

NORTHBATT NLFP block Lithium product manual

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1. Product Overview

This standard is applicable to the 25.6V lithium ion battery produced by NORTHBATT S.A. The dimensions, characteristics, technical requirements and precautions of lithium ion battery are described. The product by its integration, miniaturization, light-duty, intelligent centralized monitoring, battery maintenance and management, unattended, convenient to use the standardization of cabinet installation, energy conservation and environmental protection etc., are widely used in access network equipment, mobile communication equipment, transmission equipment, satellite ground stations and microwave communication equipment such communication field as backup power supply.

2. Product Features



- The battery is made of lithium iron phosphate (LiFePO₄) material system, which has good safety performance and long cycle life
- The battery system adopts the high-performance BMS battery management module. The BMS has the protection functions such as overdischarge, overcharge, over-current and temperature, and makes the battery system communicate well with the host.
- Flexible configuration: multiple modules in parallel can extend backup time for the system.

3. Standard charge and discharge method

Charge: Constant current 0.2C A charging to 28.4--29.2V DC, and the constant voltage of 28.4V DC charging to 0.02C A.

Discharge: Constant current 0.5C A discharging to 20 V DC.

LFP batteries cannot be charged below 0°C, nor discharged below -20°C.

4. Performance and Test Conditions

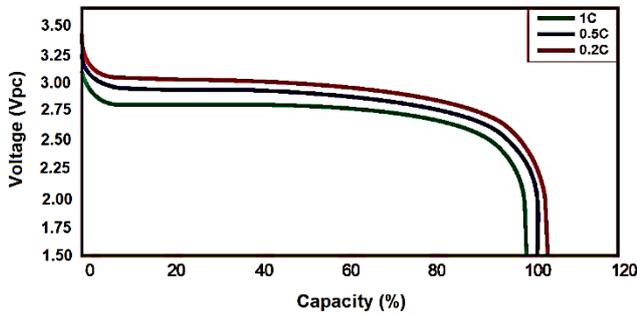
Test and measurement shall be done under temperature of 22.5± 2.5°C and relative humidity of 25~80%.

5. Power system protection function and parameters (BMS)

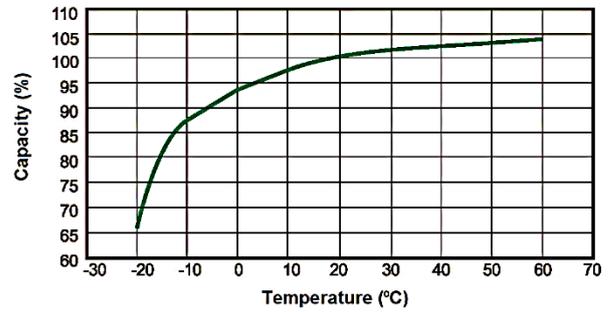
For a standard lithium battery, apply BMS to monitor voltage, current, and battery temperature. At the same time, take protective measures, overcharge, over-discharge, over-current, over-temperature, under-temperature and short circuit, etc., to provide battery balance and current, charging process restrictions to ensure safety and reliable, excellent performance.

6. Performance curve

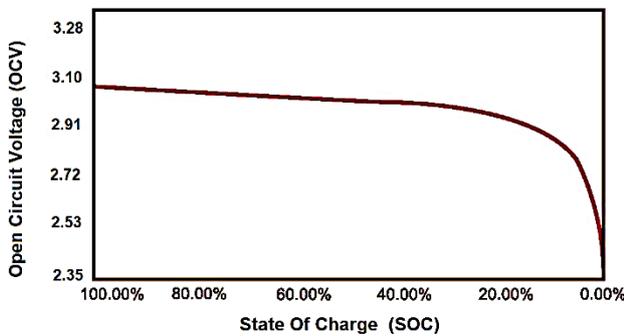
Discharge Performance at 25 °C



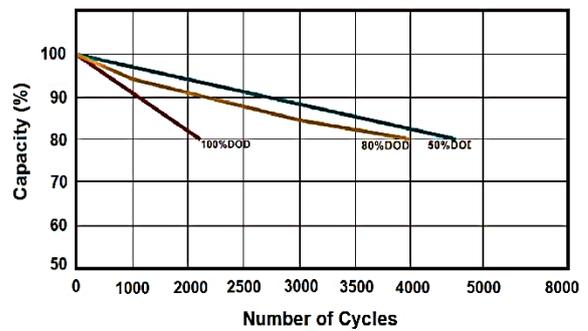
Temperature vs Capacity at 0.2C



State Of Charge vs Open Circuit Voltage

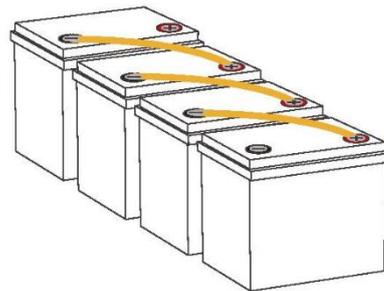
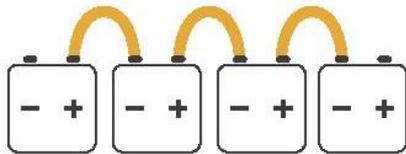


Cycle Life vs D.o.D. at 25 °C, 0.2C

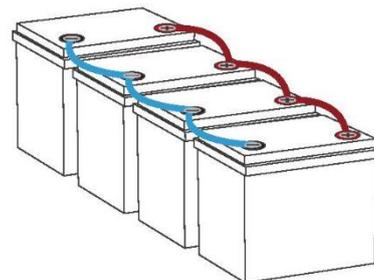
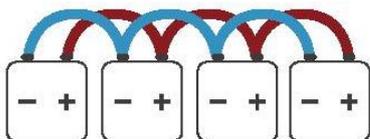


7. Power system installation and use.

SERIES CONNECTION



PARALLEL CONNECTION



Terminal connections must be properly torqued. 12.8V and 25.6V NORTHBATT NLFP batteries using M8 fasteners should be torqued to 8-10 Nm.

MOST RECOMMENDED PARALLEL CONNECTIONS MUST BE APPLIED WITH COPPER BUSBARS

MAXIMUM CONNECTIONS ALLOWED :

12.8V : 4 units in series, 4 units in parallel

25.6V : 2 units in series, 4 units in parallel

CAUTION

- **Using batteries in parallel adopts derating charging & discharging current coefficients (0.7 for 2 units, 0.6 for 3 units, 0.55 for 4 units).**
- ***The voltage difference between units should be less than 15mV before connecting in parallel.***
- ***The difference in voltage between each unit must be less than 15mV before connecting in series.***
- ***Do not connect different batches, different types, old and new batteries in series or parallel.***
- ***If replacing a lead acid system with lithium iron phosphate batteries, charger settings must be updated for the new batteries.***

Before connecting for cycling, verify voltages are within a 15mV (0.015V) range once each battery has been off the charger for 15 minutes. This way all series-connected batteries will be at 100% SOC.

If charging the batteries individually is not possible, the voltage of each battery should be within 15mV (0.015V) before putting them in service. This will minimize the severity of a charge imbalance between batteries which results in reduced pack capacity. LFP batteries, even those with similar open circuit voltages may be at drastically different SOC, due to the flat relationship between open circuit voltage and SOC for LFP cells.

8. **Packaging & Transportation**

Battery should be transported after packaging, during transportation should prevent violent vibration, impact or extrusion, sunshine and rain. It can be transported by cars, trains, ships, aircraft and other transportation.

9. **Storage & Maintenance**

When battery need long-term storage, please charge batteries to 50% capacity (after discharge, charging 2.5 hours of constant current 0.2 C), placed in dry and ventilated place, charge every three months. Battery should be stored in a clean, dry, ventilated place, avoid contacting with corrosive substances, be away from fire and heat source.

10. **Warnings and cautions in handling the lithium-ion battery**

1. Don't reverse the positive and negative terminals
2. Don't immerse the battery in water
3. Don't charge the battery under fire or very hot situation, don't use and leave the battery near a heat source, such as fire or heater.
4. Don't pierce the battery with a nail or other sharp object. Don't strike, throw or trample the battery.
5. Don't decompose battery!

11. **Storage & Maintenance**

- NORTHBATT S.A. will not be responsible when accidents caused by operations done under violating this specification.
- NORTHBATT S.A. will not inform when the content of this specification has any changes for product quality improving or upgrading relative technical specification. Please ask for the latest information about the latest product.