BPC84

6.4V 3.6Ah LiFePO4 Battery Pack

Product Description

- Lithium Iron Phosphate replacement battery pack
- 5 year design life (up to 30 °C ambient temperature)
- 2 years guarantee (See end of document for details.)

*For more details on battery precautions and usage, please visit the following link:
https://hytronik.com/service/downloads (LifePO4 Battery Precautions and Usage).

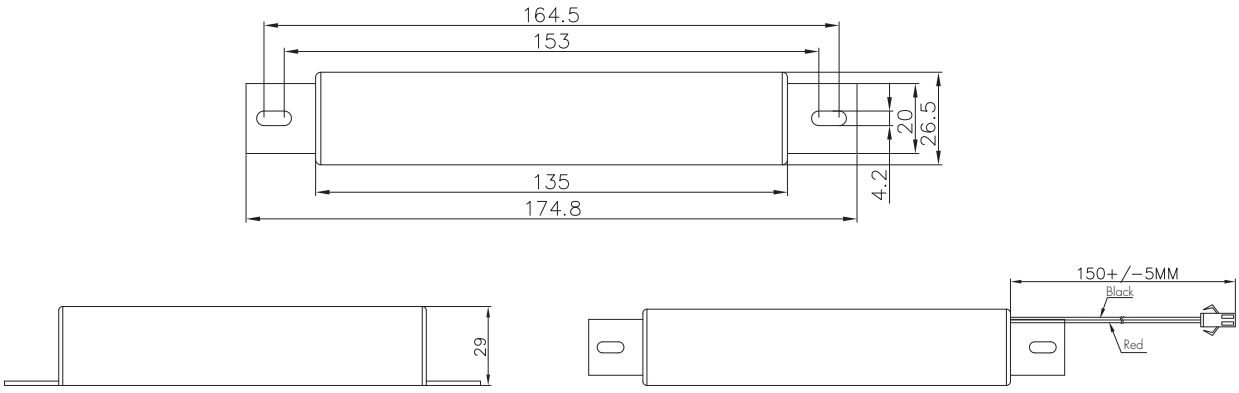
Properties

- Charge efficiency > 90 %
- Low self discharge
- Compact connector providing polarity safe battery connection
- Built-in protection and monitoring circuit
- Battery protected against operation at excessive temperatures
- Deep discharge protection
- Overcharge protection included
- Designed for use in emergency lighting applications including luminaires compliant with IEC 60598-2-22.

Mechanical Construction

- The battery pack is enclosed in flame-retardant PVC heat-shrink tubing, without a rigid outer casing.
- This packaging method is selected for its compactness and weight advantage in constrained luminaire designs.
- Important: Due to the absence of a rigid plastic enclosure, proper mechanical protection must be ensured during installation. The battery should not be exposed to direct mechanical force, piercing, or compression. Suitable mounting supports, shock absorption, and secure positioning are required.
- The battery is not intended to be used in luminaires that require enclosure-integrated fire-resistant casing, or where the battery is directly exposed to impact, vibration, or heat sources.

Mechanical Structure & Dimensions



Technical Specifications

Product Characteristics	
Nominal Voltage	6.4V
Rated Capacity	3.6Ah(C_5)
Minimum Capacity	3.5Ah(C_5)
Energy	About 23.04Wh
Combination Mode	26FC-2S1P
AC Internal Resistance	≤180mΩ
Product Size	174.8mm *26.5mm*29mm
Product Weight	195±10g
Packing Mode	PVC
Charge	Charge voltage: 7.2±0.1V Recommendation charging current: 0.72A Maximum charge current: 1.5A Cut-off charge current: 36mA~72mA
Discharge	Discharge current: ≤2A Maximum continual discharging current: 2A~3A End of discharge voltage: About 5.0V
Protection Circuit	Over charge protection, Over discharge protection Over-current Protection Temperature protection
Charge and Discharge Connector	JST-SM-2P plug cable, 20AWG, Red +Black -, cable length 130±10mm
Working Temperature	Charge temperature: 0°C~50°C Discharge temperature: -20°C~60°C
Storage Environment	Operating temperature: -40～+85°C Operating humidity: 0~95% Storage temperature: -40～+125°C Storage humidity: 0~95%
Charge Retention	≥85% after 28 days storage
Cycle Time	≥2000 cycles

Battery Pack Usage, Maintenance & Safety

⚠ *Important Note

The following sections provide detailed technical instructions and safety guidelines for the BPC83 battery pack. It is crucial for safe, reliable, and compliant use. Topics include:

1. Safety Warning Statement
2. Installation Instructions – Proper mounting, polarity, and wiring.
3. Battery Usage Guidelines – Charging/discharging limits and operating conditions.
4. Maintenance & Storage – Periodic care and correct storage environments.
5. Built-in Protection Features – BMS-triggered thresholds and system safeguards.
6. Safety Instructions – Hazards to avoid and safe handling practices.
7. Disposal & Environmental Responsibility – Recycling protocols and end-of-life care.
8. Disclaimer & Warranty – Scope of coverage and limitations.
9. Certifications & Compliance – Standards, testing protocols, and declarations.

*You may use the section headers above to locate relevant topics.

We strongly recommend reviewing all content carefully to ensure full understanding and responsible use.

1. Safety Warning Statement

The battery pack is classified as dangerous goods and must be handled with care.
Please observe the following safety warnings:

- Only trained and qualified personnel may operate or maintain the battery.
- Always use appropriate tools and protective equipment.
- Unauthorized disassembly is strictly prohibited.
- Failure to follow safety instructions may result in fire, electric shock, explosion, or chemical hazard.
- Hytronik assumes no responsibility for consequences caused by improper use.

2. Installation Requirements

2.1 Before First Use

- Perform visual inspection for damage, leakage, or swelling.
- Verify terminal polarity and check output voltage.
- If terminal area is dirty or oxidized, clean with a dry cloth before use.
- If battery voltage is <4.0V, do not charge; isolate and contact supplier.

2.2 General Conditions

- Keep the battery away from heat sources, open flames, direct sunlight, or flammable environments.
- Installation area must be clean, dry, and ventilated.
- Prevent dust, metal debris, and foreign matter from entering the battery environment.

2.3 Mounting

- The battery pack uses flame-retardant PVC heat-shrink tubing instead of a rigid plastic enclosure.
- Appropriate mechanical protection is mandatory. Do not compress, puncture, deform, or drop the battery.
- Use brackets or shock-absorbing materials to fix the battery securely inside luminaires.
- Orientation: battery must be mounted in its intended upright position.

2.4 Wiring and Terminals

- Wire polarity: Red = Positive (+), Black = Negative (–).
- Do not short the battery terminals.
- Terminals must be clean and free from corrosion. Clean using a dry cloth only.
- Do not use conductive or electrostatic tools during wiring.
- Avoid over-tightening screws; follow specified torque limits if applicable.

3. Battery Usage Guidelines

3.1 Charging Guidelines

- Only use chargers specifically designed for $LiFePO_4$ chemistry and compatible with 7.2 ± 0.1V nominal voltage.
- The charger must be connected in the following sequence: Connect the charger to the battery first, then plug into the power outlet.
- Disconnect the charger immediately after charging is complete.
- After use, recharge the battery within 12 hours to prevent performance degradation.
- For initial activation or after long-term storage, perform 2–3 full charge/discharge cycles to restore capacity.
- Reverse polarity during charging is strictly prohibited and will destroy the internal PCB.

3.2 Discharging Guidelines

- Do not reverse polarity during discharging.
- Ensure the battery pack is connected to a matching load to prevent short circuit or overheating.

*For specific charging & discharging data, please refer to the Technical Specifications table above.

3.3 Precautionary Notes

- Avoid shallow or deep over-discharge. It is recommended to operate within 10–95% SOC range.
- Prohibit serial or parallel battery connection.
- Use only isolated and compliant loads.

4. Maintenance & Storage

4.1 Routine Maintenance

- Recharge the battery within 12 hours after use.
- If unused, perform charge/discharge cycles every 2 months (or monthly for smart/communicative batteries).
- Recommended maintenance range: 6.66V – 6.8V.
- After long storage, activate battery by 2–3 full charge/discharge cycles.
- Do not allow the battery to remain in a low-voltage state for extended periods
- Replace the battery when capacity falls below 80% of the nominal rating.
- Do not attempt repair or modification of protection circuits.

4.2 Storage Conditions

Item	Environment	Storage time
Storage temperature	45℃～50℃, non-condensing	< 1 month
	25℃～45℃, non-condensing	< 3 months
	-20℃～25℃, non-condensing	< 12 months
	15℃～25℃, non-condensing	Long term

- Storage SOC should be maintained between 20% and 85%.
- Avoid mechanical shock, stacking, or storing in confined/humid spaces.
- Batteries must not be stored upside down or horizontally.

5. Built-in Protection Features

5.1 Deep discharge protection

If the battery remains connected after driver cut-off and is not recharged for a long period, its voltage may continue to drop. To prevent cell damage, the battery protection circuit disables further discharge below 2.3±0.1V.

5.2 Overcharge protection

In case of an error or wrong driver causing overcharge, the battery protection will disconnect the battery from the driver at 3.65 ± 0.05V. Discharge remains possible after protection is triggered to ensure emergency operation.

5.3 Over-current protection

The battery is protected against excessive discharge current. If the output current exceeds 12±2A, the protection circuit will disconnect the battery from the driver to prevent cell damage. The connection remains open until the fault is cleared and the battery is reconnected safely.

5.3 Overtemperature protection

The battery is protected against temporary overheating. Charging is disabled if the temperature falls below approx. 0±3°C or exceeds approx. 55±3°C. Discharging remains possible for emergency operation but is disabled below approx. -20±3°C or above approx. 65±3°C.

5.4 Protection Mechanisms (Built-in BMS)

Protection Function	Parameter
Overcharge Cut-off	3.65 ± 0.05V
Overcharge Recovery	3.4 ± 0.05V
Overdischarge Cut-off	2.3 ± 0.1V
Overdischarge Recovery	2.5 ± 0.1V
Overcurrent Cut-off	12 ± 2A
Discharge High Temp Cutoff	65 ± 3°C / Recovery: 60 ± 3°C
Discharge Low Temp Cutoff	−20 ± 3°C / Recovery: −15 ± 3°C
Charge High Temp Cutoff	55 ± 3°C / Recovery: 50 ± 3°C
Charge Low Temp Cutoff	0 ± 3°C / Recovery: 5 ± 3°C
Static Power Consumption	≤ 20 μA
Circuit On-State Resistance	≤ 60 mΩ

*The above parameters reflect BMS-only test data at 25°C and do not constitute guaranteed values of the entire battery pack. Final battery performance is subject to actual shipment inspection.

6. Safety Warnings

- Do not immerse battery in water.
- Do not strike, drop, step on, puncture, or deform battery.
- Never weld or modify battery pack or terminals.
- Do not operate in strong static or magnetic fields.
- Never use or charge batteries outside of recommended temperature ranges.
- Dispose of leaking, deformed, or damaged batteries immediately.
- Do not use the battery if it emits odor, heat, or shows swelling.
- In case of fire, only use Li-ion certified extinguisher or dry sand.
- If electrolyte contacts skin or eyes, flush with water and seek medical help.

7. Disposal & Environmental Responsibility

- End-of-life batteries must be disposed of via certified recycling agencies.
- Do not dispose of batteries in household waste.
- Cover terminals with insulating material before disposal.
- Follow all local and international regulations for lithium-ion battery disposal.

8. Disclaimer & Warranty

- Hytronik provides a 2-year limited warranty for material and workmanship under normal operating conditions.
- The warranty does not cover damage resulting from:
- Improper use, handling, or installation
- Mechanical abuse or exposure to fire, water, or corrosive environments
- Charging or discharging outside recommended parameters
- Storage without maintenance for over 3 months
- Unauthorized disassembly or modification
- Force majeure (e.g. earthquake, lightning, flood)

9. Certification & Compliance

- Compliant with IEC 60598-2-22 emergency lighting requirements
- Cell performance in accordance with IEC 62133
- RoHS / REACH Compliant
- Designed to meet UN38.3 transport requirements

Limitations and Conditions

*The battery is designed to maintain optimal performance and capacity retention (≥80%) for up to 5 years under standard ambient conditions (≤30°C). This lifespan estimation assumes moderate charge/discharge cycles and proper thermal management. Prolonged exposure to higher ambient temperatures may accelerate cell aging and reduce service life.

*The product is covered by a 2-year limited warranty against defects in materials and workmanship. This includes abnormal capacity loss (below 80%) or self-discharge beyond specification under proper use. Warranty exclusions include misuse, mechanical damage, operation beyond rated limits, or thermal abuse.