User Manual
Model: ELEBOX-HV

Content

1 Product Information

This manual introduces EITAISOLAR ELEBOX-HV battery products. Please read this manual carefully before using the battery. If you have any questions, please contact EITAI for advice and assistance.

1.1 Content Description

This user manual is applicable to EITAISOLAR Elebox-HV.

This user manual contains EITAISOLAR Elebox-HV product information, user guide, safety information, installation guide, and detailed information on frequently asked operating questions and follow-up maintenance measures.

1.2 Usage Scenarios

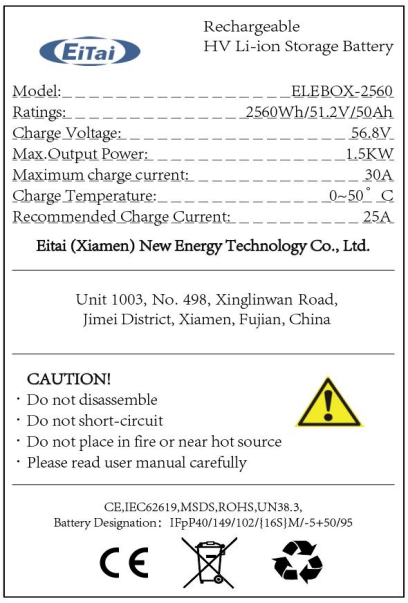
EITAISOLAR Elebox-HV is an energy storage unit designed for residential or commercial grid applications with short-term backup capability.

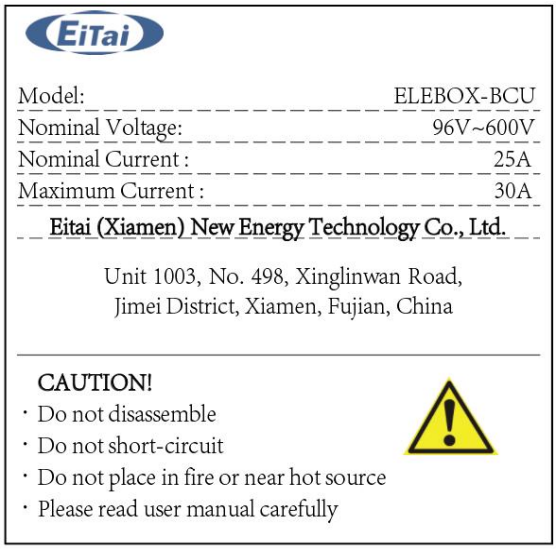
Usage Precautions：
The EITAISOLAR Elebox-HV is not intended to support life-sustaining medical devices. This product is used only in accordance with the information provided in the attached documents and local applicable standards and regulations. Any other improper use may cause personal injury or property damage. The illustrations in this manual are intended only to help explain the concept of system configuration, including usage guidelines, safety precautions, common operating problems, and subsequent maintenance measures.

Changes and modifications to the product are only permitted under the following conditions, such as the written permission of EITAI. No warranty or claim will be made for unauthorized changes. EITAI shall not be liable for any damage caused by such alteration. Any non-standard use of the product and any use beyond that described in the terms and conditions will be considered a violation. Attachment documentation is an integral part of this product. Please keep the document in a secure place for future use. The product model label (see section 1.3) must be retained on the product.

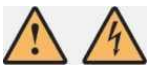
1.3 Product Label

The label is attached to the product and contains product identification information. For safe use, the user must fully understand the contents of the label.
The label：





2 Security Measures

This section contains safety information that must be followed at all times when using or installing batteries. To prevent personal injury or property damage, and to ensure the long-term operation of batteries, read this section carefully and always watch for "warnings"  issued by all safety information.

Environmental requirements

1. Do not expose the battery to more than 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 corrosive gases or liquids；
5. Do not expose the battery to flammable gases or liquids；
6. Do not expose the battery to direct sunlight for a long time；
7. Do not allow battery power terminals to touch conductive objects, such as wires；
8. Keep the battery in a safe place away from children and animals；

Operation Precautions：

1. Please do not remove the battery；
2. Do not touch the battery string with wet hands；
3. Do not crush, drop, or Pierce the battery；
4. Do not reverse the polarity or connect in series；
5. Do not short-circuit the terminal, and remove all metal jewelry items that may produce a short-circuit before installation and repair；
6. Always dispose the products in accordance with the local safety regulations；
7. Store and use the battery in accordance with the user's manual；
8. Ensure reliable grounding；
9. Disconnecting all batteries to the wires before installation and maintenance；
10. Do not stack batteries outside the protective packaging during storage or handling；
11. Packaged batteries shall not be stacked more than the quantity specified on the packaging;
12. Continued operation of the damaged battery may lead to dangerous situations, causing serious injuries such as electric shock or combustion；

3 Technical Parameters

Basic Parameters	ELEBOX-5.1	ELEBOX-7.7	ELEBOX-10.2	ELEBOX-12.8	ELEBOX-15.4	ELEBOX-17.9	ELEBOX-20.5	ELEBOX-23	ELEBOX2 5.6
Number of Battery Modules	2	3	4	5	6	7	8	9	10
System Rated Voltage	102.4V	153.6V	204.8V	256V	307.2V	358.4V	409. 6V	460.8V	512V

System Rated Capacity	5.1KW.h	7.6KW.h	10.2KW.h	12.8KW.h	15.3KW.h	17.9KW.h	20.4KW.h	23KW.h	25.6KW.H
System Usable Capacity（90%DOD）	4.59KW.h	6.84kw.h	9.18kw.h	11.52 kw.h	13.77 kw.h	16.11kw.h	18.36 kw.h	20.7 kw.h	23.04KW.H
Dimensions（W*D*H）	355/593/587	355/593/732	355/593/877	355/593/1022	355/593/1167	355/593/1312	355/593/1457	355/593/1602	355/593/1759
Weight (Kg)	93KG	127KG	161KG	195KG	229KG	263KG	297KG	331KG	365KG
Protection Level	IP65								
Cooling Mode	Natural Cooling								
Rated Charging Current	25A								
Max. Continuous Current	30A								
Rated Discharge Current	25A								
Max. Continuous Discharge Current	30A								
Temperature	-10℃ ~ 55℃								
Storage Temperature	≤25℃，12 Months								
	≤35℃，6 Months								
	≤45℃，3 Months								
Work Environment Air Humidity	<95%RH（No Condensation）								
Operating Altitude	<2000m								
Certificate	CE,IEC62619,MSDS,ROHS,UN38.3								
Lifespan	6000 @ 80% DOD / 25℃ / 0.5C / 60% EOL								

Battery Module Parameters	
Rated Voltage	51.2V
Rated Storage Capacity	50AH
Weight (kg)	34KG
Dimensions（W*H*D)	593*148.5*355mm
Protection Level	IP65

Remark：

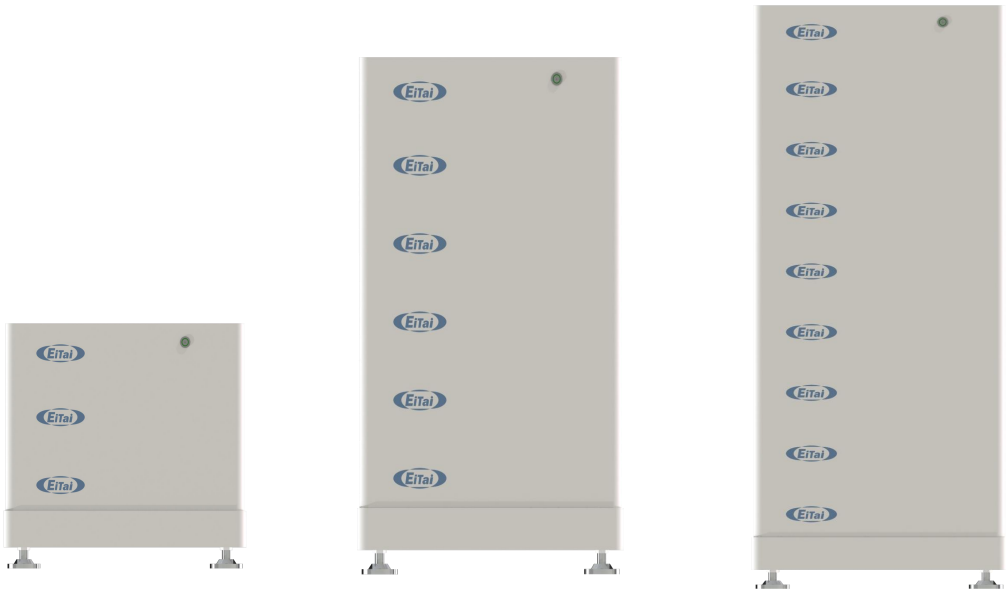
1. Operating current adjust according to the cell voltage and the battery temperature.
2. Different string battery modules of elebox-2560 (2 ~ 10 battery modules) will change parameters.

4 Technology Items

No.	Noun	Description
1	Discharge	Battery output power.
2	Recharge	To put electricity into battery by charger.
3	Full Charge	SOC is 100% when the battery is fully charged.
4	Standby	Ready for charging or discharge.
5	Shutdown	Disconnect the battery output.
6	SOC	State of charge（Available capacity).
7	Battery Voltage	Voltage between the battery module PCS+/PCS-.
8	Single String Voltage	Voltage of single battery.
9	Battery Module Voltage	Voltage between battery modules BAT+ / BAT -.
10	Protection	The battery stops charging and discharging.
11	Fault	The battery or BMS is damaged and needs to be replaced.
12	Over Release	Insufficient battery charge and requires timely charging.

5 Product Overview

5.1 Product Profile



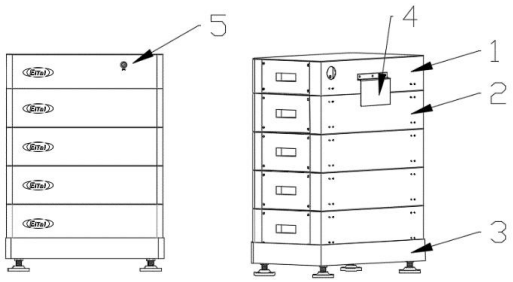
The EITAISOLAR ELEBOX-HV high voltage lithium battery energy storage system, consisting of of 2-10 battery modules (51.2V/50AH) and a BCU (Battery Control Unit) In series, with an operating voltage range of 96V-600V, is used for household / commercial energy storage applications, working with a high voltage inverter for energy storage purposes.

The EITAISOLAR ELEBOX-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.

The EITAISOLAR ELEBOX-HV have soft-start circuit inside so it can support inverters without soft-start function.

5.2 Battery System Overview

The EITAISOLAR ELEBOX-HV series consists of the ELEBOX-2560 battery module and the ELEBOX-BCU, The BCU (battery control unit) is connected in series.

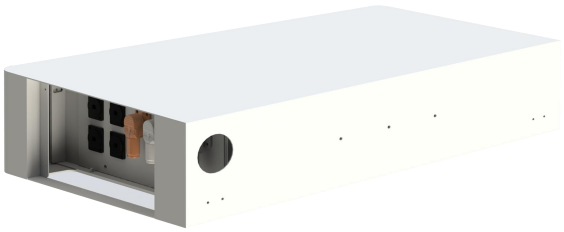


No.	Description
1	ELEBOX-BCU（Battery Control Unit）
2	ELEBOX-2560（Battery Mode）
3	ELEBOX-Base
4	Anti-roll Plate
5	Start Button

5.3 ELEBOX-BCU

The BCU includes the master BMS, DC fuse, soft starting circuit, charging circuit, discharge circuit, 12VDC/DC power supply module.

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



5.3.1 Technical Data

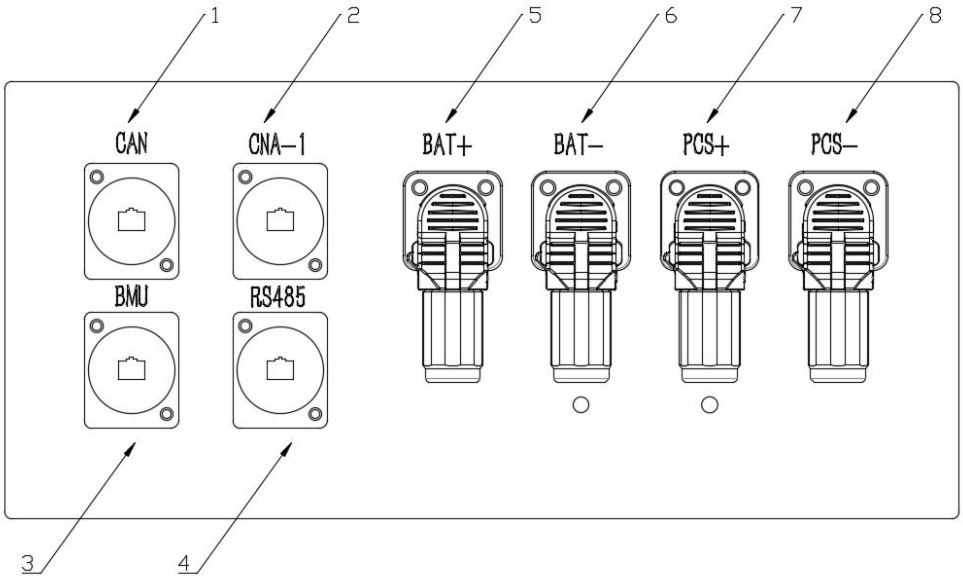
Name	Technical Parameters
Rated Voltage	96V—600V
Rated Current	25A
Max. Current	30A
Operating Temperature	-10°C~55°C
Humidity	<95%RH
Protection Level	IP65
Cooling	Natural Cooling
Weight (kg)	15KG
Dimensions(W*H*D)	593*131*355mm
Communication	CAN/RS485
Certificate	CE-EMC,CE-LVD,ROHS
Lifespan	6000@80%DOD/25°C/0.5c

5.3.2 The Power ”Button”

1. After presses the start button, release the button, and the button is locked.The power button lights on, entering the state of self-inspection for 2-3 minutes, and the self-inspection end enters the pre-charging.

2. Close the battery system: press the start button, then release the button lock, the power button lights off and the battery stop output.

5.3.3 Definition of the port



No.	Items	No.	Items
1	Connect the inverter CAN communication port.	5	Battery positive in series.
2	Reserved communication port .	6	Battery negative in series.
3	Connect the battery module communication.	7	Total positive output of battery.
4	Connect the upper bit computer communication port.	8	Total negative output of battery.

5.3.3.1 The CAN Port

The CAN communication terminal (RJ45 port) follows the CAN communication protocol and please connect to the inverter.

Port	Description	
CAN Communication port Definition	PIN 1	NC(empty))
	PIN 2	NC(empty))
	PIN 3	NC(empty))
	PIN 4	CAN-H
	PIN 5	CAN-L
	PIN 6	NC(empty))
	PIN 7	NC(empty))
	PIN 8	NC(empty))

1. BMS controls the charging current / charge voltage or discharge current /discharge stop voltage of the inverter, via CAN communication, based on the battery voltage and battery temperature.

2. If the battery capacity is less than 8%, the BMS controls the PCS to force the charge via CAN communication to avoid damage to the battery due to deep discharge.

3. If SOC is below 97% for a consecutive month, BMS controls the inverter via CAN communication, filling the battery complete to correct the SOC error.

5.3.3.2 The RS485 Port

The RS485 communication terminal (RJ45 port) follows the RS485 protocol for the commissioning port by the manufacturer or professional engineer. (It can also be made as a BMS communication port for some inverters)

Port	Description	
RS485 Communication port definition	PIN 1	NC(empty)
	PIN 2	NC(empty)
	PIN 3	NC(empty)
	PIN 4	485A
	PIN 5	485B
	PIN 6	NC(empty)
	PIN 7	NC(empty)
	PIN 8	NC(empty)

5.3.3.3 The CAN-1 Port

The CAN-1 communication terminal (RJ45 port) follows the CAN communication protocol, in the standby state.

Port	Description	
CAN-1 Communication Port Definition	PIN 1	NC(empty)
	PIN 2	NC(empty)
	PIN 3	NC(empty)
	PIN 4	CAN-H
	PIN 5	CAN-L
	PIN 6	NC(empty)
	PIN 7	NC(empty)
	PIN 8	NC(empty)

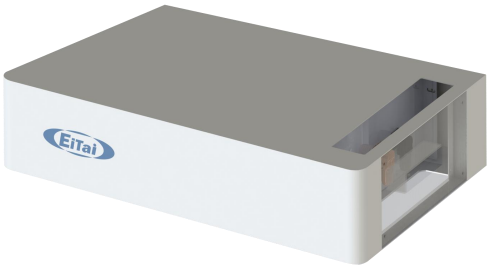
5.3.3.4 The BMU Communication Port

The BMU communication terminal (RJ45 port) follows the CAN communication protocol and connects the BCU to the internal CAN communication of each battery module. And each battery module BMS provides the DC12V operating power supply.

Port	Description	
BMU Communication port definition	PIN 1	OUT DC12V+
	PIN 2	OUT DC12V+
	PIN 3	NC(empty)
	PIN 4	CAN-H
	PIN 5	CAN-L
	PIN 6	Address
	PIN 7	OUT DC12V-
	PIN 8	OUT DC12V-

5.4 ELEBOX-2560 Battery Module

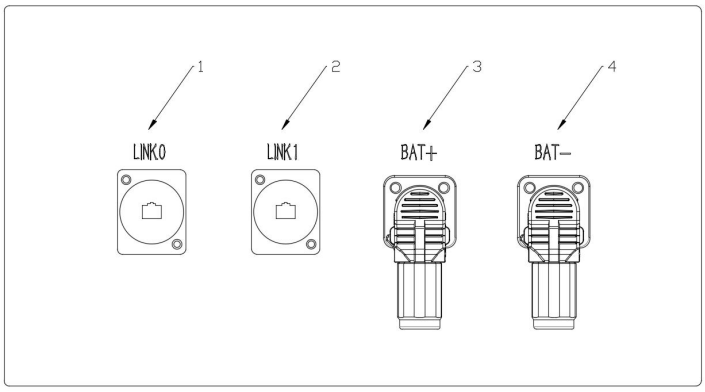
The battery module includes the 51.2V/50AH battery cell and the subordinate BMS. The slave BMS collects and transfers the battery voltage and temperature of the battery cell in real time and the BCU to the main BMS via internal communication.



5.4.1 Technical Data

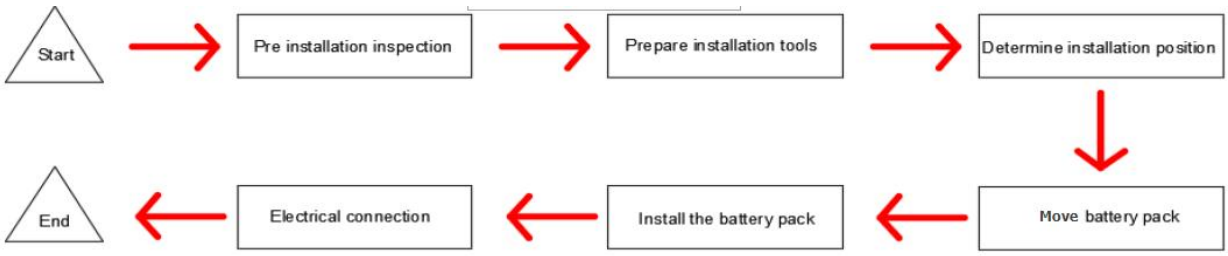
Name	Technical Parameters
Rated Voltage	51.2V
Rated Capacity	50Ah
Rated Power（100%DOD）	2560W.h
Usable Power（90%DOD）	2304W.h
DOD	< 90%
Rated Charging Current	25A
Max. Charging current	30A
Rated Discharge Current	25A
Max. Discharge Current	30A
Operating Temperature	-10°C~55°C
Humidity	<95%rh
Protection Level	IP65
Cooling	Natural Cooling
Weight (kg)	34KG
Dimensions (W*H*D)	593*148.5*355mm
Communication Port	CAN
Certificate	CE,IEC62619,MSDS,ROHS,UN38.3
Lifespan	6000 @ 80% DOD / 25℃ / 0.5C / 60% EOL

5.4.1 Definition of the Port



No.	Items	Description
1	LINK0	Communication port input
2	LINK1	Communication port output
3	BAT+	Battery module B+
4	BAT-	Battery module B-

6 Installation Guide



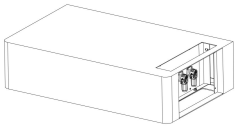
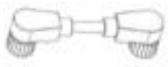
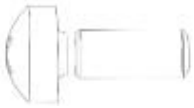
6.1 Inspection Before the installation

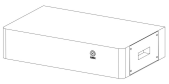
6.1.1 Check the outer packaging

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.

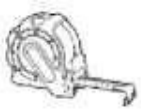
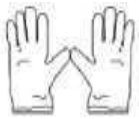
6.1.2 Check Deliverables

After unpacking the package, check that the deliverables are intact and complete. If any damage or missing parts is found, please contact the dealer. The following table shows the components and mechanical parts to be delivered.

Battery Module Packing list			
No.	**Pictures**	**Qty**	**Description**
1		1	Battery Module
2		1	Wire
3		2	Battery positioning connector piece
4		8	M4*10 cross-disc head screws
5		1	Communication network cable
6		1	Two-color grounding wire
7		1	Certificate
8		1	Test report
9		1	Quality guarantee

BCU Master module packing list			
No.	**Picture**	**Qty**	**Description**
1		1	The BCU master module
2		2	Wire
3		1	Hanging board
4		3	M5*10 cross-disc head
5		4	M4*10 cross-disc head screws
6		4	Expansion screw M8*80
7		1	Orange quick connector
8		1	Black quick connector
9		2	Communication network cable
10		1	Two-color grounding wire
11		1	Certificate
12		1	Inspection report
13		1	Quality guarantee

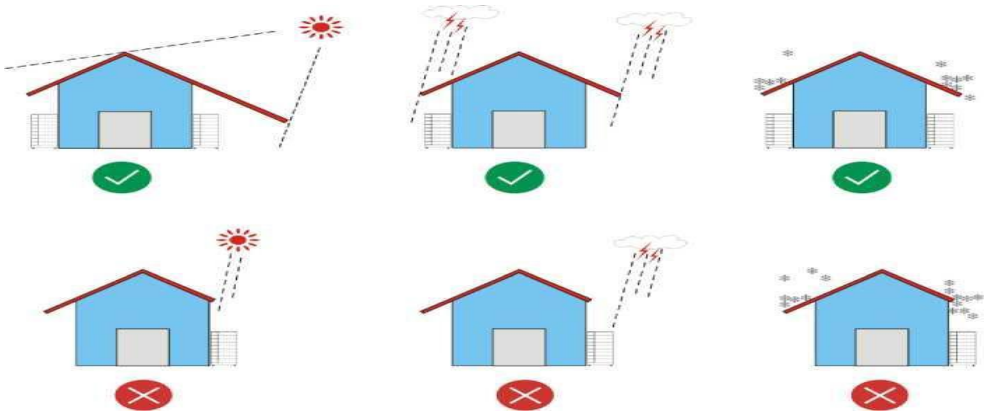
6.2 Tools

Type	Tools		
Installation	Knife 	Hammer drill 	Socket wrench 
	Rubber mallet 	Cross Screwdriver 	
	Incinometer 	Measuring tape 	
Protection	ESD gloves 	Safety goggles 	Anti-dust respirator 
	Safety shoes 		

6.3 Installation Requirements

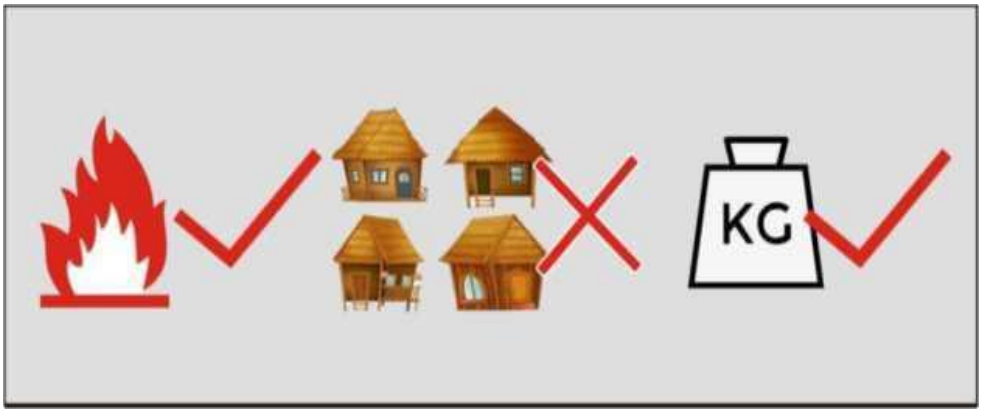
6.3.1 Installation Environment Requirements

1. Install the battery indoors or under eaves wet from rain.
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 corrosive gas or liquids.
7. Do not expose the battery to a combustible gas or liquid.



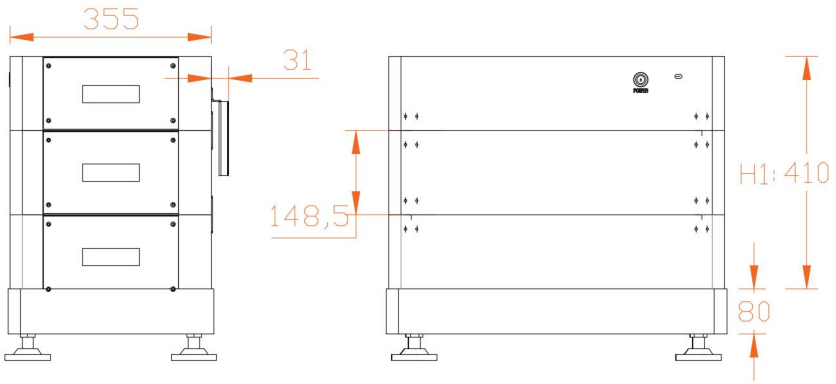
6.3.2 Installation Bracket Requirements

1. The mounting bracket shall be fire resistant. Do not install batteries on flammable buildings.
2. The mounting bracket surface shall meet the requirements of bearing gravity.



6.4 Installation and use instructions

6.4.1 Overall Dimension

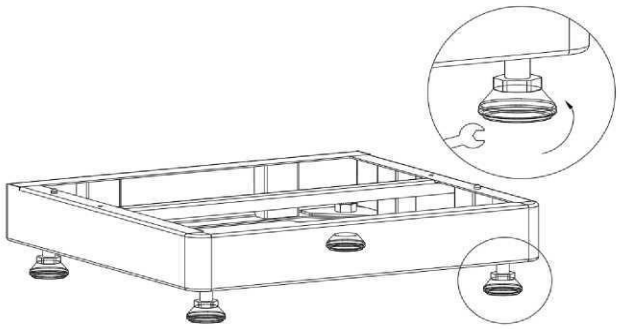


Battery pack	H1(mm)	Weight (Kg)
2	410	93KG
3	558.5	127KG
4	707	161KG
5	855.5	195KG
6	1104	229KG
7	1152.5	263KG
8	1301	297KG
9	1149.5	331KG
10	1598	365KG

6.4.2 Installation Step

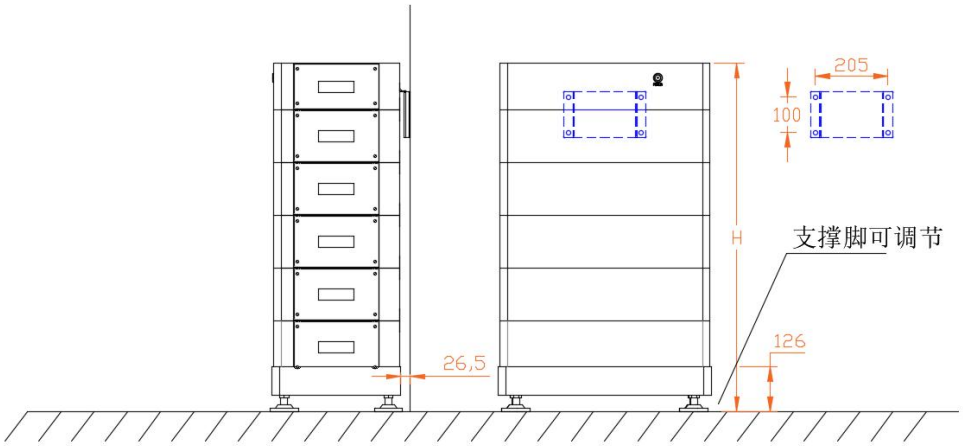
Step 1

Use the horizontal ruler to adjust the level of the base.

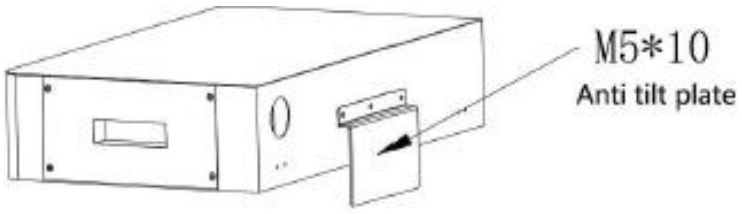


Step 2

When the battery module exceeds 4 (including 4), the anti-dumping component shall be installed. Position the holes according to the number of modules (2-10) and drill with 8mm drill.

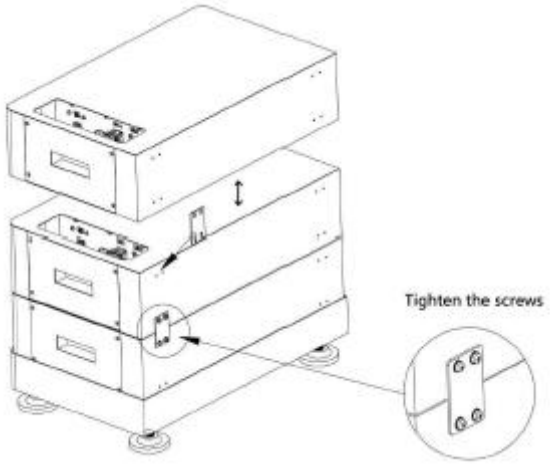


Battery	2	3	4	5	6	7	8	9	10
H（mm）	536	684.5	833	981.5	1130	1278.5	1427	1575.5	1724



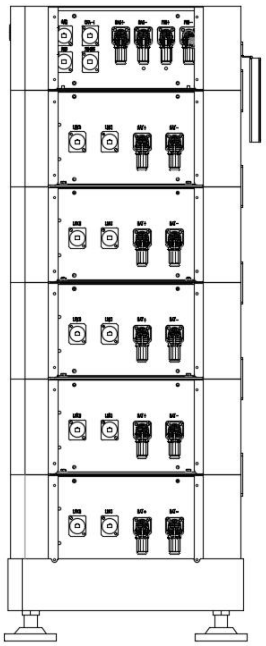
Step3

Install the battery: Before installing the next battery, tighten the screws to lock the battery module, install the battery module individually until the last battery module is installed, finally install the host module, and check the reliability of the screws.



Step 4

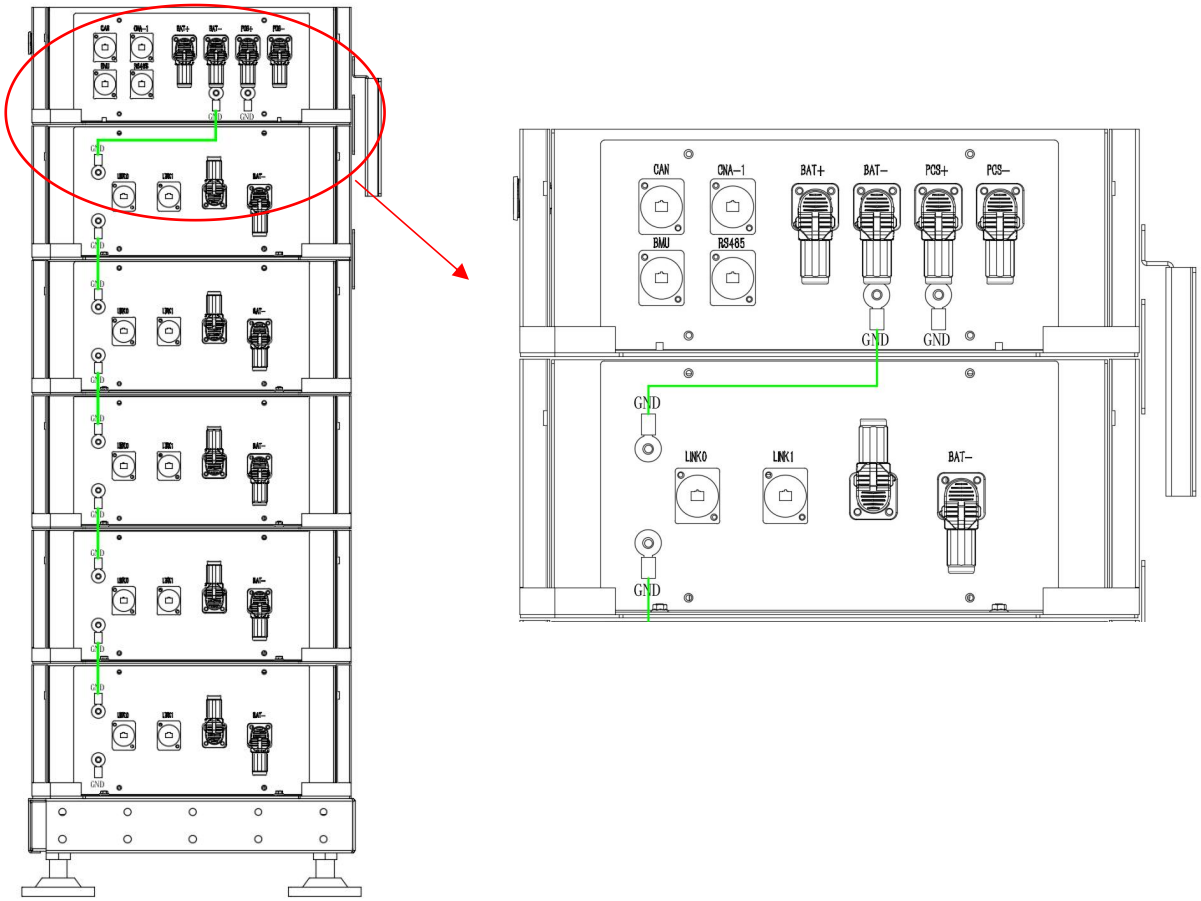
Remove the side retaining plates for all battery modules and BCU modules as shown below.



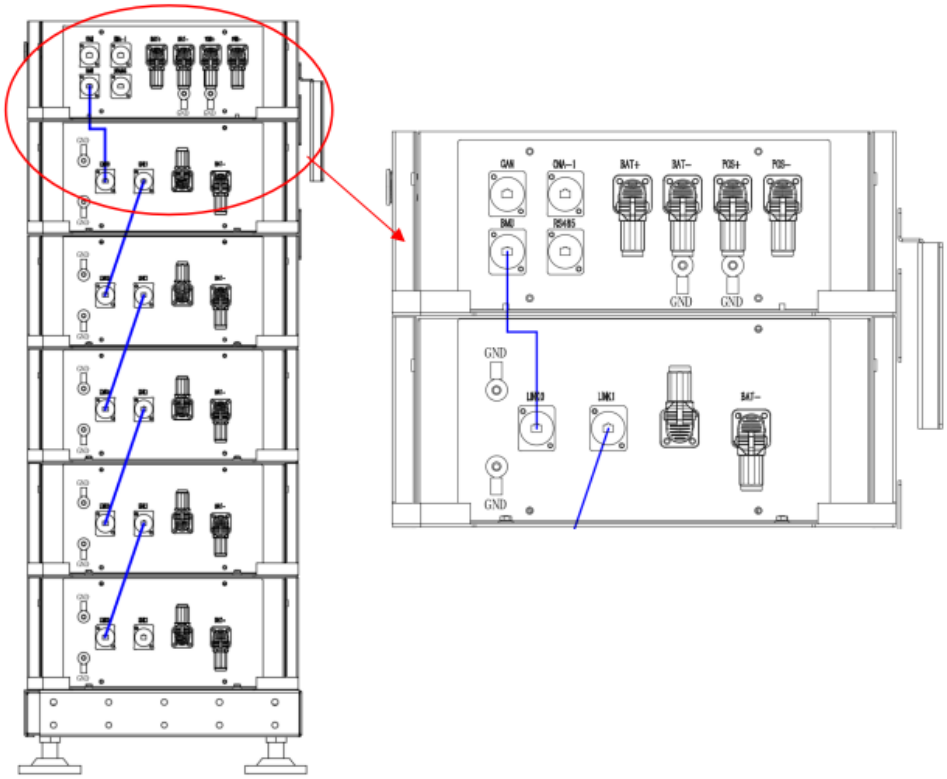
Step 5

Connection of all cables

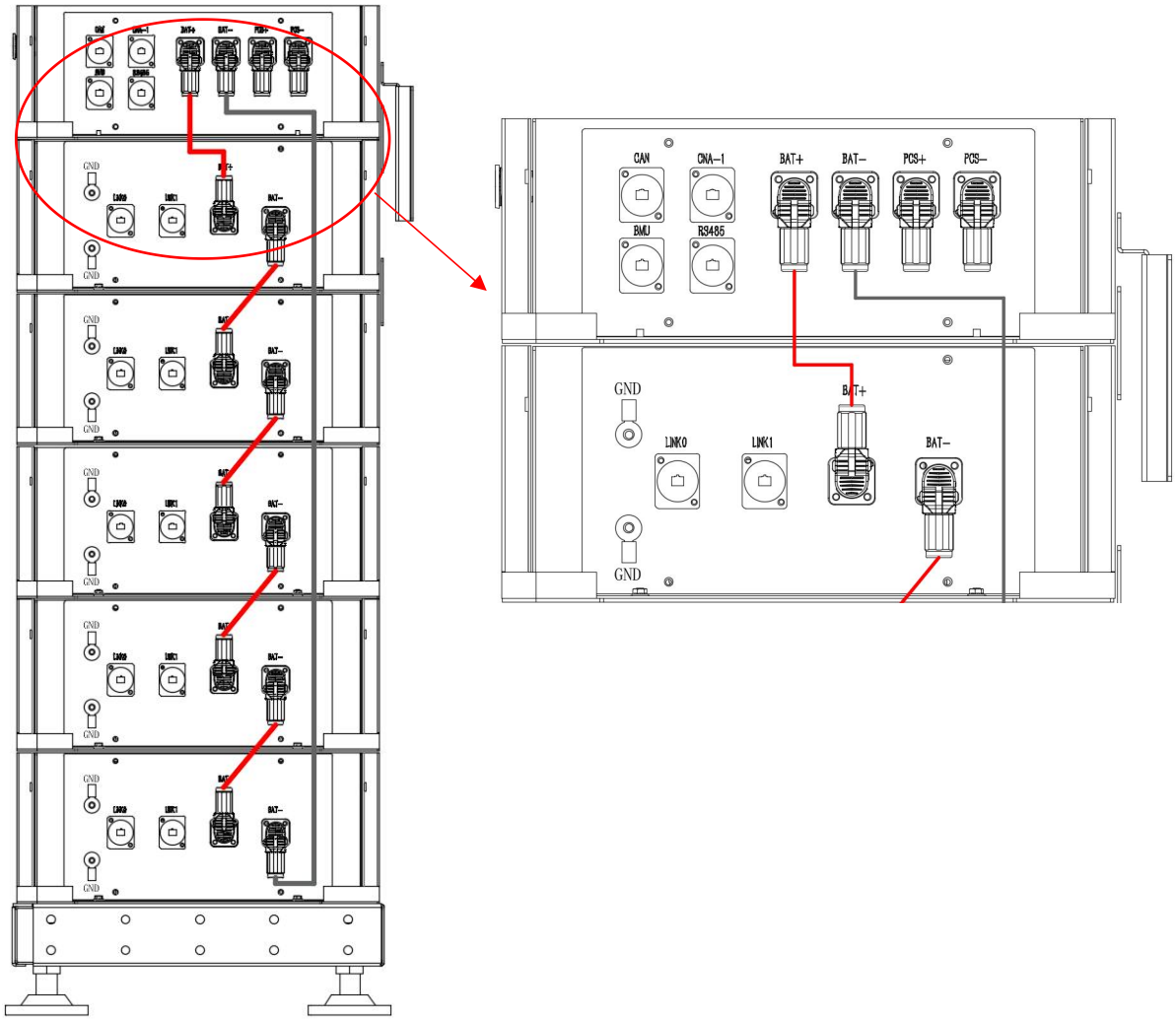
Connection of grounding wire:



Communication internal battery module：



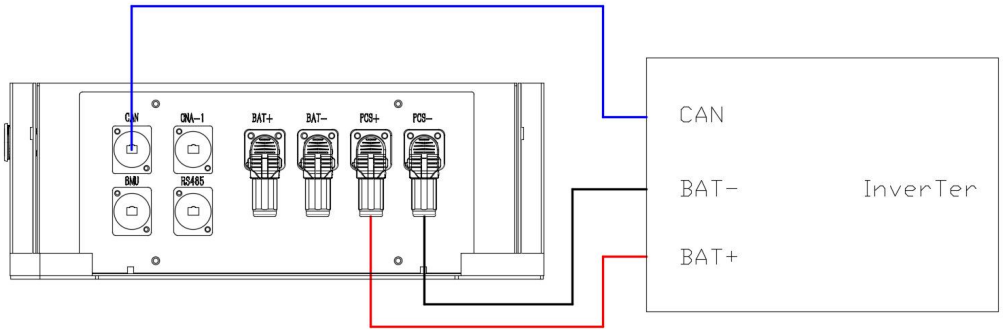
Connect the power wires between the modules：



Special note: this must be connected correctly, if the wrong connection will produce serious damage or personnel injury, harm the safety of life and property.

Step 6

Connect to the inverter.



7 Cleaning and Maintenance

7.1 Cleaning

Caution：

Power off the system before cleaning.

It is recommended to clean the ELEBOX-HV. regularly If the housing is dirty, remove dust using a soft, dry brush or remover. Do not clean the enclosure with a solvent or a corrosive liquid.

7.1.1 Recharging Requirements During Normal Storage

The battery shall be stored in an environment with a temperature range of between-10 °C + 45 °C, and maintained regularly according to the table below, to 0.5C (25A) current until 40%SOC. after long storage.

Storage Environment Temperature	Relative Humidity of the Storage Environment	Storage Time	SOC
Below -10°C	/	No use	/
-10∽25°C	5%∽70%	≦12 Months	30%≤SOC≤60%
25∽35C	5%∽70%	≦6 Months	30%≤SOC≤60%
35∽45C	5%∽70%	≦3 Months	30%≤SOC≤60%
Above 45C	/	No use	/

7.1.2 Requirements When Recharging an Over-discharge Battery

Please charge the over-discharged battery (90%DOD) within the specified time, follow the following table, or the battery module will be damaged by excessive discharge.

8 Common Issues and Solutions

The customer should not replace or change accessories. If the ALM long red is in red this means an error occurs. When you find a battery fault, please contact our after-sales service department within 48 hours.

8.1 Emergency

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

（1）**Wet**：If the battery pack is damp or immersed in water, do not try to disassemble the battery pack, please contact EITAI company or authorized dealer for technical support.

（2）**Fire**：Do not try to extinguish the fire with water! Only use dry powder fire extinguishers; If possible, place the battery pack in a safe area.

（3）**Leaked battery**：If the battery pack leaks the electrolyte, avoid contact with the leaking liquid or gas. If someone is exposed to the leaking material, do the following immediately：

1) **Inhaled gas:** People shall evacuate the contaminated area and seek medical treatment.
2) **Contact eye:** Wash eyes with water for 15 minutes and seek medical treatment.
3) **Contact skin:** Wash the infected site with soap and water and seek medical treatment.
4) **Battery damage**：Damaged battery is dangerous and must be treated with very carefully. They are not continued to use and may pose a danger to a person or property. If the battery pack is damaged, contact EITAI for handling.

8.3 Handling of the Battery System

1. The system treatment must comply with the locally applicable disposal regulations 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.

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