HARVEYPOW

User Manual

Model: 48V - 5.1kW・h/8.3kW・h/
8.8kW・h/10.3kW・h/
11.7kW・h/14.3kW・h/
15.5kW・h

Foshan Haiweineng New Energy Technology Co.,Ltd

Contents

1. Safety Precautions

- 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.
- If the battery is stored for a prolonged time, it is requirement that they are charged every three to six months, and the SOC should be no less than 80%.
- The battery needs to be recharged within 12 hours, after fully discharging.
- Do not expose cable outside.
- All battery terminals must be disconnected before maintenance.
- Do not use cleaning solvents to clean the battery.
- 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.
- Any warranty claims are excluded for direct or indirect damage due to items above.

1.1.Before Connecting

- After unpacking, please check the battery and packing 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- off mode;
- Wiring must be correct, do not mix-connect the positive and negative cables, and ensure no short circuit with the external device;
- It is prohibited to connect the battery with AC power directly;
- The embedded BMS in the battery is designed for 48VDC, please 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.

1.2.During operation

- If the battery system needs to be moved or repaired, the power must be cut off first and the battery is completely 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 or related responsibility due to violation of safety operation or violating of design, production and equipment safety standards.

2. Battery Specifications

Battery Specifications							
Model No	1	2	3	4	5	6	7

Nominal Parameters							
Voltage(V)	51.2	51.2	51.2	51.2	51.2	51.2	51.2
Capacity(Ah)	100	161.2	172.5	202	228	280	302
Energy(KwH)	5.12	8.25	8.83	10.34	11.67	14.33	15.46
Dimensions (LxWxH)(mm)	600*400*165/ 480*400*195	620*425*230/ 570*161*720	720*570*161	500*288*550/ 590*440*235	500*288*550/ 590*440*235	500*300*900	650*250*500
Weight(Kg)	53	70	75	80	88	115	120
Remarks: The battery pack with a nominal voltage of 51.2V is suitable for 48V system.The size and weight of the battery pack vary according to the design scheme/datasheet of specific model							

Basic Parameters	
Life cycles(90% DOD, 25°C)	8000 cycles
Storage time / temperature	5 months @ 25°C; 3 months @ 35°C; 1 month @ 45°C
Operation temperature	-20°C to 60°C @60±25% Relative Humidity
Storage temperature	0°C to 45°C @60±25% Relative Humidity
Enclosure protection rating	IP54 (The protection level can be improved according to customer requirements)

Electrical Parameters	
Operation voltage	44.8-58.4Vdc
Max. charging voltage	58.4Vdc
Max. charging and discharging current	100A//200A
Max Power	5120/10240W

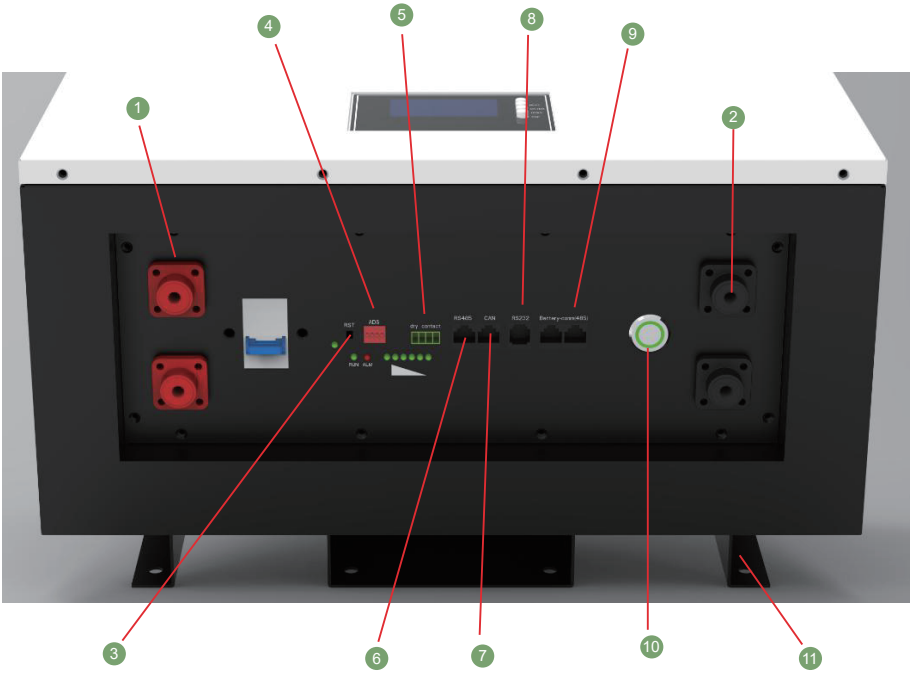
3. Introduction to the Series battery

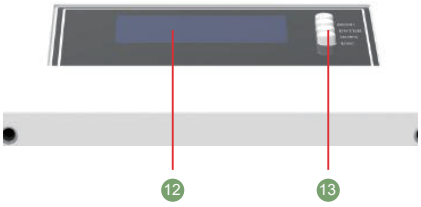
3.1 Key Features

- $LiFePO_4$ composition – provides exceptional safety and longevity
- High safety and reliability
- 8000 cycles
- Consistent performance over wide temperature range
- Various styles, matching various use occasions and installation sites
- Integrated state-of-the-art BMS to manage and monitor battery information including voltage, current and temperature as well as balance cell charging/discharging rates
- 12 years warranty

3.2 Interface Introduction

- This section details the interface functions of front and back panel.
- Front interface:


1
2
3
4
5
6
7
8
9
10
11
RST
ADS
dry contact
RS485
CAN
RS232
Battery-comm(485)
RUN
ALM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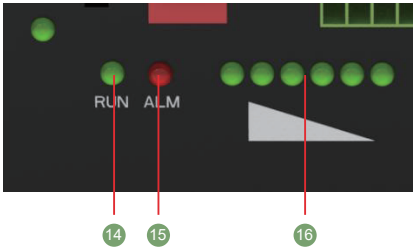

RUN
ALM
14
15
16

No.	Description	Silk-screen	Remark
1	UES0600	P+ P+	Output terminal
2	UES0600	P- P-	Output terminal
3	Port Reset button	RST	For reset the batter
4	Dial switch	ADS	Set the address
5	Do	/	/
6	RS485A Port	RS485	RS485 and inverter connection port
7	CANbus Port	CANbus	CANbus and inverter connection port
8	RS232 Port	RS232	RS232 communication port
9	RS485B port	RS485	RS485 parallel communication interface
10	switch	/	/
11	Bracket	/	/
12	LCD	/	/
13	LCD Key	/	/
14	LED	RUN	Operation indicator
15	LED	ALM	Alarm indicator
16	LED	CAPACITY	Capacity indicator

3.3 SOC Indicator & Status Indicator Guides

■ Chart 1: Battery Status

Status	Normal/ Warning/ Protection	●	●	●	●	●	●	●	●	Description
Shut Down	Shut down	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	All OFF
Standby	Normal	Flash	OFF	Based on capacity						Standby
Charge	Normal	ON	OFF	Based on capacity						
	Warning	ON	Flash							
	Protection	ON	ON							
Discharge	Normal	ON	OFF	Based on capacity						
	Warning	ON	Flash							
	Undervoltage Protection	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging
	Abnormal protection	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging
Fault	Protection	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging or discharging

■ Chart 2: Battery Capacity

Status		Charging						Discharging					
Capacity LED Indicator ·		L6	L5	L4	L3	L2	L1	L6	L5	L4	L3	L2	L1
Capacity	0-16.6%	OFF	OFF	OFF	OFF	OFF	Flash	OFF	OFF	OFF	OFF	OFF	NO
	16.6-32.2%	OFF	OFF	OFF	OFF	Flash	ON	OFF	OFF	OFF	OFF	NO	NO
	32.2-49.8%	OFF	OFF	OFF	Flash	ON	ON	OFF	OFF	OFF	NO	NO	NO
	49.8-66.4%	OFF	OFF	Flash	ON	ON	ON	OFF	OFF	NO	NO	NO	NO
	66.4%-83%	OFF	Flash	ON	ON	ON	ON	OFF	NO	NO	NO	NO	NO
	83%-100%	Flash	ON	ON	ON	ON	ON	NO	NO	NO	NO	NO	NO
RUN Status		ON						Flash					

3.4 Connectors

Charge / Discharge connectors: to connect the positive pole (+) and negative pole (-) from the battery to the inverter via DC isolator.

RS485: Active communication portal between battery and inverter.

CAN:Active communication portal between battery and inverter.

USB To RS232: to get dynamic monitoring data of the battery from upper computer.

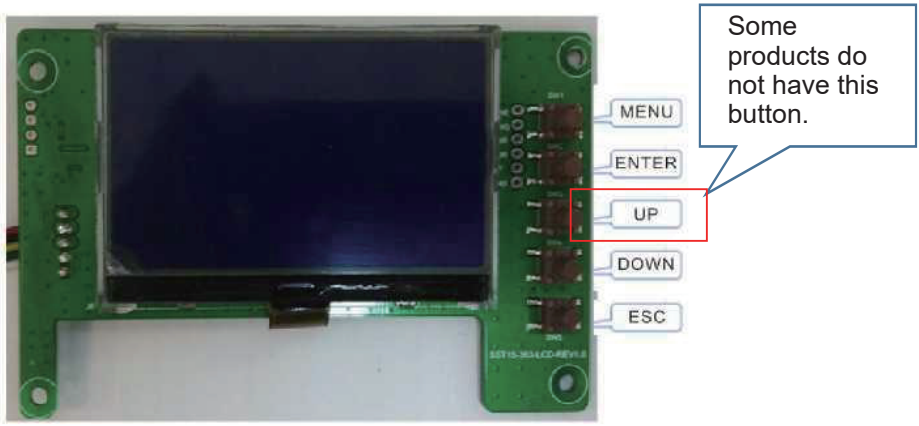
Address: Reserved Address portal for multiple parallel connections.

3.5 Wake Up button

- Switch on: When battery is shut down, press the ON/OFF button for 3 seconds. It is activated when the LED lights flicker from RUN light to the lowest capacity indicator.
- Switch off: When battery is activated, press the ON/OFF button for 3 seconds. It will be shut down when the LED lights flicker from lowest capacity indicator to RUN light.
- RESET Key: Press RST key for 6 seconds, reset BMS, then clear all abnormal states; Press RST key for 3 seconds, with shutdown and boot function;

3.6 Display function instruction

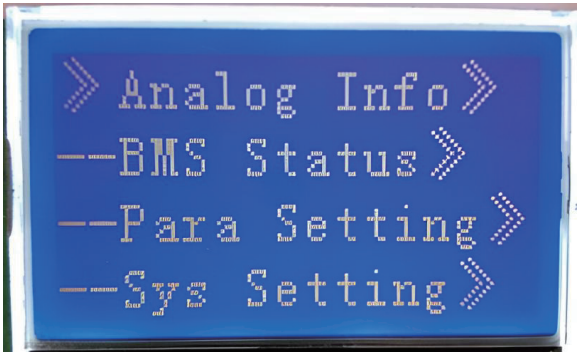
3.6.1 Reference of real figure



3.6.2.Display rendering

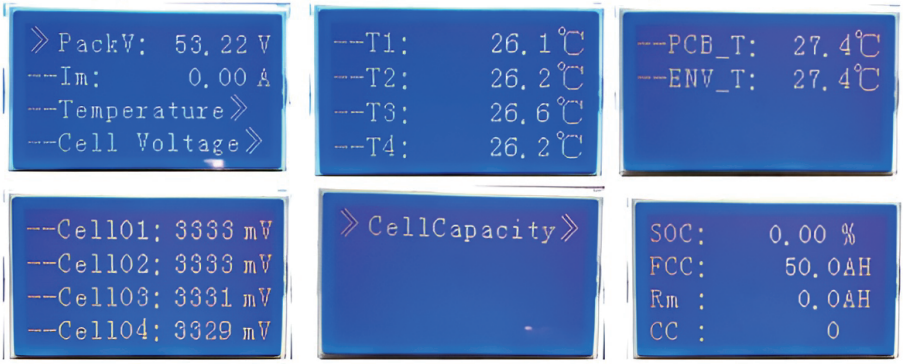
3.6.3.Functional Specifications

- Interface introduction
- Main menu page
- Electricity/dormancy activated, will show the welcome screen, press the MENU button to enter the main menu page. As shown in the figure below:



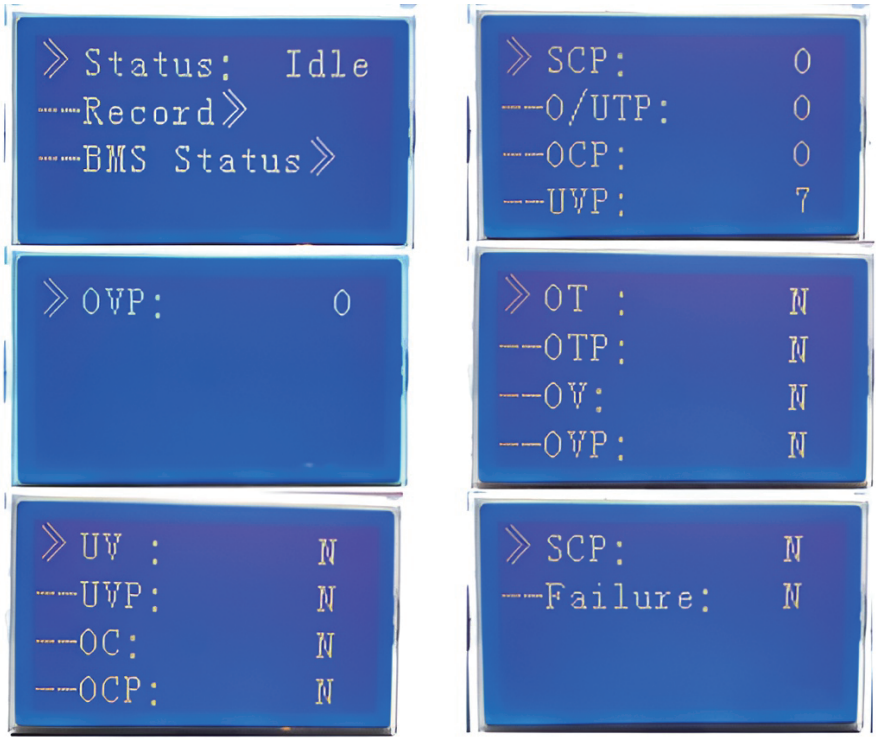
- Battery parameters collection page

When the cursor“》”is point to “Battery Parameters Acquisition”，press ENTER key will enter
into the page of“Battery Parameters Acquisition”，As shown in the figure below:



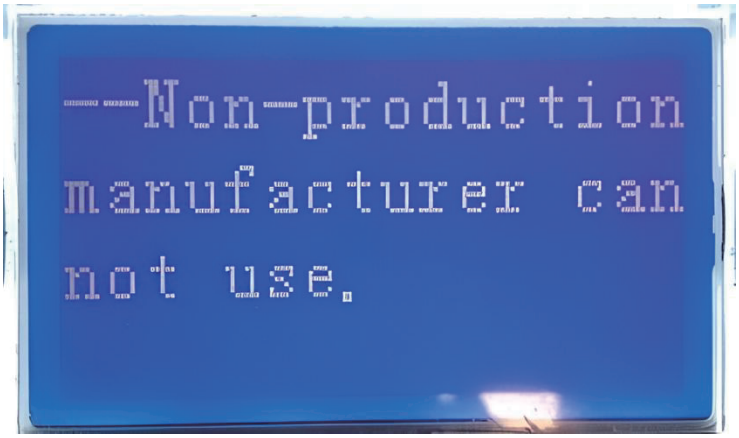
- Battery status page

When the cursor "》 "is point to"Battery Status", press ENTER key will enter into the page of "Battery Status", As shown in the figure below:



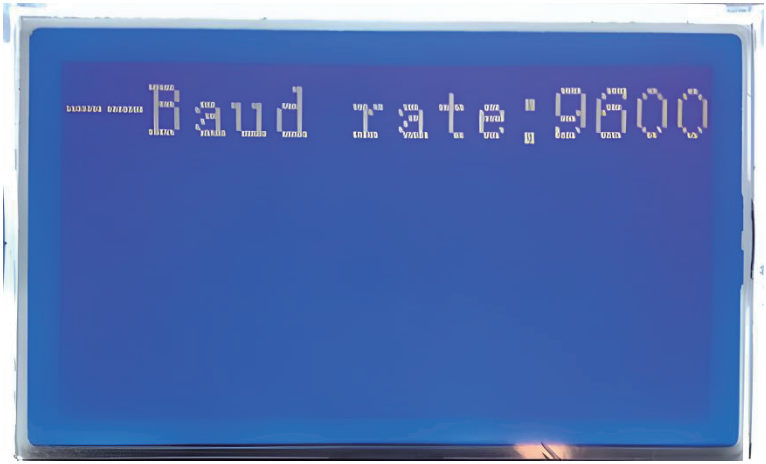
• Parameter Settings

Screen can not set parameters



• System Settings Page

Baud Rate：9600 do not set



• Key description

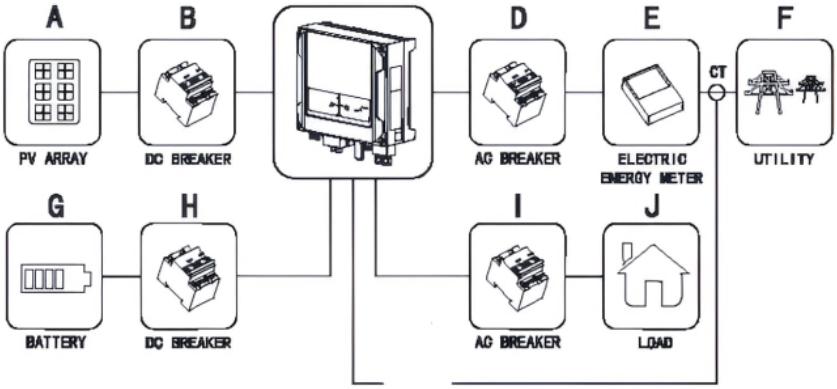
1) SW1----NEMU，SW2----ENTER，SW3----UP，SW4----DOWN，SW5----ESC.
2) Each item is “》”or“--”as a beginning，among them“》”shows the current cursor position，press UP or DOWN key can move the cursor position；with“》”end of the project，the content of the said project has not shown, press ENTER key can enter the corresponding page.
3) Press ESC key can be returned at the next higher level directory；In any position， press NEMU key can return to the main menu page.
4) In a dormant state, press any key, can activate the screen.

• Dormancy/shutdown

Under normal operation condition, with no keystrokes 1 minutes later, system will enter the state of dormancy/shutdown.
Shutdown/dormancy state，press any key，screen can be activated.

4. Safe handling guide

4.1 System Diagram



4.2 Tools

The following tools are required to install the battery pack:

- Wire cutter
- Crimping Modular Plier
- Screw Driver

Note: Use properly insulated tools to prevent accidental electric shock or short circuits.

If insulated tools are not available, cover the entire exposed metal surfaces of the available tools, except their tips, with electrical tape.

4.3 Safety Gear

It is recommended to wear the following safety gear when dealing with the battery pack:

- Insulated gloves
- Safety goggles
- Safety shoes

5. Installation

5.1Inventory of items

Thoroughly inspect the packaging upon receipt of goods. If there is any item that is missing or if there is any damage to the external packaging or to the unit itself upon unpacking, please contact us immediately.

Battery type:

A.Floor type

B. Stack-Style

C. Wall-mounted

D. Rack/Cabinet type

Accessories:

a. Mounting frame

b. Mounting frame screw

c. Cables

d. Rolling cart

NO.	Item	Accessories
A	Floor type battery	for option:c
B	Stack-Style battery	for option:c,d
C	Wall-mounted battery	a,b, for option:c
D	Rack/Cabinet battery	for option:c,rack/cabinet

5.2 Installation Location

Make sure that the installation location meets the following conditions:

- The installation site must be suitable for the size and weight of the battery.
- Must be installed on a firm surface to sustain the weight of battery.
- The area is water proof.
- There are no flammable or explosive materials in proximity
- The ambient temperature is within the range from 0°C to 45°C.
- The temperature and humidity is maintained at a constant level.
- There is minimal dust and dirt in the area.
- The installation must be vertical to the ground or backward. It is prohibited to tilt forward or diagonally to prevent falling due to uneven stress.

WARNING

If the ambient temperature is outside the operating range, the battery pack stops operating to protect

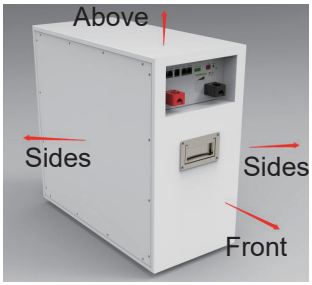
itself. The optimal temperature range for the battery pack to operate is 0°C to 45°C. Frequent exposure

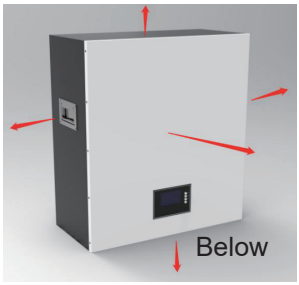
to harsh temperatures may deteriorate the performance and life of the battery pack.

5.2.1.Minimum clearances

Observe the minimum clearances to walls, other batteries or objects as shown in the diagram and picture below in order to guarantee sufficient heat dissipation

Direction	Minimum clearance (mm)
Above	300
Sides	500
Front	300
Below(Wall-mounted)	300





5.3 Installing the Battery Pack

5.3.1 Mounting to a wall

WARNING

In order to avoid electrical shock or other injury, inspect existing electronic or plumbing installations before drilling holes.

The battery is heavy, please handle with care to avoid damage to the product or injury to the installer.

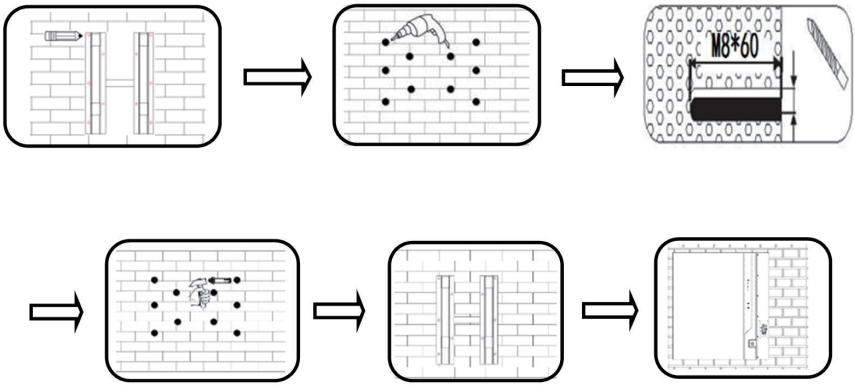
1.Choose suitable firm wall with thickness greater than 80mm.

2.Use the mounting frame as a template, mark the hole position.

3.Drill holes according to the hole position of the bracket, and the depth depends on the length of the screw.

4.Hammer the screws to the above holes, and screw the nut. Note: Do not position screws flush to the wall leave 10 to 20 mm exposed.

5.Fix the mounting frame to the screws.Raise the battery a little higher than the mounting frame while maintaining the balance of the battery. Hang the battery on the frame through the match hooks.



Note: The wall-mounted products shall be installed according to the hole position of the mounting frame. The floor-mounted and stacked products shall be installed only on the opposite side or on the corresponding base.

WARNING

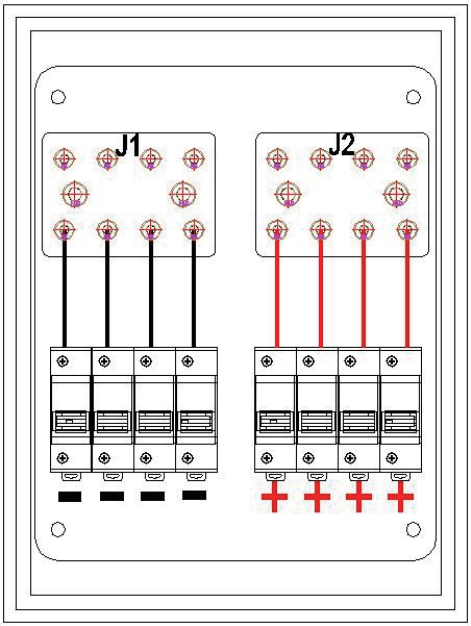
Falling equipment can cause serious or even fatal injury: never mount the inverter on the bracket unless you are sure that the mounting frame is firmly mounted on the wall after thorough checking.

5.4.Parallel use of battery

5.4.1.Power Connection

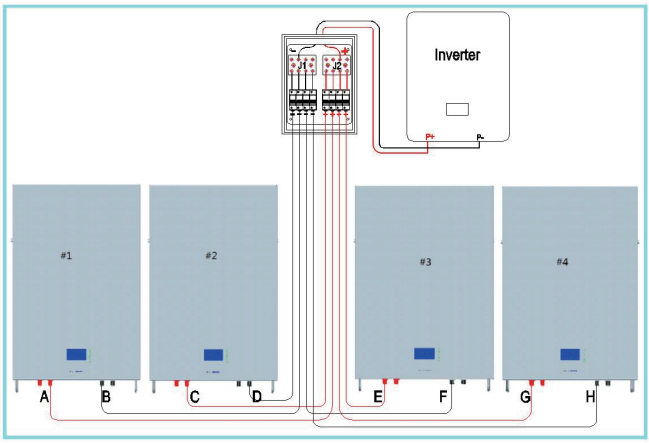
When the battery needs to be used in parallel, the maximum connection is 15 units.But the suggested number of stacked products in a single group is 4; It can be used in 4 groups, up to 15 in parallel. We recommend to use 2-4 units according to application. The application needs power and communication connections as below, choose suitable accessories:

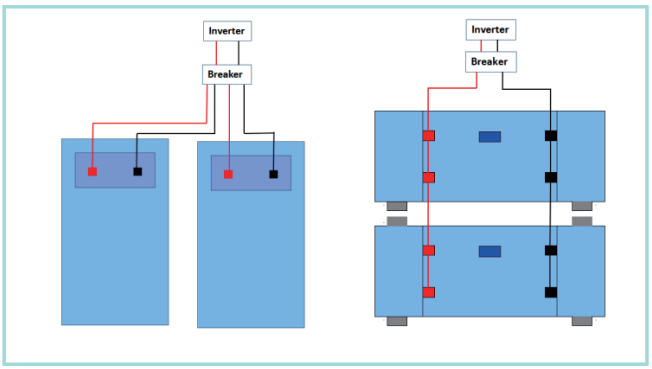
Let’s take 4 batteries for example, use an additional junction box (not included in the standard pack) to combine the power flow of both batteries:



Combiner box

1. Please refer to the figure below to connect the positive output line A.C.E.G. of the battery terminal and the negative output line B.D.F.H of the battery terminal.
2. The other end of the battery, A.C.E.G., is connected to the leakage switch of the combiner box. The negative B.D.F.H is connected to the leakage switch of the combiner box.
3. Connect J1 with inverter's negative pole
4. Connect J2 with inverter's positive pole
5. Add suitable isolators when necessary



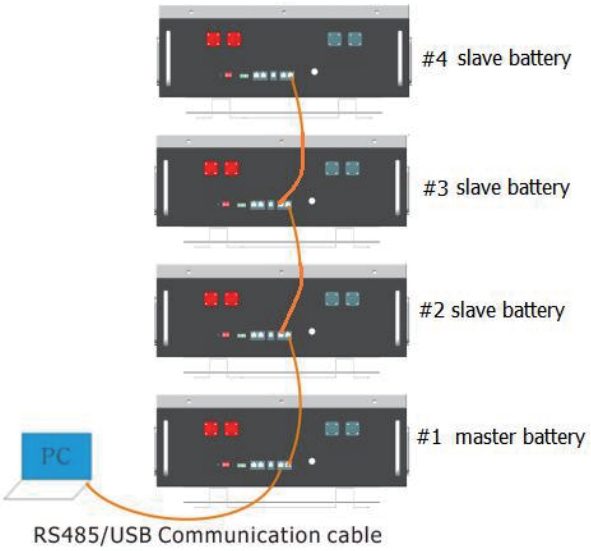


5.4.2.Communication connection

5.4.2.1 Battery and PC communication (note:insert the RS485B port)

1) Stand-alone communication

1) Stand-alone communication

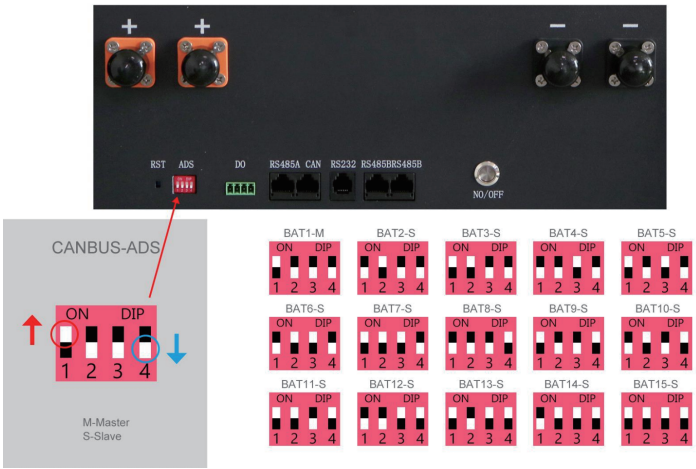


5.4.2.2 Inverter and PC communication (note:insert the RS485A or CANBUS port)

1) Stand-alone communication

2) Parallel communication

Note: When the single unit is used, the inverter communicates with the battery as the host; When multiple batteries are used in parallel, the battery is internally connected in parallel via RS485B hardware interface, and RS485A/CANBUS communicates with the inverter; Please refer to below chart to set up the master level and slave level battery.



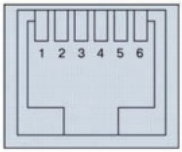
Address setting list (from 1~15batteries)Duplicate address bits cannot be used for communication

Please ensure that the battery is turned on during communication.

5.4.3.Communication Function

5.4.3.1 RS232 Communication Port Definition

RS232 Terminal Port	Definition
Pin3	TX
Pin4	R
Pin2,5	GND
Pin1,6	NC

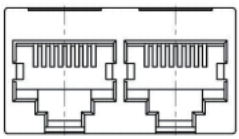


5.4.3.2 RS485A and CANbus Communication Port Definition

RS485 Terminal Port	Definition	RS485 Terminal Port	Definition
Pin1,8	RS485_B	Pin 9、10、11、14、16	NC
Pin2,7	RS485_A	Pin 12	CANL
Pin3,6	GND	Pin 13	CANH
Pin4,5	NC	Pin 15	GND

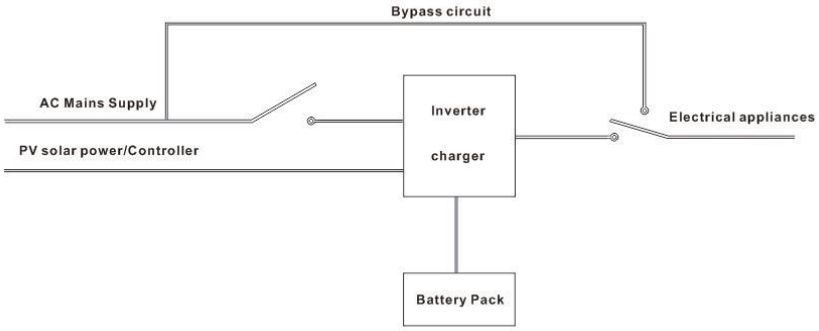
5.4.3.3 RS485B Communication Port Definition

RS485 Terminal Port	Definition	RS485 Terminal Port	Definition
Pin 1、8	RS485-B	Pin 9、16	RS485-B
Pin 2、7	RS485-A	Pin 10、15	RS485-A
Pin 3、6	GND	Pin 11、14	GND
Pin 4、5	NC	Pin 12、13	NC



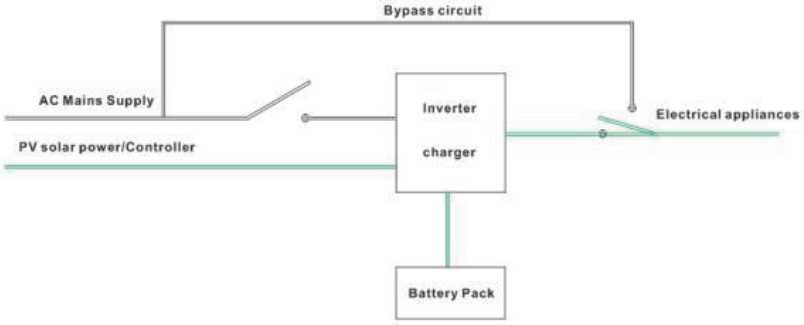
6. Working Principle

6.1 Product system block diagram



6.2 Working mode description

6.2.1 PV solar priority mode

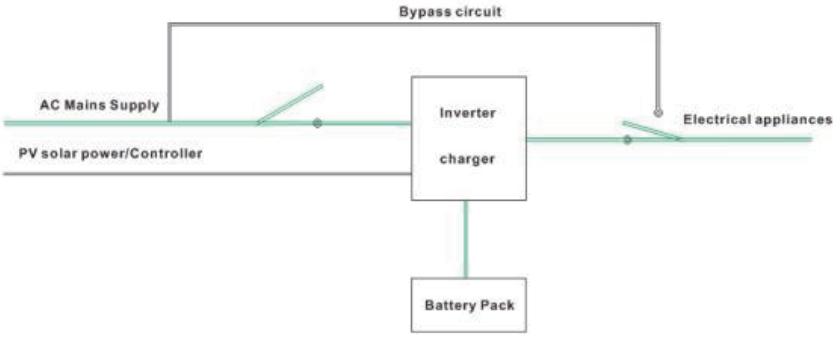


In the PV solar priority mode, the power supply to the load is fed by the solar panel input, as shown in the green path above:

The amount of electricity generated by the solar cell is stored in the battery in addition to the user load.

When the amount of electricity generated by solar energy does not meet the user load, the amount of electricity stored in the battery is replenished to the load.

6.2.2 AC priority mode



In AC mains priority mode, the power supply of the load is provided by the mains input to ensure the stability of the output power. At this time, solar power only charges the battery;

When the battery power is seriously insufficient, in addition to supplying power to the load, the AC mains will start to replenish the battery, and the battery will not be fully charged at this time;

When the AC mains is powered off or abnormal, the system will switch to the battery to supply power to the load.

7.Abnormal situation handling

Fault phenomenon	Cause of issue	Approach
Inverter cannot be turned on	AC input failure	Check if the AC input switch is closed Check if the line is open
Abnormal communication	PC cannot read device information	Whether the device is turned on Is the PC software used correctly? Whether the PC software correctly reads the serial port Signal line wiring and address are correct
Equipment overload	Excessive power or short circuit	Check if the load is less than the rated power of the device Confirm if there is a short circuit condition
Battery failure	Fault light (red light) is always on	Press the SET button 6S, all the indicators light up at the same time, release the SET button, if it can not be solved, please contact the manufacturer
Inverter failure	System operation error	Disconnect the load and reboot

8. Product Responsibilities and Consulting

1) We will not be liable for the accidents resulting from operation breaking this specification and user manual.
2) We will not send separate notice, provided that the contents of this specification are changed due to improvement of product quality or technological upgrading; provided that you want to understand the latest information of this product, please contact us.
3) The shelf life of this product is within five/ten years after it is delivered; we will maintain the product, which is in the warranty period for free of charge,provided that it has any product quality problems within the specified operation range;If the warranty period is exceeded, our after-sales service personnel will propose specific maintenance and troubleshooting methods and charge corresponding fees according to the solution.

Note:The free warranty period is five/ten years. If maintenance is required beyond the free warranty period, we will charge a certain fee according to the maintenance plan.

HARVEYPOW

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