690		690 Ah	26.50 kWh		35.43 x 16.73 x 22.44 inc h (900 x 425 x 570 mm)	683.43 lbs (310 kg)	200 A	420 A	700 A (30 S)		
48 V System											
F48210	51.2 V	1210 Ah	10.75 kWh	>3,500 times	31.50 x 14.37 x 16.14 inch (800 x 365 x 410 mm)	297.62 lbs (135 kg)	105 A	210 A	420 A (30 S)	Steel	IP65
F48280		280 Ah	14.33 kWh		30.71 x 16.73 x 18.50 inch (780 x 425 x 470 mm)	396.83 lbs (180 kg)	140 A	280 A	500 A (30 S)		
F48315S		315 Ah	16.1 kWh		27.56 x 22.05 x 18.11 inch (700 x 560 x 460 mm)	507.06 lbs (230 kg)	157 A	350 A	500 A (30 S)		
F48420		420 Ah	21.50 kWh		37.40 x 13.78 x 22.44 inch (950 x 350 x 570 mm)	661.39 lbs (300 kg)	200 A	350 A	500 A (30 S)		
		420 Ah	21.50 kWh		31.50 x 24.02 x 18.11 inch (800 x 610 x 460 mm)	617.29 lbs (280 kg)	200 A	350 A	500 A (30 S)		
F48460		460 Ah	23.55 kWh		32.28 x 25.50 x 18.50 inch (820 x 650 x 470 mm)	639.34 lbs (290 kg)	200 A	350 A	700 A (30 S)		
		460 Ah	23.55 kWh		31.50 x 16.73 x 22.44 inch (800 x 425 x 570 mm)	650.36 lbs (295 kg)	200 A	350 A	700 A (30 S)		
F48560		560 Ah	28.67 kWh		32.28 x 30.71 x 18.11 inch (820 x 780 x 460 mm)	683.43 lbs (310 kg)	200 A	350 A	700 A (30 S)		
		560 Ah	28.67 kWh		35.43 x 31.89 x 13.78 inch (900 x 810 x 350 mm)	683.43 lbs (310 kg)	200 A	350 A	700 A (30 S)		
		560 Ah	28.67 kWh		35.43 x 16.73 x 22.44 inch (900 x 425 x 570 mm)	771.62 lbs (350 kg)	200 A	350 A	700 A (30 S)		
F48690		690 Ah	35.33 kWh		37.80 x 16.73 x 22.83 inch (960 x 425 x 580 mm)	837.76 lbs (380 kg)	200 A	350 A	700 A (30 S)		
		690 Ah	35.33 kWh		34.65 x 29.92 x 18.50 inch (880 x 760 x 470 mm)	749.57 lbs (340 kg)	200 A	500 A	700 A (60 S)		

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

Specifications

Model	Nominal Voltage	Nominal Capacity	Nominal Energy	Cycle Life	Dimensions (L*W*H)	Weight lbs. (kg)	Charge Current	Continuous Discharge Current	Peak Discharge Current	Casing Material	IP Rating
72 V System											
F72420	70.4 V	420 Ah	30.9 kWh	>3,500 times	31.50 x 14.57 x 22.44 inch (800 x 370 x 570 mm)	903.90 lbs (410 kg)	200 A	350 A	500 A (30 S)	Steel	IP65
F72460	73.6 V	460 Ah	33.86 kWh		27.56 x 16.73 x 22.44 inch (700 x 425 x 570 mm)	925.94 lbs (420 kg)	200 A	350 A	700 A (30 S)		
		460 Ah	33.86 kWh		25.59 x 24.80 x 18.50 inch (650 x 630 x 470 mm)	947.99 lbs (430 kg)	200 A	350 A	700 A (30 S)		
F72560	76.8 V	560 Ah	41.22 kWh		29.92 x 16.73 x 22.44 inch (760 x 425 x 570 mm)	1102.31 lbs (500 kg)	200 A	350 A	700 A (30 S)		
		560 Ah	41.22 kWh		30.71 x 24.80 x 18.50 inch (780 x 630 x 470 mm)	1124.36 lbs (510 kg)	200 A	350 A	700 A (30 S)		
80 V System											
F80420	80 V	420 Ah	33.6 kWh	>3,500 times	35.43 x 24.80 x 22.44 inch (900 x 630 x 570 mm)	881.85 lbs (400 kg)	200 A	350 A	700 A (60 S)	Steel	IP65
F80460		460 Ah	36.8 kWh		32.28 x 24.61 x 22.83 inch (820 x 625 x 580 mm)	881.85 lbs (400 kg)	200 A	350 A	500 A (60 S)		
F80560		560 Ah	44.8 kWh		32.28 x 27.17 x 22.44 inch (820 x 690 x 570 mm)	1058.22 lbs (480 kg)	200 A	350 A	700 A (30 S)		
		560 Ah	44.8 kWh		31.89 x 28.74 x 22.44 inch (810 x 730 x 570 mm)	1080.27 lbs (490 kg)	200 A	350 A	700 A (30 S)		
F80608		608 Ah	48.64 kWh		35.43 x 31.89 x 22.44 inch (900 x 810 x 570 mm)	1102.31 lbs (500 kg)	200 A	420 A	700 A (30 S)		
F80690		690 Ah	55.2 kWh		38.58 x 31.89 x 22.44 inch (980 x 810 x 570 mm)	1025.15 lbs (465 kg)	200 A	420 A	700 A (30 S)		
		690 Ah	55.2 kWh		31.89 x 30.71 x 22.44 inch (810 x 780 x 570 mm)	1201.52 lbs (545 kg)	200 A	420 A	700 A (30 S)		
F80840		840 Ah	67.2 kWh		39.37 x 32.28 x 22.44 inch (1000 x 820 x 570 mm)	1444.03 lbs (655 kg)	200 A	420 A	700 A (30 S)		
90 V System											
F90460	89.6 V	460 Ah	41.2 kWh	>3,500 times	39.37 x 24.41 x 23.62 inch (1000 x 620 x 600 mm)	1135.38 lbs (515 kg)	200 A	350 A	700 A (30 S)	Steel	IP65
F90608		608 Ah	54.48 kWh		35.43 x 27.17 x 22.44 inch (900 x 690 x 570 mm)	1212.54 lbs (550 kg)	200 A	200 A	600 A (60 S)		

Working Temperature Range	Charge	Discharge	Storage (1 month)	Storage (1 year)
	-4°F~131°F (-20°C ~ 55°C)	-4°F~131°F (-20°C ~ 55°C)	-4°F~131°F (-20°C ~ 55°C)	32°F~95°F (0°C~35°C)

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