低压电池故障排查手册
Low Voltage Battery Troubleshooting Manual

目录/Catalogue

报电压/温度断线故障，电池亮红灯后异常休眠

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The voltage/temperature disconnect fault is reported, and the battery is abnormally hibernated when the red light is on

报Mos过温故障

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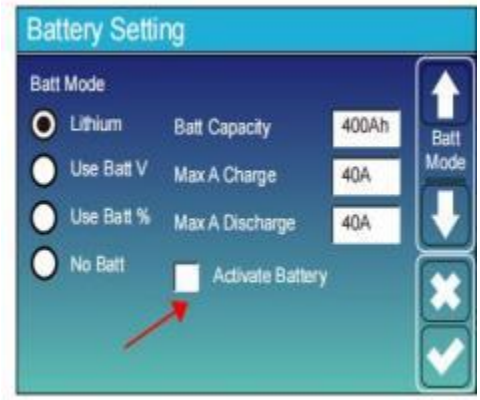
The Mos overtemperature fault was reported

剩余电量为零的故障

The fault of SOC is 0

当电池LED指示灯指示剩余电量为0时，与此同时，逆变器显示电池电压失效。此时，需要激活电池。进入逆变器显示屏的电池系统页面，找到正确的激活选项(注：要激活混合逆变器，必须连接电网、光伏或柴油发电机)，如图所示:

When the battery LED light indicates SOC is 0. At the same time, inverter shows battery voltage failure. At this point, the battery needs to be activated. Enter the battery system page of the inverter display screen and find the right activation option (Remark: To activate the hybrid inverter, it must be connected to the grid, PV or diesel generator), as shown in the figure:



电池组过压/欠压故障

The fault of pack over- voltage/under- voltage

1.用电脑打开上位机。将对应的电池组与CAN盒连接，读取电池组的电池芯数据，找到对应的电芯;

1.Use computer to open upper computer. Connect the corresponding battery pack with the CAN box, read cell data of the battery pack, and find the corresponding battery cell;

3.检查线束/FPC:找到对应的电池连接线/FPC，检查是否有松动，并测量线束两端的电导性。

3.Check the wiring harness/FPC: Find the corresponding cell wire/ FPC, check whether there is loose or not, and measure the conduction at both ends of the wiring harness.

4.检查BMS（在测量位置可以看到“相邻单体电压高低故障”）

4. Check BMS (measurement location can see ″ The fault of voltage of adjacent cells is high and low”

可用电量不足的电池故障

The fault of battery is low on usable power

使用上位机读取电池组的历史数据。分析某电池单体是否有最高充电和最低放电记录。如果有问题，首先检查电池电压线束是否松动。如果线束正常，检查BMS(测量位置可以看见“相邻单体电压高低故障”)。如果没有任何问题，则电池损坏，必须返回工厂进行处理。

Use the upper computer to read the historical data of the battery pack. Analyze whether a certain battery cell has the highest charging and the lowest discharging record. If has the problem, firstly check whether the battery voltage wiring harness is loose or not. If the wiring harness is normal, check the BMS (measurement location can see ″ The fault of voltage of adjacent cells is high and low″) . If there is no any problem then the battery cell is damaged and have to be returned to the factory for processing.

相邻电池电压故障有高有低

The fault of voltage of adjacent cells is high and low

比如：电池A#4.0V, 电池A+1 或 -1# 1.6V

For example: cell A# 4 .0V , cell A+1 or -1# 1.6V

首先，检查电压线束是否有断线。如果没有问题，你需要测量BMS对应的点。

Firstly,check whether the voltage wiring harness has a break line or not.If there is no problem, you shall measure the corresponding point of BMS.

正常电压为每个电池的对应电压±0.005V

The normal voltage is equal to the corresponding battery voltage ±0.005V per cell C123 - B1+

C122 - B2+

C121 - B3+

C120 - B4+

C117 - B5+

C106 - B6+

C105 - B7+

C99 - B8+

C88 - B9+

C79 - B10+

C118 - B11+

C109 - B12+

C106 - B13+

C100 - B14+

C89 - B15+

C80 - B16+

温度为-40℃的故障

The fault of temperature is -40℃

首先，检查温度线束是否有断线。如果没有问题，你需要测量BMS对应的点。

Firstly, check whether temperature wiring harness has break line or not. If there is no problem,you shall measure the corresponding point of BMS.

将故障点电压与其他正常电压进行比较

The problem point voltage compare with other normal voltages

NTC1=C85

NCT2=C86

NTC3=C87

NTC4=C98

NTC5=C101

NTC6=C102

无通讯故障

The fault of no communication

首先，检查通信线束是否断开。如果没有问题，需要测量BMS的对应点

Firstly, check whether the communication wiring harness is disconnected or not. If there is no problem, you need measure the corresponding point of BMS

E3V3 to GND, Normal 3.25—3 .35V

R5V to RGND, Normal 4 .9 —5.25V

开关键失效故障

The fault of switch key failure

1.开关合不上

1.The switch does not close

开关机械故障

The switch mechanically failure

测量BMS- R17电阻到GND的电压(正常范围为21V - 26V)

Measure the voltage of the BMS- R17 resistor to GND (Normal 21- 26V)

无法自动并联故障

The fault of Unable to automatic parallel

检查DO/ DI和CAN网口连接是否正常

Check whether DO/ DI and CAN network interfaces are properly connected or not

如果DO、DI、CAN线连接，则连接CAN_TESE

If the lines of DO, DI and CAN are connected, connect CAN_TESE

1.确认是否已发送消息

1.Confirm whether any messages have been sent

2.如果已发送，则发送DO关闭命令测试DO+到GND的电压(正常范围11.2-12.2 v)

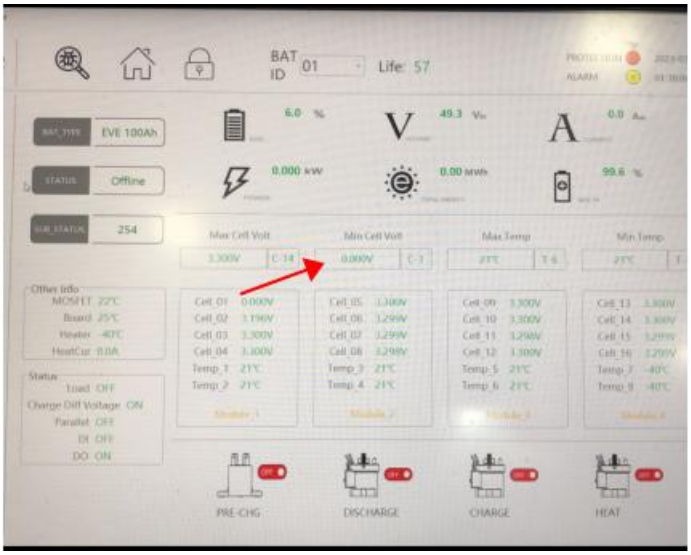
2 . If so, send a DO close command to test the voltage of DO+ to GND(Normal range11 . 2 — 12 . 2V)

3.如果出现以上两种情况，请在DI±上连接6v电源，使用CANTEST读取是否检测到DI

3.If both of above are presented, connect 6 V power supply on the DI±and use CANTEST to read whether DI is detected or not

单体电压为0V的故障
Single voltage 0V fault

1.请参阅下图
1.Refer to the figure below



故障类型及解决方法：
Fault types and corresponding solutions:

1.单电池包系统SOC跳变（云平台的SOC记录经常从10%以上的SOC值跳变到0%，或由90%以下的SOC跳变到100%）

1. SOC jumps in the single-battery pack system. (SOC records on cloud platforms often jump from SOC values above 10% to 0%, or from SOC values below 90% to 100%.)

分析方法:
Analytical method:

1)查询SOC记录，以SOC每次到0%或到100%之后为起始点，在电流持续的情况下，是否会发生SOC跳变；并查看是否充电至100%和放电至0%的过程中均会发生SOC跳变，或者若仅充电/放电过程中出现；

1) Query SOC records, starting from SOC reaching 0% or 100% each time, to see whether SOC jumps occur when the current continues; And check whether SOC jumps occur during charging to 100% and discharging to 0%, or if they occur only during charging/discharging;

2）若存在从100%到0%或从0到100%中无跳变的情况，且是否跳变均发生在2天以上没有满充/满放的情况下；

2) If there is no jump from 100% to 0% or from 0 to 100%, and whether the jump occurs in the case of more than 2 days without full charge/full discharge;

处理措施：
Treatment measure:

1) 若充放电均会发生等值SOC跳变，可能为电池容量不足，根据电池使用时长确认是否为正常容量衰减或异常容量衰减，异常衰减则为客户更换电池；

1) If the equivalent SOC jump occurs in both charge and discharge, it may be that the battery capacity is insufficient. According to the battery usage time, it could be confirmed whether it is normal capacity decay or abnormal capacity decay. If it is abnormal capacity decay, the battery needs to be replaced for the customer.

2）若仅放电中存在跳变，且基本跳变都发生在电池较长时间的静置之后，应当为电池电流采样零漂过大，为客户升级采样零漂小的电池固件；

2)If there is only a jump in the discharge, and the basic jump occurs after the battery has been standing for a long time, the reason for the jump should be the battery current sampling zero drift is

too large, we need to upgrade the battery firmware for customers with small sampling zero drift;

2.Mos粘连故障（电池显示出了粘连灯语）

2.Mos adhesion failure (the battery shows the adhesion signal)

分析方法:

Analytical method:

1）使用电压表量P+、P-电压，确认电压是否为51V左右的电池电压；

1) Use the voltmeter to measure the P+ and P- voltage and confirm whether the voltage is the battery voltage of about 51V;

处理措施：

Treatment measure:

1)若P+ P-两端存在51V电压，需更换BMS板；

1) If 51V voltage exists at both ends of P+ P-, we should replace the BMS board;

2）若P+P-电压仅为30V左右，需升级新电池固件，清除Mos粘连故障；

2) If the P+P- voltage is only about 30V, we should upgrade the battery firmware to clear the Mos adhesion fault;

3.多电池包系统SOC跳变（云平台的SOC记录经常从一个SOC值跳变到另一个SOC值，并且一定时间后会跳变回去）

3. SOC jump in multi-battery pack system (SOC record of cloud platform often jumps from one SOC value to another SOC value, and will jump back after a certain time)

分析方法:

Analytical method:

1)确认现场是否有个别电池经常亮起红色故障灯；

1)Confirm whether there are individual batteries that often light up red fault lights;

2)读取电池历史事件或故障码进一步分析；

2) Read battery history events or fault codes for further analysis;

处理措施：

Treatment measure:

1）根据具体故障，更换问题电池包或具体处理；
1) Replace the faulty battery pack or handle the problem according to the specific fault;

4.电池和逆变器无通讯
4. The battery does not communicate with the inverter

分析方法:
Analytical method:

1.检查Deye逆变器工作模式是否为锂电池模式
1. Check whether the Deye inverter works in lithium battery mode
2.检查Deye逆变器通讯协议设置是否为00（CAN通讯模式）
2.Check whether the Deye inverter communication protocol is set to 00 (CAN communication mode)
3.检查电池包通讯口（PCS CAN）是否有正常报文（如0x350、0x351，波特率500k）
3.Check whether the battery pack communication port (PCS CAN) has normal packets, such as 0x350 or 0x351, with a baud rate of 500k.
4.检查逆变器通讯口（CAN）是否与电池包通讯口（PCS CAN）连接线束接好
4. Check whether the inverter communication port (CAN) is properly connected to the battery pack communication port (PCS CAN) cable harness
5.检查测试记录，PCS CAN通讯是否有PASS的测试记录
5.Check the test record to see if there is a PASS test record for PCS CAN communication

处理措施：
Treatment measure:

1.按分析方法定位问题后，对应处理；
1. After locating the problem according to the analysis method, the corresponding treatment;

5.电池SOC总为99%后停止，不能充电至100%
5. The battery SOC stops after 99% and cannot be charged to 100%

分析方法:
Analytical method:

1.检查逆变器功率分配，电池充电末端是否按照电池上报的充电限制电流分配充电电流
1. Check the power distribution of the inverter and whether the charging terminal of the battery allocates the charging current according to the charging limit current reported by the battery.

处理措施：
Treatment measure:

1.修改逆变器设置；
1. Modify inverter Settings;

6.报电压/温度断线故障，电池亮红灯后异常休眠

6.The voltage/temperature disconnect fault is reported, and the battery is abnormally hibernated when the red light is on

分析方法:

Analytical method:

1.检查采集线连接器是否有退PIN

1.Check whether the acquisition cable connector has returned PIN.

2.检查采集线束是否有折断

2.Check whether the collection harness is broken.

3.检查BMS板采集回路是否有烧损

3.Check whether the acquisition circuit of the BMS board is burned.

处理措施:

Treatment measure:

1.更换采集线;

1. Replace the collection line;

2.更换BMS;

2.Replace the BMS;

英文名（English Name）	中文名（Chinese Name）	LED_1	LED_2	LED_3	LED_4	LED_5	LED_8（常亮故障 steady fault）	LED_8（3s闪烁故障 3s blinking fault）
ALARM_ID_CELL_OVER_VOLT_LEV_2	单体高压保护 High voltage protection for an unit	*					*	
ALARM_ID_CELL_LOW_VOLT_LEV_2	单体低压保护 Low voltage protection for an unit		*				*	
ALARM_ID_SUM_OVER_VOLT_LEV_2	总压过压保护 Total voltage overvoltage protection	*	*				*	
ALARM_ID_SUM_LOW_VOLT_LEV_2	总压欠压保护 Total voltage undervoltage protection			*			*	
ALARM_ID_CHG_OVER_CUR_LEV_2	充电过流保护 Charge overcurrent protection	*		*			*	
ALARM_ID_DSG_OVER_CUR_LEV_2	放电过流保护 Discharge overcurrent protection		*	*			*	
ALARM_ID_CHG_OVER_TEMP_LEV_2	充电高温保护 Charge high temperature protection	*	*	*			*	
ALARM_ID_CHG_LOW_TEMP_LEV_2	充电低温保护 Charge low temperature protection				*		*	
ALARM_ID_DSC_OVER_TEMP_LEV_2	放电高温保护 Discharge high temperature protection	*			*		*	
ALARM_ID_DSC_LOW_TEMP_LEV_2	放电低温保护 Discharge low temperature protection		*		*		*	
ALARM_ID_OVER_DIFF_VOLT_LEV_2	单体压差过大保护 Excessive voltage difference between cells protection	*		*	*		*	
ALARM_ID_OVER_DIFF_TEMP_LEV_2	温差过大保护 Excessive temperature difference between cells protection			*	*		*	
ALARM_ID_MOS_OVER_TEMP_LEV_2	MOS高温保护 MOS high temperature protection	*		*	*		*	
ALARM_ID_HEAT_OVER_TEMP_LEV_2	加热膜高温保护 Heating film high temperature protection		*	*	*		*	
ALARM_ID_AFE_OCD1	OCD1	*	*	*	*		*	
ALARM_ID_AFE_OCD2	OCD2					*	*	
ALARM_ID_AFE_UV	AFE UV	*				*	*	
ALARM_ID_AFE_OV	AFE OV		*			*	*	
ALARM_ID_AFE_OCDL	OCDL	*	*			*	*	
ALARM_ID_AFE_OCC	OCC			*		*	*	
ALARM_ID_AFE_SCD	SCD	*		*		*	*	
ALARM_ID_AFE_UT	UT		*	*		*	*	
ALARM_ID_AFE_OT	OT	*	*	*		*	*	
ALARM_ID_AFE_SCDL	SCDL				*	*	*	
ALARM_ID_AFE_COMM_FAIL	AFE通信失败 AFE communication failure	*			*	*	*	
ALARM_ID_CELL_VOLT_SAMPLE_ERRO R	单体电压采集故障 The voltage collection		*		*	*	*	

	of the single unit fault							
ALARM_ID_TEMP_SAMPLE_ERROR	温度采集故障 Temperature collection fault	*	*		*	*	*	
ALARM_ID_MOS_SHORT_CICUIT	Mosfet 短路 Mosfet short circuit			*	*	*	*	
ALARM_ID_EEPROM_ERROR	EEPROM故障 EEPROM fault	*		*	*	*	*	
ALARM_ID_INTERNAL_COMM_ERROR	内部通信故障 Internal communication fault		*	*	*	*	*	
ALARM_ID_PCS_CAN_COMM_FAIL	PCS通信故障 PCS communication fault	*	*	*	*	*	*	
ALARM_ID_HOST_ADDR_REPEAT	主机地址重复 Host address repetition	*					*	
ALARM_ID_HEAT_MOS_SHORT_CICUIT	加热Mos粘连 Heating MOS adhesion		*					*
ALARM_ID_HEAT_ERROR	加热异常 Anomalous heating	*	*					*
ALARM_ID_PRECHARGE_ERROR	预充失败 Precharge failure			*				*
ALARM_ID_CHARGE_REVERSE	充电反接 Charge reverse connection	*		*				*
ALARM_ID_SOC_LOW_LEV_2	SOC过低 SOC is too low		*	*				*
ALARM_ID_FUSE_BLOWN	保险丝熔断故障 The fuse is blown	*	*	*				*

英文名	中文名	LED_1	LED_2	LED_3	LED_4	LED_5	LED_8(常亮故障)	LED_8(3s闪烁故障)
ALARM_ID_CELL_OVER_VOLT_LEV_2	单体高压保护	*					*	
ALARM_ID_CELL_LOW_VOLT_LEV_2	单体低压保护		*				*	
ALARM_ID_SUM_OVER_VOLT_LEV_2	总压过压保护	*	*				*	
ALARM_ID_SUM_LOW_VOLT_LEV_2	总压欠压保护			*			*	
ALARM_ID_CHG_OVER_CUR_LEV_2	充电过流保护	*		*			*	
ALARM_ID_DSG_OVER_CUR_LEV_2	放电过流保护		*	*			*	
ALARM_ID_CHG_OVER_TEMP_LEV_2	充电高温保护	*	*	*			*	
ALARM_ID_CHG_LOW_TEMP_LEV_2	充电低温保护				*		*	
ALARM_ID_DSG_OVER_TEMP_LEV_2	放电高温保护	*			*		*	
ALARM_ID_DSG_LOW_TEMP_LEV_2	放电低温保护		*		*		*	
ALARM_ID_OVER_DIFF_VOLT_LEV_2	单体压差过大保护	*		*	*		*	
ALARM_ID_OVER_DIFF_TEMP_LEV_2	温差过大保护			*	*		*	
ALARM_ID_MOS_OVER_TEMP_LEV_2	MOS高温保护	*		*	*		*	
ALARM_ID_HEAT_OVER_TEMP_LEV_2	加热膜高温保护		*	*	*		*	
ALARM_ID_AFE_OCD1	OCD1	*	*	*	*		*	
ALARM_ID_AFE_OCD2	OCD2					*	*	
ALARM_ID_AFE_UV	AFE UV	*				*	*	
ALARM_ID_AFE_OV	AFE OV		*			*	*	
ALARM_ID_AFE_OCDL	OCDL	*	*			*	*	
ALARM_ID_AFE_OCC	OCC			*		*	*	
ALARM_ID_AFE_SCD	SCD	*		*		*	*	
ALARM_ID_AFE_UT	UT		*	*		*	*	
ALARM_ID_AFE_OT	OT	*	*	*		*	*	
ALARM_ID_AFE_SCDL	SCDL				*	*	*	
ALARM_ID_AFE_COMM_FAIL	AFE通信失败	*			*	*	*	
ALARM_ID_CELL_VOLT_SAMPLE_ERROR	单体电压采集故障		*		*	*	*	
ALARM_ID_TEMP_SAMPLE_ERROR	温度采集故障	*	*		*	*	*	
ALARM_ID_MOS_SHORT_CICUIT	Mosfet短路			*	*	*	*	