

Prepared Date	2013-05-03
Approved Date	
Part No.	IFM12-90E2
Page No.	1/7
Version	A

Lithium iron Phosphate Battery Specification

MODEL: IFM12-90E2 (12.8V 9.0Ah)

Prepared By/Date	Checked By/Date	Approved By/Date

Customer Approval	Signature/Date
	Company Name
	Company Stamp

Prepared Date	2013-05-03
Approved Date	
Part No.	IFM12-90E2
Page No.	2/7
Version	A

Amendment Records

Edition	Description	Prepared by	Approved by	Date
A	First Edition	Hao	Menglei	2012-12-10
B	Second Edition	Hao	Menglei	2013-05-03

Sample BOM

物料编码	物料名称	规格型号	备注
0801020113	电芯 CELL	IFR18650EC-1.5Ah	
0104132099	保护板 PCBA	PCBA-F04S012-B-99-	
0103010016	包装 Package	ABS+PC housing/ ABS+PC 塑胶外壳	

Remark: For more information Please read SJZDB005 (BOM)

1. Scope

This specification is applied to the LiFePO4 battery pack distributed by Master Instruments Pty Ltd.

2. Product Specification

Table 1 (表 1)

No.	Item	General Parameter	Remark
1	Rated Capacity (额定容量)	9.0Ah	Standard discharge (0.2 C ₅) after standard charge (0.2 C ₅) (0.2C 标准充电后 0.2 C ₅ 标准放电)
2	Minimal Rated Capacity (最小容量)	8.5Ah	
3	Nominal Voltage (标称电压)	12.8V	
4	Life Exception (预估寿命)	Higher than 60% of the Initial Capacity of the Cells (初始容量的 60%)	<ul style="list-style-type: none"> ◆ Charge: CC@0.2C to 14.6V, then CV till current to 0.05C ◆ Rest: 30min. ◆ Discharge: 0.2C to 10.0V ◆ Temperature: 20±5°C ◆ Carry out 1000cycles ◆ 先以 0.2 C₅ 恒流充电至 14.6V, 再恒压充电至电流小于 0.05C ◆ 搁置: 30min. ◆ 放电: 0.2 C₅ 放至 10.0V ◆ 温度: 20±5°C ◆ 循环 1000 次 100%DOD
5	Discharge cut-off voltage (放电截止电压)	≥ 9.2V	10.0V (recommended) 10.0V (推荐值)
6	Charging cut-off voltage (充电截止电压)	≤ 15.6V	14.6V (recommended) 14.6V (推荐值)
7	Cell and assembly method (电芯和组装方式)	IFR18650EC-1.5AH	4S6P
8	Housing material (外壳材料)	ABS+PC housing/ ABS+PC 塑胶外壳	Flame retardant plastic 阻燃材料

Continuous the table 1

No.	Item	General Parameter	Remark
9	Standard charge (标准充电)	0.2C constant current(CC) charge to 14.6V,then constant voltage (CV) 14.6V charge till charge current decline to $\leq 0.05C$ 0.2C 恒流充电至 14.6V, 再恒压 14.6V 充电直至充 电电流 $\leq 0.05C$	Charge time : Approx 7h (充电时间:大约 7 个小时)
10	Standard discharge (标准放电)	Constant current 0.2C Cut-off voltage 10.0V (持续电流: 0.2C 截止电压:10.0V)	
11	Maximum Charge Current (最大充电电流)	9.0A	$\leq 9A$ (recommended) $\leq 9A$ (推荐值)
12	Maximum Continuous Discharge Current (最大持续放电电流)	12 A	Over current 75 \pm 20A 9mS 过流值 75 \pm 20A 9 毫秒
13	Maximum Continuous Output Power (最大持续输出功率)	120W	
14	Operation Temperature Range (工作温度范围)	Charge (充电) : 5~45°C	60 \pm 25% R.H. 23 \pm 5°C (recommended) 推荐 23 \pm 5°C
		Discharge (放电) : -10~60°C (cell surface temperature $\leq 80^\circ C$)	
15	Storage Temperature Range (储存温度范围)	Less than 1 year : 0~25°C (小于一年: 0~25°C)	60 \pm 25% R.H. at the shipment state (出货态时的湿度范围) 23 \pm 5°C (recommended) 推荐 23 \pm 5°C
		Less than 3 months:-10~35°C (小于 3 个月:-10~35°C)	
16	Weight (重量)	Approx/大约: 1.2Kg	IFR18650EC-1.5Ah
17	Max. Dimension (最大尺寸)	Height/高度:94mm	
		Width/宽度: 65mm	
		Length/长度: 151mm	

Prepared Date	2013-05-03
Approved Date	
Part No.	IFM12-90E2
Page No.	5/7
Version	A

3. Performance And Test Conditions

3.1 Standard Test Conditions

Test should be conducted with new batteries within one week after shipment from our factory and the batteries shall not be cycled more than five times before the test. Unless otherwise specified, test and measurement shall be done under temperature of $20\pm 5^{\circ}\text{C}$ and relative humidity of 45~85%. If it is judged that the test results are not affected by such conditions, the tests may be conducted at temperature 15~30°C and humidity 25~85%RH.

3.2 Measuring Instrument or Apparatus

3.2.1 Dimension Measuring Instrument

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm.

3.2.2 Voltmeter

Standard class specified in the national standard or more sensitive class having inner impedance more than $10\text{k}\Omega/\text{V}$

3.2.3 Ammeter

Standard class specified in the national standard or more sensitive class. Total external resistance including ammeter and wire is less than 0.01Ω .

3.2.4 Impedance Meter

Impedance shall be measured by a sinusoidal alternating current method (1kHz LCR meter).

3.3 Standard Charge/Discharge

3.3.1 Standard Charge : 0.2C

Charging shall consist of charging at a 0.2C constant current rate until the battery reaches 14.6V. The battery shall then be charged at constant voltage of 14.6V volts while tapering the charge current. Charging shall be terminated when the charging current has tapered to $0.05\text{ C}_5\text{A}$. Charge time: Approx 7.0h, The battery shall demonstrate no permanent degradation when charged between 5 °C and 45 °C.

Prepared Date	2013-05-03
Approved Date	
Part No.	IFM12-90E2
Page No.	6/7
Version	A

3.3.2 Standard Discharge : 0.2C

Battery shall be discharged at a constant current of 0.2C to 10.0V @ 20° ± 5C

3.3.3 If no otherwise specified, the rest time between charging and discharging is 30min.

3.3.4 LT Discharge performance: Cell 0.2C discharge to 1.5V at -20°C , Higher than 65% of the Initial Capacity of the cell, (after full standard charged) Pack's LT Discharge performance is decided by PCM.

3.4 Appearance

There shall be no such defect as crack, rust, leakage, which may adversely affect commercial value of battery.

4. Handling of battery

4.1 Prohibition short circuit

Never short circuit battery. It generates very high current which causes heating of the battery and may cause electrolyte leakage, gassing or explosion that is very dangerous.

The poles may be easily short-circuited by putting them on conductive surface.

Such outer short circuit may lead to heat generation and damage of the battery.

An appropriate circuitry with PCM shall be employed to protect accidental short circuit of the battery pack.

4.2.Mechanical shock

Falling, hitting, bending, etc. may cause degradation of battery characteristics.

5. Others

Prevention of short circuit within a battery pack

Enough insulation layers between wiring and the cells shall be used to maintain extra safety protection.

The battery pack shall be structured with no short circuit internally, which may cause generation of smoke or firing.

6. Period of Warranty

The period of warranty is 12 months from the date of INVOICE. Master Instruments guarantees to give a replacement in case of battery with defects proven due to manufacturing process instead of the customer abuse and misuse.

Prepared Date	2013-05-03
Approved Date	
Part No.	IFM12-90E2
Page No.	7/7
Version	A

7. Storing the Batteries

The batteries should be stored at room temperature, charged to about 30% to 50% of capacity. We recommend that batteries be charged about once per three months to prevent over-discharge.

8. Other Chemical Reaction

Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage. If the batteries cannot maintain a charge for long periods of time, even when they are charged correctly, this may indicate it is time to change the battery.

9. Photo:



10. Any other items which are not covered in this specification shall be agreed by both parties.