



产品规格确认书

Specification Approval Sheet

产品名称Product name	堆叠式储能电池组 Stacked storage battery pack
产品型号Product model	PARTASTAR-6KW-10Kwh-P
客户名称Customer code	
文件编号Document number	PARTASTAR-P512200-OC100A-01
版本号Version number	V1.0
发行日期Issue date	2023-11-27

批准 Approved by	审核 examine	定制 formulate
客户确认 Customer confirmation	签字Autograph	日期Date
	公司名称Company Name:	
	公司签章Company Seal:	



目录

01、范围 Scope	2
02、产品简介 Product introduction	2
04、尺寸图 Dimensional picture	8
05、电池组基本参数 Basic battery string parameters	9
06、逆变器参数 Inverter parameter	10
07、BMS 参数 BMS parameter	11
08、BMS 基本配置 Basic BMS configuration	12
09、指示灯说明 LED light description	13
10、通讯说明 Communication specification	14
11、级联通讯 Communication in cascade	15
12、电池组主要物料 BOM/BOM of battery pack materials	16
13、电池组性能 Battery performance	16
14、电化学性能 Electrochemical performance	17
15、电芯安全性能 Cell safety performance	18



16、环境适应性能 Environmental adaptability	19
17、保质期及产品责任 Warranty Period & Product Liability	21
18、电池使用时警告事项及注意事项 Warnings and Cautions in Using the Battery.....	21



01、范围 Scope

本规范介绍了锂离子充电电池的基本性能、技术要求、测试方法、注意事项。本规范仅适用于深圳市国世康科技有限公司

This specification describes the basic performance, technical requirements, test methods and precautions of lithium-ion

rechargeable batteries. This specification is only applicable to Shenzhen Guoshikang Technology Co., LTD

02、产品简介 Product introduction

这是一款堆叠式模块化磷酸铁锂储能电池组，它由独立的电池模块和逆变器模块组成可依据用户需求搭配相应的容量和逆变器方便用户自由选择非常适合家用自发电系统。

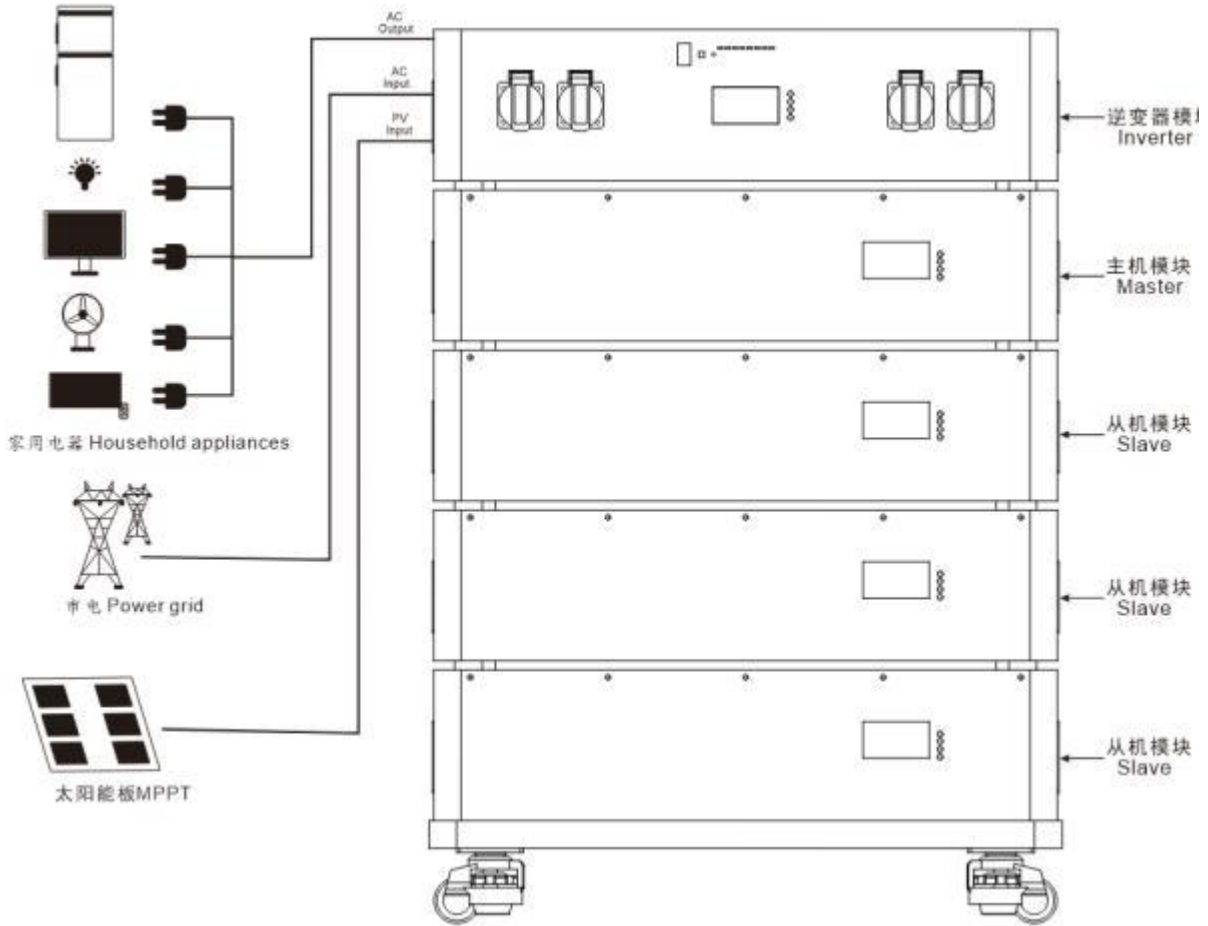
This is a stacked modular lithium iron phosphate energy storage battery pack, it is composed of independent battery module and inverter module can be based on user needs with the corresponding capacity and inverter convenient for users to freely

choose very suitable for home self-electric system

2.1 储能模块搭配逆变器模块的组合方式，储能模块的数量可根据用户需求自由选择，我们建议搭配数量不超过5个。

The combination of energy storage module and inverter module, the number of energy storage modules can be freely selected

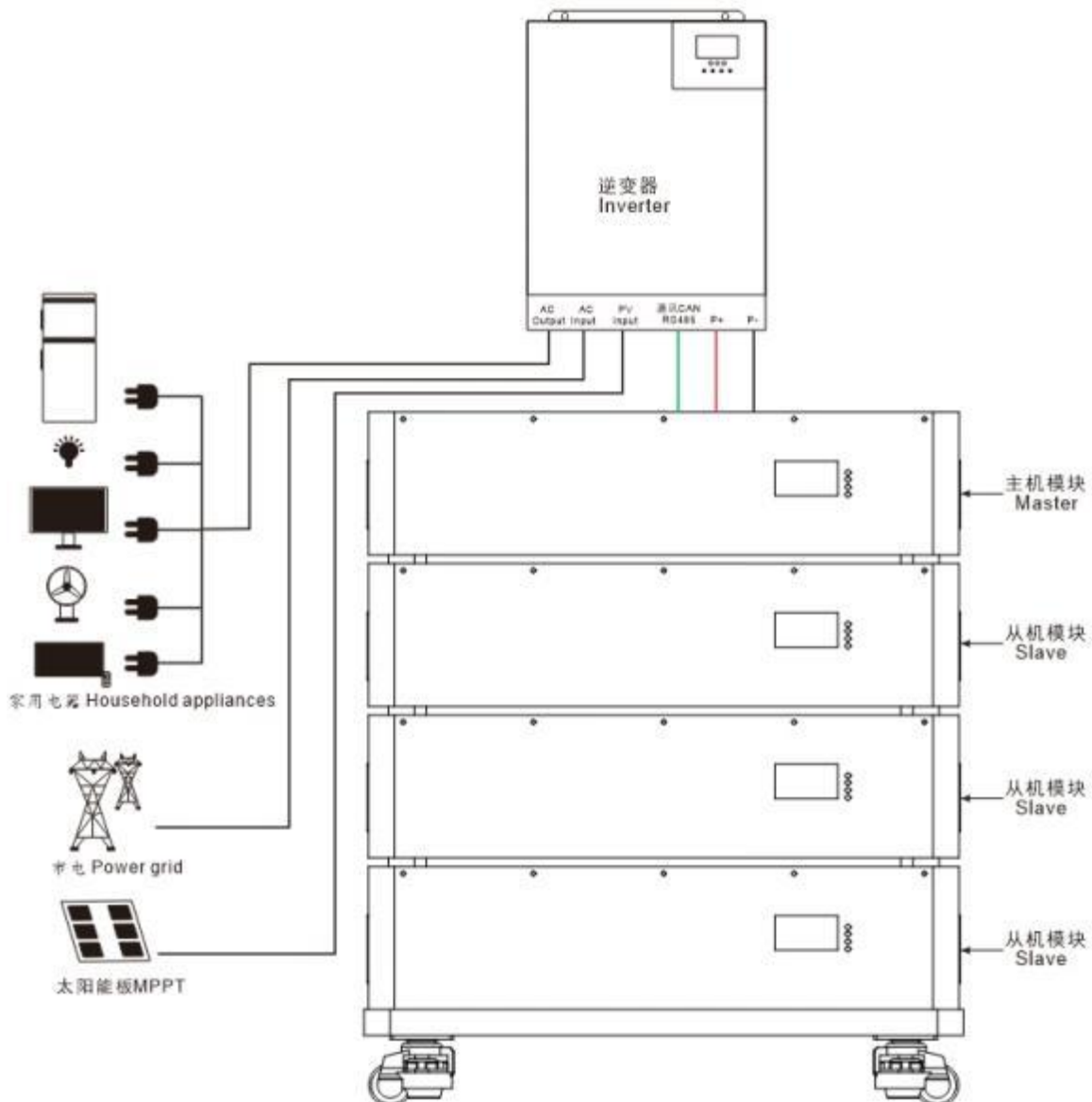
according to user needs, werecommend that the number of collocation is not more than 5.





2.1 储能模块搭配用户自己的逆变器组合方式，储能模块的数量可根据用户需求自由选择，我们建议搭配数量不超过5个，逆变器用户需选择48V电池电压的逆变器。

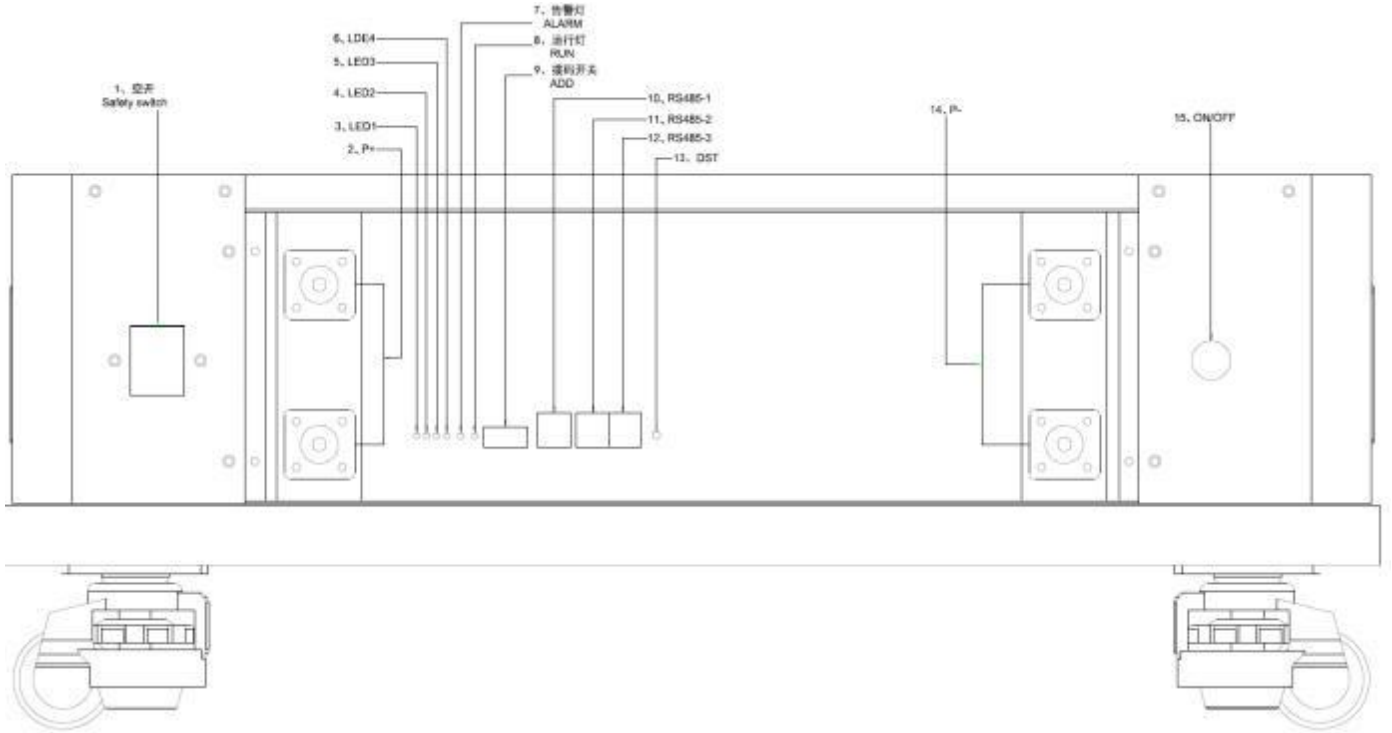
Energy storage module with the user's own inverter combination, the number of energy storage modules can be freely selected according to user needs, we recommend that the number of collocation is not more than 5, inverter users need to choose 48V battery voltage inverter





03、面板介绍 Panel introduction

3.1 储能电池面板 This section describes the energy storage battery panel





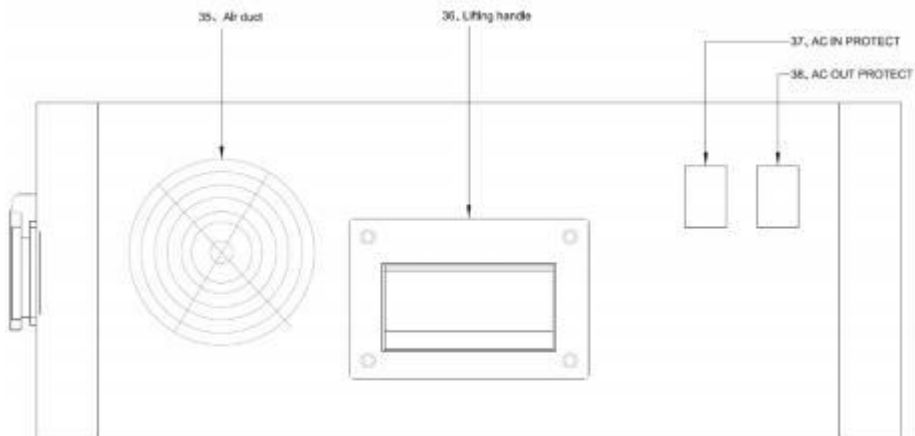
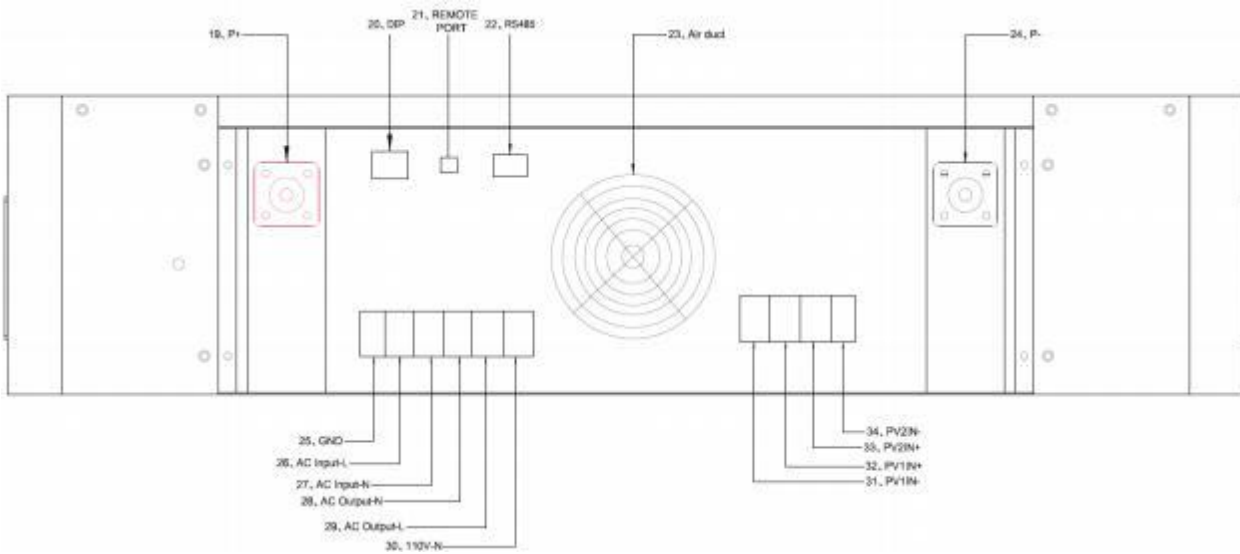
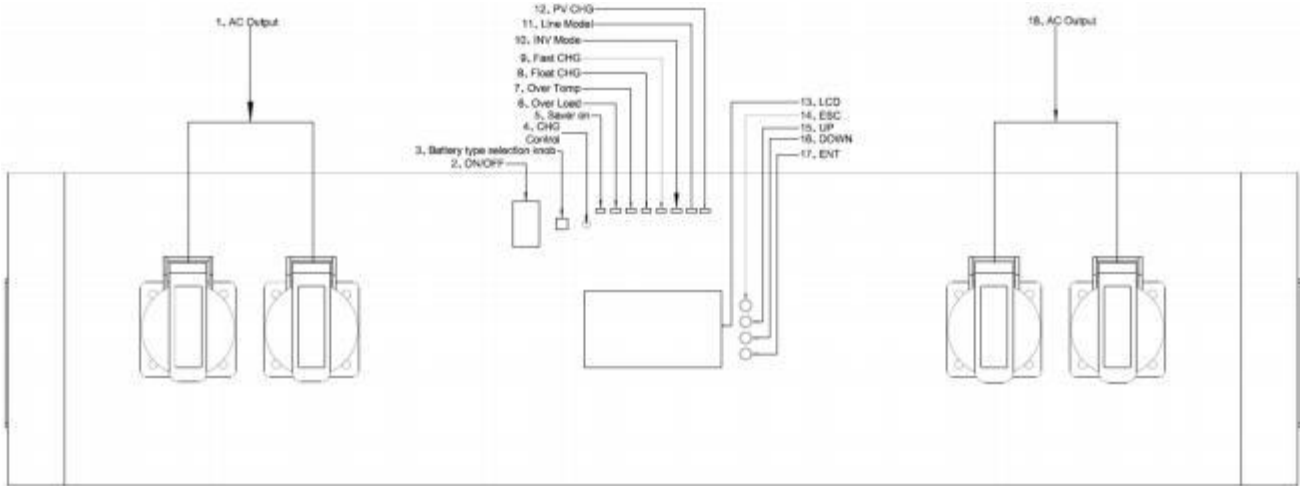
电池面板说明

Battery Panel Description

序号 Serial number	名称name	说明Instructions
1	空开 Safety switch	电池安全开关 Safety switch
2	P+	正极接线柱 Positive terminal
3	LED1	电量灯1 SOC1
4	LED2	电量灯2 SOC2
5	LDE3	电量灯3 SOC3
6	LED4	电量灯4 SOC4
7	ALM	告警灯 ALARM
8	RUN	运行灯 RUN
9	拨码开关ADD	在电池组作并联使用时, 可通过硬件地址区分不同PACK When battery packs are used in parallel, different packs can be distinguished by their hardware addresses
10	RS485-1	用于上位机和逆变器通讯 Used for communication between upper computer and inverter
11	RS485-2	用于并机时输入通讯 For simultaneous input communication
12	RS485-3	用于并机时输出通讯 For parallel machine output communication
13	DST	复位开关 Reset switch
14	P-	负极接线柱 Negative terminal
15	ON/OFF	弱点开关 Negative terminal
16	脚轮 Castor	方便移动 Easy to move
17	托盘 Tray	方便放置产品 Easy placement of products
18	提手 Lifting handle	方便搬运 Easy to handle
19	LCD	参数显示屏 Easy to handle
20	MANU	菜单键 Menu key
21	ENTER	确认键 Confirm key
22	DOWN	下翻键 Scroll down key
23	ESC	退出键 Scroll down key



3.2 逆变器面板介绍 This topic describes the inverter panel





逆变器面板说明 Inverter panel description

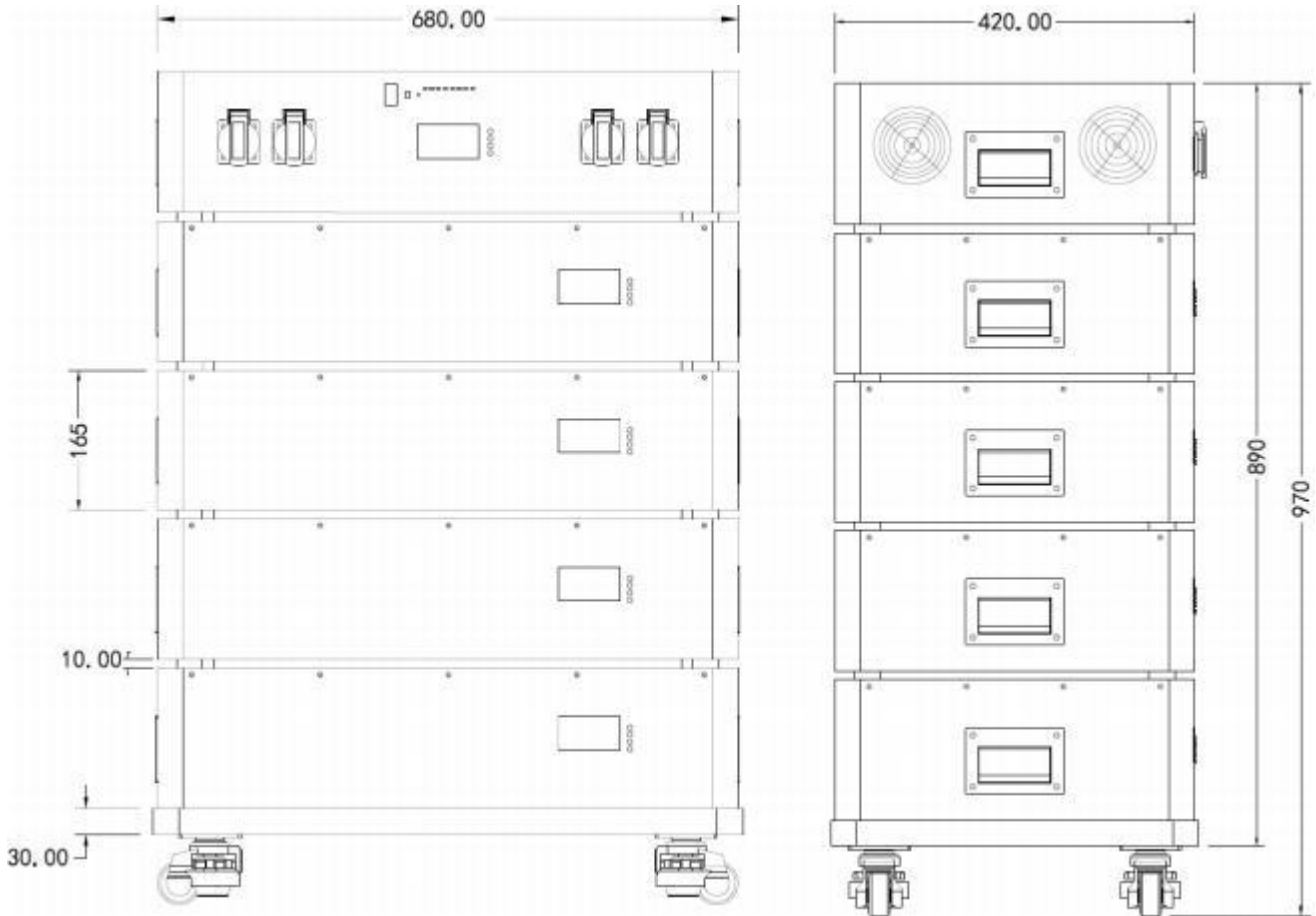
项item	名称name	说明Instructions
1	AC Output	交流电220V 输出 AC220V Output
2	ON/OFF	电源开关 Power switch
3	Battery type selection knob	电池类型选择 Battery typeselection knob
4	CHG Control	充电电流控制按键 Charge current control
5	Saver on	节能模式 Energy-saving mode
6	Over Load	超负荷指示灯 Overload warning
7	Over Temp	过温指示灯 Overtemperature indicator light
8	Float CHG	浮充模式 Floating charge mode indicator
9	Fast CHG	快充模式 Fast charge mode
10	INV Mode	逆变模式 Inverter mode
11	Line Mode	市电模式 Mains mode indicator
12	PV CHG	太阳能充电 Solar charging
13	LCD	显示屏 LCD
14	ESC	退出键 Cancel
15	UP	上翻键 Upward
16	DOWN	下翻键 Scroll down key
17	ENT	确认键 Confirm key
18	AC Output	交流电220V 输出 AC220V Output
19	P+	接电池正极 Connect to the negative battery terminal
20	DIP	拨码开关 Dip switch
21	REMOTE PORT	远程接口 Remote interface
22	RS485	用于与电池通讯 Used to communicate with the battery
23	Air duct	直流风扇 DC fan
24	P-	接电池负极 Connect to the negative battery terminal
25	GND	接地线 Ground wire
26	AC Input-L	接交流电输入220V 火线 Connect AC power input 220V live wire
27	AC Input-N	接交流电输入220V 零线 Connect to the AC input 220V neutral line
28	AC Output-N	接交流电输出220V 零线Connect to the AC output 220Vneutral line
29	AC Output-L	接交流电输出220V 火线Connect to AC output 220V live wire
30	110V-N	接交流电 110V输出零线 Connect to the AC 110V output neutral line
31	PVIN1-	太阳能输入 1 负极Connect to solar input 1 negative terminals
32	PVIN1+	太阳能输入 1 正极Connected to solar input 1 positive electrode



33	PVIN2+	接太阳能输入2 正极 Connected to solar input 2 positive electrode
34	PVIN2-	接太阳输入2 负极 Connect to solar input 2 negative terminals
35	Air duct	直流风扇 DC fan
36	Lifting handle	内嵌式提手便于搬运 The handle is easy to handle
37	AC IN PROTECT	交流输入保护器 Ac input protection switch
38	AC OUT PROTECT	交流输出保护器 Ac output protection switch



04、尺寸图 Dimensional picture





05、电池组基本参数 Basic battery string parameters

型号 Model	GSK-6KW-10KWh-1P	
电池组 Battery pack	16S1P	
产品尺寸 Size (L*W*H)mm	680x420x165mm	
产品重量 Weight (kg)	About 73Kg	
电池类型 Battery Type	磷酸铁锂 LiFePO4	
额定电压 Rated voltage	51.2V	
额定能量 Rated Power	10240Wh	
标称容量 Nominal Capacity	200Ah	
实际容量 Actual capacity	≥195Ah	
工作电压范围 Operating Voltage Range	40V-58.4V	
标准充电电流 Standard charging current	30A	
最大持续充电电流 Maximum continuous charging current	100A	
最大持续放电电流 Maximum continuous discharge current	100A	
峰值放电电流 Peak Discharge Current	200A (2S)	
充电截止电压 charge cut-off voltage	58.4V	
放电截止电压 Discharge cut-off voltage	38.4V	
内阻 Internal Resistance (mΩ)	≤20mΩ	
电池循环寿命 Battery Cycle Life	2000 times ((0.5C standard charge and discharge)	
防水等级 Waterproof Level	IP20	
冷却方式 Cooling Mode	自然风 Natural Cooling	
运输电压 Transport voltage	51V-53V	
通讯方式 Communication method	RS485	
操作温度 Operating Temperature	充电 Charge	-5°C~55°C
	放电 Discharge	-15°C~60°C
	贮存 Storage	-10°C~40°C



06、逆变器参数 Inverter parameter

纯正弦波逆变器参数 Pure sine wave inverter parameters		
额定功率 Rated power	6000W	
交流参数 Ac parameter	峰值功率 Peak power	10000VA
	输入电压 Input voltage	AC180V-240V
	输出电压 Output voltage	AC110V-240V
	输出波形 Output waveform	纯正弦波 Pure sine wave
	额定频率 Rated frequency	50Hz/60Hz
	感性负载能力 Inductive load capacity	4HP
	UPS 功能 UPS function	支持 support
电池工作参数 Battery operating parameter	切换时间 Switching time	电脑设备 10ms, 家用电器 10ms Computer equipment 10ms, household appliances 10ms
	工作电压范围 Operating voltage range	DC 40-60V
	额定电压 Rated voltage	DC 48V
	浮充电压 Floating charge voltage	DC 54V (settable)
MPPT 参数 MPPT parameters	最大工作电流 Maximum operating voltage	100A
	MTTP 功率 MPPT power	5600W
	光伏输入电压范围 Photovoltaic input voltage range	DC65V- 150V (Two ways)
	光伏输入最高电压 Maximum photovoltaic input voltage	DC170V
	最大充电电流 Maximum charging current	100A
显示屏 Display screen	MPPT 追踪效率	99.99%
	LCD 接口 LCD interface	2 × 8pin / PITCH 2.54mm, 支持 128 位段码, 最多 4 键 +4LED, 可显示运行模式/负载/输入/输出等。 2 × 8pin / PITCH 2.54mm, support 128-bit segment code, up to 4 buttons +4LED, can display Run mode / load / input / output, etc.
接口 interface	并行接口 Parallel interface	并联功能 Parallel function



07、BMS参数 BMS parameter

序号	测试项目(Test item)		标准(Criterion)
1	电流 Current	工作状态自耗电 Normal current consumption of PCM	25mA Max
		最大持续放电电流 Maximal continuous discharging current	100A
		一级放电过流保护 Primary discharge overcurrent protection	120A±5A(15S)
		二级放流过流保护 Secondary discharge overcurrent protection	400A-500A(1500ms)
		最大持续充电电流 Maximum continuous charging current	100A
		一级充电过流保护 Primary charge overcurrent protection	120A±5A (15S)
2	过充电保护 Overcharge protection	单体过充保护电压 Single overcharge protection voltage	3.75V±0.05V
		单体过充保护延时时间 Cell overcharge protection delay time	3S
		单体过充保护恢复电压 Single overcharge protection recovery voltage	3.6V±0.05V
		过充保护恢复方式 Overcharge protection and recovery mode	自恢复 self-recovery
3	过放电保护 Over discharge protection (single cell)	单体过放保护电压 Single overdischarge protection voltage	2.2V±0.05V
		单体过放保护延时时间 Cell overdischarge protection delay time	3S
		单体过恢复电压 Cell overrestore voltage	2.7V±0.05V
		过放保护恢复方式 Overshoot protection and recovery mode	充电恢复 Charge recovery



4	短路保护 Short circuit protection	短路保护电流 Short-circuit protection current	1200A-1500A
		短路保护延时时间 Short circuit protection delay time	300-800uS
		短路保护恢复方式 Short-circuit protection and recovery mode	充电恢复、 Charge recovery
5	温度保护 Temperature protection	充电高温保护 Charging high temperature protection	65°C±5°C
		充电高温恢复 Charge high-temperature recovery	55°C±3°C
		充电低温保护 Charge low temperature protection	-10°C±3°C
		充电低温恢复 Charge cold recovery	-5°C±3°C
		放电高温保护 Discharge high temperature protection	75°C±3°C
		放电高温恢复 Discharge high-temperature recovery	65°C±3°C
		放电低温保护 Low temperature discharge protection	-20°C±3°C
		放电低温恢复 Low-temperature discharge recovery	-10°C±3°C
		MOS 高温保护 MOS high temperature protection	90°C±3°C
		MOS 高温保护恢复 MOS high temperature protection and recovery	70°C±3°C
6	均衡 Balance	均衡开启电压 Equalizing opening voltage	3.3V±0.03V
		均衡开启压差 Equalize the opening pressure difference	15mV
		均衡电流 Equalizing current	20-70mA

08、BMS 基本配置 Basic BMS configuration

配置 disposition	参数 argument	配置 disposition	参数 argument
电池类型 Battery type	铁锂 LiFePO4	通讯 communication	RS485 CAN
支持串数 Number of strings supported	15-16S	GPS	\
加热功能 Heating function	\	蓝牙 Bluetooth	\
均衡功能 Equalizing function	支持 support	蜂鸣器 buzzer	\
持续电流 Sustained current	100A	开关功能 Switching function	支持



温控 Temperature control	2 路内置, 4 路外 置 2 built-in, 4 external	保护功能 Protection function	2 级
LDE 电量指示灯 LDE power light	支持 support	显示屏 Display screen	支持 support
充电限流 Charge current limiting	支持 support	预放电功能 Predischarge function	支持 support



09、指示灯说明 LED light description

9.1 正常状态指示(Indication in normal state)

状态 (State)	电量百分比 (Percentage of Battery)	运行 RUN	告警 ALARM	SOC LED4	SOC LED3	SOC LED2	SOC LED1
Power off		OFF	OFF	OFF	OFF	OFF	OFF
Standby		FLASH	OFF	OFF	OFF	OFF	OFF
充电 Charging	<25%	ON	OFF	OFF	OFF	OFF	FLASH
	=25%, <50%	ON	OFF	OFF	OFF	FLASH	ON
	=50%, <75%	ON	OFF	OFF	FLASH	ON	ON
	=75%, <100%	ON	OFF	FLASH	ON	ON	ON
	FULL	ON	OFF	ON	ON	ON	ON
放电 Discharging	=75%, <100%	FLASH	OFF	ON	ON	ON	ON
	=50%, <75%	FLASH	OFF	OFF	ON	ON	ON
	=25%, <50%	FLASH	OFF	OFF	OFF	ON	ON
	=6%, <25%	FLASH	OFF	OFF	OFF	OFF	ON

9.2 异常状态指示(Indication in abnormal state)

系统状态 System States	运行状态 States of running	运行 RUN	告警ALARM	电池SOC Percentage of Battery				解释 Explain
				●	●	●	●	
		●	●	●	●	●	●	
待机Standby	正常 Normal	FLASH	OFF	OFF				Standby
	告警 Warning	FLASH	FLASH					Battery in low voltage
	充电保护 Discharge Protection	OFF	ON					
充电 Charging	正常 Normal	ON	OFF	According to the rest of percentage of capacity				
	告警 Warning	ON	FLASH					
	任何保护 Any Protection	ON	OFF					
放电 Discharging	正常 Normal	FLASH	OFF	According to the rest of percentage of capacity				-
	告警 Warning	FLASH	FLASH					Stop discharging
	过流保护 Over-Current Protection	OFF	ON	Lights off				
	欠压保护 Under-Voltage Protection	OFF	OFF	Lights off				
	正常 Normal	According to the rest of percentage of capacity						
	充电告警 Charge Warning	ON	FLASH	According to the rest				




温度 Temperature	放电告警 Discharge Warning	FLASH	FLASH	of percentage of	
	任何保护 Any Protection	OFF	ON	OFF	



10、通讯说明 Communication specification

10.1 通讯接口Pin 脚定义 Communication interface pin PIN definition

接插件示意图 (Schematic diagram)	PIN	端口定义 port definition			备注 (Notes)
		RS458-1	RS485-2	RS485-3	
	1	RS485-B	RS485-B2	RS485-B2	
	2	RS485-A	RS485-A2	RS485-A2	
	3	GND	GND	GND	
	4	CANH	ADS_IN	ADS_OUT	
	5	CANL	ADS_OUT	ADS_IN	
	6	NC	GND	GND	
	7	RS485-A	RS485-A2	RS485-A2	
	8	RS485-B	RS485-B2	RS485-B2	

10.2 拨码地址定义 Dip address definition

地址 DIP	开关位置 Switch position				说明 Instructions
	#5	#6	#7	#8	
0000	OFF	OFF	OFF	OFF	Master PACK 0
0001	OFF	OFF	OFF	ON	Slave PACK 1
0010	OFF	ON	ON	OFF	Slave PACK 2
0011	OFF	OFF	ON	ON	Slave PACK 3
0100	OFF	ON	OFF	OFF	Slave PACK 4
0101	OFF	ON	OFF	ON	Slave PACK 5
0110	OFF	ON	ON	OFF	Slave PACK 6
0111	OFF	ON	ON	ON	Slave PACK 7
1000	ON	OFF	OFF	OFF	Slave PACK 8
1001	ON	OFF	OFF	ON	Slave PACK 9
1010	ON	OFF	ON	OFF	Slave PACK 10
1011	ON	OFF	ON	ON	Slave PACK 11
1100	ON	ON	OFF	OFF	Slave PACK 12
1101	ON	ON	OFF	ON	Slave PACK 13
1110	ON	ON	ON	OFF	Slave PACK 14
1111	ON	ON	ON	ON	Slave PACK 15

ON



OFF

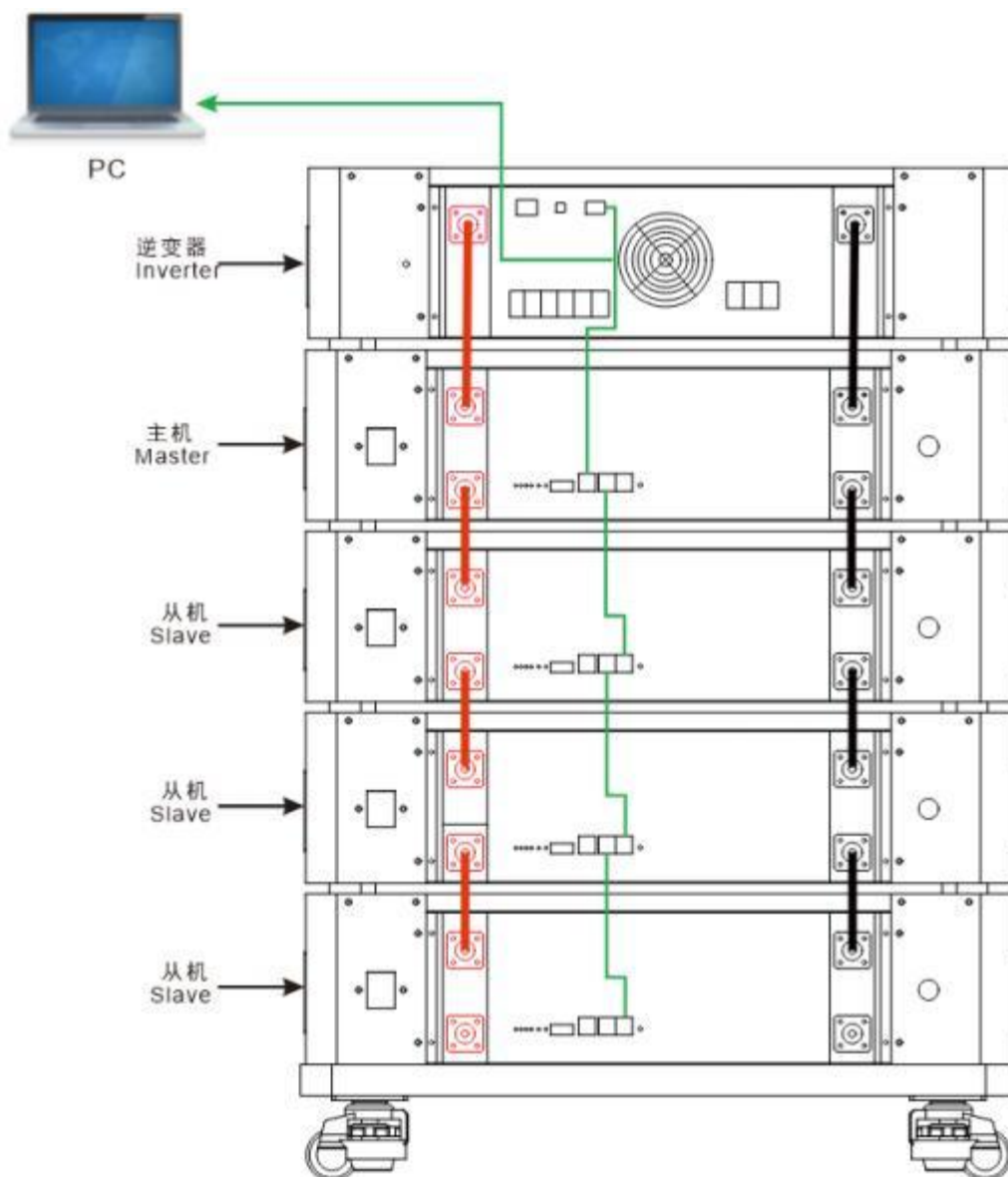


如上图所示通讯地址为0001 有效地址由5-8 从第8 位开始拨、第 1-4 位为无效地址默认拨到OFF

As shown in the figure above, the communication address is 0001. Valid addresses are dialed from the 8th digit to the 5th digit.

Invalid addresses are dialed to OFF by default.

11、级联通讯 Communication in cascade



11.1 首先将其中一个储能电池连接至上位机或逆变器，其作为级联系统中的主机。

First, one of the energy storage batteries is connected to the master computer or inverter, which acts as the host in the cascade

system.

11.2 主机的RS485-2 端口连接至下一个从机的RS485-3 端口，并以此类推。

Connect port RS485-2 on the host to port RS485-2 on the next slave, and so on

11.3 主机地址必须为“0000”，从机地址按照级联顺序往后加。

The host address must be "0000", and the slave address should be added one later in the cascade order.

11.4 地址之间不能重复,具体拨码顺序请参考 11.2 拨码地址定义表。

The IP addresses must be unique. For details about the DIP switch sequence, see 11.2 DIP Switch Address Definition Table.



12、电池组主要物料 BOM/BOM of battery pack materials

部件名称 Part Name	描述 Description	用量 dosage	摘要 Remarks
电芯 Cell	IFP184	16	
BMS	48V100A	1	
外壳 outer shell	650X300X626mm	1	
滑轮 Pulley	万向轮 Universal wheel	4	
逆变器模块 Inverter module	6KW	1	
通讯端子 Communication terminal	RS485	1	
直流端子 Dc terminal	安德森 120A		
空开 Circuit breaker	125A	1	
LCD	控制面板 Control panel	1	
风扇 fan	散热风扇 Cooling fan	2	
AC 输入接口	品字头	1	
PV 输入接口	2PIN 接口	1	
AC 输出插口 AC output jack	美规安全插孔 Us gauge safety jack	4	

13、电池组性能 Battery performance

若没有特别说明， 电池在做各项试验前， 均需在86KPa~106 KPa 大气压， 环境温度20°C±5°C， 相对湿度为45%~75%的条件下， 以0.33C₅A 恒流放电至终止电压38.4V， 并在收到产品两周内进行以下试验。

If no specific instructions, battery before doing the test, must be in 86 KPa to 106 KPa atmospheric pressure, temperature

of 20 °C + / - 5 °C, relative humidity is 45% ~ 75% of the condition, with 0.33 C5A electric constant exile to termination

voltage 38.4V, and carried out the following test within two weeks after receipt of the product.

一些术语的定义: the definitions of some nomenclatures of this specification



标准充电：在环境温度 $20^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 的条件下，以 $0.33\text{C}_5\text{A}$ 充电，当电池端电压达到充电截止电压时，改为恒压充电，直到充电电流小于或等于 $0.05\text{C}_5\text{A}$ 后停止充电。

standard Charge: Charge with current $0.33\text{C}_5\text{A}$ to limit charge voltage under the condition of $20^{\circ}\text{C}\pm 5^{\circ}\text{C}$ surrounding temperature, then change to charge with constant voltage till the current less than or equal to $0.05\text{C}_5\text{A}$



14. 电化学性能 Electrochemical performance

序号 NO.	项目 Item	标准 Standard	测试方法 Test Method
1	常温放电性能 Discharge Characteristics	A) $1C_5A \geq 1h$ B) $10C_5A \geq 5.4min$ C) $15C_5A \geq 3.2min$	<p>在 1 标准大气压, 环境温度 $20^{\circ}C \pm 5^{\circ}C$, 相对湿度为 45% ~ 75% 的条件下, 电池标准充电后 (以下若没有特别说明, 均在此条件下放置, 皆按此充电方式), 搁置 30min, 分别以 $1C_5A$、$10C_5A$、$15C_5A$ 进行放电至终止电压, 循环三次, 当有一次达到标准, 即达到标准要求 (下同)。</p> <p>Standard charged under the condition of normal atmospheric pressure and the environmental temperature of $25^{\circ}C \pm 5^{\circ}C$ and 45% ~ 75%RH, then rest for 30min and discharge at $1C_5A$、$10C_5A$、$10C_5A$ to the discharge cut-off voltage respectively.</p> <p>Charge/discharge cycle can be conducted for 3 times before meeting the Standards (the same below)</p>
2	常温荷电保持能力 Normal Storage	放电时间 $\geq 255min$ Discharge Time $\geq 255min$	<p>电池标准充电后, 开路放置 28 天, 再以 $0.33C_5A$ 放电至终止电压。</p> <p>Store for 28 days after standard charged, then discharge at $0.33C_5A$ to the discharge cut-off voltage.</p>
3	循环寿命 Cycle Life	容量保持率 $\geq 80\%$ Capacity retention rate is greater than	<p>在环境温度为 $20^{\circ}C \pm 5^{\circ}C$ 下, $0.33C_5A$ 充电至 58.4V, 搁置 10min, 然后放电至终止电压, 放电结束后搁置 10min, 再进行下一次充放电循环, 连续进行充放电循环 6000 次。</p> <p>Under the environment temperature is $20^{\circ}C + 5^{\circ}C$, C_5A charging 0.33 to 58.4V, for 10 min, and then to discharge voltage, discharge shelved after 10 min, and then</p>



or equal to
80%

the next charge and discharge cycle,
continuous charge and cycle 2000 times.



15、电芯安全性能 Cell safety performance

序号 NO	项目 Item	标准 Standard	测试方法 Test Method
1	过充性能 (3C10V) Overcharge	不爆炸、不起火 No fire、No explosion	<p>将电芯正负极连接于恒压电源，调节电流至3C₅A，电压为10V，</p> <p>然后对电芯以3C₅A 充电，直到电压为10V,电流接近0A.当电芯</p> <p>温度下降到比峰值低约10°C时，结束实验。</p> <p>Connect the positive and negative terminals of the battery to the constant voltage power supply, adjust the current to3C₅A , and the voltage is 10V.Then charge the battery with 3C₅A , until the voltage is 10V, and the current is close to 0A. When the batteryThe experiment was terminated when the temperature dropped to about 10 ° C lower than the peak.</p>
2	过放性能 Over Discharge	不起火、不爆炸 No fire、No explosion	<p>电池标准充电后，以1C₅A 进行放电至终止电压，然后用10Ω 的电阻将电池正负极相连，搁置14天。</p> <p>Standard charged. Discharge at 1C₅A to discharge cut-off voltage and then connect the positive and negative terminals with a resistor of 10Ω for 14 days.</p>



3	常温短路性能 Short Circuit at Room Temperature	不爆炸、不起火 最高温度<150°C No fire No explosion Max.temperature < 150°C	电池标准充电后, 置于防爆玻璃罩中直接短路其正负极 (线路总电阻不大于 50mΩ),当电池温度下降到比峰值约低 10 °C时试验结束。观察电池的温度及外观变化。 Standard charged. Keep the battery into a ventilation cabinet and short-circuit the positive and negative terminals directly (general resistance shall be less than or equal to 50mΩ). Stop the test when the temperature falls to value 10 °C lower than the peak value. Observe the variation of the battery' s appearance and temperature.
4	挤压测试 Crush	不着火不爆炸 No fire and no explosion	挤压测试前电池用0.2C 充满电, 搁置24 小时。从 径向挤压压力达到13KN。 Charge at 0.2C,and then leave for 24hrs, The crushing was continued until a force of 3000 lb (13 kN)



5	重物冲击性能 Impact	不爆炸、不起火 No fire No explosion	<p>电池标准充电后，放在平面上，并与热电偶相连，将一直径为15.8mm 的棒放在电池高度方向中间位置，让重量9.1kg 的重物从610mm 高度自由垂落至冲击台面。 Standard charge. Keep the battery connected with a thermocouple and put it on a impaction platform, place a 15.8mm diameter bar across the center of the biggest surface, then let a 9.1kg heavy hammer self fall off to the platform from a height of 610mm. Observe the variation of the battery' s appearance.</p>
6	热冲击安全性能 Hot Oven	不起火、不爆炸 No fire、 No explosion	<p>电池标准充电后，放置于热箱中，并与热电偶相连，温度以（5 °C±2 °C）/min 的速率升至130 °C±2 °C并保温30Min。 Standard charge. Keep the battery connected with a thermocouple and put it into a circulating air oven. Temperature is raised at a rate of 5 °C±2 °C per minute to a temperature of 130°C±2 °C and remained for 30min at this temperature. Observe the variation of the battery' s appearance.</p>

16、环境适应性能 Environmental adaptability

序号 NO.	项目 Item	标准 Standard	测试方法 Test Method
1	针刺性能 Needle	不着火、不爆炸 No fire no explosion	<p>针刺测试前电池用0.2C 充满电，搁置24 小时。用Φ4mm 钢针刺穿电池 Charge at 0.2C,and then leave for 24hrs,check battery before / after cut through battery with Φ4mm needle</p>



2	恒定湿热性能 Static Humidity	电池不起火、不爆炸 放电时间≥120min Discharge Time ≥ 120min No remarkable deformation No smoking\ explosion	电池标准充电后，置于温度为 $40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ ，相对湿度为90%的恒温恒湿箱中，搁置48h后，取出电池 $20\pm 5^{\circ}\text{C}$ 环境下搁置2h。观察电池外观变化。然后以 $0.2C_5A$ 放电至终止电压。 Standard charge. Put the battery into a $40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ and 90% RH chamber for 48h, then get it out and store it for 2h at room temperature. Observe the variation of the battery' s appearance and then discharge at $0.2C_5A$ to discharge cut-off voltage, measuring final capacity.
---	---------------------------	--	---



<p>跌落性能 Drop</p>	<p>不起火、不爆炸 放电时间≥125min No smoking 、 No fire、 No explosion Discharge time≥125min</p>	<p>标准充电后，将电池样品由高度(最低点高度)为1m 的位置自由跌落到 18 ~ 20mm 的硬木板上，要求各面各跌落一次。然后将电池以0.2C₅A 放电至终止电压，做0.2C₅/0.2C₅ 循环达到要求停止，充放电循环次数不高于3 次</p> <p>Standard charge. Then let it self fall off from a height of 1.0m (the lowest height) to a smooth wooden surface. The self fall off should be conducted from every positive and negative direction. Then discharge at0.2C₅A to discharge cut-off voltage. Conduct 0.2C₅A /0.2C₅A cycle for 3 times.</p>
<p>不同温度下的 放电性能 High-low Temperature Discharge</p>	<p>A)60 °C时≥ 120min B)0 °C时≥ 110min; C)-20 °C时≥100min 电池不爆炸、不起火。 A)60 °C时≥ 120min B)0 °C时≥ 110min; C)-20 °C时≥100min No fire\explosion</p>	<p>电池标准充电后，在60±2°C条件下恒温搁置2h、以0.2C₅A 放电至终止电压，然后在室温条件下标准充电，依次按照0±2°C/ - 20±2°C的顺序在相应的恒温条件下搁置 16h，以0.2C₅A 放电至终止电压。</p> <p>Standard charge. Then store for 2h at 60±2°C and discharge at 0.2C₅A to discharge cut-off voltage. then standard charge at room temperature and store for 20h according to the order of 0±2 °C/-20±2 °C and discharge at 0.2C₅A measuring corresponding discharge capacity.</p>



振动环境 适应性能 Vibration	电池外观无明显损伤、 不漏液、不冒烟、不爆炸 No remarkable damage、 No smoking 、 No explosion	<p>电池标准充电后，安装在振动台面上，按下面的振动频率和对应的振幅调整好试验设备,X、Y、Z 三个方向每个方向上从 10Hz~ 55Hz 循环扫频振动 30min，扫频速率为 1oct/min</p> <p>：</p> <p>A)振动频率： 10Hz~30Hz ； 位移幅值 (单振幅) ： 0.38mm ； B)振动频率： 30Hz~55Hz ； 位移幅值 (单振幅) ： 0.19mm。</p> <p>Standard charge. Measure initial status. Equip it to the vibration platform, adjust and prepare the test equipment according to following vibration frequency and relevant swing, doing frequency sweeping from X,Y, Z three directions, each from 10Hz to 55Hz for 30 minutes of recycling, rating of which is 1oct/min:A)vibration frequency:10Hz~ 30Hz ； Displacement breadth (single swing): 0.38mm ； B) vibration frequency: 30Hz~ 55Hz ； Displacement breadth(single swing): 0.19mm。</p> <p>Measure final status after sweeping and Observe the variation of the battery' s appearance.</p>
---------------------------	--	---



17、保质期及产品责任 Warranty Period & Product Liability

保质期是从出厂日期（喷码）开始起 12 个月；深圳市国世康科技有限公司对因没有按本规格书规定操作而导致的意外不负责任。

The warranty period is 12 months from the date of delivery (code spraying). Dongguan Blue Sky Gaoke Energy Technology Co., Ltd.. Is not responsible for accidents caused by failure to operate in accordance with this specification.

18、电池使用时警告事项及注意事项 Warnings and Cautions in Using the Battery

为防止电池可能发生泄漏,发热、爆炸,请注意以下预防措施:

To prevent a possibility of the battery from leaking, heating or explosion please observe the following precautions:

- 严禁将电池浸入海水或水中,保存不用时,应放置于阴凉干燥的环境中。

Do not immerse the battery in water or seawater, and keep the battery in a cool dry surrounding if it stands by.

- 禁止将电池在热高温源旁,如火、加热器等使用和留置

Not use or leave the battery near a heat source as fire or heater.

- 充电时请选用锂离子电池专用充电器。

Use the battery charger specifically for that purpose when recharging.

- 严禁颠倒正负极使用电池

Do not reverse the position and negative terminals.

- 严禁将电池直接插入电源插座。

Do not connect the battery to an electrical outlet.

- 禁止将电池丢于火或加热器中

Do not discard the battery in fire or a heater.

- 禁止用金属直接连接电池正负极短路。

Do not short-circuit the battery by directly connecting the positive and negative



terminals with metal objects.

- 禁止将电池与金属,如发夹、项链等一起运输或贮存

Do not transport or store the battery together with metal objects such as hairpins, necklaces, etc • 禁止敲击或抛掷、踩踏电池等

Do not strike, trample or throw the battery..

- 禁止直接焊接电池和用钉子或其它利器刺穿电池.

Do not directly solder the battery and pierce the battery with a nail or other sharp objects