

51.2V314Ah-HV

User Manual

Light up every corner of the world with renewable energy.

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1 General Information

This manual introduces the 51.2V314Ah-HV battery products. Which includes: battery information, using way, guide, safety information, installation guide, common issues and maintenance. Please read this manual carefully before using the battery. For any questions, please contact EITAI immediately for advice and clarification.

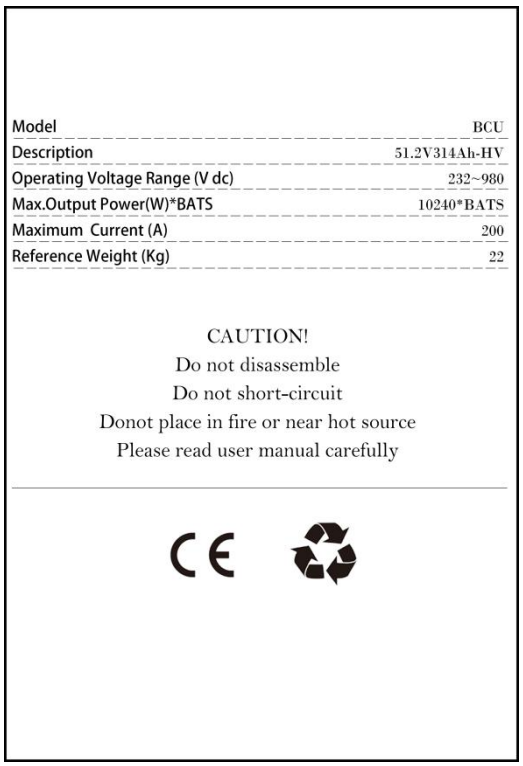
51.2V314Ah-HV is an energy storage unit,that is designed for residential application scenarios with the capability of short-term backup, not suitable for supporting life-sustaining medical devices. This product is intende for used only in accordance with the information provided in the enclosed documents and applicable local standards and regulations. Any other use may result in personal injury or property damage. The illustrations in this manual are only intended to help explain the concept of the system configuration, including use guidelines, safety precautions, common operating problems, and subsequent battery maintenance.

Alterations to the product, e.g. changes or modifications, are only permitted with the express written permission of EITAI. Unauthorized changes will not be allowed by warranty claims. EITAI shall not be liable for any damage resulting from such changes. Any use of the product other than described in the intended use section does not qualify as appropriate. The enclosed documentation is an integral part of this product. Please keep the documentation in a safe and convenient place for future reference.

The type labels were attached on the product, which contain the product identification information. For safe usage, the user must be well-informed of the contents in the type labels.

Labels:


Lithium-ion
Battery Pack
Battery Model 51.2V314Ah
Description 51.2V314Ah-HV
Total Energy Capacity(Wh) 16077
Rated Voltage (V dc) 51.2
Rated Capacity (Ah) 314
Max.Output Power(W)*BATS 10240*BATS
Maximum Current (A) 200
Reference Weight (Kg) 118
CAUTION!
Do not disassemble
Do not short-circuit
Donot place in fire or near hot source
Please read user manual carefully
CE, UN38.3, MSDS


Model BCU
Description 51.2V314Ah-HV
Operating Voltage Range (V dc) 232~980
Max.Output Power(W)*BATS 10240*BATS
Maximum Current (A) 200
Reference Weight (Kg) 22
CAUTION!
Do not disassemble
Do not short-circuit
Donot place in fire or near hot source
Please read user manual carefully

2 Safety Measures

This section contains safety information that must always be observed when using or installing batteries. To prevent personal injury or property damage and ensure long-term operation of the batteries, please read this section carefully, always watch for warnings from all safety messages.

Environmental requirements:

1. Do not expose the battery to temperature above 50 °C;
2. Do not place the battery near any heat source;
3. Do not expose the battery to moisture or liquid;
4. Do not expose the battery to a corrosive gas or liquid;
5. Do not expose the battery to a combustible gas or liquid;
6. Place the battery in safe place away from children and animals.

Operation Precautions:

1. Do not disassemble the battery;
2. Do not touch the battery pack with wet hands;
3. Do not smash, fall, or puncture the battery;
4. Do not short-circuit the terminal, and remove all metal jewelry items that may produce a short-circuit before installation and repair;
5. Always handle the products in accordance with the local safety regulations;
6. Store and use the battery in the user's manual, 8.Ensure reliable grounding;
7. Disconnecting all wires from the batteries before installation and repair;
8. The stacking of packaging batteries shall not exceed the quantity specified on the packaging.

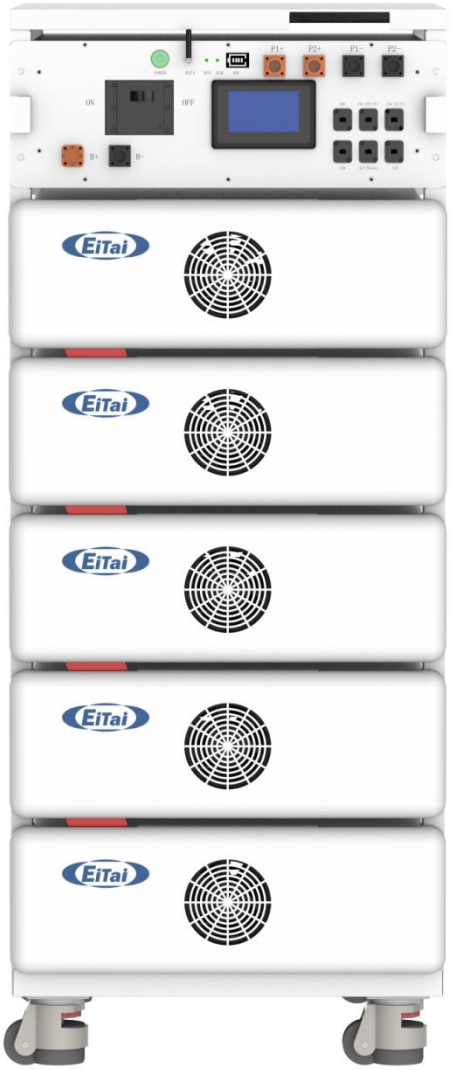
3 Technical Parameters

51.2V314Ah-HV							
Model	HV-80K	HV-96K	HV-113K	HV-129K	HV-145K	HV-161K	HV-177K
Number of battery modules	5	6	7	8	9	10	11
Nominal voltage	256V	307.2V	358.4V	409.6V	460.8V	512V	563.2V
Nominal capacity	80.38KW.h	96.46KW.h	112.54KW.h	128.61KW.h	144.69KW.h	160.77KW.h	176.84KW.h
Total energy (90% DOD)	72.35KW.h	86.81KW.h	101.28KW.h	115.75KW.h	130.22KW.h	144.7KW.h	159.16KW.h
Cabinet size (W*D*H)	610*734*1430(mm)	610*734*1650(mm)	(610*2)*734*990(mm)	(610*2)*734*1210(mm)	(610*2)*734*1210(mm)	(610*2)*734*1430(mm)	(610*2)*734*1430(mm)
Net weight	612Kg	730Kg	848Kg	966Kg	1084Kg	1202Kg	1320Kg
51.2V314Ah-HV							
Model	HV-193K	HV-209K	HV-225K	HV-241K	HV-257K	HV-273K	
Number of battery modules	12	13	14	15	16	17	
Nominal voltage	614.4V	665.6V	716.8V	768V	819.2V	870.4V	
Nominal capacity	192.92KW.h	209KW.h	225.08KW.h	241.15KW.h	257.23KW.h	273.31KW.h	
Total energy (90% DOD)	173.63KW.h	188.1KW.h	202.57KW.h	217.04KW.h	231.51KW.h	245.98KW.h	
Cabinet size (W*D*H)	(610*2)*734*1650(mm)	(610*2)*734*1650(mm)	(610*3)*734*1210(mm)	(610*3)*734*1430(mm)	(610*3)*734*1430(mm)	(610*3)*734*1430(mm)	
Net weight	1438Kg	1556Kg	1674Kg	1792Kg	1910Kg	2028Kg	
General parameters							
Maximum current	200A						
Maximum power	10240W* battery module number						
Battery type	LiFePO4						
Maximum number of parallel	4 sets						
Cooling mode	Fan cooling						
Protection level	IP20						
Discharging working temperature	-20℃ ~ 60℃						
Charging working temperature	0℃ ~ 60℃						
Storage temperature	≤25℃, 12 months						
	≤35℃, 6 months						
	≤45℃, 3 months						
Working humidity	≤85%rh						
Store humidity	≤85%rh						
Working altitude	<2000m						
Communication port	CAN, RS485, WIFI						
Certificate	UN38.3, MSDS, CE						
Cycle life	≥8000 times						
Warranty	5+5 years						

Battery Module Parameters	
Rated Voltage	51.2V
Rated Storage Capacity	314Ah
Weight	118Kg
Dimensions (W*D*H)	734*550*220 (mm)
Protection Level	IP20

4 Product Overview

4.1 Brief Introduction



51.2V314Ah-HV high voltage lithium battery energy storage system, consisting of 5-17 battery modules (51.2V314Ah) and a BCU (Battery Control Unit) in series, with an operating voltage range of 232V-979.2V, is used for household / commercial energy storage applications, working with a high voltage inverter for energy storage purposes.

51.2V314Ah-HV has a built-in BMS (battery management system, including the main BMS in BCU and the slave BMS in battery module), which can manage and monitor battery information, including voltage, current and temperature. In addition, BMS can balance battery charging to prolong service life. BMS has over discharge, over charge, over-current, high / low temperature and other protection functions. The system can automatically manage the charge state, discharge state and balance state.Each battery module is equipped with a cooling fan, plus a porous sheet metal design, which effectively alleviating the problem of working heat.

51.2V314Ah-HV built-in wireless WIFI module, which can realize remote monitoring and debugging by mobile phone. External touch screen, status indicator and power indicator can also clearly observe the status of the energy storage system.

51.2V314Ah-HV have soft-start circuit inside so it can support inverters without soft-start function.

4.2 ET-HV BCU

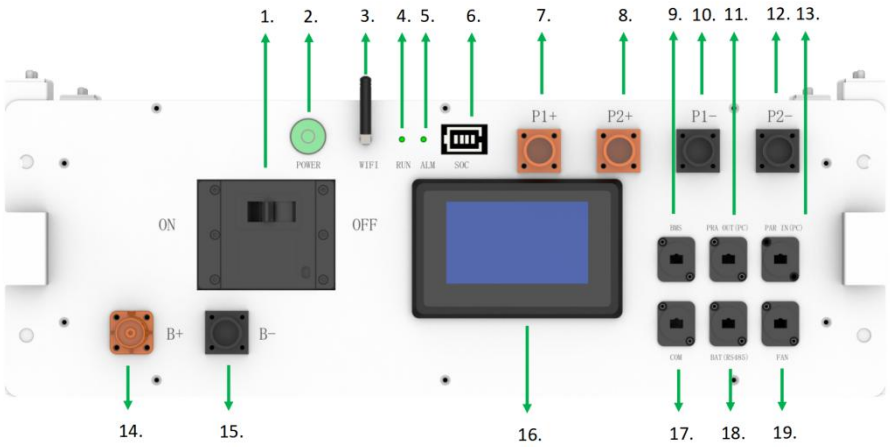
The BCU includes the master BMS, DC fuse, soft starting circuit, charging circuit, discharge circuit, 24VDC/DC power supply module, cut off the protection switch, touch color screen, wireless WIFI module, status indicator.

The BMS in the battery module collects the battery voltage and temperature data uploaded to the master BMS via the internal CAN. BMS's BCU controls the charging voltage / current and discharge voltage / current.

4.2.1 BCU Technical Data

Adaptable battery model	51.2V314Ah-HV
Rated voltage	232V-979.2V
Max. power	10240W* battery module number
Max. current	200A
Refer dimension (W*D*H)	734*550*220 (mm)
Refer weight	22Kg

4.2.2 BCU Port



NO.	Name	Description	NO.	Name	Description
1.	ON/OFF	Cut-off protection switch	2.	POWER	Power switch
3.	WIFI	WIFI module	4.	RUN	Normal operation
5.	ALM	Alarm	6.	SOC	Power indicator
7.	P1+	Connection position of PCS positive pole	8.	P2+	Connection position of PCS positive pole
9.	BMS	Inverter communication port	10.	P1-	Connection position of PCS negative pole
11.	PAR OUT (PC)	Parallel communication output (upper computer)	12.	P2-	Connection position of PCS negative pole
13.	PAR IN (PC)	Parallel communication input (upper computer)	14.	B+	Connection position of battery positive pole
15.	B-	Connection position of battery negative pole	16.		Touch screen
17.	COM	Cabinet communication button	18.	BAT (RS485)	Battery communication port (third part)
19.	FAN	Fan power supply port			

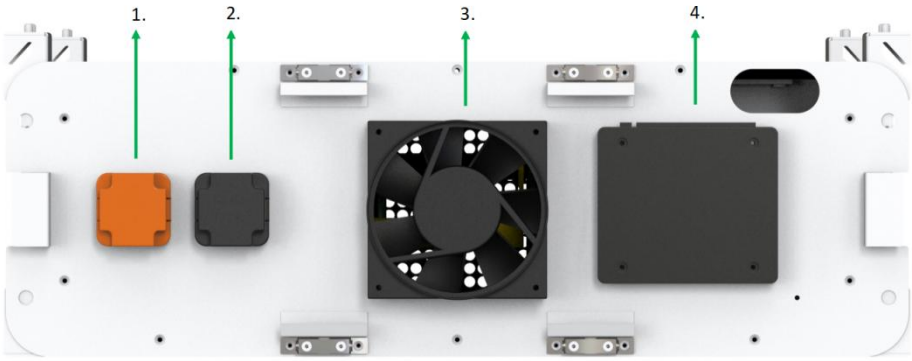
4.3 BCU-PIN



PORT	PIN1	PIN2	PIN3	PIN4	PIN5	PIN6	PIN7	PIN8
PC	NC	NC	NC	CAN0H	CAN0L	NC	NC	NC
CAN	NC	NC	NC	CAN1H	CAN1L	NC	NC	NC

PAR	DO	DI	CAN0H	CAN0L	CAN1H	CAN1L	NC	NC
BAT	NC	NC	NC	SPI-H	SPI-L	NC	NC	NC
FAN	24V+	24V+	24V-	24V-	24V-	24V-	24V+	24V+

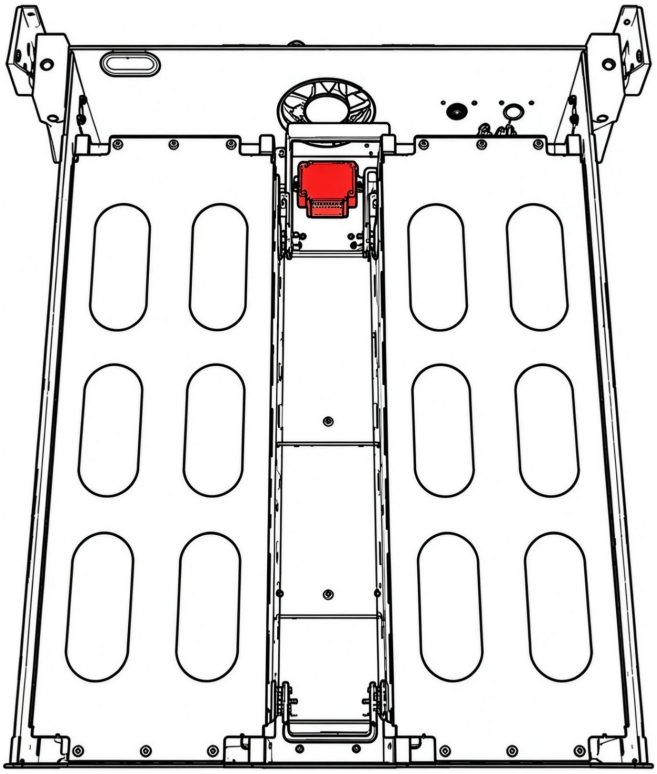
4.4 ET-HV Battery Module



NO.	Name	Description
1.	B+	Battery module positive pole (orange)
2.	B-	Battery module negative pole (black)
3.	FAN	Cooling fan
4.	BMU	Salve BMS

The battery module includes battery cell and the salve BMS. The slave BMS collects and transfers the battery voltage and temperature of the battery cell in real time and the BCU to the main BMS via internal communication. When the energy storage system reaches the set temperature, the main BMS controls the cooling fan to adjust the temperature.

4.5 ET-HV Fire Protection Module



Battery module fire protection function description:

The battery module is internally integrated with an automatic fire protection module. When the internal temperature of the module reaches the set triggering temperature, the fire protection module will automatically start and release fire suppression gas to suppress the initial fire, reducing the risk of fire spread and thermal runaway expansion. This function does not require manual triggering by an operator; it will automatically execute fire protection when the triggering conditions are met.

The fire protection module should be securely installed and in good condition. Unauthorized disassembly, modification, or damage is not allowed. After the fire protection module is triggered, corresponding measures should be taken immediately in accordance with the product safety procedures, and professionals should inspect the battery module and the fire protection module to confirm the system is safe before resuming operation.

5 Installation Guide

5.1 Inspection Before the Installation

5.1.1 Check the Outer Packaging

Packaging materials and components may be damaged during transportation. Check the outer packaging material before installing the battery. Check the packaging material surface for

damage, such as holes and cracks. If any damage is found, do not unpacking the battery and contact the dealer as soon as possible. It is recommended that you remove the packaging material within 24 hours before installing the battery.

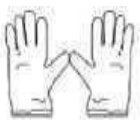
5.1.2 Check Deliverables

After unpacking the package, check that the deliverables are intact and complete. If any damage or missing parts is found, please contact EITAI.

Accessories list in the package.

51.2V314Ah-HV					
NO.	Name	Model	Unit	Qty	Mark
1	Battery module	51.2V314Ah-HV	PCS	1	
2	Communication cable		PCS	1	For battery connection
3	Power cable	Red/black 2AWG	SET	1	For battery connection
NO. 1~3 are accessories for slave control; NO. 4~10 are accessories for BCU.					
4	Battery control unit	BCU	PCS	1	
5	Power cable	Red/black 2AWG	PCS	2	For inverter connection
6	Communication cable		PCS	1	For inverter connection
7	User manual	51.2V314Ah-HV user manual	PCS	1	
8	User manual	Wifi user manual	PCS	1	
9	Upper computer cable	USB-CAN	PCS	1	For computer connection
10	Rack stacking parts	Steel	SET	1	

5.2 Tools

Type	Tools			
Installation	Measuring tape 	Hammer drill 	Socket wrench 	Cross Screwdriver 
Protection	ESD gloves 	Safety goggles 	Dust mask 	Safety shoes 

5.3 Installation Requirements

1. Install the battery in an indoor environment.
2. Place the battery in a safe position away from children and animals.
3. Do not place the battery near any heat source, and avoid generating sparks.
4. Do not expose the battery to moist air or liquid.
5. Do not expose the battery to direct sunlight.
6. Do not expose the battery to a combustible gas or liquid.
7. The mounting carrier shall be fire resistant. Do not install batteries on flammable buildings.
8. Ensure ground connection.

5.4 Fix the Battery

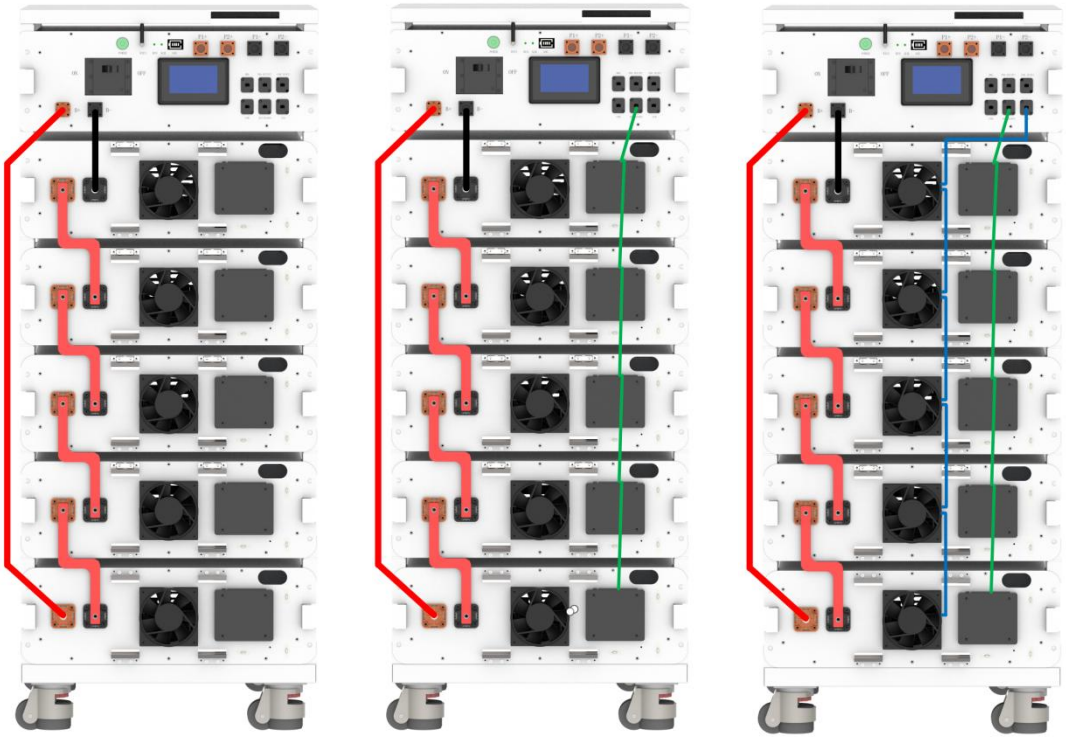
Insufficient or no grounding may cause an electric shock. Device malfunctions, and insufficient or no grounding may cause device damage and life-threatening electric shocks.

1. Assembly the support base.
2. Install four stack sheets one by one on battery strings and main control modules.
3. Assemble the battery pack from bottom to top, align with the limit hole, and finally install the main control and top cover.
4. After connecting the circuit, install the front cover.

5.5 Battery Circuit Assembly

Before connecting the power cable of the battery string, check that the installed battery module and the main control module are delivered together in set. Do not mix them with other systems to avoid system exceptions.

1. Power cable assembly (red and black).
2. Communication cable assembly (green), insert it into the battery in turn, and finally connect it to the main control BAT port.
3. Cooling fan cable assembly (blue), insert it into the battery in turn, finally connect it to the FAN port of the main control.



6 Touch Screen External

6.1 User Mode

First boot, enter user mode.



Click anywhere on the screen to pop up the following button, with specific instructions as follows:

Click “left&right” different user mode styles (including day/night mode) can be switched.; slide the “sun icon” left and right to adjust screen brightness; click “settings” to enter engineering mode to view more information; click “back” to return to the interface.

6.2 Engineering Mode

Enter engineering mode, with the date displayed on the top left, faults displayed between date and time, and time displayed on the right.

Central display of total voltage, SOC, total Current, highest voltage, lowest voltage, highest temperature, lowest temperature.

The navigation menu is displayed at the bottom, allowing you to switch to viewing interface details.



‘Cell Vol’: single cell voltage;

‘Cell Temp’: single cell temperature;

‘Heating Temp’: MOS temperature, environment temperature;

‘Relay Status’: relay detail information, includes: relay- name, On/ Off status and Alarm. Slide left and right to check more information.

‘Chg_Inf’: enter the charging detail page, to check charging time, BMS request and charger information.

‘Others’: enter heating information, edge resistance value, diagnosis information and cumulative time information interface. Click each icon to enter the three-level interface to view details

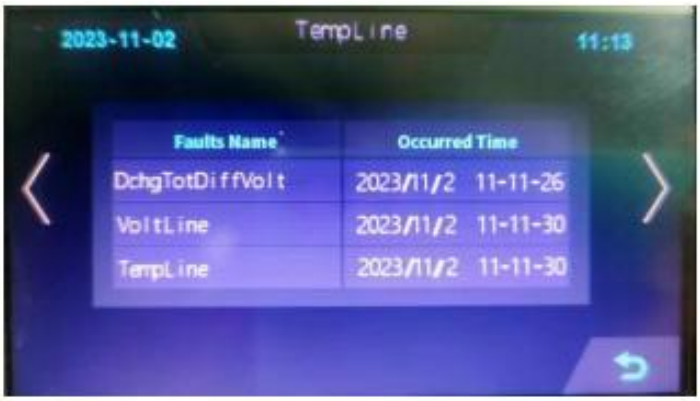
6.3 Set Up

Click “Settings” to enter the settings interface, which includes language settings and brightness settings.



6.4 Fault Information Interface

Click the real-time status bar to enter the fault information interface, where you can view the fault name and time of occurrence. Swipe left and right to check see more faults



7 Cleaning and Maintenance

7.1 Cleaning Work

Please note: please turn off the power supply of the system before cleaning. It is recommended to clean battery regularly. If the shell is dirty, please use a soft and dry brush or dust collector to remove the dust. Do not use solvents, or corrosive liquids to clean the enclosure.

7.2 Maintenance

7.2.1 Recharging Requirements During Normal Storage

The battery shall be stored in an environment with a temperature range of -10℃~45℃ and shall be maintained regularly according to the following table to 0.5C current is charged until 60%SOC after long storage.

Charging conditions during storage

Store the ambient temperature	Relative humidity of the storage environment	Storage time	SOC
Below -10℃		Prohibit	/
-10~25℃	5%~70%	≤12 months	30%≤soc≤60
25~35℃	5%~70%	≤6 months	30%≤soc≤60
35~45℃	5%~70%	≤3 months	30%≤soc≤60
Above 45℃		Prohibit	

7.2.2 Recharging Requirements for Excessive Discharge

Charge the over-discharge (90%DOD) battery within the time of meeting the table below, otherwise the over-discharge battery module will be damaged.

Charging requirements for excessive battery discharge

Storage environment temperature	Storage time	Note:
-10~25℃	≤ on Day 15	The battery pack disconnected from PCS, charge the battery with DC charger.
25~45℃	≤ on Day 7	
-10~45℃	<12 hours	Battery pack connected to the Inverter, charge the battery with PV or grid.

8 Common Issues and Solutions

8.1 Common Issues and Solutions

The user can monitor the operating status, warning, and alarm information through the battery LCD display.

1. If the battery cannot be turned on and all LED indicators are off, the battery may be deeply discharged and requires charging first. If unable to charge, contact EITAI.

2. If red light shows system abnormal, please check below values:

1) Temperature: Above 60℃ or below 0℃, the battery protection turns on, could not charge.
Solution: Move the battery to normal operating temperature range between 0℃ to 60 ℃.
2) Temperature: above 60℃ or below -20℃, the battery cannot discharge.
Solution: Move the battery to normal operating temperature range between -20℃ to 60 ℃.
3) Current: If 51.2V314Ah-HV's current is greater than 200A, the battery protection device

will be turned on.

Solution: Stop using electrical appliances that exceed the maximum battery power load.

4) High voltage: If the single battery cell's voltage is higher than 3.6V, battery charging protection turns on.

Solution: The inverter will stop charging the battery if it sets the intelligent LI mode or a reasonable charging voltage.

5) Low voltage: If the single battery cell's voltage is lower than 2.9V, battery charging protection turns on.

Solution: Charge the battery.

Excluding the above five points, if the fault cannot be found, turn off the battery and contact EITAI.

3. It's normal that the SOC LED are different if in multiple battery parallel systems. Before installing batteries in parallel, measure the voltage of each battery to ensure that the voltage difference of each battery is within 1V, and the the battery production date within 1 year.

1) When installing for the first time, please charge in full first to balance the capacity gap;
2) If the error is within 10% when the lowest SOC display percentage is compared with the highest SOC display percentage, and the SOC display percentage is the same within 10 minutes, it is normal operation;
3) Before expanding battery capacity, please charge and discharge the online battery to 45%-50%SOC; After expanding the capacity, charge the battery system to balance the capacity gap. Ensure that the capacity difference before parallel is no more than 10%. If the capacity gap is large, it will take about 2 cycles to balance the capacity gap. The actual equilibrium time depends on the capacity difference and the charge-discharge current.

Exclude the above three points. If the SOC display still fails, please contact EITAI.

8.2 Emergency

Please cut off the power supply and turn off the battery in an emergency.

1. **If the battery pack is damp or immersed in water**, do not get close to the battery, and then contact EITAI or an authorized dealer for technical support.
2. **Do not use water to fire when a fire!** Only dry powder extinguishers; place the battery pack in a safe area if possible.
3. **Battery leaking the electrolyte.** If the battery pack leaks the electrolyte, avoid contact

with leaking liquid or gas.

If someone is exposed to the leaking material, do the following immediately:

Inhalation: evacuate the contaminated areas and seek medical treatment.

Contact eye: Rinse eyes with running water for 15 minutes and seek medical treatment.

Contact skin: Wash the infected site with soap and water and seek medical treatment.

Swallow in: urge vomiting, and seek medical treatment.

Battery damage: Damaged battery is dangerous and must be treated very carefully. Battery cannot be used or may be dangerous to persons or property. If the battery pack is damaged, contact EITAI for handling.

8.3 About Battery System

1.The system treatment must comply with the "locally applicable regulations for the disposal of electronic waste and second-hand batteries.

2.Do not treat the battery system along with household waste.

3.Avoid exposing the battery to high heat or direct sunlight.

4.Avoid exposing the battery to high humidity or corrosive environments.

5.Do not expose the battery to a combustible gas or liquid.

EITAI green energy, better service, getting "brighter".

Eitai（Xiamen）New Energy Technology Co.,Ltd.

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