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HOME POWER STORGAE

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User Manual

FOR LEGACY HOME POWER STORAGE

TH-51100-M / TH-51205-M / TH-51280-M

TOUCH WIFI/BLUETOOTH

Contents

Note: please comply with all warings and operating instructions in this manual strictly. Save this manual properly and read carefully the following instructions before installing the unit. Do not operate this unit before reading through all safety information and operating instructions carefully.

Warning

Read instruction before use.

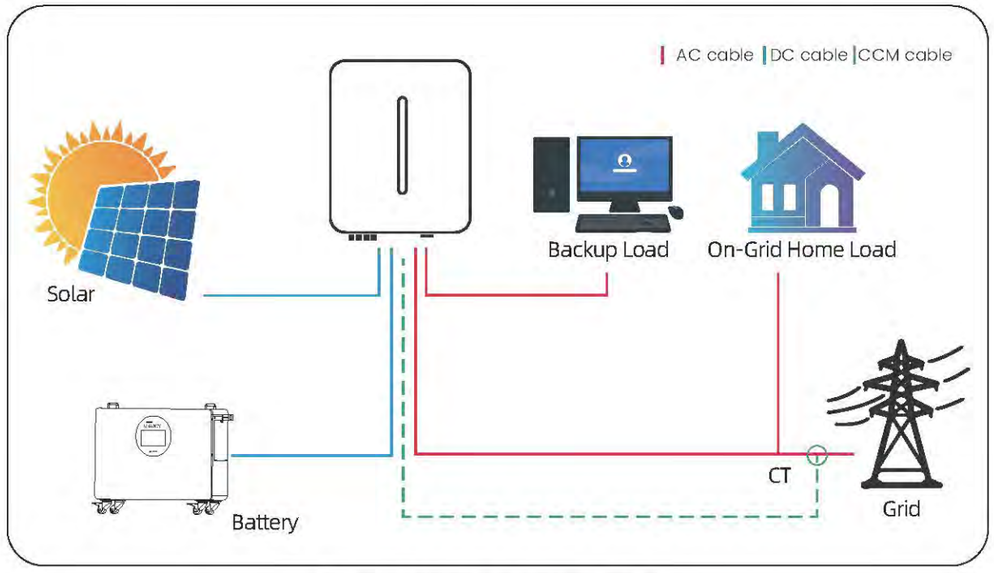
Recyclable.

Do not dispose battery in household trash.

1. Instructions

The Energy storage pack is an essential component of the photovoltaic power generation system. It can provide electricity for the connected load, and it can also store photovoltaic solar modules, fuel generators, or wind energy generators by charging the remaining energy in case of emergency. When the sun goes down, energy demand is high, or there is a power outage, you can use the energy stored in the system to meet your energy needs at no additional cost. In addition, the energy storage Pack can help you achieve energy self-consumption and ultimately achieve the goal of energy independence.

According to different power conditions, the energy storage PACK can output power during peak powerconsumption, and can also store energy during low power consumption. Therefore, when connecting the matching photovoltaic modules or inverter arrays, external equipment is required to match the energy storage the working parameters of the pack to achieve the highest operating efficiency. For a simple diagram of a typicaenergy storage system.



Energy storage System Overview

It is very important and necessary to read the user manual carefully before instaling 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.

- If the battery is stored for a long time, it is requirement that they are charged every three to six months, and the SOC should be no less than 80%,after fully discharging,The battery needs to be recharged within 12hours.
- Do not expose cable outside;Do not use cleaning solvents to clean the battery.
- All battery terminals must be disconnected before maintenance.

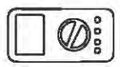
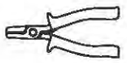
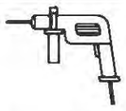
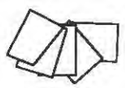
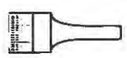
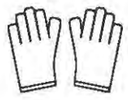
2.Important Safety Warning

- Do not expose the battery to flammable or harsh chemicals or vapors.
- Do not paint any part of the battery, include any internal or external components.
- Do not connect battery with PV solar wiring directly.
- Any foreign object is prohibited to be inserted into any part of the battery.
- Our company will not bear any warranty claims for direct or indirect damage caused by violation of the above items.

2.1 Before connecting

- After unpacking, please check the battery and pack list first, if the battery is damaged or spare parts are missing, Please contact the dealer.
- Before installation, be sure to cut off the grid power and make sure the battery is in the turned-offmode;
- Wiring must be correct, do not mix-connect the positive and negative cables, and ensure no short circuitwith the external device;
- It is prohibited to connect the battery with AC power directly;
- The BMS in the battery is designed for 24VDC/48VDC, DO NOT connect battery in series;
- It is prohibited to connect the battery with different type of battery;
- Please ensure the electrical parameters of battery system are compatible to inverter;
- Keep the battery away from fire or water.

Necessary installation Tools.

 Clamp meter	 Multi-meter	 Label paper	 Phillips screwdriver
 COAX crimping tool	 Diagonal pliers	 Wire stripper	 Claw hammer
 Hammer drill	 Insulation tape	 Cotton cloth	 Brush
 Heat shrink tubing	 Heat gun	Electrician's knife	 Protective gloves

Personal protective equipment

 Insulated gloves	 Safety goggles	 Safety shoes	 Helmet

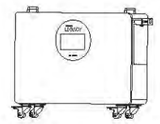
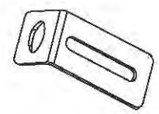
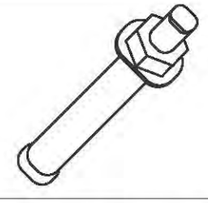
2.2 During operation

- If the battery system needs to be moved or repaired, the power must be cut off first and the battery iscompletely shutdown;
- It is prohibited to connect the battery with different type of battery;
- It is prohibited to put the batteries working with faulty or incompatible inverter;
- In case of fire, only dry powder fire extinguisher can be used, liquid fire extinguishers are prohibited;
- Please do not open, repair or disassemble the battery. We do not undertake any consequences orrelated responsibility due to violation of safety operation or violating of design, production andequipment safety standards.

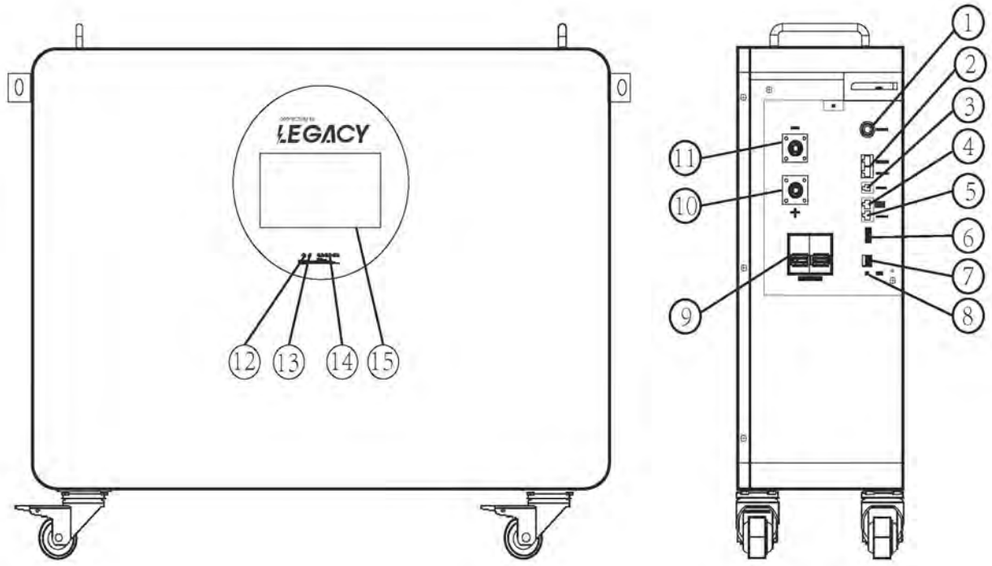
3.Unpacking & Overview

3.1 Packing List

You will receive the following parts(Not a full set), sample as follow picture.For customized requirements, please place an order with the manufacturer.

Battery pack	Mounting brackets *2	Power out positive cable
		
Parallel common cable(RJ45)	Power out positive cable	Usermanual*1
		
Mounting frame screw *2	The RS232 communication	Inverter commoncable(RJ45)
		
M6 Combination screw *2		
		

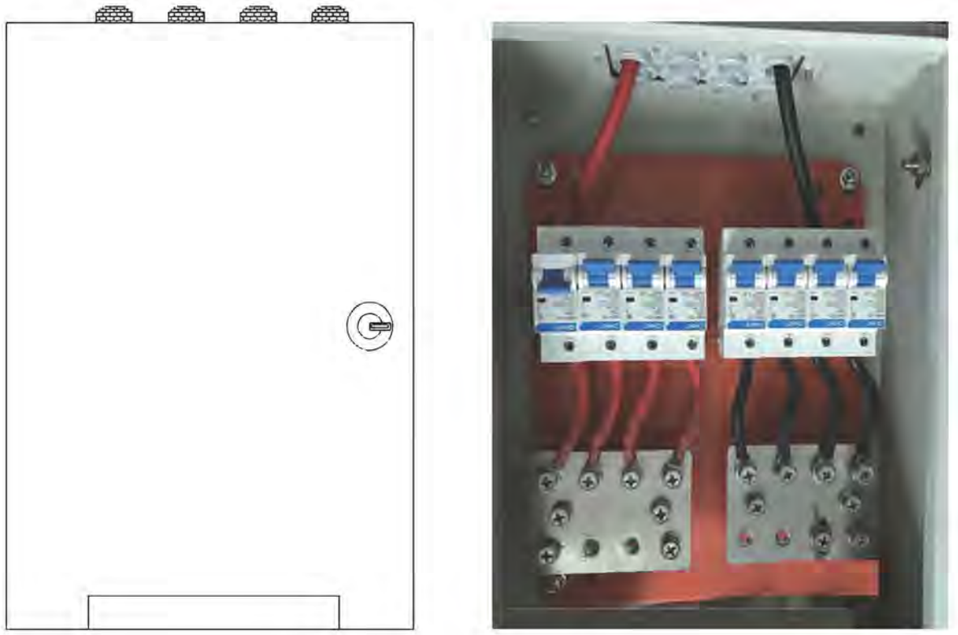
3.2 Rroduct Overview



A General battery shape.Front view

NO.	Description	Silk-screen	Remark
1	E-switch	ON/OFF	
2	RS485B communication port	RS485B	
3	RS232 communication port	RS232	
4	CAN communication port	CAN	Connect to inverter
5	485A Communication port	RS485A	Connect to inverter
6	DRY connect port	DRY CONTACT	
7	ADS Coder	ADS	Set Battery address code
8	reset	RST	
9	Power switch	DC Switch	
10	Positive pole output	+	
11	Negative electrode output	-	
12	LED	RUN	
13	LED	ALM	
14	LED	capacity	
15	LCD		

Combiner control box:4 port IN,4 port out



Combiner control box

4.Installation

4.1 Selecting Mounting Location

Consider the following points to install the energy storage Pack:

- Do not mount the Pack on flammable construction materials. Mount on a solid surface.
- Install this Pack module at eye level in order to allow the readability of LCD display at all times.
- For proper air circulation to dissipate heat, please leave a gap of about >0.3 meter from the ground,30 cmfrom the side of the device.
- The ambient temperature should be between 0'c and 40'c and relative humidity should be between 25%and 85% to ensure optimal operation.
- The recommended installation is flat wise adherence.
- Install the battery module in a dry, protected area with no excessive dust and sufficient air circulation. Do notoperate in locations where the temperature and humidity are outside the specified range.

4.2 Mounting The PACK

WARNING!! Remember that this Pack is heavy so please be careful when removing it from the package,or install it.

When installing the Pack bracket, use appropriate screws to fix it. After that, the equipment should be firmly bolted.The pack can be run indoors or outdoors, However, only professional personnel can enter this area for installation or maintenance.

Step 1:

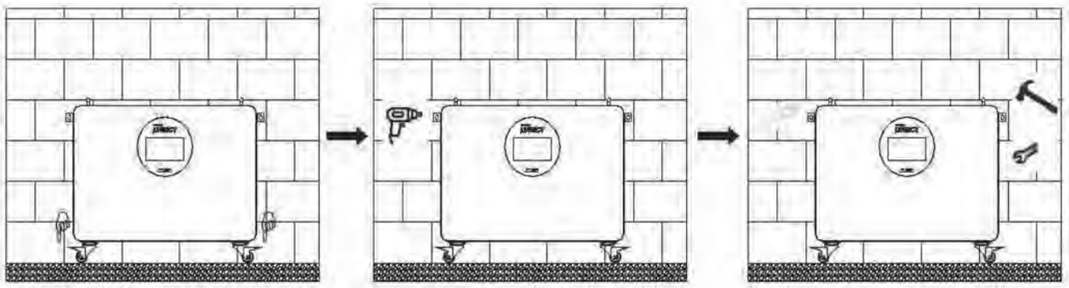
- Whe n receiving the product, open the wooden box. First check if all the accessories are complete. If any missing,please contact the dealer.

Step 2:

- The battery pack is very heavy and needs to use a forklift or more people. To remove the battery from the wooden box.

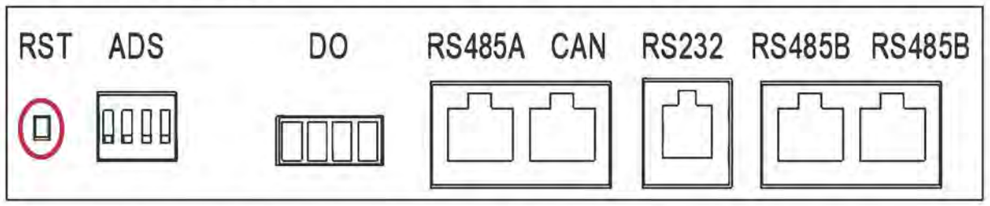
Step 3:

- After the battery pack is taken out, it is recommended to place it against the wall. At the same time, brake the universal wheel at the bottom of the battery pack. Install battery pack 2 fixed supports and punch 10*80MM holes in the wall with impact drills. Plug the explosion screw into the hole. Fasten the battery pack to the wall with screws. Complete the installation.



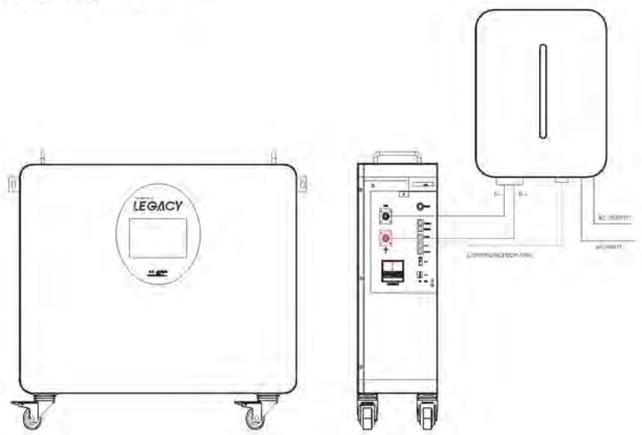
Step 4:

- Connect the wiring of the Pack as shown below. See figure 11. If inverter need CAN BUS port/RS485 port. Please insert communication cable (RJ45) to CAN port or RS485A, RS485B only be used for battery packs parallel mode.

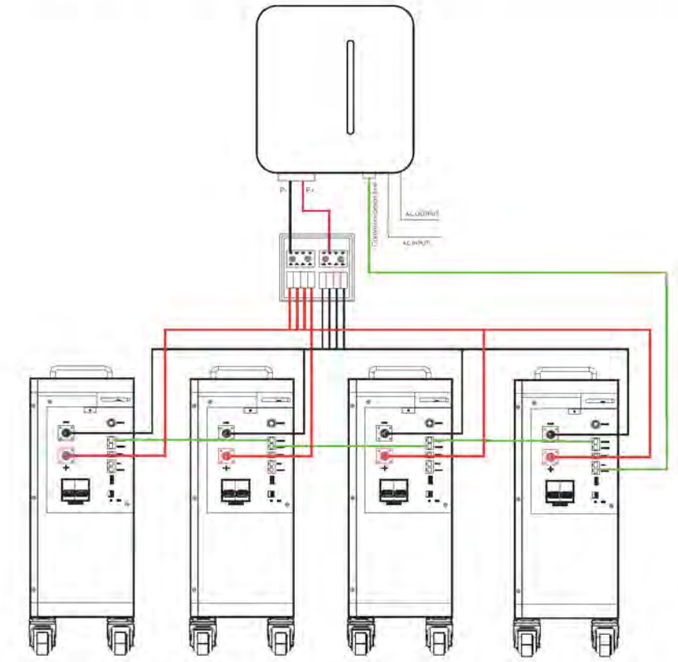


CAN and RS485A---Communication with external devices, sample as inverter, EPS
RS232---Communication with host computer
RS485B---Communication with host computer or parallel
Communication with battery pack

1pack---1 Inverter. Single mode.



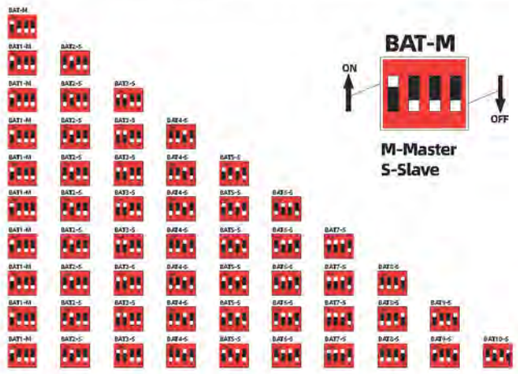
4-pack-1 Inverter. Package 1-3 is cluster machine, package 4 is host, the length of positive and negative power cord should be the same.(4 parallel machine junction boxes shall be added)



Step 5:

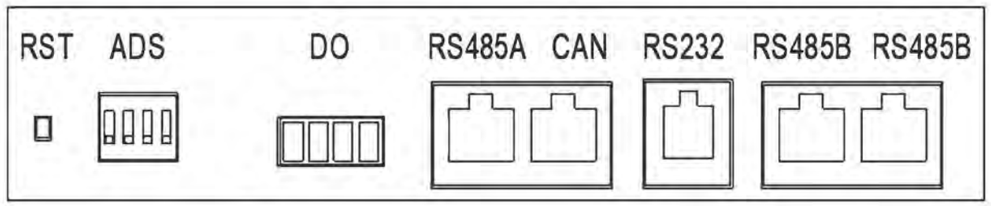
- Set the address of pack. This a important syep, you can see there is 4bit or 8bit coder in bottom of Pack. Please set as bill 1 and 2.

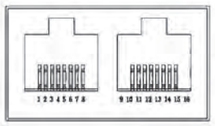
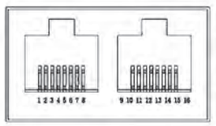
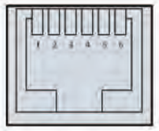
4 bit CODER: this is Binary CODER, Calculated by 8 4 2 1 BCD code. Pack 1 set as Master(BCD 1 0 0 0), see bill 1. It support 15 PCS pack (max) in parallel. Address "0" is only used for single mode.



ID	Position of the DIP switch			
	#1	#2	#3	#4
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON

This is 4bits coder and communication port.CAN port and RS485A port can be selected as the same time.

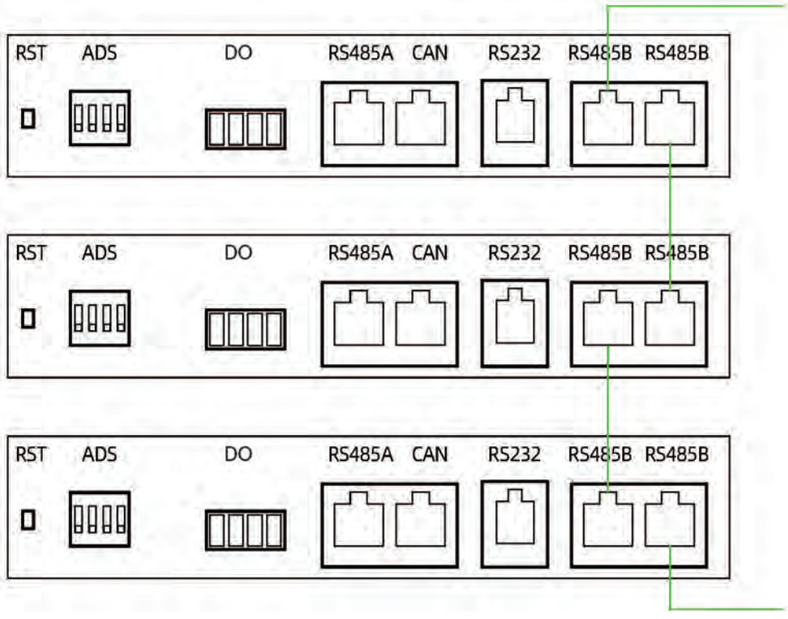


Parallel communication		RS485B-8P8C		RS485B-8P8C	
		RJ45		RJ45	
		1,8	RS485-B	9,16	RS485-B
		2,7	RS485-A	10,15	RS485-A
		3,6	GND	11,14	GND
		4,5	NC	12,13	NC
External communication		RS485A port		CAN port	
		RJ45		RJ45	
		1,8	RS485-B1	9,10,11,14,16	
		2,7	RS485-A1	12	CAN-L
		3,6	GND	13	CAN-H
		4,5	NC	15	GND
Communication with host computer		RS232 RJ11			
		RJ11		RJ11	
		1	NC	4	RX
		2	NC	5	GND
		3	TX	6	NC

NOTE: The output connected to the communication cable with a waterproof plug is listed according to the order requirements, which are customized products, and are not listed here.

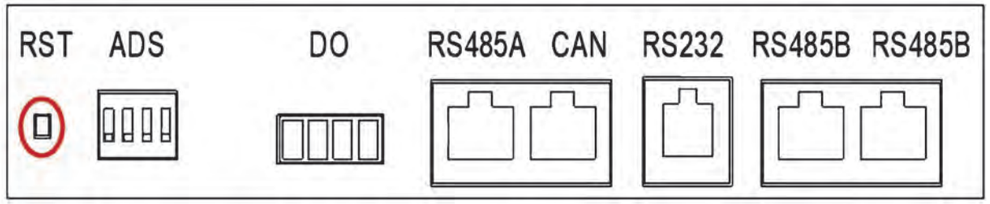
Step 6:

- When more than 3 PCS packs are connected in parallel,then we recommend you install combiner box.3 locations we recommend you install the combiner box.First select location is Top and Botttom.



Step 7 :

- Start and stop battery pack. Confirm that the operation is correct, and you can press down power switch(ON/OFF) 3 second for start battery pack, then turn on switch in the combiner box, the battery start working and output, it enter standby mode(if there is no power switch, please use a little pole and press down the RESET key 3-6second, like as follow picture, LED indicate all running status and check it's self).



Step 8:

- Running the device, set the external charger or inverter parameters, please set according to the corresponding operation manual. Can not exceed the rated parameter requirements.

Battery Pack parameters:

NO	Item	General Parameter
1	Combination method	51.2V
2	Rated Capacity(Ah) (typical)	280
3	Factory Voltage(V)	51-53V
4	Rate power(Wh)	14336
5	Charging Voltage(V) recommend/max	57/57.6V
6	Charging Current(A) recommend/max	0.5C
7	Float charge Voltage(V)	55.5C
8	Discharge Cut-off Voltage(V)	≤44V
9	Max Discharging current(A)	150A
13	Internal Impedance	≤20mΩ
14	Communication protocol	CAN/485
15	Host software and Communication protocol	RS232/485
16	Operation Temperature Range	Charge: 0~55℃ Discharge:-20~55℃
17	Storage Temperature Range(recommend)	0℃~25℃

Battery Pack parallel parameters:

NO	Item	General Parameter
1	Combination method	51.2V
2	Rated Capacity(Ah)*Parallel	PACK*Parallel
3	Factory Voltage(V)	51-53V
4	Charging Voltage(V) recommend/max	57/57.6V
5	Charging Current(A) recommend/max	0.1C/0.2C (total)
6	Float charge Voltage(V)	56V
7	Discharge Cut-off Voltage(V)	≤50V
8	Max Discharging current(A)	150*Parallel
12	Internal Impedance	≤20mΩ
13	Communication protocol	CAN or 485
14	Host software and Communication protocol	RS232/485
15	Operation Temperature Range	Charge:0~5℃ Discharge:-20~55℃
16	Storage Temperature Range(recommend)	0℃~25℃

Battery Pack support communication with inverter:(More communication protocols need to be proposed separately)

NO.	Specification						
1	SMA						
2	MUST						
3	Victron						
4	Schneider						
5	DeYe						
6	Growatt						

Step 9:

- Monitor all running status, and record all parameters, if there has any mistake, please record it. After start the system, every pack is on, and led indicate these status.

Step 10: Stop running battery pack.

- When it is necessary to stop the charging and discharging of the battery or troubleshooting, please stop the external equipment first, cut off the input and output circuits, and then press the power switch off each battery pack.

Appendix 1

BMS parameters.

LED indicate,picture of 4bit coder.

Chart 1: Battery Status

Chart 2: Battery Capacity

status	charge					discharge						
SOC(%)	L6	L5	L4	L3	L2	L1	L6	L5	L4	L3	L2	L1
0-16.6%	OFF	OFF	OFF	OFF	OFF	Flash 2	OFF	OFF	OFF	OFF	OFF	light
16.6-33.2%	OFF	OFF	OFF	OFF	Flash 2	light	OFF	OFF	OFF	OFF	light	light
33.2-49.8%	OFF	OFF	OFF	Flash 2	light	light	OFF	OFF	OFF	light	light	light
49.8-66.4%	OFF	OFF	Flash 2	light	light	light	OFF	OFF	light	light	light	light
66.4-83%	OFF	Flash 2	light	light	light	light	OFF	light	light	light	light	light
83-100%	Flash 2	light	light	light	light	light	light	light	light	light	light	light
RUN LED	light					Flash(flash 3)						

Chart 3: LED flash and buzzer mode (Off by defauli)

MODE	ON	OFF	MODE	ON	OFF
Led Flash1	0.25S	3.75S	Buzzer1	0.25S	0.25S
Led Flash2	0.5S	0.5S	Buzzer2	0.25S	2S
Led Flash3	0.5S	1.5S	Buzzer3	0.25S	3S

Chart 4: LED flash mode

System status	Run status	ON/OFF	RUN	ALM	SOC						REMARK
Power off	SLEEP	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	All led off
Stand by	NORMAL	Light	Flash1	OFF	Lighting for SOC						stand by mode
	ALARM	Light	Flash1	Flash3							Low volt alarm
CHARGE	NORMAL	Light	Light	OFF	Lighting for SOC(The flash2, while it is the high SOC)Alarm LED do not flash, when the BMS into OVP mode.						
	ALARM	Light	Light	Flash3							

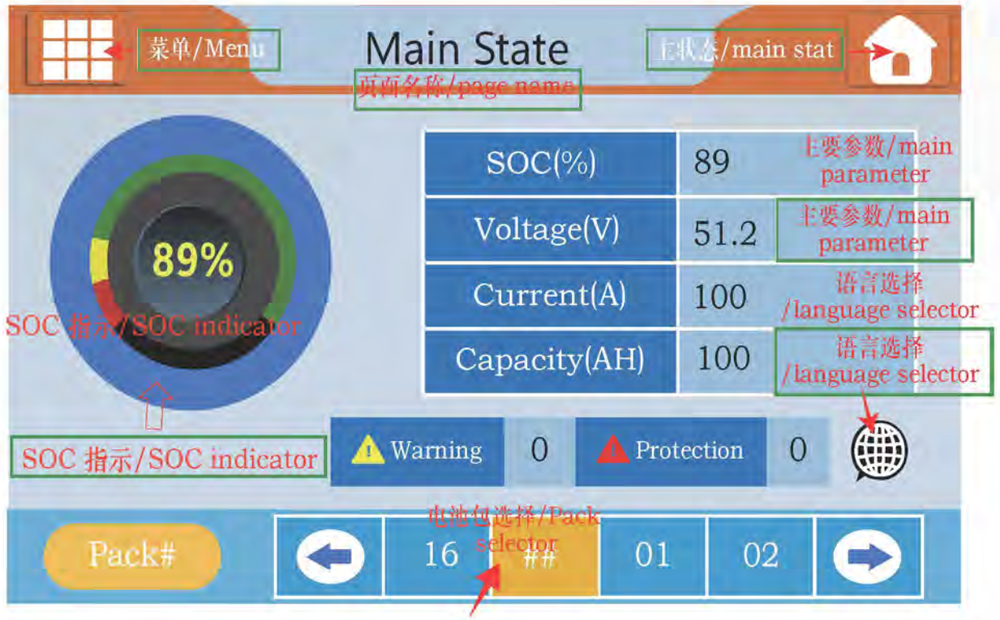
	ALARM	Light	Light	OFF	Light	Light	Light	Light	Light	Light	No charge in,into standby
	OVP	Light	OFF	Light	OFF	OFF	OFF	OFF	OFF	OFF	Stop charge
Discharge	OTP, OCP Fail	Light	Flash3	OFF	Lighting for SOC						
	ALARM	Light	Flash3	Flash3							
	UVP	Light	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Discharge off
	OTP, OCP, SCP, Fail	Light	OFF	Light	OFF	OFF	OFF	OFF	OFF	OFF	Discharge off
FAIL		OFF	OFF	Light	OFF	OFF	OFF	OFF	OFF	OFF	NO Charge or discharge

Chart 5: LCD screen display

1. Introduction of the UI

Description: Welcome interface ,power on for 3 seconds, used for program preparation, communication and data exchange with BMS motherboard; Then enter the main status interface.

2. Main state page

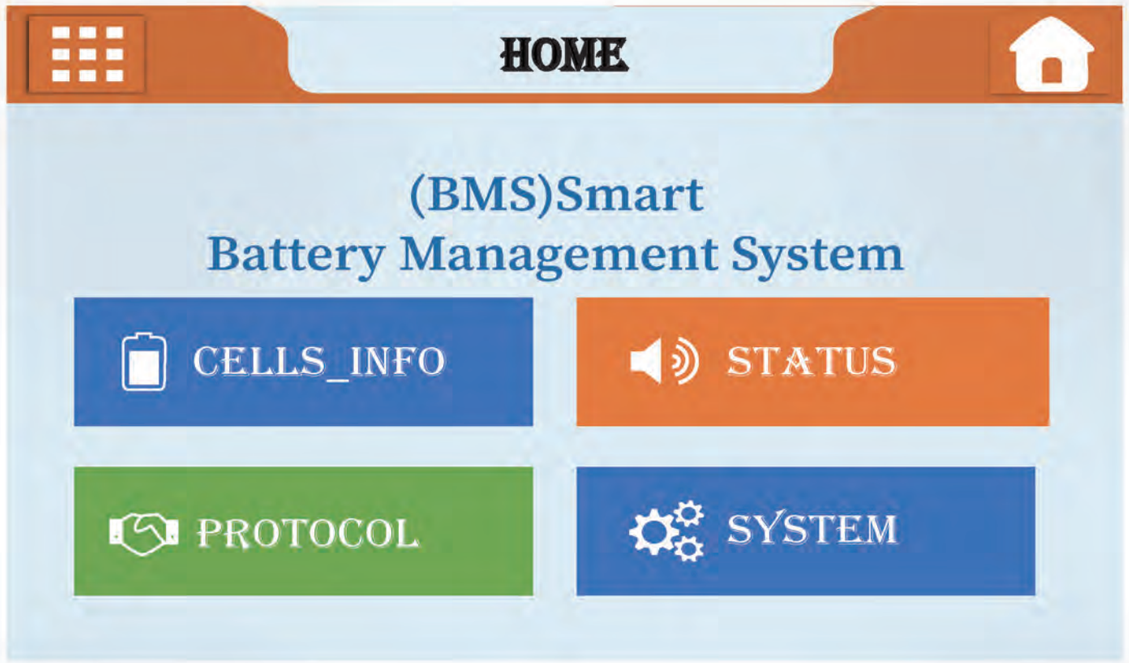


Note: After 3 seconds of the startup welcom interface, it will automatically enter this interface; At any time, automatically enter this interface after waking up from the screen;

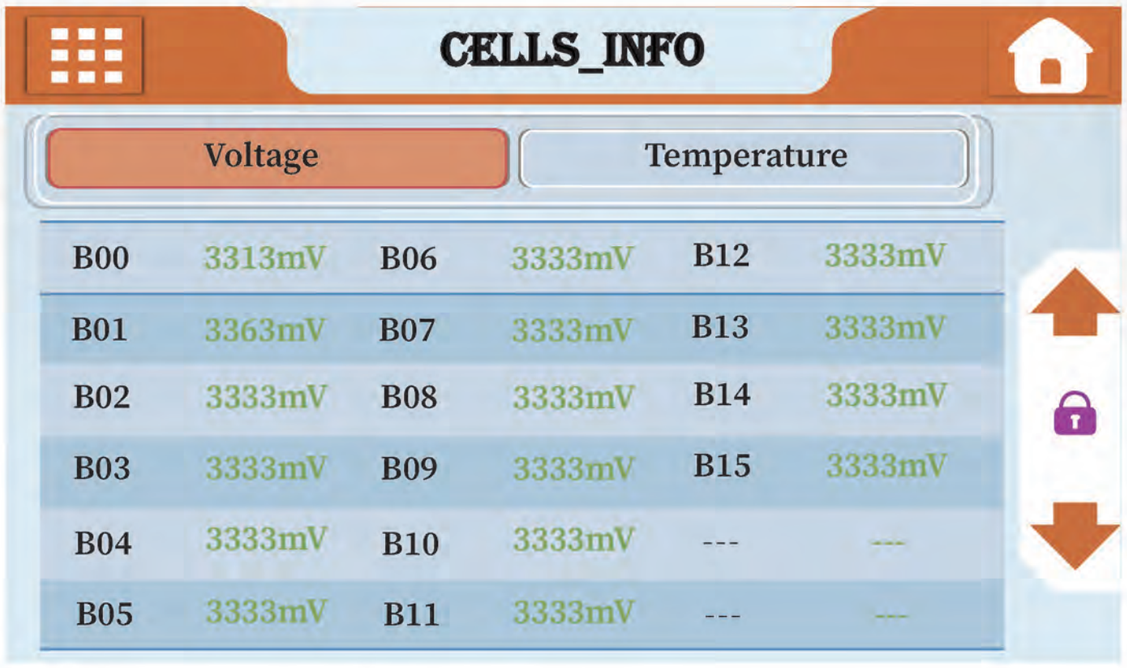
Icon Description

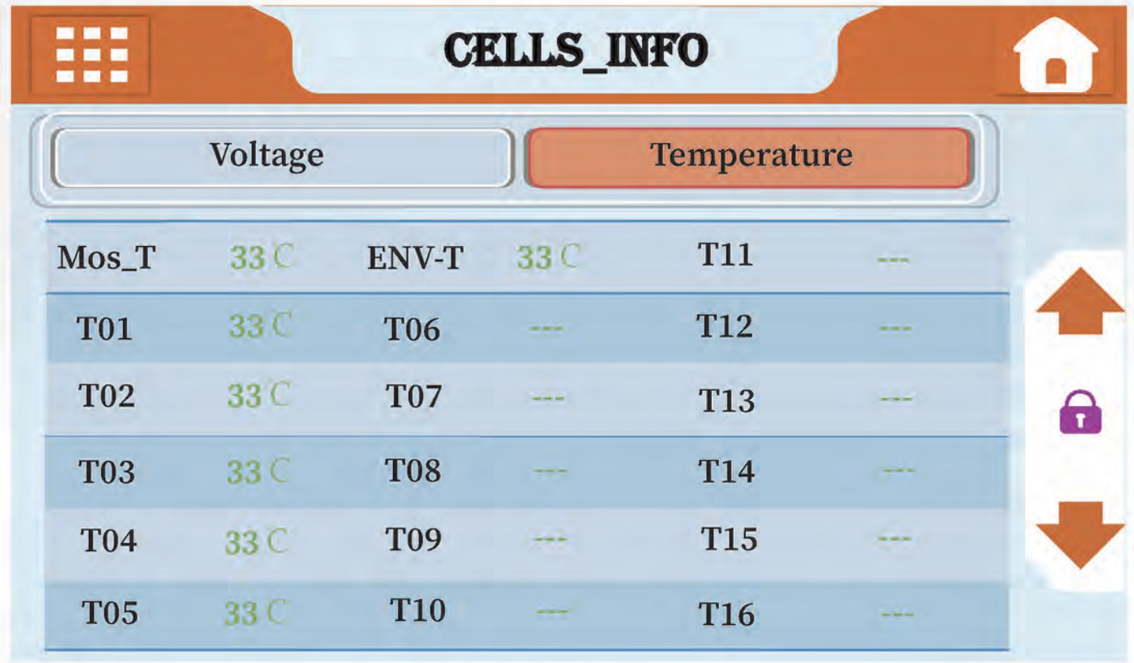
	Main menu icon, click to enter the main menu interface
	Main state icon, click to enter the Main State interface
	System Settings/Language Selection

3. Menu Page

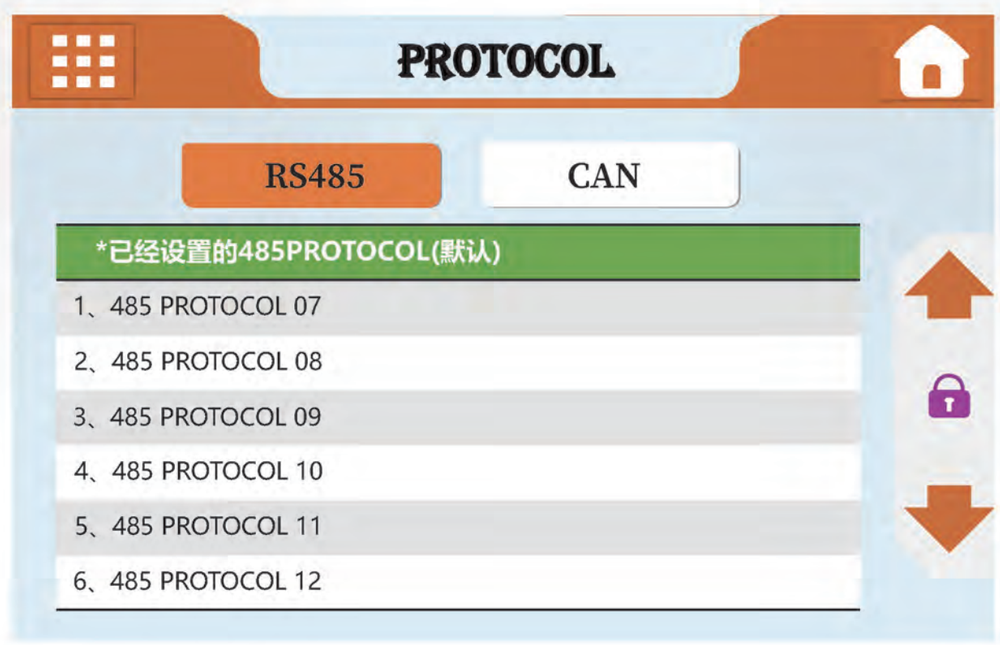


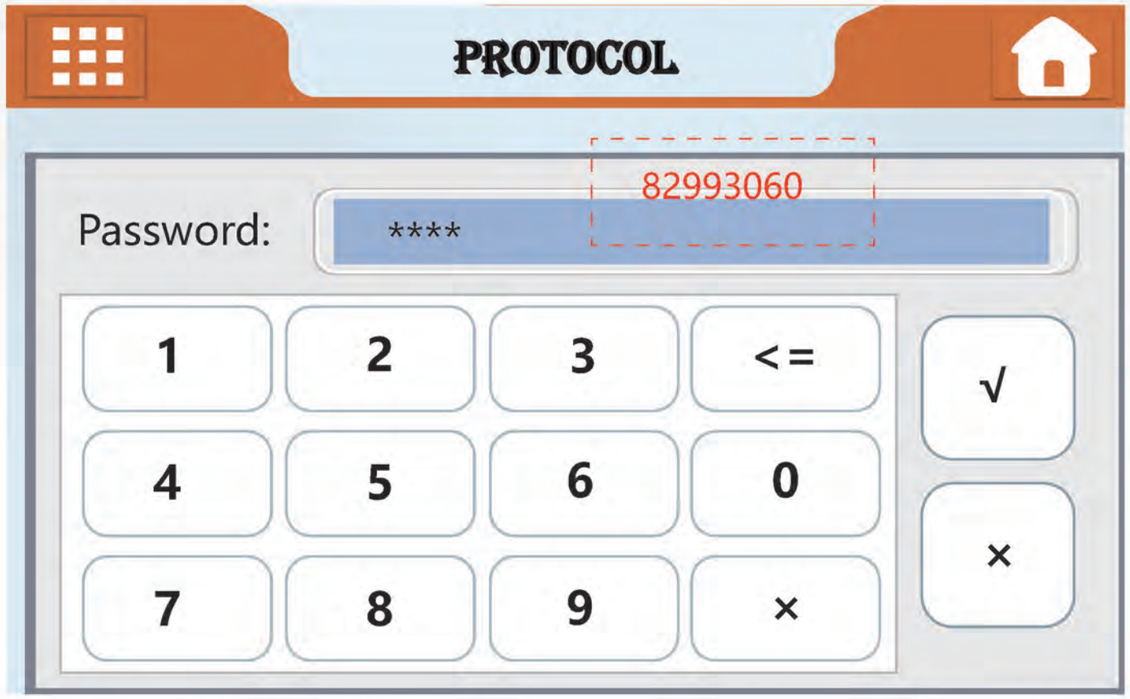
3.1 Cell s info





3.2 Protocol page



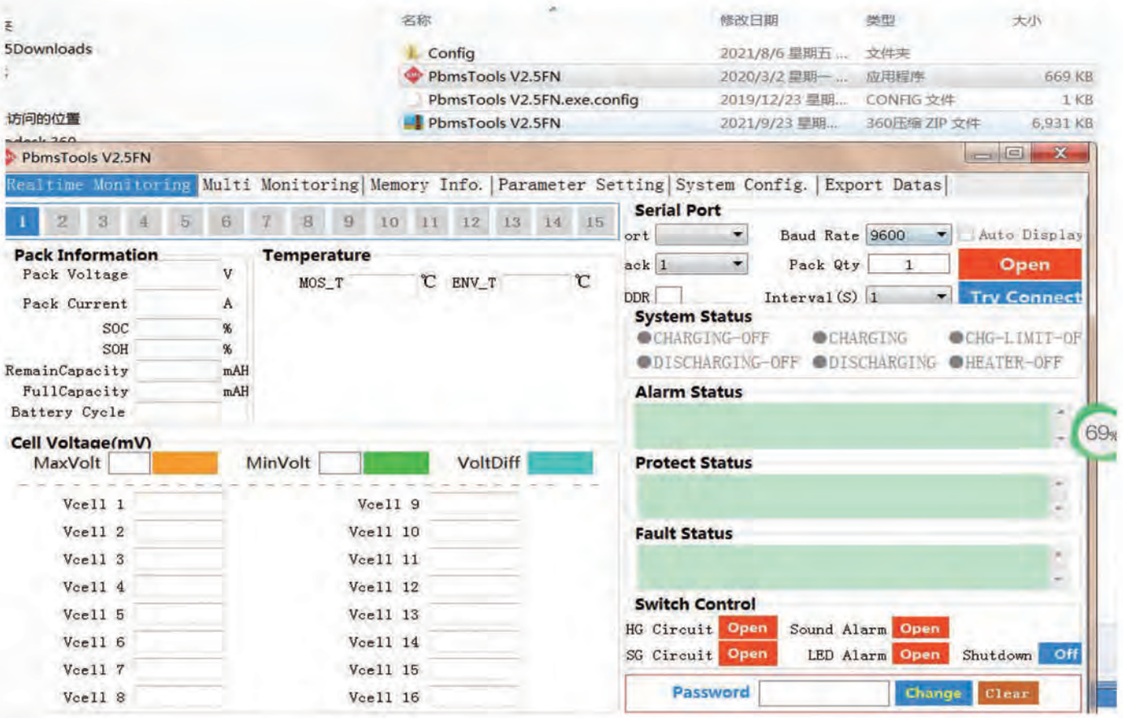


Note: Built in unlock password 82993060; Exit the protocol interface, the permission is invalid, modify the protocol again, and the permission needs to be verified again.

3.3 system page

Appendix 2

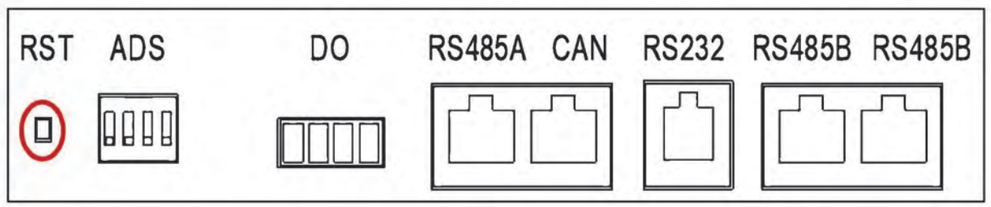
Host soft operation:



Appendix 3

Troubleshootin

1. Battery pack stop work.
A: Turn on switch,be sure it is ON; If battery is low SOC.it need to charging in.
B: Battery pack low volt or enter sleep mode,there you will press down "RST" button3-6 second,or charging in.



2. No communication ,inverter can not received any DATA from BMS.
A: Check whether if communication cable is OK,check RJ45 PIN,
CAN: PIN4:CANH,485A-A
PIN5:CANL;485-B
RS485A: PIN2:485A-A
PIN1:485A-B;
B: Replace the communication line.Please give feedback to the dealer and exchange it.
C: Check inverter or other device which connect to BMS,update it is firmware.
D: If the communication function needs to be upgraded, please consult the agent or manufacturer.
E: Confirm your inverter and battery protocol is correct,Different protocol or different connection will make a mistake.

3. Battery pack report SOC is mistake.
A: Inverter received Data from Master BMS, but it is SOC < total SOC, sample as: 9PCS packs has 1800Ah, but inverter read DATA is 1600Ah. So you may check any one is disconnected.check RS485B communication cable(vellow), RS485 communication cable, replace the cable which is broken.RJ45 PIN:
CAN: PIN4:CANH,
PIN5:CANL;
RS485A: PIN2:485-A,
PIN1:485-B;
B: SOC DATA has Large tolerance.
Discharge empty the battery first, then charge it fully with a small current, and learn to discharge. Any pack ismistake, we advice you read the BMS Data(When we authorize the terminal to use) with host software.then we reset the BMS and calibration.
C: When multiple batteries are connected in parallel, the SOC is different.
We recommend that each pack has a small current discharged and it is emptied until the SOC alarm appears, and then recharged in parallel and fully charged.

4. How to turn on the Pack todischarge.
We recommend method is:
A: Reset the single pack's BMS, LED will flash and startwork
B: Turn on the power switch on the bottom/front panel;
C: Turn on power switch in the combiner box.

WARNING: The operating parameters of the equipment cannot exceed the rated working voltage and current ofthe Pack, exceed the rated volt and current,Can cause damage to the Pack or other failures.

5. Inverter or other external device can not connect the battery.
We recommend method is:
A: Check whether the working parameter's of the device and battery are appropriate, and improper parameters cannot be matched.
B: When the device is turned on, the current is too large, resulting in battery protection, At this time, you should beable to see the LED flashing from the battery panel.In this case, You can adjust your equipment parameters or contact the dealer to solve.
C: It is necessary to update BMS parameters and match the device,then Reset BMS and restart your device.

6. Replace bad Pack.
There is a bad battery pack, it is need to replace, please connect your supplier, need professional installers to operate it. We recommend replace all or make pack has same voltage and same specification batteries pack.
NOTE: When replacing the battery, the same module needs to be replaced at the same time, and the voltage should be the same.

7. Need to replace spare parts or emergency maintenance.
Some parts can be obtained from the sales or agency, and the excess parts need to be purchased separately.
Be careful, turn off the power switch before replacing parts.

8. Need to place some safety device for keep a safe environment.
You'd keep a safe case for Pack and external device, Please place safety device, as: fire-fighting sand, fire-fighting blankets, fire-fighting water pipes, Install Monitor sound, light, electricity, smoke and other equipment.

WARNING:

Emergency process:

1. The external device catches fre and explodes:
A: Under the condition of ensuring safety, non-operating personnel immediately move to a safe location.
B: Under the condition of ensuring safety, the operator immediately cut off the external power supply of the equipment and the internal power supply.
C: Use fire-fighting equipment for fire-fighting treatment
(the use of fire-fighting sand, fire-fighting blankets, fire- fighting water pipes)
D: If you cannot completely extinguish the fire, please call the local fre department for help.
E: Keep the accident site data so that the source of the accident can be traced.

2. The Pack catches fre and explodes:
A: Under the condition of ensuring safety, non-operating personnel immediately move to a safe location.
B: Under the condition of ensuring safety, the operator immediately cut off the external power supply of the equipment and the internal power supply.
C: Use fire-fighting equipment for fire-fighting treatment
(the use of fire-fighting sand, fire-fighting blankets, fire- fighting water pipes)
D: If you cannot completely extinguish the fire, please call the local fre department for help.
E: Keep the accident site data so that the source of the accident can be traced.