

Cylindrical Lithium Iron Phosphate Battery

LiFePO4 ADVANTAGES

- High Voltage DC Distribution Improves Efficiency
- Lighter Than Conventional Batteries
- Increased Cyclability
- Longer Life

KEY FEATURES

- Attractive Cycle Life
- Extended Safety Performance
- Wide Operating Temperature Range
- Unrivalled High Temperature Performance
- Green Energy without Metal Contaminant
- High Capacity
- Steady Output Voltage
- Low Self-Discharge Rate
- Double Safety Protection
- Withstands Very High Levels of Vibration & Shock

CELL STRUCTURE & DESIGN

- Cylindrical LiFePO4 Cell— 32650 3.2V / 5-5.5Ah
- Bolted Cells for Safety, Stability & Reliability
- Each Cell is Protected by a Patented PCB
- Built-in BMS (Battery Management System)



CELL SAFETY

Passed the Following Abuse & Safety Tests

Impact Test , Puncture Test, Drop & Shock Test, Puncture Test, Crush Test, Thermal Shock, Over-Charge, Over-Discharge, Positive & Negative Short Circuit.

All tests resulted in No Fire, No Explosion while retaining a Stable Chemical Structure.

ELECTRICAL CHARACTERISTICS

| | |
|-------------------------------------|---|
| Nominal Voltage | 38.4V |
| Nominal Capacity (at 0.5C, 25°C) | 30Ah |
| DC Internal Resistance | ≤ 45m Ω |
| Expected Cycle Life | More than 2000 cycles, w/ 1C charge and discharge rate, @ 25C |

MECHANICAL CHARACTERISTICS

| | |
|-------------------------|--------------------------------|
| BCI Group Size | 31 |
| Length | 12.95" / 329mm (± 1mm) |
| Width | 6.77" / 172mm (± 1mm) |
| Height | 8.42" / 214mm (± 1mm) |
| Weight | 29.76lbs / 13.5kg |
| Terminal Torque Setting | 135-165 in lbs. / 15.3-18.6N*M |

OPERATIONAL CONDITIONS

| | |
|---------------------------------------|----------------------------|
| Charge Method | CC-CV (Constant Current / |
| Max. Charge Voltage | 43.8V |
| Continuous Charge Current | Max. 30A |
| Charge Temperature | 32°F~ 113°F / 0°C~ 45°C |
| Continuous Discharge Current | Max. 30A |
| Peak Discharge Current | 60A (1 Sec.) |
| Discharge Cut-off Voltage | 30.0 V |
| Discharge Temperature | -4°F~ 149°F / -20°C ~ 65°C |
| Storage Temperature | -4°F~ 113°F / -20°C ~ 45°C |
| Self-Discharge (Stored @ 50 % SOC) | ≤3% Per Month |

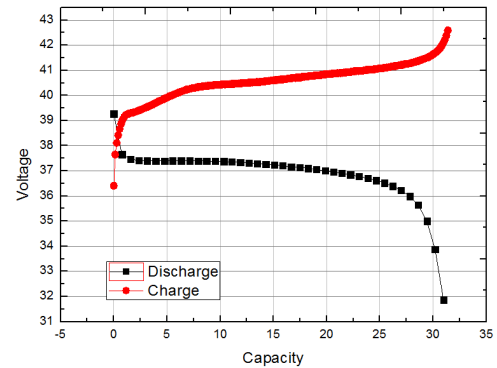
PERFORMANCE CHARACTERISTICS

| CYCLING CAPACITY | | |
|------------------|----------------------|----------|
| NUMBER OF CYCLES | DEPTH OF DISCHARGE % | CAPACITY |
| 100 | 100 | 100 |
| 500 | 100 | 96.3 |
| 1000 | 100 | 90.8 |
| 1500 | 100 | 85.4 |
| 2000 | 100 | 80.1 |

| CYCLE LIFE @ 25°C | |
|-------------------|----------------------|
| NUMBER OF CYCLES | DEPTH OF DISCHARGE % |
| 2200 | 100 |
| 4000 | 80 |
| 6200 | 50 |
| 9300 | 30 |

| TEMPERATURE PERFORMANCE | | |
|-------------------------|------------|------------|
| FARENHEIT °F | CELSIUS °C | CAPACITY % |
| 104 | 40 | 103 |
| 68 | 20 | 98 |
| 50 | 10 | 92 |
| 32 | 0 | 83 |
| 0 | -17.78 | 75 |

CHARGE & DISCHARGE CURVE



FUNCTION OF PCM / BMS (Battery Management System)

Circuit Protection: Constant Power Lithium cells are optimized through the use of its PCM / BMS. Monitoring the cells provides protection against overcharge, over discharge and short circuit. It also enables every battery pack to obtain an independent balancing function. Overall the BMS helps to ensure safe and accurate operation.

| ITEM | CONTENT | CRITERIA |
|---------------------------|-------------------------------------|------------------------|
| Overcharge Protection | Overcharge Detection Voltage | $3.90 \pm 0.05V$ |
| | Overcharge Release Voltage | $3.85 \pm 0.05V$ |
| | Maximum Charge Voltage | $3.65 \pm 0.05V$ |
| | Maximum Charge Current | $\leq 35A$ |
| Over Discharge Protection | Over Discharge Detection Voltage | $2.0 \pm 0.1V$ |
| | Over Discharge Detection Delay Time | $\leq 167mS$ |
| | Over Discharge Release Voltage | $2.3 \pm 0.075V$ |
| Over Current Protection | Over Current Detection Current | $\leq 100A \pm 10A$ |
| | Detection Delay Time | $\leq 1 S$ |
| | Release Condition | Cut Load |
| | Maximum Continuous Current | $\leq 35A$ |
| Short Circuit Protection | Detection Condition | Exterior Short Circuit |
| | Detection Delay Time | 230 - 500uS |
| | Release Condition | Cut Short Circuit |
| Cell Balancing | Balancing Current | $40 \pm 10mA$ |
| | Balancing Voltage | $3.60 \pm 0.01V$ |
| Remark | NONE | |

STORAGE & TRANSPORTATION

1. Based on the character of the cell, a proper environment for transportation of the LiFePO₄ battery pack needs to be created to protect the battery.
2. During transportation 50% SOC must be kept to insure that short circuit, appearance of liquid on the battery never occurs.
3. Do not immerse the battery in liquid.
4. Battery should be kept at -20°C - 45°C (-4°F - 113°F) in a warehouse where it is clean, dry and well ventilated.
5. During transportation of the battery, attention must be paid against dropping, turning over and serious stacking.

WARNINGS AND TIPS

*** In order to prevent the battery from leaking, getting hot and exploding. Please pay attention to the following instructions ***

WARNING!

- Never submerge the battery into water. Keep it dry and in a cool place when not in use.
- Do not install or store upside down.
- Never allow metal to contact to the Positive and Negative Terminals.
- Never ship or store the battery with metal.
- Never knock, throw or trample the battery.
- Never puncture or cut the battery with a sharp tool.
- If the battery is leaking and battery electrolyte get in your eyes, do not knead. Wash with water and get medical attention immediately
- If the battery begins to emit a peculiar smell, appears distorted or unconventional during storage, charging or use. Remove the battery for the device, stop charging and stop using.
- Check battery terminals and connections before use.
- Use of a correct Lithium Battery charger is required.
- Prior to charging inspect the battery for improper physical condition and ageing. Do not charge if these conditions exist.

TIPS!

- Never use or store the battery under high temperatures. Otherwise it may overheat, catch fire or reduce the life span and functionality of the battery. The proposed temperature for long term storage is 10°C - 45°C (50°F - 113°F).
- Never throw the battery into a fire. Avoid excessive heat. Dispose of the scrap battery to your supplier and authorized recycling station.
- Never use the battery under a strong static or magnetic field, otherwise damage to the protection system will occur.
- The battery pack voltage must not be less than the cut-off voltage. If this problem exists contact your Customer Service Department for proper battery repair and charging.
- The battery should be stored and transported at 50% SOC. Batteries need to be charged if stored for 3 months.
- Clean dirty battery terminals with a clean dry cloth or poor contact / operation may occur.

CONTACT US:

ROYAL BATTERY DISTRIBUTORS, INC.
12045 34th STREET NORTH
ST. PETERSBURG, FL 33716
727-800-9578
Sales56@royalbattery.com

ROYAL BATTERY DISTRIBUTORS, INC.
2580 NORTH ORANGE BLOSSOM
TRAIL KISSIMMEE, FL 34744
407-846-6070
Sales51@royalbattery.com

ADDITIONAL LOCATIONS INCLUDE:
BROWARD / MIAMI, FL * PALM BAY, FL
HOLLY HILL (Daytona), FL * PENSACOLA, FL
MACON, GA * BIRMINGHAM, AL