



EUROPA BATTERIES

ZI Rue Marc SANGNIER
45300 PITHIVIERS

☎: +33 (0) 238 300 080

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🌐: www.europa-batteries.com

PRODUCT SPECIFICATION

LiFePO₄ BATTERY

EU1212FJ





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1. SCOPE

The product specification describes the requirement of the LiFePO₄ Cell to be supplied to the customer by **EUROPA Batteries**. Should there be any additional information required by the customer, customer are advised to contact **EUROPA Batteries**.

2. DESCRIPTION

Rechargeable LiFePO₄ Battery

3. Model

EU1212FJ

4. GENERAL SPECIFICATIONS

4.1. Nominal Capacity	12Ah/min 11.5Ah (at 0.2C Discharge)
4.2. Charging Voltage	14.6V±0.05V
4.3. Average working Voltage	12.80V,@0.2C
4.4. Standard Charge Method	Constant Current and Constant Voltage (CC/CV) Current 0.2C Voltage 14.6V End Current 600mA
4.5. Maximum Charge	End time 4h Current 1C End time 2.5h
4.6. Standard Discharge	Constant Current (CC) Current 1C End Voltage 8.0V
4.7. Maximum Discharge	Current 1C, 3C peak
4.8. Cycle Life	Capacity≥80% Nominal Capacity after 1000 cycles
4.9. Weight of Bare Cell	Approx. 1.3Kg
4.10. Operating Temperature	Charge 0°C ~ 45 °C Discharge -20°C ~ 60°C
4.11. Storage Temperature	1 month -20°C ~ 45 °C 6 months -20°C ~ 35 °C

5. OUTLINE DIMENSION (UNIT: mm)

5.1. Dimension: max101mm (T) ×max99 mm (W) ×max152mm (L), refer to the attached drawing 1.

6. APPEARANCE

There shall be no such defect as deep scratch, flaw, crack, rust, leakage, which may adversely affect commercial value of the cell.



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7. TEST CONDITION AND DEFINITIONS

7.1. Measuring Equipment

1. Voltmeter

Inner impedance > 1000Ω per volt.

2. Ampere-meter

Total external resistance (ammeter and wire) < 0.01Ω.

3. Slide caliper

The slide caliper should have a scale of 0.02mm.

4. Impedance meter

The impedance meter should be operated at AC 1KHz.

7.2. Unless otherwise specified, all tests shall be performed at $(20 \pm 5)^\circ\text{C}$ and humidity of $(65 \pm 20)\%$ RH.

7.3. All tests shall be performed at the same charge voltage, per 7.1.

7.4. Definitions:

7.4.1. C Rate ("C"): The rate (milliamperes) at which a fully charged cell is discharged to its end voltage in one (1) hour.

7.4.2. C Capacity: The capacity (milliampere-hour) obtained during a C discharge. For test purposes, C is defined as the minimum rated capacity of the cell.

8. CHARACTERISTICS

8.1. Charge method:

8.1.1 Charging shall consist of charging at a 0.5C constant current rate until the cell voltage reaches 14.6V. The cell shall then be charged at constant voltage of 14.6 volts while tapering the charge current. Charging shall be terminated when the charging current has tapered to 350mA.

8.2. Discharge method:

8.2.1. Cells shall be discharged at a constant current of 1C to 8.0 volts @ $20^\circ\text{C} \pm 5^\circ\text{C}$

8.2.2. Cells shall be discharged at a constant current of C/2 to 8.0 volts @ $20^\circ\text{C} \pm 5^\circ\text{C}$

8.2.3. Cells shall be discharged at a constant current of C/5 to 8.0 volts @ $20^\circ\text{C} \pm 5^\circ\text{C}$

8.3. Weight of Bare Cell

Meet 4.9. by balance.

8.4. Internal Impedance

The impedance shall be measured at AC 1000 Hz initially.

Initial Internal Impedance $\leq 60\text{mohm}$

8.5. Discharge capacity (1C)

Within 1 hour after charge as per 4.6, discharge at 1C until end of discharge voltage.

The capacity $\geq 95\%$ of Nominal Capacity



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8.6. Cycle Life

Charge cells per 4.4 Rest 10 minutes. Discharge per 4.6. Rest 10 minutes before recharge. A cycle is defined as one charge and one discharge. Discharge capacity shall be measured after 1000 cycles. Discharge capacity (1000th Cycle) $\geq 80\%$ of Nominal Capacity

8.7. Storage Characteristics

After charge as per 4.4, store the testing cells at $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 28 days. Then discharge at 0.2C to 2.0V. Discharge capacity $\geq 85\%$ of Nominal Capacity

8.8. Temperature Characteristics

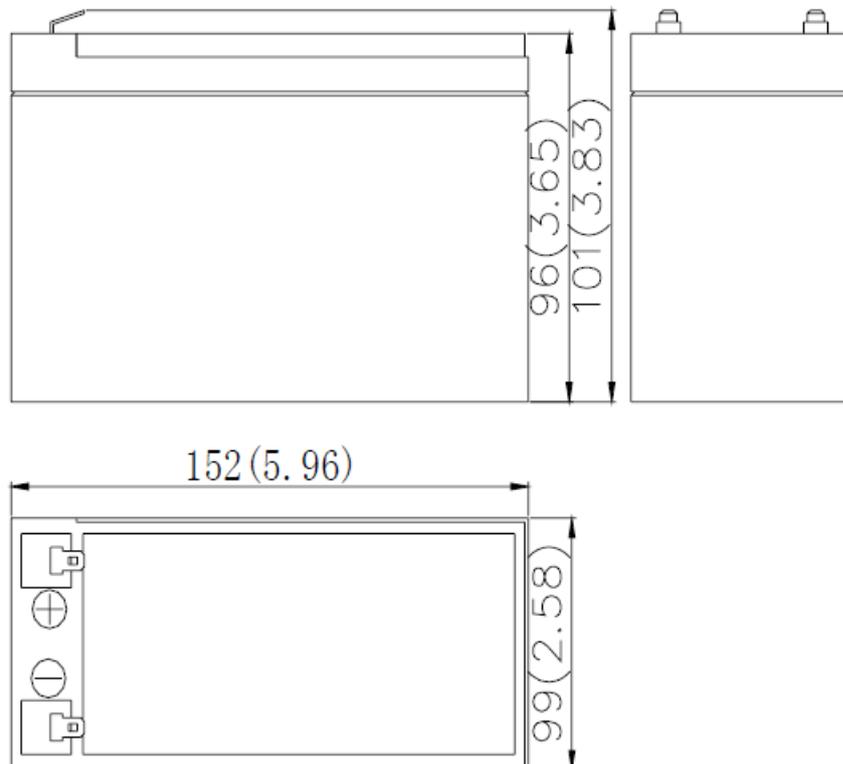
Cells shall be charged per 4.4 and discharged per 4.6. except to be discharged at temperatures per Table 1. Cells, full charged, shall be stored for 3 hours at the test temperature prior to discharging and then shall be discharged at the test temperature. The capacity of a cell at each temperature shall be compared to the capacity achieved at 20°C and the percentage shall be calculated. Each cell shall meet or exceed the requirements of Table 1.

Table 1

-10°C @0.5C	20°C@0.2C	60°C@ 1C
$\geq 40\%$ Nominal Capacity	12Ah	$\geq 90\%$ Nominal Capacity

8.9 Battery drawing:

See attached file according to customers different request.
 Drawing 1



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9. SAFETY

9.1. External Short-circuiting Test

Cell, charged per 4.4, is to be short circuited by connecting the positive and negative terminals of the cell with copper wire having a maximum resistance ≤ 50 mohms. Stop the test when the battery temperature decays to about 10 °C from the maximum.

Criteria: No Explosion, No Fire

9.2. Overcharge Test

Overcharge test take constant current and constant Voltage. Charging at 3A firstly, the voltage increase following charging time. When voltage reach 40V, cell charge with constant voltage, the current decreases gradually. Stop the test when battery temperature decays to about 10°C from the maximum or the current decays to less than 350mA.

Criteria: No Explosion, No Fire

9.3. Tack Through

Hitting the battery with a nail of diameter 2.5~5.0mm for 6h , end test

Criteria: No Fire, No Explosion

9.4. Heating Test

Cell, Charged per 4.4, is to be heated in a gravity convection or circulating air oven. The temperature of the oven is to be raised at a rate of $(5\pm 2)^{\circ}\text{C}/\text{min}$ to a temperature of $(130\pm 2)^{\circ}\text{C}$ and remain for 60 minutes at that temperature before the test is discontinued.

Criteria: No Explosion, No Fire

9.5. Pressing test

Fix the testing cells in the middle of bottom armor plate, pressing the cells with 13kN.

Criteria: No Explosion, No Fire

10. Danger and Warning and Cautions in handing the battery

Danger Warning

Danger warning(it should be described in manual or instruction for users, indicated especially)To prevent the possibility of the battery from leaking, heating, explosion,

Please observe the following precautions:

1. Do not disassemble or reconstruct battery.
2. Do not short-circuit battery
3. Do not use or leave battery nearby fire, stove or heated place(more than 80 °C)
4. Do not immerse the battery in water or sea water , or get it wet
5. Do not charge battery nearby the fire or under the blazing sun
6. Do use the specified charger and observe charging requirement
7. Do not drive a nail into the battery. Strike it by hammer, or tread it
8. Do not give battery impact or fling it
9. Do not use the battery with conspicuous damage or deformation
10. Do not make the direct soldering on battery
11. Do not reverse charge or overdischarge the cell
12. Do not reverse-charge or reverse-connect

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13. Do not connect battery to the plug socket or car-cigarette-plug
14. Do not use battery for unspecified equipment
15. Do not touch a leaked battery directly

Warning

1. Do not use Lithium ion battery in mixture
2. Keep the battery away from babies
3. Do not get into a microwave or a high pressure container
4. Do not use a leaked battery nearby fire
5. Do not use an abnormal battery

Caution

1. Do not use or leave the battery under the blazing sun(or heated car by sunshine). The battery may smoke, heat or flame. And also, it might cause the deterioration of battery's characteristics or cycle life.
2. Do not use nearby the place where generates static electricity (more than 64V).
3. Do not charge the battery out of recommended temperature range of 0°C and 60°C.
4. When the battery has rust, bad smell or something abnormal at first-time-using, do not use the equipment and go to bring the battery to the shop which it was bought.
5. In case children use the battery, their parents teach how to use batteries according to the manual with care.
6. If the skin or cloth is smeared with liquid from the battery, wash with fresh water.