



# 产品规格书

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## 280Ah 产品规格书

## Product Specification of 280Ah Cell

型号 MODEL: GSP71173204F

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## 1 适用范围 Scope of application

本说明书只适用于描述本规格书中相关的产品以及广州鹏辉能源科技股份有限公司提供的电池。

This document is applied to describe the related battery product in this specification and the battery/cell supplied by Guangzhou Great Power Energy & Technology CO. Ltd only.

## 2 电芯规格 Cell specification

### 2.1 概要 General

No.	参数 Parameter	产品规格 Specification	条件 Condition
2.1.1	标称容量 Nominal capacity	280Ah	参考 2.2 与 2.3 标准充放电模式测试 Refer to 2.2&2.3 standard charge and discharge procedure
2.1.2	标称能量 Nominal energy	896Wh	
2.1.3	工作电压 Operation voltage	2.5~3.65V 2.0~3.65V	电芯温度 $T > 0^{\circ}\text{C}$ Cell temperature $T > 0^{\circ}\text{C}$ 电芯温度 $T \leq 0^{\circ}\text{C}$ Cell temperature $T \leq 0^{\circ}\text{C}$
2.1.4	电池内阻 Impedance(1KHz)	0.15~0.25m $\Omega$	新电池状态(40%SOC) Fresh cell (40%SOC)
2.1.5	出货容量 Shipping capacity	112 $\pm$ 1.5Ah	40%SOC
2.1.6	出货电压 Shipping voltage	3.290~3.310V	40%SOC 电芯下线 12h 内 Within 12h after cell production
2.1.7	月自放电 Residual capacity loss	$\leq 3.5\%$ /月 Per month $\leq 3.5\%$	出货三个月以后的电芯, 标准充电到 40%SOC, 25 $\pm$ 2 $^{\circ}\text{C}$ 储存 Fresh cell after 3 month, 40%SOC, 25 $\pm$ 2 $^{\circ}\text{C}$ storage
2.1.8	工作温度(充电) Operating temperature (charging)	0~60 $^{\circ}\text{C}$	参考第 2.2 节 Reference to paragraph 2.2
2.1.9	工作温度(放电) Operating temperature (discharging)	-20~60 $^{\circ}\text{C}$	参考第 2.3 节 Reference to paragraph 2.2
2.1.10	电池重量 Cell weight	5.27 $\pm$ 0.30kg	N.A.
2.1.11	存储温度 Storage temperature	-20~60 $^{\circ}\text{C}$	存储环境湿度 < 85%ROH, 无凝露 Storage ambient humidity < 85% ROH, no condensation
2.1.12	电池尺寸 Typical dimension (W*H*T)	宽度(Width): 173.9 $\pm$ 0.5mm 高度(Height): 207.3 $\pm$ 0.5mm 厚度(Thickness): 71.7 $\pm$ 0.8mm	300 $\pm$ 20Kgf 压力下, 新鲜电池 (详见本技术协议第 3 条) Thickness with compression force (300 $\pm$ 20Kgf), Height with Terminal, BOL (Reference to item 3)
2.1.13	静置 SOC Rest SOC	$\geq 5\%$	无负载或充电时的 SOC 区间 SOC interval without load or charging

## 2.1 概要 General (续上表 continuous)

No.	参数 Parameter	产品规格 Specification	条件 Condition
2.1.14	应用海拔 Altitude	$\leq 4000\text{m}$	N.A.
2.1.15	可充放电次数 Cycle performance	$\geq 6000\text{Cycles}$	$25\pm 2^{\circ}\text{C}$ 初始夹紧力 $300\pm 20\text{Kgf}$ , 标准充放电测试, 80%额定容量 $25\pm 2^{\circ}\text{C}$ , cycle test by the standard charge and discharge method under $300\pm 20\text{Kgf}$ preload, 80% nominal capacity
2.1.16	循环衰减 Cycle fading	$\leq 5\%$	$25\pm 2^{\circ}\text{C}$ 初始夹紧力 $300\pm 20\text{Kgf}$ , 标准充放电测试循环 200 圈 $25\pm 2^{\circ}\text{C}$ , cycle test by the standard charge and discharge method under $300\pm 20\text{Kgf}$ preload for 200 cycles
2.1.17	存储衰减 Storage fading	$\leq 5\%$	$25\pm 2^{\circ}\text{C}$ 初始夹紧力 $300\pm 20\text{Kgf}$ , 标准充电至 100%SOC 存储 6 个月 $25\pm 2^{\circ}\text{C}$ , standard charging to 100% SOC storage under $300\pm 20\text{Kgf}$ preload for 6 month

## 2.2 充电模式/参数 Charging/Parameter

No	参数 Parameter	产品规格 Specification	条件 Condition
2.2.1	标准充电电流 Standard charge Current	0.5C	$25\pm 2^{\circ}\text{C}$
2.2.2	标准充电电压 Standard charge voltage	单体电池最大 3.65V Cell max voltage 3.65V	N.A.
2.2.3	标准充电模式 Standard charge method	0.5C 恒流恒压充电至 3.65V, 截至电流 0.05C 0.5C CC-CV charge to 3.65 V, cut off 0.05C	
2.2.4	标准充电温度 Standard charge temperature	$25\pm 2^{\circ}\text{C}$	电芯温度 Cell Temperature
2.2.5	绝对充电温度 (电芯温度) Absolute charging temperature (Cell Temperature)	$0\sim 60^{\circ}\text{C}$	无论电芯处在何种充电模式, 一旦发现电芯温度超过绝对充电温度范围即停止充电 No matter what charge mode the battery is in, stop charging once the cell temperature exceeds absolute charge temperature range
2.2.6	绝对充电电压 Absolute charging voltage	最大 3.65V Max 3.65V	无论电芯处在何种充电模式, 一旦发现电芯电压超过绝对充电电压范围即停止充电 No matter what charge mode the battery is in, stop charging once the cell voltage exceeds absolute charge voltage

### 2.2.7 其他充电条件(模式)C-Rate Other charge Condition (C-Rate)

#### 2.2.7.1 持续充电 Constant charge

电芯温度/ $^{\circ}\text{C}$ Cell Temperature $^{\circ}\text{C}$		0	5	10	15	20	25	45	50	55	60
最大充电电流/C Max charge current/C	0%~100%SOC	0	0.1	0.3	0.5	0.8	1.0	0.8	0.5	0.25	0

备注: 数据供参考, 待更新。

PS: Data is for reference, to be updated.

## 2.3 放电模式/参数 Discharging/Parameter

No.	参数 Parameter	产品规格 Specification	条件 Condition
2.3.1	标准放电电流 Standard discharge current	0.5C	25±2℃
2.3.2	最大持续放电电流 Maximum discharge current (continuous)	1.0C	N.A.
2.3.3	放电截止电压 Discharge cut-off voltage	2.5V 2.0V	温度(Temp.) T>0℃ 温度(Temp.) T≤0℃
2.3.4	标准放电温度 Standard discharge temperature	25±2℃	电芯温度 Cell temperature
2.3.5	绝对放电温度 Absolute discharge temperature	-20~60℃	无论电芯处在持续放电模式或脉冲放电模式, 若电芯温度超过绝对放电温度, 则停止放电 Stop discharging once cell temperature is outside this range regardless of whether continuous or pulse current is adopted.

## 2.3.6 其他放电条件(模式) D-Rate Other discharge Condition (D-Rate)

电芯温度/℃ Cell Temperature/℃		0	5	10	15	20	25	45	50	55	60
最大放电电流/C Max discharge current/C	0%~100%SO C	0.2	0.2	0.3	1.0	1.0	1.0	1.0	0.5	0.5	0

## 2.4 高低温容量 High/Low temperature capacity

No.	参数 Parameter	产品规格 Specification	条件 Condition
2.4.1	55℃ 的容量 Capacity@55℃	≥274Ah	新电池状态, 55℃, 0.5C, 2.5V~3.65V Fresh cell, 55℃, 0.5C, 2.5V~3.65V
2.4.2	-20℃ 的容量 Capacity@-20℃	≥196Ah	新电池状态, -20℃, 0.5C, 2.0V~3.65V Fresh cell, -20℃, 0.5C, 2.0V~3.65V

备注: 数据待实测更新

PS: Data will be updated.

## 2.5 电芯温升 Cell temperature rise

本规格书中温升是指放电后的电池表面温度减去放电前的电池表面温度。电池温升的测量应在环境温度较为稳定且空间足够大的房间里进行。每个电池温度测量应选取经过校正的可以记录时间数据的温度感应器

The temperature rise refers to the surface temperature of the cell after discharge minus the surface temperature of the cell before discharge. The measurement of the temperature rise of the cell should be carried out in a room where the ambient temperature is relatively stable and the space is large enough. For each cell temperature measurement, a calibrated temperature sensor that records time data should be selected.

No.	参数 Parameter	产品规格 Specification	条件 Condition
2.5.1	持续放电温升 Continuous discharge temperature rise	$\leq 10^{\circ}\text{C}$	电池以标准放电模式进行放电 The cell is discharged in the standard discharge method
2.5.2	脉冲放电温升 Pulse discharge temperature rise	$\leq 5^{\circ}\text{C}$	在任何充电状态下, 每个电池以 500A 电流放电 10 秒 The cell is discharged at 500A for 10 s under any state of charge

## 2.6 电芯安全 Safety performance

No.	参数 Parameter	产品规格 Specification	条件 Condition
2.6.1	过充电试验 Over charge test	不起火, 不爆炸 No explosion, no fire	电池单体初始化充电, 电池单体以恒流方式充电至电压达到电池单体充电终止电压的 1.5 倍或时间达到 1h 时停止充电, 充电电流取 1C 与产品最大持续充电电流中的较小值, 观察 1h。 The cell is initially charged, and charged at constant current until the voltage reaches 1.5 times of the charging termination voltage or the time reaches 1h. The charge current is the smaller value between 1C and the maximum continuous charging current of the product, and the cell is observed for 1h.
2.6.2	过放电试验 Forced discharge test	不起火, 不爆炸 No explosion, no fire	电池单体初始化充电; 电池单体以恒流方式放电至时间达到 90min 或电压达到 0V 时停止放电, 放电电流取 1C 与产品的最大持续放电电流中的较小值; 观察 1h。 The cell is initially charged, and discharged at constant current until the time reaches 90 minutes or the voltage reaches 0V. The charge current is the smaller value between 1C and the maximum continuous charging current of the product, and the cell is observed for 1h.
2.6.3	短路试验 External short test	不起火, 不爆炸 No explosion, no fire	电池单体初始化充电; 将电池单体正、负极经外部短路 10min, 外部线路电阻应小于 $5\text{m}\Omega$ ; 观察 1h。 The cell is initially charged, and short-circuited by connecting the positive and negative terminals for 10min, and the resistance of the external line should be less than $5\text{m}\Omega$ , and the cell is observed for 1h.

## 2.6 电芯安全 Safety performance(续上表 continuous)

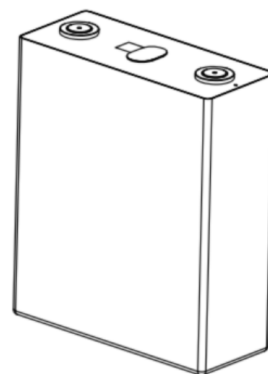
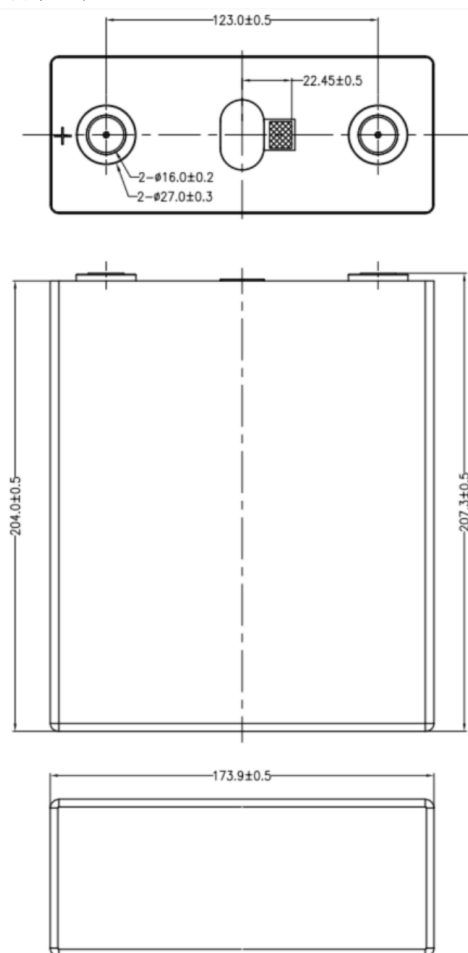
No.	参数 Parameter	产品规格 Specification	条件 Condition
2.6.4	挤压测试 Impact test	不起火, 不爆炸 No explosion, no fire	电池单体初始化充电; 放置在直径75mm的半圆柱体下, 以 $(5\pm 1)$ mm/s 的速度垂直于电池方向施压, 直到电压达到0V 或者变形量达到30%或挤压力达到 $13\pm 0.78$ kN, 保持10min后停止挤压; 观察1h。 The cell is initially charged, and placed under the diameter of 75mm semi-cylinder, and pressed perpendicular to the direction of the cell at $(5\pm 1)$ mm/s, until the voltage reaches 0V or the deformation amount reaches 30% or the extrusion force reaches $13\pm 0.78$ kN. Hold for 10min and stop extruding, and the cell is observed for 1h.
2.6.5	跌落试验 Drop test	不起火, 不爆炸 No explosion, no fire	电池单体初始化充电, 将电池单体的正极或负极端子朝下从1.5m高度处自由跌落到水泥地面上1次, 观察1h。 The cell is initially charged, and the positive or negative terminal of the cell is placed downwards and the cell drops down from the height of 1.5m to the cement floor once and the cell is observed for 1h.
2.6.6	低气压试验 Low pressure test	不起火, 不爆炸, 不漏液 No explosion, no fire, no leakage	电池单体初始化充电, 将电池单体放入低气压箱中, 将气压调节至 11.6kPa, 温度为 $(25\pm 5)$ °C, 静置 6h, 观察 1h。 The cell is initially charged, and placed into a low-pressure box, then the air pressure is adjusted to 11.6kPa, and the temperature is adjusted to $(25\pm 5)$ °C. Stand for 6h and the cell is observed for 1h.
2.6.7	加热试验 Thermal exposure test	不起火, 不爆炸 No explosion, no fire	电池单体初始化充电, 将电池放入加热试验箱, 以 5°C/min 的速率由环境温度升至 $(130\pm 2)$ °C, 并保持此温度 30min 后停止加热, 观察 1h。 The cell is initially charged, and placed in the heating test chamber, and the ambient temperature is increased to $(130\pm 2)$ °C at a rate of 5°C/min. Hold the temperature for 30min and stop heating, and the cell is observed for 1h.



## 2.6 电芯安全 Safety performance(续上表 continuous)

No.	参数 Parameter	产品规格 Specification	条件 Condition
2.6.8	热失控试验 Thermal runaway test	不起火, 不爆炸 No explosion, no fire	<p>电池单体初始化充电后, 再用 1C 恒流充电 12min; 启动加热装置对测试对象持续加热, 当发生热失控或监测点温度达到 300℃时, 停止触发, 关闭加热装置, 观察 1h。(发生热失控: 升温速率<math>\geq 1^{\circ}\text{C/s}</math>, 电池产生电压降或升温速率<math>\geq 1^{\circ}\text{C/s}</math>, 温度达到 300℃)</p> <p>The cell is initially charged, and charged with 1C constant current for 12min. Start the heating device to heat the test object. Stop triggering and close the heating device when thermal runaway occurs or the temperature of the monitoring point temperature reaches 300℃, and the cell is observed for 1h. (Thermal runaway occurs: heating rate <math>\geq 1^{\circ}\text{C/s}</math>, the cell voltage drops or heating rate <math>\geq 1^{\circ}\text{C/s}</math>, and the temperature reaches 300℃)</p>

## 3 电芯初始尺寸 Cell initial Dimensions



## 4 电池装配注意事项 Notice for assembling battery pack

在电池装配过程中不允许撞击、高温或接触尖锐部分。

Shocks, high temperature, or contacts of sharp edge components should not be allowed in battery pack assembling process.

### 4.1 电池连接 Cell connection

1) 严禁直接焊接引线或设备到电池上。

2) 极片在焊接引线之前应该先点焊到电池上, 直接与电池热焊接, 产生的热量会使电池的隔离体及绝缘体受损。

1) Direct soldering of wire leads or devices to the cell is strictly prohibited.

2) Lead tabs with pre-soldered wiring shall be spot welded to the cells. Direct soldering may cause damage of components, such as separator and insulator, by heat generation.

### 4.2 电池内部的短路预防 Prevention of short circuit within a battery pack

在电池和引线之间应该有足够的绝缘层用于安全保护。电池的包装构成应没有导致起烟起火的短路情况。

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 within the battery pack, which may cause generation of smoke or firing.

### 4.3 禁止拆卸 Prohibition of disassembly

1) 不要拆卸电池。

拆卸电池会发生电池内部短路, 会引起起火、爆炸、有害气体或者其它问题。

2) 电解液是有害的

万一电解液沾到皮肤、进入眼睛, 应立即用清水冲洗以及求助医生。

1) Never disassemble the cells

the disassembling may generate internal short circuit in the cell, which may cause gassing, firing, explosion, or other problems.

2) Electrolyte is harmful

LIP battery should not have liquid from electrolyte flowing, but in case the electrolyte come into contact with the skin, or eyes, physicians shall flush the electrolyte immediately with fresh water and medical advice is to be sought.

### 4.4 不要把电池倾倒入火中 Prohibition of dumping of cells into fire

不要焚毁电池, 否则会致电池爆炸, 这个很危险, 必须禁止。

Never incinerate nor dispose the cells in fire. these may cause explosion of the cells, which is very dangerous and is prohibited.

### 4.5 禁止浸泡电池 Prohibition of cells immersion into liquid such as water

请不要把电池浸泡在液体当中, 像清水、海水, 及非酒精饮料、果汁、咖啡或者其它的饮料。

The cells shall never be soaked with liquids such as water, seawater, drinks such as soft drinks, juices, coffee or others.

### 4.6 更换电池 Battery cells replacement

更换电池应由电池生产商或设备供应商完成, 用户不要自行更换。

The battery replacement shall be done only by either cells supplier or device supplier and never be done by the user.

### 4.7 禁止使用损坏的电池 Prohibition of use of damaged cells

电池可能在出货途中碰撞而受损。如果发现电池有异常, 例如包装损坏、电池包裹变形, 有电解液的味道、发现漏液等等, 不要再使用这些电池。

电池如果有电解液的味道或者出现漏液, 电池放置应该远离火源避免起火及爆炸。

The cells might be damaged during shipping by shock. If any abnormal features of the cells are found such as damages in a plastic envelop of the cell, deformation of the cell package, smelling of an electrolyte, an electrolyte leakage and others, the cells shall never be used any more.

The cells with a smell of the electrolyte or a leakage shall be placed away from fire to avoid firing or explosion.

## 5 保质期 Period of Warranty

电池的保质期从出货之日算起为三年。如果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。

The period of warranty is three year from the date of shipment. Great Power guarantees to give a replacement in case of cells with defects proven due to manufacturing process instead of the customer abuse and misuse.

## 6 电池的存放 Storage of the Batteries

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，建议每半年充一次电以防止电池过放电。

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 half a year to prevent over discharge.

## 7 其它化学反应 Other The Chemical Reaction

由于电池是利用化学反应的原理，所以随时间的增加电池的性能会降低，即使是存放很长一段时间而不使用。如果使用条件如充电、放电及周围环境温度等情形不在指定的使用范围内，会使缩短电池的使用寿命，或者会产生漏液导致设备损坏。如果电池长周期不能充电，即使充电方法正确，这样需要更换电池了。

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.

## 8 注释 Note

本说明书未包括事项应由双方协议确定。

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