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|  | 欧赛新能源科技股份有限公司                              | 签发日期  | 2023 年 10 月 7 日 |
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|                                                                                  | IFB3-18-d-E2-18650-01<br>(3.2V1.8Ah) 产品规格书 | 页次    | 1 /7            |
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Customer/客户: \_\_\_\_\_

Lithium iron Phosphate Battery  
Specification  
磷酸铁锂电池说明书

MODEL: IFB3-18-d-E2-18650-01  
(3.2V1.8Ah) 产品规格书

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| Prepared By/Date<br>编 制/日 期 | Checked By/Date<br>审 核/日 期 | Approved By/Date<br>批 准/日 期 |
|                             |                            |                             |

|                   |                       |
|-------------------|-----------------------|
| Customer Approval | Signature/Date(签名/日期) |
|                   |                       |
|                   | Company Name(公司名称)    |
|                   |                       |
|                   | Company Stamp(公司印章)   |
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| Amendment Records<br>(修正记录) |                      |                      |                      |               |
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| A0                          | First Edition        | Yang.Li              | S.F.Wang             | 2023.10.7     |
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## 1. Scope（范围）

This specification is applied to the LiFePO4 battery pack manufactured by O’CELL Technology Co., Ltd.

本说明书适用于本书中所提及的欧赛科技有限公司制造的磷酸铁锂电池组。

## 2. Product Specification（产品技术规格）

| No. | Item<br>项目                                            | Specification<br>规格 | Remark<br>备注                                  |
|-----|-------------------------------------------------------|---------------------|-----------------------------------------------|
| 1   | Cell mode<br>(电芯型号)                                   | IFR 18650           |                                               |
| 2   | Rated capacity<br>(额定容量)                              | 1.8Ah               | Standard 0.2C<br>charge and 0.2C<br>discharge |
| 3   | Minimum capacity<br>(最小容量)                            | 1.71Ah              |                                               |
| 4   | Rated energy<br>(额定能量)                                | 5.76Wh              |                                               |
| 5   | Rated voltage<br>(额定电压)                               | 3.2V                |                                               |
| 6   | Resistance<br>(内阻)                                    | ≤90m Ω              | 1kHz LCR meter                                |
| 7   | Charging cut-off voltage<br>(充电截止电压)                  | ≤3.65V              |                                               |
| 8   | Discharge cut-off voltage<br>(放电截止电压)                 | ≥2.5V               |                                               |
| 9   | Standard charging method<br>(标准充电)                    | 0.36A               | 0.2C                                          |
| 10  | Standard discharging method<br>(标准放电)                 | 0.36A               | 0.2C                                          |
| 11  | Maximum charge current<br>(最大充电电流)                    | 1.8A                |                                               |
| 12  | Maximum continuous discharge<br>current<br>(最大持续放电电流) | 1.8A                |                                               |

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Continuous the table 1 （续 表 1）

| No. | 项目 Item                         | 规格 Specification      | 备注 Remark           |
|-----|---------------------------------|-----------------------|---------------------|
| 13  | Cycle Life<br>(循环寿命)            | ≥2000 次               | 25℃,<br>0.2C,80%DOD |
| 14  | Housing Material<br>(外壳材料)      | PVC                   | Blue                |
| 15  | Weight<br>(净重)                  | ≈46g                  |                     |
| 16  | Operation Temperature<br>(工作温度) | 充电 Charge: 0~45℃      |                     |
|     |                                 | 放电 Discharge: -20~60℃ |                     |
| 17  | Storage Temperature<br>(存储温度)   | 1 year : 0~25℃        |                     |
|     |                                 | 3 months:-10~35℃      |                     |
| 18  | Relative Humidity<br>(存储相对湿度)   | 65±20%                |                     |
| 19  | Dimension<br>(尺寸)               | Length/长度: 69±1mm     |                     |
|     |                                 | Width/宽度: 19±1mm      |                     |
| 20  | Outline<br>(出线)                 | AWG22 100±5mm         |                     |

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### 3. Performance And Test Conditions (电池性能及测试条件)

#### 3.1 Standard Test Conditions (标准测试条件)

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  $20\pm5^{\circ}\text{C}$  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  $15\sim30^{\circ}\text{C}$  and humidity 25~85%RH.

测试必须使用出厂时间不超过一个星期的新电池，且未进行过五次以上的充放电循环。除非特别说明，否则测试会在温度  $20\pm5^{\circ}\text{C}$ ，相对湿度 45~85%的条件下进行。如果经鉴定测试结果不受上述条件影响，测试也可以在温度  $15\sim30^{\circ}\text{C}$ ，相对湿度 25~85%RH 的条件下进行。

#### 3.2 Measuring Instrument or Apparatus (测量器具及设备)

##### 3.2.1 Dimension Measuring Instrument (尺寸测量器具)

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

尺寸测量器具的精度等级应不小于 0.01 mm。

##### 3.2.2 Voltmeter (伏特计)

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

按照国家标准指定规格等级或采用灵敏度更高的，测量电压时内阻不应小于  $10\text{k}\Omega/\text{V}$ 。

##### 3.2.3 Ammeter (安培计)

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

按照国家标准指定规格等级或采用灵敏度更高的，包括电流表及电线在内的总电阻应小于  $0.01\Omega$ 。

##### 3.2.4 Impedance Meter (电阻计)

Impedance shall be measured by a sinusoidal alternating current method (1kHz LCR meter). 内阻测试仪测量原理应为交流阻抗法 (1KHz LCR)。

#### 3.3 Standard Charge/Discharge (标准充放电)

##### 3.3.1 Standard Charge : 0.2C

标准充电: 0.2C

Charging shall consist of charging at a 0.2C constant current rate until the battery reaches 3.65V. The battery shall then be charged at constant voltage of 3.65V while tapering the charge current. Charging shall be terminated when the charging current has tapered to 0.05C Charge time: Approx 5.5h, The battery shall demonstrate no permanent degradation when charged between  $5^{\circ}\text{C}$  and  $45^{\circ}\text{C}$ .

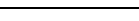
电池先以 0.2C 恒流充电至 3.65V，再以 3.65V 恒压充电至电流减小到 0.05C，充电时间大约为 5.5 个小时。在  $0^{\circ}\text{C}\sim45^{\circ}\text{C}$  内充电电池应没有永久损害。

##### 3.3.2 Standard Discharge : 0.2C

标准放电: 0.2C

Battery shall be discharged at a constant current of 0.2C to 2.5V @  $20^{\circ}\pm5^{\circ}\text{C}$

电池以 0.2C 恒流放电至 2.5V@  $20^{\circ}\pm5^{\circ}\text{C}$

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

如果没有特别说明，电池充放电间隔时间为 30 分钟。

### 3.4 Appearance (外观)

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

电池外观应没有破裂、污渍、生锈、漏液等影响市场价值的缺陷存在。

## 4. Handling of battery (电池操作注意事项)

### 4.1 Prohibition short circuit (禁止电池短路)

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.

避免电池短路。短路会产生很高的电流而使电池发热以及电解液泄漏，产生有毒气体或爆炸是非常危险的。电极端连接在导电物体表面很容易短路，外部短路会导致发热及损害电池。选用一个适当的保护电路可以在意外短路时保护电池。

### 4.2 Mechanical shock (机械撞击)

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

跌落、碰撞、弯曲等等都可能会降低电池的性能。

## 5. Period of Warranty (保质期)

The period of warranty is 18 months from the date of shipment. O'CELL guarantees to give a replacement in case of battery with defects proven due to manufacturing process instead of the customer abuse and misuse.

电池的保质期从出货之日算起为 18 个月。如果证明电池的缺陷是在制造过程中形成的而不是由于用户滥用及错误使用造成，本公司负责退换电池。

## 6. Storing the Batteries (电池的存放)

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.

电池应当在室温下存放，应充到 30%至 50%的电量。如长时间储存，建议每三个月充一次电以防止电池过放电。

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## 7.Photo: (照片)



## 8.Specification of PCM(保护板参数)

| No. | Item(项目)                         |                                              | Parameter (参数)                 |
|-----|----------------------------------|----------------------------------------------|--------------------------------|
| 1   | Voltage 电压                       | Charging voltage/充电电压                        | DC:3.6V                        |
|     |                                  | Balancing voltage/均衡电压                       | /                              |
| 2   | Current 电流                       | Balancing current/均衡电流                       | /                              |
|     |                                  | Self-consume current/静态电流                    | ≤7uA                           |
|     |                                  | Max. continuous charging current 最大持续充电电流    | 2A                             |
|     |                                  | Max. continuous discharging current 最大持续放电电流 | 2A                             |
| 3   | Over-charging protection 过充保护    | Over-charging voltage/过充电压                   | 3.65±0.025V/cell               |
|     |                                  | Over-charging release voltage/过充恢复电压         | 3.65±0.05V/cell                |
| 4   | Over-discharging Protection 过放保护 | Over-discharging voltage/过放电压                | 2.5±0.06V/cell                 |
|     |                                  | Over-discharging release voltage/过放恢复电压      | 2.5±0.1V/cell                  |
| 5   | Over-current protection 过流保护     | Over discharge current detection/过放电流保护      | 5±2A                           |
|     |                                  | Over-current delay time/过流延时                 | 8-16ms                         |
|     |                                  | Release condition/恢复条件                       | Remove load<br>移除负载            |
| 6   | Short circuit protection 短路保护    | Function condition/功能条件                      | External short circuit<br>外部短路 |
|     |                                  | Release condition/恢复条件                       | Remove short<br>断开短路           |
| 7   | Impedance 内阻                     | Protection circuitry (MOSFET)保护电路            | ≤60mΩ                          |

**9. Any other items which are not covered in this specification shall be agreed by both parties (本说明书未包括事项应由双方协议确定)**