

产 品 说 明 书

PRODUCT MANUAL

客户代码 (Customer Code) : _____

产品名称 (Product Name) : 51.2V 628Ah Battery Pack

版 本 号 (Rev. No) : A0

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A0	2025.11.07	首版发行 First Edition	/	

1. 安全防范措施 (Safety Precautions)

- 在安装或使用电池之前，仔细阅读用户手册是非常重要和必要的。如果不遵守本文件中的任何指或警告，可能导致电击、重伤、死亡，或可能损坏电池和整个系统。

It is very important and necessary to read the user manual carefully before installing or using the battery. Failure to follow any of the instructions or warnings in this document can result in electrical shock, serious injury, death, or may damage the battery and the whole system.

- 完全放电后，电池需要在12小时内充电。

The battery needs to be recharged within 12 hours, after fully discharging.

- 不要在外面暴露电缆。

Do not expose cable outside.

- 维修前必须断开所有电池端子。

All battery terminals must be disconnected before maintenance.

- 不要使用清洁溶剂清洁电池。

Do not use cleaning solvents to clean the battery.

- 不要将电池暴露在易燃或苛刻的化学品或蒸气中。

Do not expose the battery to flammable or harsh chemicals or vapors.

- 不要给电池的任何部分喷漆，包括任何内部或外部部件。

Do not paint any part of the battery, include any internal or external components.

- 不要将电池与光伏太阳能直接连接接线。

Do not connect battery with PV solar wiring directly.

- 禁止任何异物插入电池的任何部分。

Any foreign object is prohibited to be inserted into any part of the battery.

- 任何保修索赔都不包括由于上述项目造成的直接或间接损坏。

- Any warranty claims are excluded for direct or indirect damage due to items above.

- 如果电池储存时间较长，则要求每三个月充电一次，SOC应不低于30%。

If the battery is stored for a prolonged time, it is requirement that they are charged every three months, and the SOC should be no less than 30%.

1.1 安装前注意事项 (Note before installation)

- 拆箱后, 请先检查电池和装箱单, 如果电池损坏或备件丢失, 请与经销商联系;
After unpacking, please check the battery and packing list first, if the battery is damaged or spare parts are missing, please contact the dealer;
- 安装前, 一定要切断电网电源, 确保电池处于关断模式;
Before installation, be sure to cut off the grid power and make sure the battery is in the turned-off mode;
- 接线必须正确, 不要将正负电缆混接, 并确保与外部设备无短路;
Wiring must be correct, do not mix-connect the positive and negative cables, and ensure no short circuit with the external device;
- 禁止将蓄电池与交流电源直接连接;
It is prohibited to connect the battery with AC power directly;
- 电池中的嵌入式BMS是为51.2VDC设计的, 请不要串联电池;
The embedded BMS in the battery is designed for 51.2 VDC, please do not connect battery in series;
- 禁止用不同类型的电池连接电池;
It is prohibited to connect the battery with different type of battery;
- 请确保电池系统的电气参数与逆变器兼容;
Please ensure the electrical parameters of battery system are compatible to inverter;
- 电池远离火或水。
Keep the battery away from fire or water.

1.2 行动中 (During Operation)

- 如果电池系统需要移动或修复, 必须先切断电源, 电池完全关闭;
If the battery system needs to be moved or repaired, the power must be cut off first and the battery is completely shutdown;
- 禁止用不同类型的电池连接电池;
It is prohibited to connect the battery with different type of battery;
- 禁止将电池与故障或不兼容的逆变器工作;
It is prohibited to put the batteries working with faulty or incompatible inverter;
- 发生火灾时, 只能使用干粉灭火器, 禁止使用液体灭火器;
In case of fire, only dry powder fire extinguisher can be used, liquid fire extinguishers are prohibited;
- 请不要打开、修理或拆卸电池。我方不因违反安全操作或违反设计, 生产和设备安全标准而承担任何后果或相关责任。
Please do not open, repair or disassemble the battery. We do not undertake any consequences or related responsibility due to violation of safety operation or violating of design, production and equipment safety standards.

2. 系统应用介绍 (System Application Introduction)

本产品为家用储能电池组，系统搭配32.15KWh电量51.2V 628Ah磷酸铁锂电池组。此产品可以配合电力使用，这样就可以对用电进行调节。本产品支持自发自用余电上网，削峰填谷，备用电源等多种应用模式。具体运行逻辑如下：

This product is a household energy storage battery pack. The system is matched with a 32.15KWh 51.2V 628Ah lithium iron phosphate battery pack. This product can be used in conjunction with electricity, so that electricity consumption can be adjusted. This product supports a variety of application modes, such as spontaneous and self-use residual power surfing, peak clipping and valley filling, standby power supply, etc. The specific operation logic is as follows:

2.1 自发自用余电上网 (PV Self-use Surplus Power to Grid)

在白天光照良好的条件下，PV组件发出的直流电通过逆变器变成交流电，为家庭负载供电。若家庭负载无法用尽光伏发电量，剩余的电力会被存在电池中。若电池电量也存满，光伏会向电网供电。在夜间或阴雨天，光伏无法发电。电池会通过逆变器向家庭负载供电。若电池电量不足，家庭负载才会从电网取电。

Under the condition of good illumination in the daytime, the DC power from PV panel is changed into AC through inverter to supply power for household load. If the household load cannot run out of photovoltaic power, the remaining power will be stored in the battery. If the battery is full, photovoltaic power will be supplied to the grid. In the night or rainy days, photovoltaic cannot generate electricity. The battery supplies power to the home load through an inverter. If the battery is low, the household load will take power from the grid.

2.2 削峰填谷 (Peak Shaving and Valley Filling)

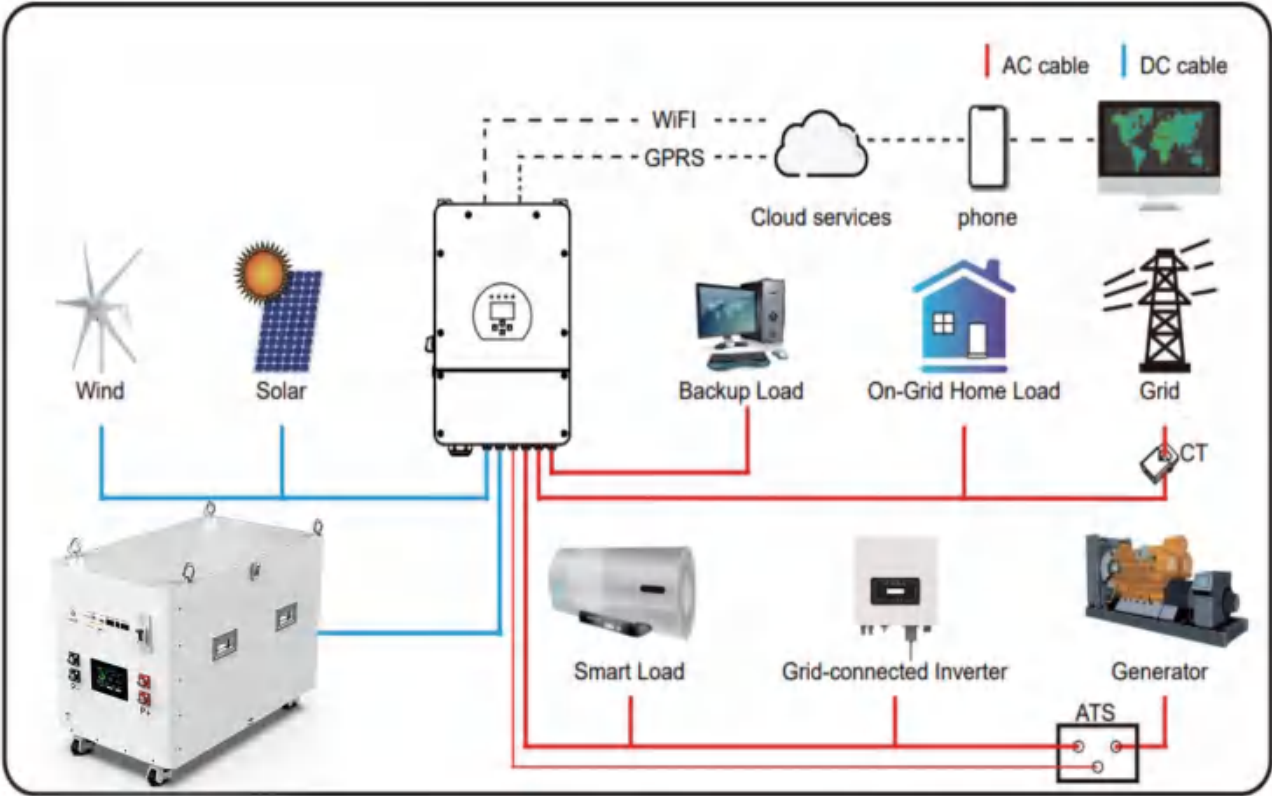
在一些实行峰谷分时电价的国家 and 地区，如果尖峰电价和低谷电价的差值比较大，储能系统可以采用削峰填谷的应用模式。在电价低谷时段，储能系统充电；在电价高峰时段，储能系统为家庭负载供电。可以避免用户在高电价时过多使用电网电量，节约能源开支。

In some countries and regions where peak valley time of use price is implemented, if the difference between peak price and low price is large, the application mode of peak shaving and valley filling can be adopted in energy storage system. In the low electricity price period, the energy storage system is charged; in the peak period of electricity price, the energy storage system supplies power to the household load. It can avoid users using too much power grid when the electricity price is high, and save energy expenditure.

2.3 备用电源 (Standby Power Supply)

在一些极端天气下（如龙卷风，台风，冰雹），或变电站运行故障时，电网供电会中断。如果用户安装了储能系统，在这种情况下仍可享受充足的电力保障。

In some extreme weather (such as tornadoes, typhoons, hail), or substation operation failure, power supply will be interrupted. If the energy storage system is installed, the user can still enjoy sufficient power guarantee in this case.



系统连接图System Connection Diagram

3. 产品规格 (Product Specification)

No.	项目 Item	规格 Specification
01	产品结构 Pack Configuration	16S1P
02	电芯型号 Cell Model	LF3.2V/628Ah
03	充电电压Charge Voltage	56V(3.5V/Cell)
04	放电截止电压 Discharge cut-off Voltage	44.8V(2.8V/Cell)
05	标称电压 Nominal Voltage	51.2V(3.2V/Cell)
06	最小容量 Minimum Capacity	628Ah @ 0.5C discharge
07	标称容量 Nominal Capacity	628Ah @ 0.5C discharge
08	标称能量 Nominal Energy	32153.6Wh @ 0.5C discharge
09	最大充电电流 Max Charge Current	300A
10	最大持续放电电流 Max Continuous Discharge Current	300A

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11	标准充电 Standard Charge	0.3C恒流充电至56V，然后以54.5V恒压充电，至充电电流降至0.05C为止 Using constant current charge to 54.5V, then using constant voltage 54.5v charge to taper current $\leq 0.05C$	
12	标准放电 Standard Discharge	0.5C恒流放电，至电压降至44.8V为止 Using 0.5C constant current discharge to 44.8V	
13	产品尺寸Dimension (mm)	740*440*510mm	
14	成品重量 Pack Weight	大约220Kg About220Kg	
15	IP等级 IP level	IP21	
16	推荐SOC范围 Recommended SOC Range	15-95%	
17	出货电压 Shipment Voltage	51~53V	
18	Operating Temperature 工作温度	充电 Charge	标准充电方式: 0°C ~45°C Standard charging method: 0°C ~45°C
		放电 Discharge	-20°C ~60°C
19	Storage Temperature 储存温度	-20 ~ 25°C, 储存一年之后产品的可恢复容量不少于额定容量的80%; -20 ~ 45°C, 储存三个月之后产品的可恢复容量不少于额定容量的80%; -20 ~ 60°C, 储存一个月之后产品的可恢复容量不少于额定容量的80% -20 ~ 25°C, the pack shall be able to deliver $\geq 80\%$ rated capacity after 1 year of storage; -20 ~ 45°C, the pack shall be able to deliver $\geq 80\%$ rated capacity after 3 months of storage; -20 ~ 60°C, the pack shall be able to deliver $\geq 80\%$ rated capacity after 1 month of storage	

3.1 Product Performance 产品性能

No.	项目 Item	测试方法Test Method	Criteria 标准
1	容量 Capacity	标准充电后，以0.3C的电流放电至44.8V截止电压所放出的容量 The capacity shall be measured at a discharge current of 0.3C and a cut-off voltage of 44.8V after standard charging.	$\geq 628Ah$
2	循环寿命 Cycle Life	标准充电后，以0.5C电流放电到44.8V；持续重复以上测试，直到保持容量为初始容量的80% After standard charging, discharge the battery at 0.5C to 44.8V. Repeated the above test cycle till retained capacity is80% of initial capacity.	循环次数 ≥ 8000 次 Cycles ≥ 8000 times

4. 产品简介 (Product introduction)



M12*100mm lifting ring
It can be taken off when not in use.

产品尺寸 product size: 740*440*510MM

不包括端子, 轮子, 挂耳等 Does not include terminals, wheels, hanging ears, etc.

4.1 界面及按键介绍（Interface and Key Introduction）



序号	定义	说明	备注
1	运行灯 RUN	见表1 See Table 1	
	警报灯 ALM	详见表1 See Table 1	
	剩余电量指示灯 SOC	详见表2 See Table 2	
2	开关按钮 RESET	用于系统上、下电工作 Using for power on/off of the system	

LED operating status indication

状态 state	正常/告警/保护 normal/Alarm/protection	ON/OFF	RUN	ALM	L1	L2	L3	L4	L5	L6
关机 Shutdown	正常 normal	灭 OFF	灭 OFF	灭 OFF	灭 OFF	灭 OFF	灭 OFF	灭 OFF	灭 OFF	灭 OFF
均衡 equilibrium	正常 normal	亮 ON	闪烁 flashing	灭 OFF	根据电量显示 Displayed according to the battery level					灭 OFF
充电 charge	正常 normal	亮 ON	闪烁 flashing	灭 OFF	根据电量显示 Displayed according to the battery level					灭 OFF
	过流\过温\过压\充电失败 Overcurrent\Overtemperature\Overvoltage\Charging failed	亮 ON	闪烁 flashing	闪烁 flashing	根据电量显示 Displayed according to the battery level					灭 OFF
放电 discharge	正常 normal	亮 ON	闪烁 flashing	灭 OFF	根据电量显示 Displayed according to the battery level					灭 OFF
	过流\过温\过压\充电失败 Overcurrent\Overtemperature\Overvoltage\Charging failed	亮 ON	闪烁 flashing	闪烁 flashing	根据电量显示 Displayed according to the battery level					灭 OFF
其它告警 Other alarms	密码未修改\短路\温度异常 The password has not been changed\short circuit\Abnormal temperature	亮 ON	闪烁 flashing	闪烁 flashing	根据电量显示 Displayed according to the battery level					灭 OFF

Capacity indication

状态 state		充电 charge					放电 discharge				
容量指示灯 Capacity indicator		L5	L4	L3	L2	L1	L5	L4	L3	L2	L1
电量% Electricity	0~20%	灭 OFF	灭 OFF	灭 OFF	灭 OFF	亮 ON	灭 OFF	灭 OFF	灭 OFF	灭 OFF	亮 ON
	20~40%	灭 OFF	灭 OFF	灭 OFF	亮 ON	亮 ON	灭 OFF	灭 OFF	灭 OFF	亮 ON	亮 ON
	40~60%	灭 OFF	灭 OFF	亮 ON	亮 ON	亮 ON	灭 OFF	灭 OFF	亮 ON	亮 ON	亮 ON
	60~80%	灭 OFF	亮 ON	亮 ON	亮 ON	亮 ON	灭 OFF	亮 ON	亮 ON	亮 ON	亮 ON
	80~100%	亮 ON	亮 ON	亮 ON	亮 ON	亮 ON	亮 ON	亮 ON	亮 ON	亮 ON	亮 ON

4.2 显示屏界面（Display Screen Interface Description ）

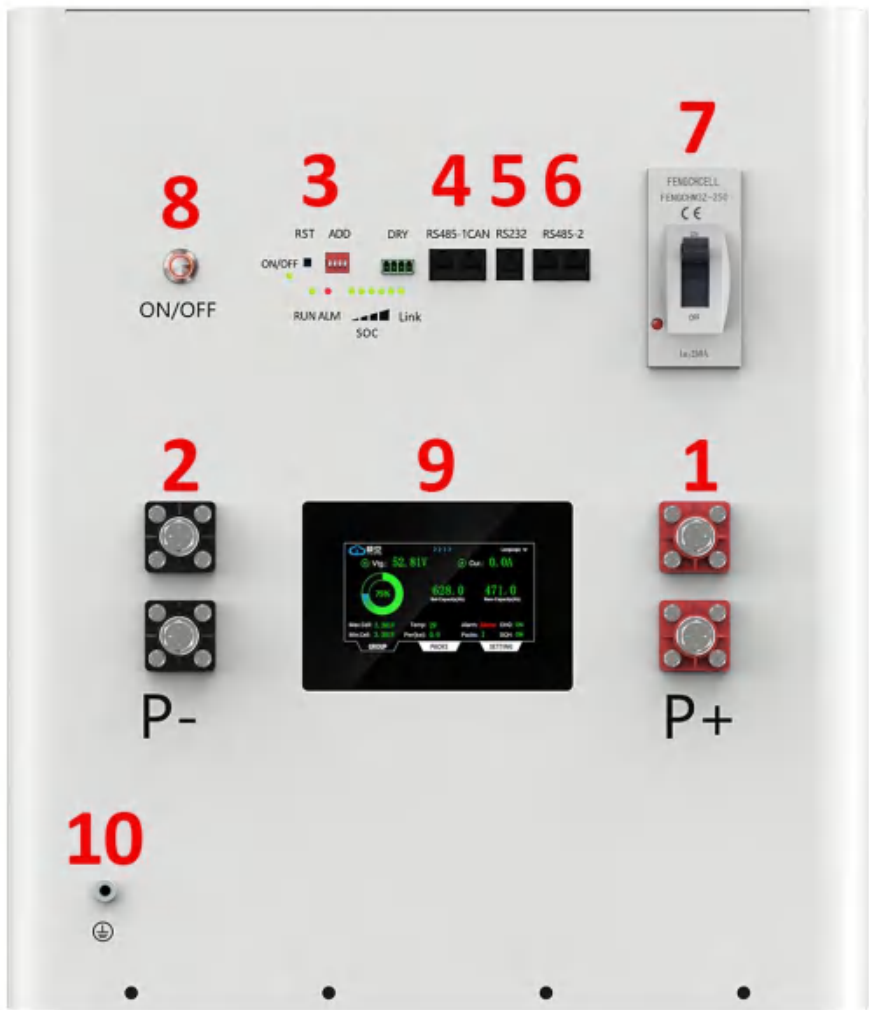


1. 电池组界面可以显示当前电池组的电压、电流、在线电池包数量，整个电池组充放电状态，最高和最低单体温度。

The battery string screen displays the current voltage and current of the battery string, the number of online battery packs, the charging and discharging status of the entire battery string, and the highest and lowest cell temperature



4.3 接口界面说明 (Interface Description)



No. 序号	Illustration 说明	Silk-screen 丝印	Remark 备注
1	Power supply anode 电源正极	P+	M8Anode output 正极输出端
2	Power supply cathode 电源负极	P-	M8Cathode output 负极输出端
3	Dial switch 拨码开关	DIP	The BMS automatically recognizes addresses without dialing无需拨码，BMS可自动识别地址
4	CANbus terminal CANbus端口/ RS485A terminal RS485A端口	CAN/RS485	CANbus/RS485 and inverter connection ports CANbus/RS485和逆变器连接端口

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5	RS232 □	RS232	RS232 parallel communication port RS232 通讯接口
6	RS485B □	RS485	RS485 parallel communication port RS485 并联通讯接口
7	breaker断路器	ON/OFF	Switch and protection 开关及保护
8	Weak current switch弱电开关	ON/OFF	BMS weak current switch
9	display screen 显示屏	●	●
10	ground lead 接地线	●	●

4.4 Battery Connection and Communication Instructions 电池连接及通讯说明:

- 正、负极输出接口：通过直流隔离器将正极(+)和负极(-)连接到汇流箱电池正负极接入口。
Positive and negative output interface: Connect the positive (+) and negative electrode (-) through the DC isolator to the busbar chamber battery positive and negative connection inlet.
- RS485: 具有双 RS485 接口，可以查看 PACK 的信息，默认波特率为 19200bps。如需通过 RS485 与监控设备通信，监控设备作为主机，依据地址轮询数据，地址设置范围为 2~15。
RS485: With a dual RS485 interface to check PACK information, with a default baud rate of 19200bps. To communicate with the monitoring equipment through the RS485, the monitoring equipment as the host, according to the address polling data, address setting range of 2~15.
- CAN/RS485: 带隔离 CAN/RS485 通信，CAN默认通信速率 500K/RS485默认波特率为 9600bps, 电池与逆变器之间的主动通信门户。
CAN/RS485: With isolated CAN/RS485 communication, CAN communication rate 500K/RS485 default baud rate of 9600bps, active communication portal between the battery and the inverter.

4.4.1 电气接口图示 Electrical interface diagram

干接点接口定义

引脚序号	引脚定义	备注
1	COM1	有告警状况下 S1 和 COM1 导通
2	S1	
3	COM2	低电量状况下 S2 和 COM2 导通
4	S2	

CAN 和 RS485-1 接口定义

RS485-采用 8P8C 立式 RJ45 插座		CAN-采用 8P8C 立式 RJ45 插座	
引脚序号	引脚定义	引脚序号	引脚定义
1、8	RS485-B1	9、10、11、14、16	NC
2、7	RS485-A1	12	CANL
3、6	GND	13	CANH
4、5	NC	15	GND

RS232 接口定义

RS232-采用 6P6C 立式 RJ11 插座		
引脚序号	引脚定义	备注
1、2、6	NC	
3	RS232_TX	
4	RS232_RX	
5	GND	

RS485-2 并联接口定义

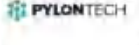
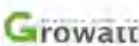
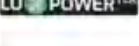
RS485-采用 8P8C 立式 RJ45 插座		RS485-采用 8P8C 立式 RJ45 插座	
引脚序号	引脚定义	引脚序号	引脚定义
1、8	RS485-B2	9、16	RS485-B2
2、7	RS485-A2	10、15	RS485-A2
3、6	GND	11、14	GND
4、5	NC	12、13	NC

5. 协议匹配 Protocol matching

具有多种CAN/RS485协议，可兼容多品牌的逆变器。为了确保电池模块完美工作，最好使用下面列出的兼容逆变器。注意:不同型号的逆变器可能有不同的协议和设计，即使是同一品牌。对于某些型号，需要固件更新才能实现完美的通信，以下是匹配列表：With a variety of CAN/RS485 protocols, can be compatible with multi-brand inverters. To ensure that the battery module works perfectly, it is best to use the compatible inverters

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listed below. Note: Different models of inverters may have different protocols and designs, even for the same brand. For some models, firmware updates are required to achieve perfect communication. Below is a list of matches:

Extreme Space BMS-PB Series Communication Protocol Inverter List Summary (CAN)						
Inverter brand		Protocol name	Communication interface	Real machine debugging	Matching model	Protocol in inverter code
德业 Deye		低压储能CAN通信协议V1.0 Low-voltage hybrid inverter CAN communication protocol V1.0	CANBUS-500K	yes	SUN-5K-SG03LP1-EU	1. Battery Setup Menu->Lithium 2. Advanced Function->BMS_Err_Stop
派能 PYLON		派能CAN总线协议V1.2 PYLON CANBUS Protocol V1.2	CANBUS-500K	NO		
		派能低压RS485通信协议V3.5 PYLON low voltage RS485 Protocol V3.5	RS485-9600-115200			
古瑞瓦特 Growatt		古瑞瓦特低压CAN总线协议V1.08 Growatt BMS CAN-Bus-protocol-low-voltage_V1.08	CANBUS-500K	yes	SPF 3000TL HVM-48	1. Set LI in 05 2. If the value is set to 1 in 36, CAN communication is enabled
		储能机与电池PACK之间RS485通讯协议V2.01 Growatt xxSxxP ESS Protocol V2.01	RS485-9600	YES	SPF 3000TL HVM-48	1. Set LI in 05 2. If the value is set to 51 in 36, CAN communication is enabled
维克多 Victron		维克多CAN总线协议201707 CAB-BUS_BMS_Protocol_201707	CANBUS-500K	YES	Cerbo GX	
英威腾 Invent		英威腾户用储能逆变器低压版BMS通信协议(V00) INVT BMS CAN Bus protocol V00	CANBUS-500K	YES	BDSKTL-RL1	
固德威 GoodWe		固德威低压CAN总线协议V1.7(ES/EM/S-BP/BP系列) GoodWe LV BMS Protocol (CAN) V1.7(For ES/EM/S-BP/BP Series)	CANBUS-500K	YES	GW5000-E5-20	For battery type, select GoodWe->SECU-A5.4L*1
SMA		SMA电池与逆变器通信协议V1.0 FSS-ConnectingBat-TI-en-10 Version 1.0	CANBUS-500K	NO		
日月元 Voltronic		日月元逆变器与BMS RS485通信协议20200325 Voltronic Power Inverter and BMS 485 communication protocol 20200325	RS485-9600	NO		
硕日 SRNE		硕日Modbus通信协议 PACE BMS Modbus Protocol for RS485 V1.3	RS485-9600	YES	HF2430S60-100	1. Set 39 to BMS 2. Set 32 to BMS 3. Set 33 to WOW
美世乐 MUST		美世乐PV1800F-系列CAN通信协议1.04.04 MUST PV1800F-CAN communication Protocol1.04.04	CANBUS-100K	YES		
迈格瑞能 MEGAREVO		迈格瑞能混合逆变器CAN通信协议	CANBUS-500K	YES		
		MEGAREVO_Hybrid_BMSCAN_Protocol				
鹏城 Luxpowertek		鹏城CAN通信协议V01	CANBUS-500K	YES		
		Luxpowertek Battery CAN Protocol Vo1				
美世乐 MUST						
Sofar						
Solis						
Easun						
Anenji						

6. 异常情况处理 Abnormal Situation Addressing

1. 上电后电池组不能正常工作怎么办？

1. What if the battery pack does not work properly after power on?

答：最直接的办法是连接上位机，通过上位机查看故障现象，从上位机界面上提示的告警、保护、故障等信息可以大概分析一下原因，也能给进一步做试验提供必要的参考。

A: The most direct way is to connect to the upper computer, through the upper computer to find the fault phenomenon, causes can be roughly analyzed from the upper computer interface prompt alarm, protection, fault and other information, it can also provide necessary reference for further testing.

2. RS232 在什么情况下会出现通讯失败？

2. Under what circumstances will RS232 communication fail?

答：可通过以下步骤排除问题：

A: The following steps can be taken to eliminate the problem:

1) 确认电池组的状态指示灯至少有一个灯是亮或闪烁，即电池组处于正常工作状态；

1) Confirm that at least one of the indicator lights of the battery pack is on or flashing, that is, the battery pack is in normal working condition;

2) 确认上位机软件选择正确 COM 口（查看设备管理器）；

2) Confirm that the host computer software selects correct COM port (view device manager);

3) 确认 RS232 通讯线是否完全插入电池组相应的通信接口。

3) Confirm whether the RS232 communication line is fully inserted into the corresponding communication interface of the battery pack.

3. RS485 在什么情况下会出现RS485并机通讯失败？

3. Under what circumstances will RS485 fail to paralleling batteries communication?

答：出现并机通讯失败的可能如下：首先确定是否已连接并行RS485通讯口，然后再确定在并机时电池组的地址拨码拨动位置正确，RS485端子要确保插接到位。

A: The possibility of failure of parallel batteries communication is as follows: first ensure whether the parallel RS485 communication port has been connected, and then make sure that the address dialing position of the battery pack is correct, and make sure that the RS485 terminal Plug-in in the right place.

3. 故障告警机制是什么？

1. What is the fault alarm mechanism?

答：电池组具有故障告警功能，可通过上位机软件查看。

A: battery pack has fault alarm function, can be checked through upper computer software.

故障包括有：

Failure includes:

1) 采样故障：模拟前端与主控芯片之间通信出现故障。出现该故障时，关闭充放电功能，当故障清除后可自动清除故障告警。

1) Sampling failure: analog front-end and main control chip communication failure. When the fault occurs, the charge and discharge function is turned off, and the fault alarm can be automatically cleared after the fault is cleared.

2) 温度 NTC 失效：主要检测温度 NTC 是否短路或断开。出现该故障时，关闭充放电功能，当故障清除后可自动清除故障告警。

2) Temperature NTC failure: mainly detects whether the temperature NTC is short-circuited or disconnected. When the fault occurs, the charge and discharge function is turned off, and the fault alarm can be automatically cleared after the fault is cleared.

3) 电芯故障：电芯压差超过 1V，或总电压检测电压与各单体电压之和相差超过 5V，或最低电压低于 0.5V。电压采样线断开也报该故障。当故障清除后可自动清除故障告警。

3) Cell failure: the voltage difference of the cell exceeds 1V, or the difference between the total voltage detection voltage and the sum of single cell voltage is more than 5V, or the minimum voltage is less than 0.5V. The voltage sampling line disconnect also reports the same fault. When the fault is cleared, the fault alarm can be automatically cleared.

电池装上系统显示过流保护或短路保护，这种情况并不是电池组有问题，而是用电设备的容性负载太大。充电可以解除该报警，或者是加长电池组预充电路延迟时间。

After the battery is connected to the system and shows over-current protection or short circuit protection. This is not a problem with the battery pack, but the capacity load of the electrical equipment is too large. Charging can remove the alarm, or extend the battery pack precharge circuit delay time.