



**20KW/50kWh | 30KW/60KWh HIGH VOLTAGE
BATTERY ENERGY STORAGE SYSTEM**

User Instruction

This manual introduces high-voltage lithium batteries. Before installing the battery, please read this manual and carefully follow the instructions during the installation process. If you have any questions, please contact our company immediately for advice and technical support.


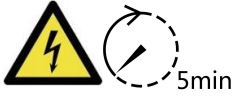






Catalogue

1. Symbol Description	4
2. Safety Precautions	5
2.1 Before Connecting	5
2.2 In Using	6
3. Introduction	6
3.1 Features	7
3.2 Specification	8
3.3 High voltage box (PDU) interface description	10
3.4 Inverter Description	12
4. Safe Handling of Lithium-iron ESS Batteries Guide	13
4.1 Solution Diagram	13
4.2 Danger Label	13
4.3 Tool	13
4.4 Safety Gear	14
5. Installation and operation	14
5.1 Transportation and Mobility	14
5.2 Installation Location	14
5.3 Installation Steps	15
5.4 System turns on	15
5.5 System turns off	15
6. Emergency Situations	15
6.1 Battery Leakage	15
6.2 On Fire	15
6.3 Wet Batteries	16
6.4 Damaged Batteries	16
7. Remarks	16
7.1 Recycle and Disposal	16
7.2 Maintenance	16
Battery Parts List	17
PDU Parts List	17
Rack cabinet Parts List	17
Maintenance Record	18
Dear user.thank you for selecting our product,Please fill in and keep the warranty card for better services.	18

(Revision History)

Ver.No	Date	Revised Content	Reasons for Change	Reviser	Approve
A0	2024.03.09	First Edition	First Draft	ZhangDigen	
A1	2024.05.15	Second Edition	Add models	ZhangDigen	

1. Symbol Description

	Do not place near open fire or flammable materials.
	A potential hazard exists when the equipment is working. Wear personal protective equipment during operation.
	Warning electric shock. Power off the equipment before any operation.
	Maintenance personnel must wait for 5 minutes after turning off the power before starting work.
	Grounding: indicate PE cable connection position.
	Do not place in areas accessible to children.
	Keep the battery away from open fire or ignition sources.
	Read the product and operation manual before operating the battery system.
	Label for Waste Electrical and Electronic Equipment (WEEE) Directive (2012/19/EU).
	The certificate label for CE.
	Recycle label.

2. Safety Precautions



Alert

- 1) It is important and necessary to read the user manual carefully (and attachment) before installing or using battery. Failure to do so or to follow any instruction or warning in this document can result in electrical shock, serious injury, and death, or damage battery, potentially rendering it unusable.
- 2) When battery is stored for a long time, it is required to charge once every 6 months, and the SOC should be no less than 50%.
- 3) After battery module cannot be discharged, it needs to be recharged within 12h.
- 4) Do not connect power terminal reversely.
- 5) All power supplies must be disconnected during maintenance.
- 6) Please contact the supplier within 24 hours if there is something abnormal.
- 7) Do not use any liquid to clean the battery.
- 8) Do not expose battery to flammable or irritating chemicals or vapor.
- 9) Do not paint any part of battery, including any internal or external components.
- 10) Do not connect battery with PV solar wiring directly.
- 11) Do not install or use this product beyond provisions of the manual.
- 12) Direct or indirect damages caused by the above reasons are not covered by warranty claim.

2.1 Before Connecting



Warning

- 1) Please check the external packaging condition before unpacking. If it is damaged, contact corresponding local retailer.
- 2) After unpacking, please check the products and spare parts according to spare parts list. If the product is damaged or missing, please contact your local retailer.
- 3) Before installation, be sure to cut off the grid power and make sure battery switch is on OFF mode.
- 4) It is prohibited to connect the battery and AC power directly.
- 5) Before connecting the photovoltaic panel, please check the voltage of the inverter and ensure that it meets the specifications of the energy storage system.
- 6) All electrical wiring must be connected in accordance with local regulations. Before connecting the DC input and AC output, the grounding wire must be connected first.
- 7) Please ensure that electrical performance of system is compatible with the equipment.
- 8) The installation onsite shall be equipped with fire-fighting facilities that meet relevant requirements, such as fire sand, dry powder fire extinguisher, etc.

2.2 In Using



- 1) If battery system needs to be moved or repaired, power must be cut off and battery is completely shut down.
- 2) It is prohibited to connect battery with different types of battery.
- 3) After disconnecting from the power grid and PV circuit, the voltage may still exist, which is still dangerous. Please wait for at least 5 minutes.
- 4) Except for personnel from The Company or other authorized personnel, batteries shall not be opened, repaired or disassembled. The company shall not bear any liability or responsibility caused by violation of any safety operation or design standard, production standard, equipment safety standards or any other standards or requirements.

3.Introduction

This product is one of the energy storage products developed and produced by our company. It is an electrical energy storage solution that combines photovoltaic inverters and lithium iron phosphate energy storage battery packs. It integrates electrical units such as inverters, lithium battery packs, and monitoring into a modular cabinet system. Cooperate with photovoltaic power generation to form an energy-saving and green photovoltaic storage system.

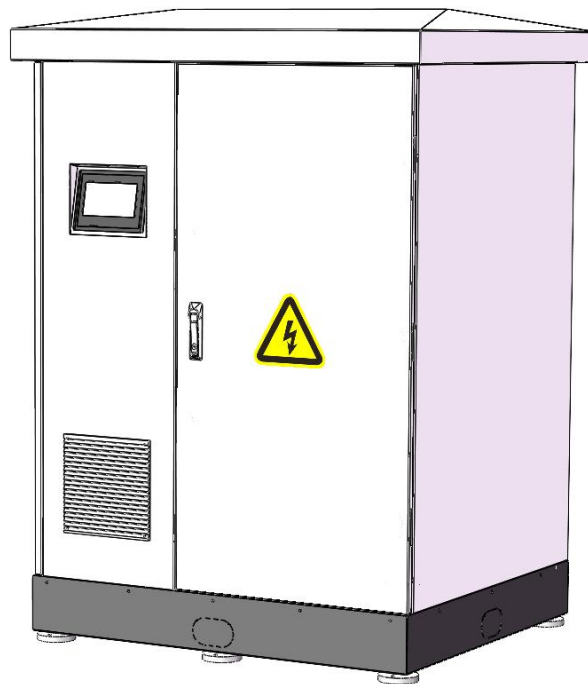


Figure 3-1

3.1 Features

- 1) The module is non-toxic, non-polluting and environmentally friendly.
- 2) Cathode material is made from LiFePO₄ with safety performance and long cycle life.
- 3) Built-in start function to reduce current impact.
- 4) When multiple modules are series connected, module addresses are set automatically.
- 5) Support for upgrading the battery module from the upper controller through CAN communication.
- 6) Battery management system (BMS) has protection functions including over- discharge, over-charge, over-current and high/low temperature.
- 7) The system can automatically manage charge and discharge state and balance voltage of each cell.
- 8) Adopted self-cooling mode rapidly reduced system entire noise.
- 9) Suitable for load design of household appliances, communication base stations, optical storage devices, etc., easy to install and operate.
- 10) Self-consumption and feed-in to the grid, Programmable multiple operation modes: On grid, off grid and UPS.
- 11) Supporting WiFi(optional) monitoring and build-in 2 strings for 1 MPP tracker, 1 string for 1 MPP tracker.

Functions

Protection and Alarm	Management and monitor
Charge/Discharge End	Cell Balance
Over voltage Charging Protection	Intelligent Charge Model
Under Voltage Discharging Protection	Charge/Discharge Current Limit
Charge/Discharge Over current Protection	Capacity Retention Calculate
High/Low Temperature Protection	Soft start
Short Circuit Protection	History Record
Compatible with grid frequency	prevent excess power overflow to the grid

3.2 Specification Parameters

Items	Specification	
Product Name	20KW/50kWh Energy storage cabinet	30KW/60kWh Energy storage cabinet
Battery parameters		
Module Model	102.4V100Ah	
Battery Type	LFP 1P160S	LFP 1P192S
Nominal Capacity	51.2 kWh	61.4 kWh
Nominal Voltage	512V	614.4V
Working Voltage	448~584V	537.6~700.8V
PV		
Max. DC Input Power	26000W	39000W
Max. DC Input Voltage	1000VDC	
Start-up Voltage	180V	
MPPT Voltage	150~850VDC	
PV Input Current	26+26A	36+36+36A
Max.PV Input Current	39+39A	55+55+55A
AC Input/Output		
Rated AC Input/Output Power	20000W	30000W
Input/Output Frequency and Voltage	50/60Hz; 3L/N/PE 220/380, 230/400Vac	
AC Input/Output Rated Current	30A	45A
Max.AC Input/Output Current	33A	50A
Max. Continuous AC Pass through	80A	200A
Overall parameters		
Communication	RS485 ,CAN (WiFi ,Bluetooth optional)	
Storage Temperature	-20°C ~ 55°C (Recommended)	
Working Humidity	≤95% (RH) No Condensation	
Working Temperature	0°C ~ 55°C	
Working Altitude	≤2000m	
Cooling method	forced air cooling/natural cooling	
Protective Class	IP54	
Weight	~805kg	~940kg
Dimension	1170mm*1031mm*1636mm	
Design Life	10 Years (25°C)	
Cycle Life	> 6000 (25°C) ,80% EOL	

Image of energy storage system

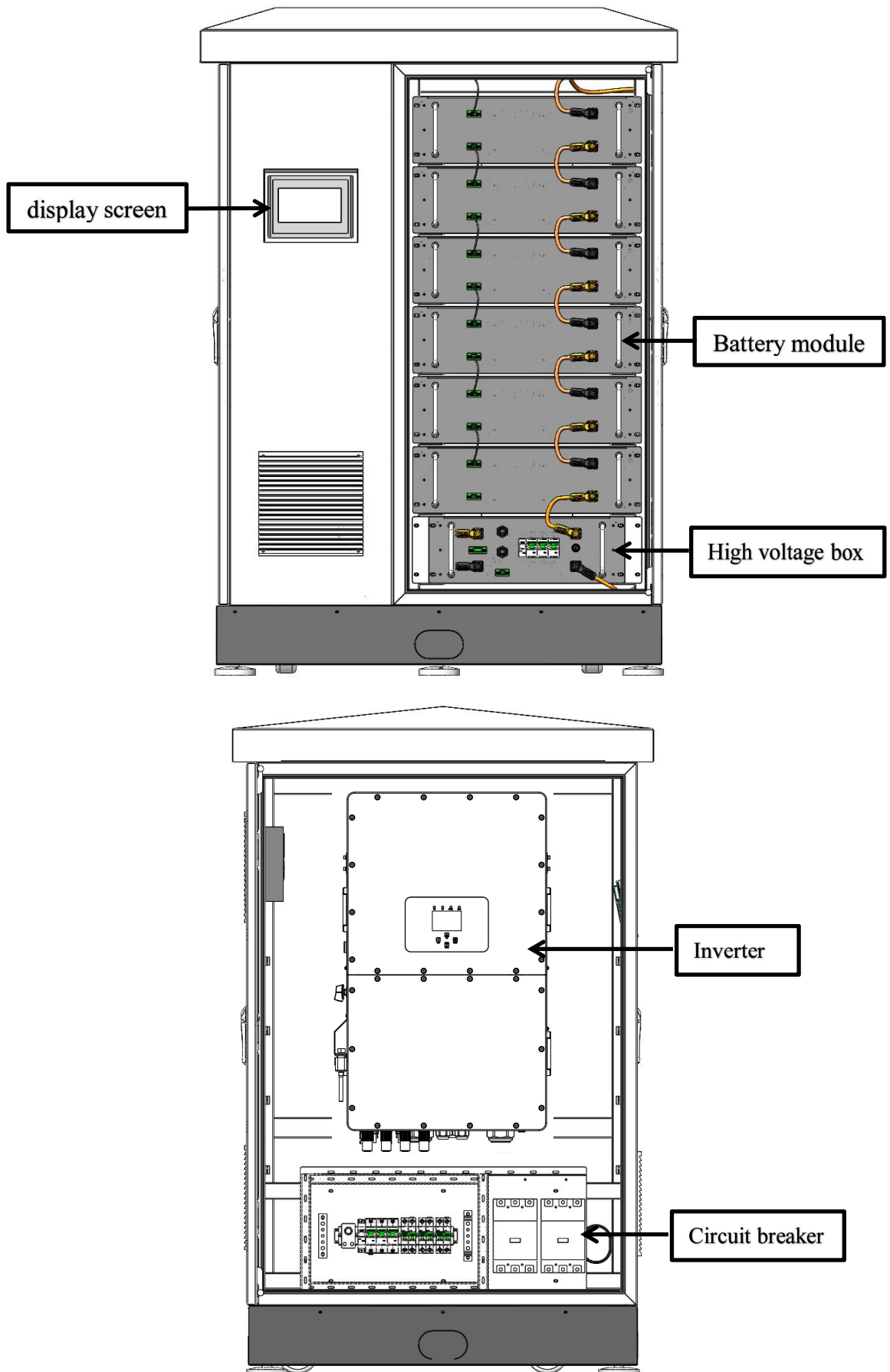


Figure 3-2

3.3 High voltage box (PDU) interface description

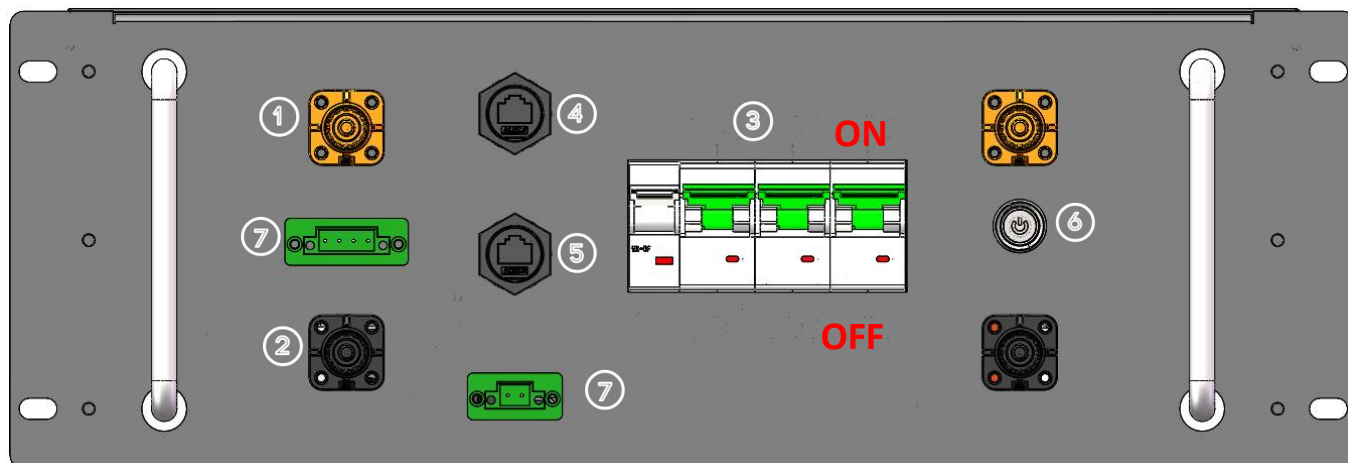


Figure 3-3

- ① Positive terminal: battery positive output--Connect 6AWG cable
- ② Negative terminal: battery negative output--Connect 6AWG cable
- ③ Breaker: control circuit output, turn the switch to ON when use
- ④ PCS: battery communication with PCS by RJ45 8P8C
- ⑤ DBUG: Maintenance inspection port
- ⑥ Start : System start switch, Press the button BMS will works
- ⑦ PORT:Slave communication / Display screen communication

➤ Start

Start button: When battery is dormant, press the START button to start the battery module.

➤ Breaker

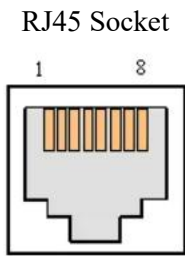
When the circuit breaker is pushed to the ON position, Positive Power Terminal will connect with the HV+ battery contactor and Negative Power Terminal will connect with the battery HV-, on the other hand, when the circuit breaker at OFF position both connection will off.

Attention:

It is strictly prohibited to turn off the circuit breaker switch first when the inverter is charging and discharging the battery

➤ **PCS port**

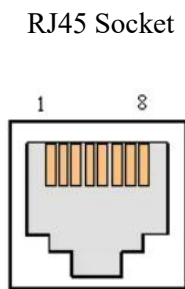
Be used to communicate with inverter or upper battery.



Pin	Definition
1	/
2	/
3	CAN1G
4	CAN1H
5	CAN1L
6	RS485G
7	RS485A
8	RS485B

➤ **DBUG port**

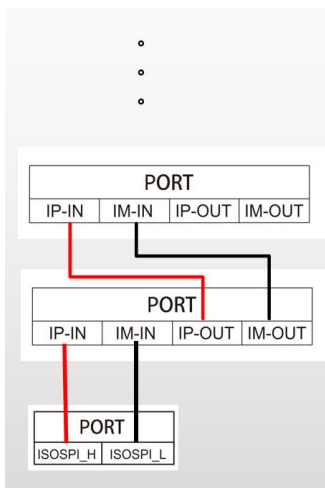
Maintenance inspection port



Pin	Definition
1	CAN0H
2	CAN0L
3	/
4	CAN1H
5	CAN1L
6	/
7	RS485A
8	RS485B

➤ **port**

Slave communication



Pin	Slave communication Definition
1	ISOSPI-H -----IP-IN
2	ISOSPI-L -----IM-IN

Pin	Display screen Definition
1	485A
2	485B
3	24V+
4	24V-

3.4 Inverter Description

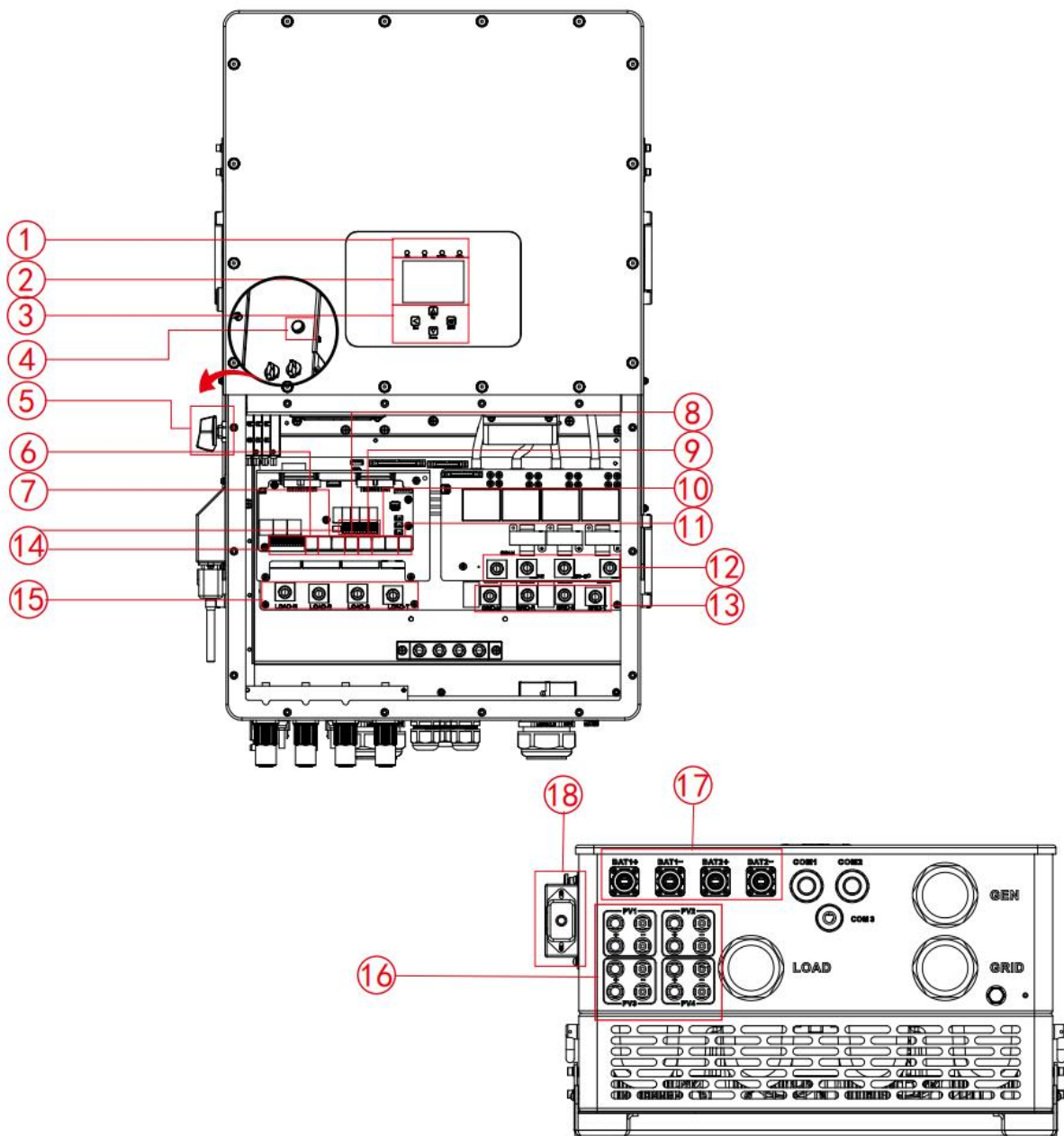


Figure 3-4

- | | | |
|------------------------|---------------------|--------------------|
| 1: Inverter indicators | 7: Parallel port | 13: Grid |
| 2: LCD display | 8: CAN port | 14: Function port |
| 3: Function buttons | 9: DRM port | 15: Load |
| 4: Power on/off button | 10: BMS port | 16: PV input |
| 5: DC switch | 11: RS485 port | 17: Battery input |
| 6: Meter port | 12: Generator input | 18: WiFi Interface |

Attention:

Please refer to the inverter manual for detailed information

4. Safe Handling of Lithium-iron ESS Batteries Guide

4.1 Solution Diagram

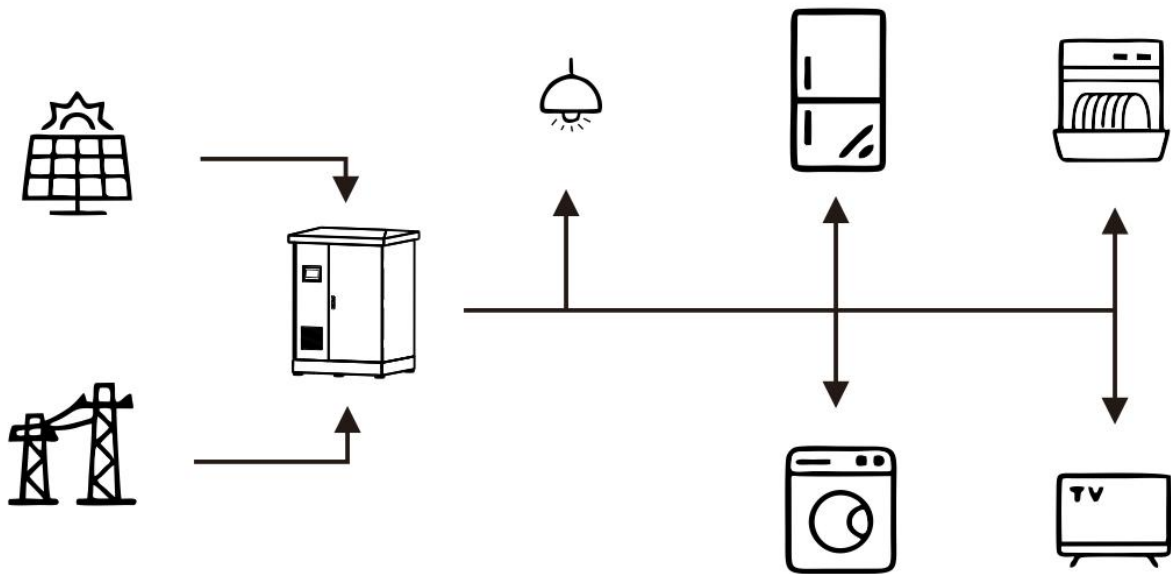


Figure 4-1

4.2 Danger Label

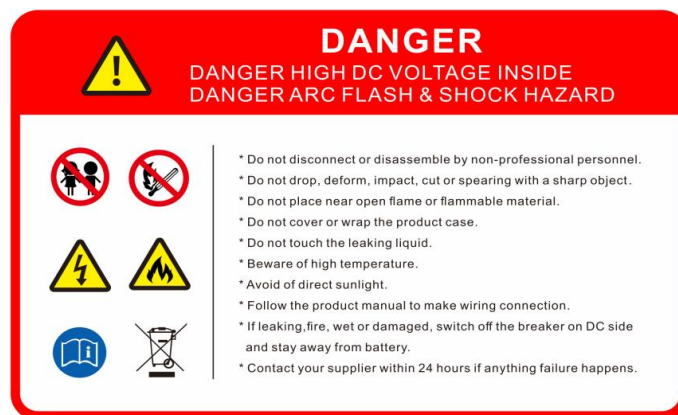


Figure 4-2

4.3 Tool



Wire Cutter



Modular Crimping Pliers



Screwdriver



Electric drill

Note

Properly use insulated tools to prevent accidental electric shock or short circuits. If tools are not insulated, cover the entire exposed metal surfaces of available tools with electrical tape except their tips.

4.4 Safety Gear

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



Insulated Gloves



Safety Goggles

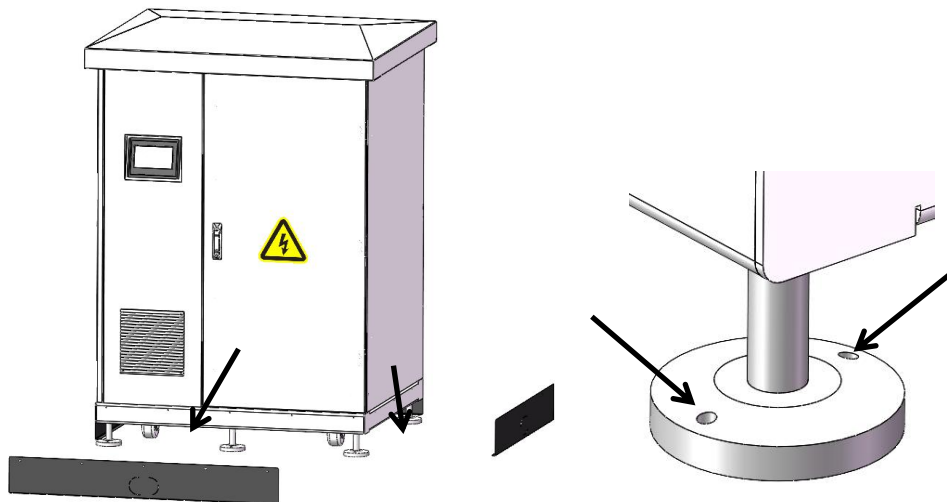


Safety Shoes

5. Installation and operation

5.1 Transportation and Mobility

- 1) After removing the bottom plate, it can be transported by a forklift.
- 2) The bottom of the all-in-one machine cabinet comes with tires for easy movement.
- 3) The support foot pads at the bottom of the all-in-one machine cabinet can be fixed to the ground with screws.



5.2 Installation Location

Make sure that installation location should meet the following condition:

- 1) Ensure that the area is completely waterproof during installation.
- 2) The floor should be flat and level.
- 3) No flammable or explosive materials.
- 4) The ambient temperature is within the range from 0°C to 55°C.
- 5) The temperature and humidity are maintained at a constant level. Ventilation shall avoid high salinity $\leq 30\%$, humidity $\leq 95\%$.
- 6) There is just a little dust and dirt in the area.
- 7) The distance from heat source should be more than 2 meters.
- 8) The distance from air outlet of inverter is more than 0.5 meters.
- 9) Installation areas should avoid direct sunlight.

10) No forced ventilation requirement for battery module, but please avoid installing in a closed area.

5.3 Installation Steps



Warning

- 1) It is prohibited to install circuits under live conditions.
- 2) All installation and operation must follow local electric standard and requirements.
- 3) When battery modules are connected in series, the system should be powered off before installation operation.

5.4 System turns on

Warning: Double check all the power cables and communication cables. . Check all the power switches are OFF.
System turns on step:

- 1) Check all cables are connected correctly. Check grounding is connected.
- 2) Switch all the battery racks' Isolating Switch to on position.
- 3) Press the start button in sequence. If there is a button switch on the battery layer, first turn on the metal start button of the battery, and finally turn on the start button of the battery box control box(PDU).
- 4) If necessary, turn on the switch at inverter's battery side or between inverter and battery. If possible, turn on AC or PV power source to wake up inverter.
- 5) Once the device is installed correctly and the battery is connected properly, open the on/off button located on the left side of the inverter to turn on the inverter device.
- 6) If no alarm ,the battery system will be ready for charging and discharge with PCS.

5.5 System turns off

When failure or before service, must turn the battery storage system off:

- 1) Turn off inverter or power supply on DC side.
- 2) Turn off the switch between PCS and battery system.
- 3) Switch Isolating Switch to off position. (Switch off the slave battery firstly, finally switch off the master battery.)

Note

- 1) One battery system shall just have one master, all the others are slaves. (The one on the extreme side connected to inverter is the master battery.)
- 2) It is forbidden to switch off the Isolating Switch during charging and discharging.

6. Emergency Situations

6.1 Battery Leakage

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. If one is exposed to the leaked substance, immediately perform the actions described below.

- 1) Inhalation: Evacuate contaminated area and seek medical aid.
 - 2) Contact with eyes: Rinse eyes with flowing water for 15 minutes and seek medical aid.
 - 3) Contact with skin: Wash affected area thoroughly with soap water and seek medical aid.
- Ingestion: Induce vomiting and seek medical aid.

6.2 On Fire



NO WATER!

Only dry powder fire or carbon dioxide extinguisher can be used; if possible, move the battery module to a safe area before it catches fire.

6.3 Wet Batteries

If the module is wet or submerged in water, do not let people access it, then contact us or an authorized dealer for technical support. Cut off all power switch on inverter side.

6.4 Damaged Batteries

Damaged batteries are dangerous and must be handled with utmost care. They are not fit for use and may pose a danger to people or property. If the module seems to be damaged, pack it in its original container, then return it to authorized dealer.



Warning

Damaged batteries may leak electrolyte or produce flammable gas.

7. Remarks

7.1 Recycle and Disposal

In case a battery (normal condition or damaged) needs disposal or needs recycling, it shall follow the local recycling regulation (Suggest Regulation (EC) N° 1013/2006 among European Union) to process, and using the best available techniques to achieve a relevant recycling efficiency.



7.2 Maintenance

Check installation environment such as dust, water, insect etc. Make sure it is suitable for IP54 battery system. Connection of power connector, grounding point, power cable and screw are suggested to be checked every year.

Battery Parts List

Item	Part Name	Description	Unit	Quantity
1	Battery layer	Optional up to 6 floors	PCS	3-6
2	Battery power cable	6AWG black- orange	PCS	Same as the number of batteries
3	Communication cable	Battery series connection cable	PCS	Same as the number of batteries
4				
5				

PDU Parts List

Item	Part Name	Description	Unit	Quantity
1	PDU	Battery box control box	PCS	1
2	PDU power cable	6AWG Orange-Orange	PCS	1
3				
4				
5				

Rack cabinet Parts List

Item	Part Name	Description	Unit	Quantity
1	Battery cabinet	6layer	PCS	1
2	Inverter(PCS)	Contained inside the cabinet	PCS	1
3	Instructions	Inverter(PCS)	PCS	1
4	Instructions	Battery	PCS	1
5				

Maintenance Record

Dear user.thank you for selecting our product,Please fill in and keep the warranty card for better services.

Attn:_____Product No.:_____

Tel:_____E-mail:_____

Purchase Date:_____

Address:_____

Maintenance Record			
Date of repair	Content	Maintenance Personnel	Note



Suzhou Preta Intelligence and Technology Co.,Ltd

Add: No..55 Shangxiang Road, Huaqiao Corporation Head Quarter Centre, Kunshan City, Suzhou City, China

Tel: 0512-36684019

Email: info@pretapower.com

Web: <https://pretapower.com/>