

LI-HV SYSTEM

Solinteg EBS-5150



User Manual

ENGLISH VERSION



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1 About This Manual

This manual is an integral part of Solinteg EBS-5150 series LFP battery system (hereinafter referred to as the battery or EBS battery). It mainly introduces the assembly, installation, electrical connection, debugging, maintenance and troubleshooting of the products.

The products, services or features purchased are subject to the commercial contracts and terms of Solinteg Power Co., Ltd. All or part of the products, services or features described in this document may not be within purchased. This document serves only as a guide to use, and all statements, information and recommendations in this document do not constitute any express or implied guarantee.

1.1 How To Use This Manual

Before installing and using batteries, please read this manual carefully, understand the safety information and be familiar with the functions and characteristics of batteries.

The manual content of subsequent versions of the battery may be subject to change. The latest manual can be found at www.solinteg.com.

1.2 Target Groups

This manual is applicable to the electrical installers with professional qualifications and end-users, who should have the following skills:

- ① Training for installation and commissioning of electrical system, as well as dealing with hazards.
- ② Knowledge of the manual and other related documents.
- ③ Knowledge of the local regulations and directives.

2 Safety Description

2.1 Safety Notes

Before installation, please read this manual and warning labels on battery carefully and follow the instructions in this manual strictly.

2.2 Important Safety Matters

SAVE THESE IMPORTANT SAFETY INSTRUCTIONS. EBS stackable Li-HV system installation and repair instructions assume knowledge of high voltage electricity and should only be performed by Solinteg certified installers. Solinteg assumes no liability for injury or property damage due to repairs attempted by unqualified individuals or a failure to properly follow these instructions. These warnings and cautions must be followed when using our product.



Read this entire document before installing or using EBS stackable Li-HV system. Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock, serious injury, or death, or can damage EBS stackable Li-HV system, potentially rendering it inoperable.



A battery can present a risk of electrical shock, fire, or explosion from vented gases. Observe proper precautions.



EBS stackable Li-HV storage system installation must be carried out only by Solinteg Certified Installers, who have been trained in dealing with high voltage electricity.



The product is heavy and challenging to lift.



Do not use EBS Battery if it is defective, appears cracked, broken, or otherwise damaged, or fails to operate.



Do not attempt to open, disassemble, repair, tamper with, or modify EBS Battery. EBS Battery is not user serviceable. LFP Cells in EBS Battery are not replaceable. Contact the EBS Authorized Reseller who sold the EBS Battery for any repairs.



Do not connect EBS Battery to alternating current carrying conductors. EBS storage system including battery and battery must be wired to either a battery or a DC combiner panel that is then wired to an inverter. No other wiring configuration may be used.



EBS Battery contains components, such as switches and relays, that can produce arcs or sparks.



To protect EBS Battery and its components from damage when transporting, handle with care. Do not impact, pull, drag, or step on EBS Battery. Do not subject EBS Battery to any strong force. To prevent damage, leave EBS Battery in its shipping packaging until it is ready to be installed.



Do not insert foreign objects into any part of EBS Battery.



Do not expose EBS Battery or its components to direct flame.



Do not install EBS Battery near heating equipment.



Do not immerse EBS Battery or its components in water or other fluids.



Do not use cleaning solvents to clean EBS Battery, or expose EBS Battery to flammable or harsh chemicals or vapors.



Do not use fluids, parts, or accessories other than those specified in this manual, including use of non-genuine EBS parts or accessories, or parts or accessories not purchased directly from Solinteg or a Solinteg –certified party.



Do not place EBS Battery in a storage condition for more than one (1) month, or permit the electrical feed on the EBS Battery to be severed for more than one (1) month. Please reach out to your installer for more information if needed.



Do not paint any part of EBS Battery, including any internal or external components such as the exterior shell or casing.



Do not connect EBS Battery directly to photovoltaic (PV) solar wiring.



When installing EBS Battery in a garage or near vehicles, keep it out of the driving path. If possible, install the EBS Battery on a side wall and/or above the height of vehicle bumpers.

2.3 Environmental Conditions



Install EBS Battery at a height that prevents damage from flooding.



Operating or storing EBS Battery in temperatures outside its specified range might cause damage to EBS Battery.



Do not expose the EBS Battery to ambient temperatures above 45° C (113° F) or below -0° C (32° F).



Ensure that no water sources are above or near EBS Battery, including downspouts, sprinklers, or faucets.

2.4 Statement

Solinteg Power Co., Ltd. has the right not to undertake quality assurance in any of the following circumstances:

- ① Damages caused by improper transportation.
- ② Damages caused by incorrect storage, installation or use.
- ③ Damages caused by installation and use of equipment by non-professionals or untrained personnel.
- ④ Damages caused by failure to comply with the instructions and safety warnings in this document.
- ⑤ Damages of running in an environment that does not meet the requirements stated in this document.
- ⑥ Damages caused by operation beyond the parameters specified in applicable technical specifications.
- ⑦ Damages caused by unauthorized disassembly, alteration of products or modification of software codes.
- ⑧ Damages caused by abnormal natural environment (force majeure, such as lightning, earthquake, fire, storm, etc.).
- ⑨ Any damages caused by the process of installation and operation which don't follow the local standards and regulations.
- ⑩ Products beyond the warranty period.

3 Product Description

3.1 Models

The EBS series battery includes 7 models which are listed below:
EBS-5150-5, EBS-5150-7, EBS-5150-10, EBS-5150-12, EBS-5150-15, EBS-5150-17, EBS-5150-20.

3.2 Appearance Introduction

▼ 3.2.1 BMS Module

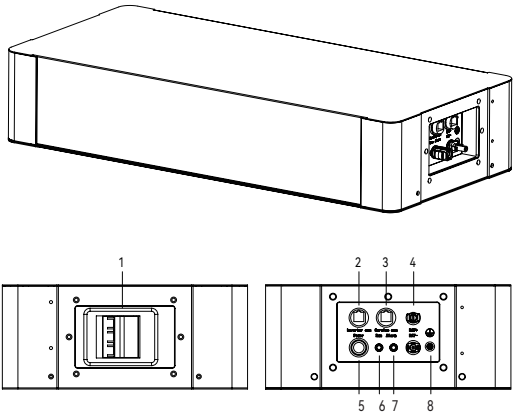


Figure 3-1 EBS-5150-BMS

Item	Terminal	Note
1	Battery MCB	Control battery output
2	Inverter COM	Connect to the inverter communication port
3	Service COM	Debug Interface
4	Battery output	Used for power cable connection
5	Power button and indicator	Turn the battery on and off
6	Run Indicator	Display the working status of the battery
7	Alarm Indicator	Display the alarm status of the battery
8	PE	Ground terminal

▼ 3.2.2 Battery Module and Base

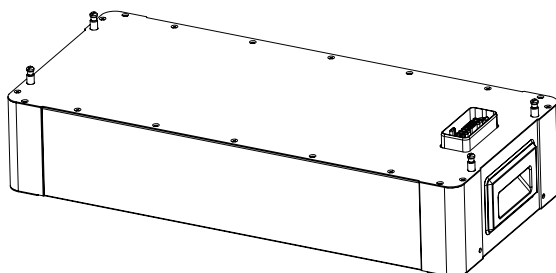


Figure 3-2 Battery Module (EBS-5150-BAT)

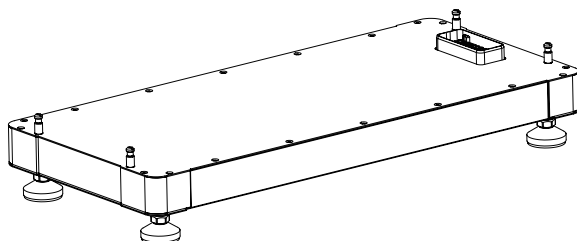


Figure 3-3 Base (EBS-5150-BAS)

3.3 Indicator

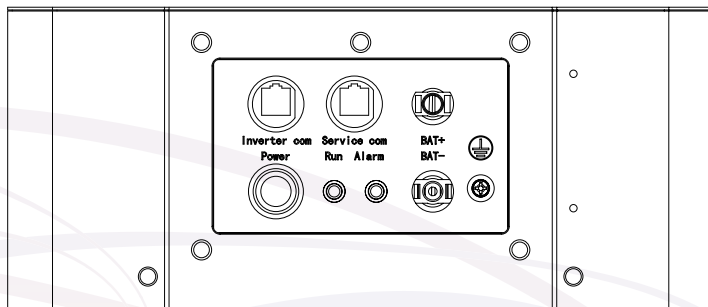


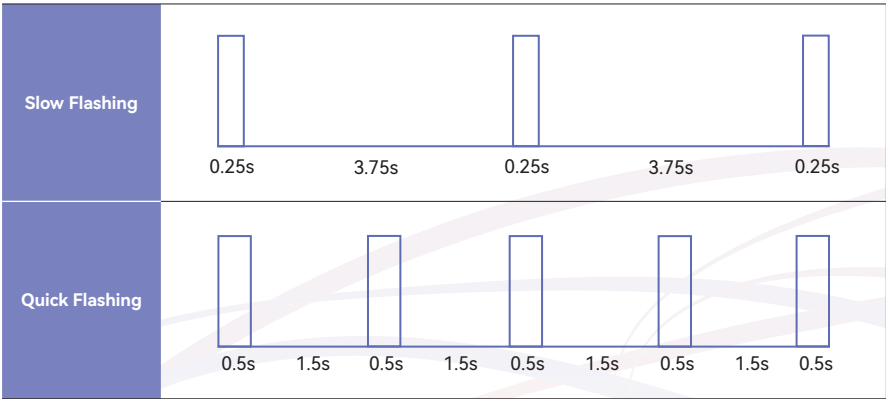
Figure 3-4 Battery indicator

Power Indicator

Status	Description
Off	Battery power off.
On	Battery power on.

Run and Alarm Indicator

Indicator Status and Color		Description	
RUN (Green)	Alarm (Red)		
Off	Off	Power off	
Slow Flashing	Off	Normal	Waiting Status
Slow Flashing	Quick Flashing	Alarm	
On	Off	Normal	Charging Status
On	Quick Flashing	Alarm	
On	Off	Overcharge Protection	
Quick Flashing	Off	Normal	Discharging Status
Quick Flashing	Quick Flashing	Alarm	
Off	Off	Under voltage protection	
Off	On	Temperature, overcurrent, short circuit, reverse connection, hardware failure and other protections.	



3.4 Packing List

The package of the battery includes the following accessories. Please check whether the accessories in the packing box are complete when receiving the goods.

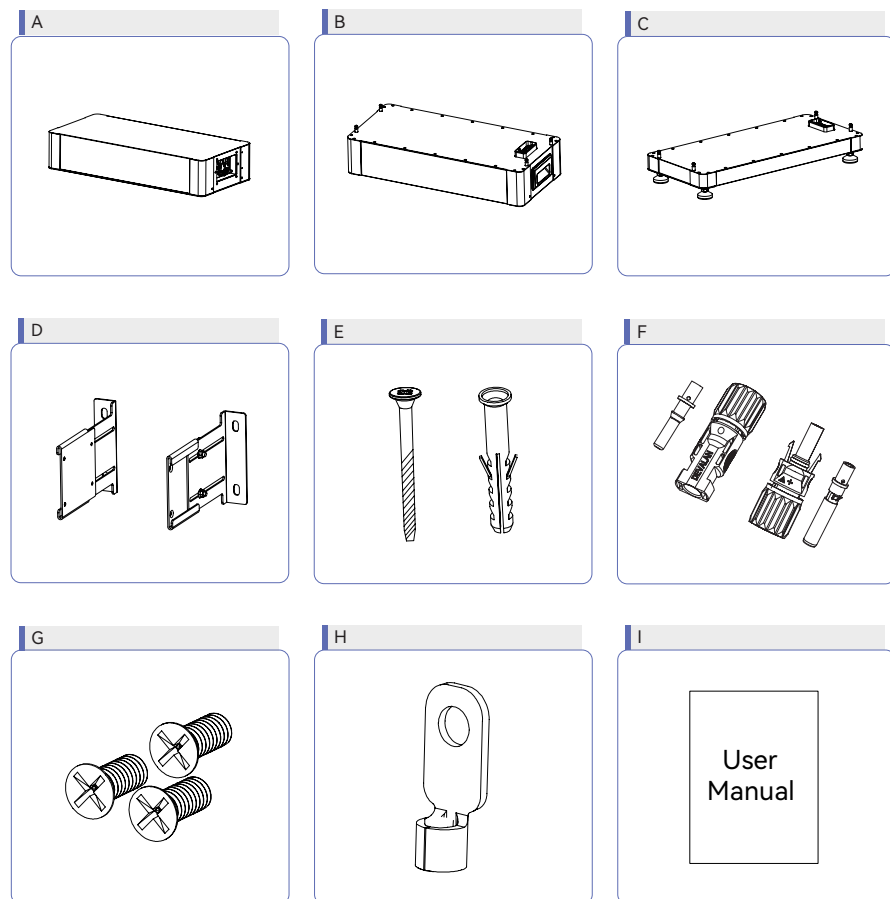


Figure 3-5 Packing list

Item	Name	Quantity
A	BMS Module (EBS-5150-BMS)	1
B	Battery Module (EBS-5150-BAT)	1~8
C	Base (EBS-5150-BAS)	1
D	Fixings	2
E	Expansion	4
F	Battery Terminal	1
G	Fixed Bolt	40
H	PE Terminal	1
I	User Guide	1

4 Installation

4.1 Location

- ① The area is completely water proof. The floor is flat and level.
- ② There are no flammable or explosive materials.
- ③ The ambient temperature is within the range from 0 to 50°C.
- ④ The temperature and humidity are maintained at a constant level. There is minimal dust and dirt in the area.
- ⑤ The distance from heat source is more than 2 meters.
- ⑥ The distance from air outlet of whole system is more than 0.5 meters. Do not cover or wrap the battery case or cabinet.
- ⑦ Do not place the battery at children or pet touchable area. The installation area shall avoid direct sunlight.
- ⑧ There are no mandatory ventilation requirements for battery module, but please avoid installation in confined area (minimum 300mm to top/left/right/front).
- ⑨ The aeration shall avoid of high salinity, humidity, or temperature.

4.2 Mounting

▼ 4.2.1 Install the Base

- ① Check the installation environment to ensure ground level.
- ② Place the base on the ground, and make sure it is level and stable.

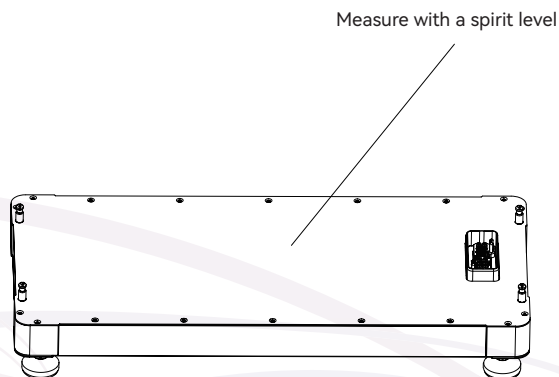


Figure 4-1 Adjust the base to level state

- ③ Distance between base and wall is 20mm~120mm.

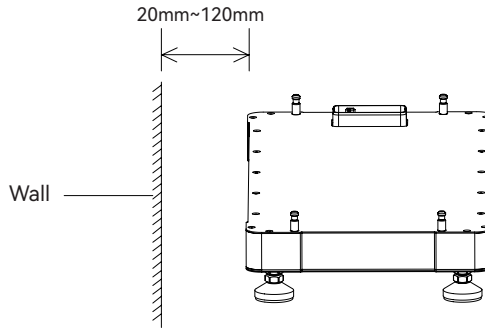


Figure 4-2 Distance between base and wall

▼ 4.2.2 Install the Module

- ① After the base is installed, remove the protective film of the terminals, and the remaining battery module and BMS module are then placed in turn.

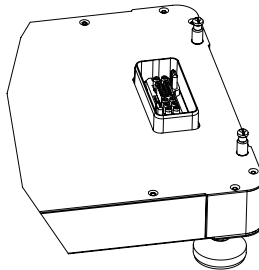


Figure 4-3 Remove the protective film

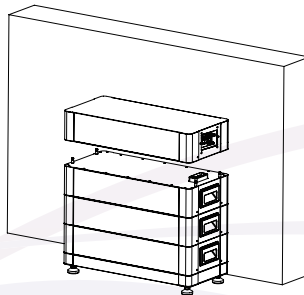


Figure 4-4 Place the modules

- ② Install the fixings on both sides of the BMS module.

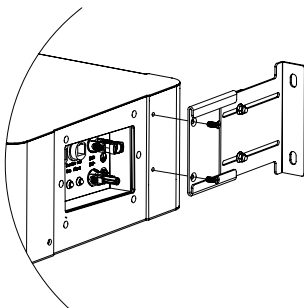


Figure 4-5 Install the fixings

- ③ Use the fixings as the template to mark the position of 4 holes on the wall.

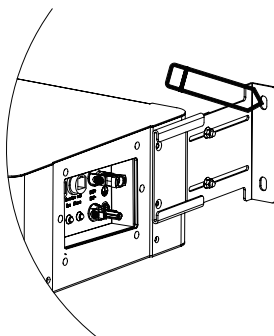


Figure 4-6 Mark the position

- ④ Remove the BMS Module.

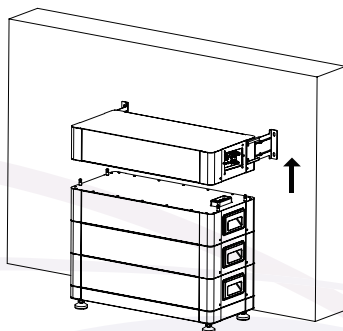


Figure 4-7 Remove the BMS Module

- ⑤ Use an electrical driller with 10mm diameter bit to drill 4 holes in the wall with 80mm depth.

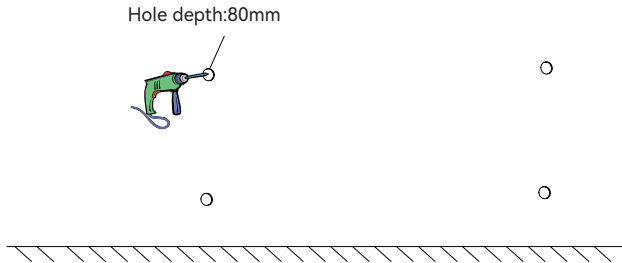


Figure 4-8 Drill holes



Before drilling, make sure to avoid any buried water tube and electric wires in the wall.

- ⑥ Insert the expansion tubes into the holes.

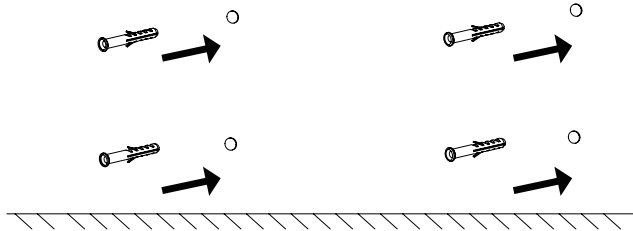


Figure 4-9 Insert the expansion tubes

- ⑦ Place the BMS Module on battery module.

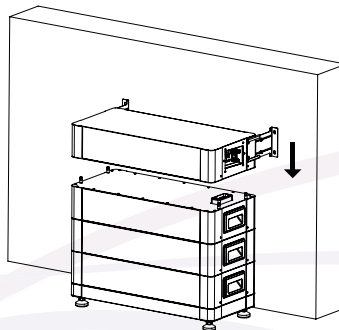


Figure 4-10 Place the BMS Module

- ⑧ Tighten modules with fixed bolt on the left and right side.

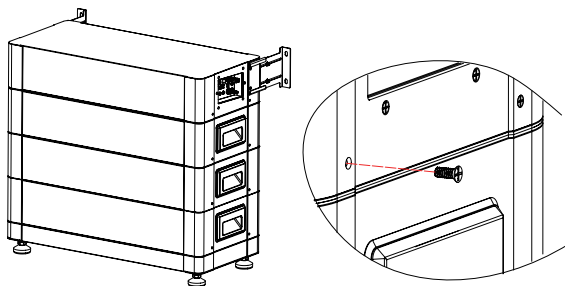


Figure 4-11 Tighten modules

- ⑨ Insert the expansion screws into the holes, then fix the fixings onto the wall with expansion screws by using a cross screwdriver.

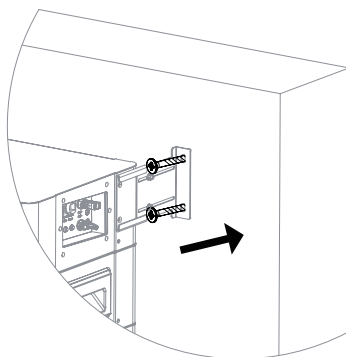


Figure 4-12 Fix the fixings

- ⑩ Turn the adjusting screw to fix the battery onto the wall by using a wrench.

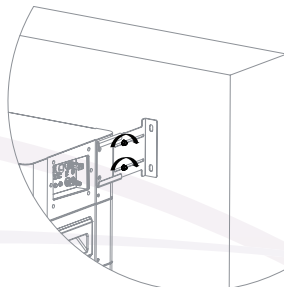


Figure 4-13 Fix the battery

▼ 4.2.3 Ground Connection



Proper grounding is good for resisting surge voltage shock and improving EMI performance. Battery must be well-grounded.

For a system with only one battery, the PE cable needs to be grounded.

For a multi-battery paralleling system, the PE wire or all battery groups need to be connected to the same grounding copper bar to ensure equipotential bonding.

Ground terminal connection steps:

- ① The external grounding terminal is located in the right side of the control module.
- ② Fix the grounding terminal to the PE wire with a proper tool and lock the grounding terminal to the grounding hole in the right side of the control module.
- ③ The cross-sectional area of the external grounding cable is 6mm^2 .

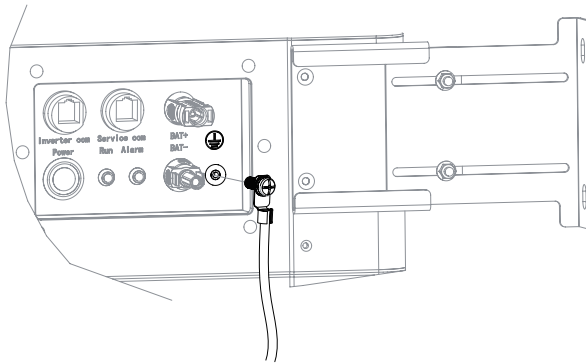


Figure 4-14 Grounding terminal connection

5 Electrical Connection



A high voltage in the conductive part of the battery may cause an electric shock. When installing the battery, make sure that the DC sides of the battery is completely de-energized. Ensure all cables are voltage-free before performing electrical operations.



Do not ground the positive or negative pole of the battery output, otherwise it will cause serious damage to the battery.



Static may cause damage to the electronic components of the battery. Anti- static measures should be taken during installation and maintenance.



Do not use other brands or other types of terminals other than the terminals in the accessory package. Solinteg has the right to refuse to held liable of all damages caused by the mixed-use of terminals.



Moisture and dust can damage the battery, ensure the cable gland is securely tightened during installation. The warranty claim will be invalidated if the battery is damaged as a result of using poorly connected cable connector.

5.1 Electrical Wiring Diagram

After mechanical installation is finished, here are positive power line, negative power line, communication cable and earth cable between inverter and control module need to be connected.

The picture on this page shows the cables connection. Please follow the instruction and make sure all the cables are connected correctly.

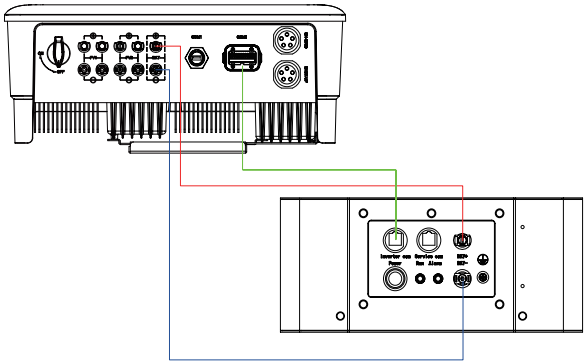


Figure 5-1 Wiring diagram

5.2 Power Cable of the Battery Connection

1.The following principles must be considered when making battery connection:

- ① Disconnect the AC breaker on the grid side.
- ② Disconnect the breaker on the battery side.
- ③ Turn the inverter DC switch to the “OFF” position.

2.Lithium battery connector assembly procedures

- ① Select an appropriate DC cable.

Cable requirements		Cable stripping length
Outside diameter	Conductor core section	
5.0-8.0 mm	10 mm ²	10 mm



If the conductor core of the battery power cable is too small, which may cause poor contact between the terminal and the cable, please use the cable specified in the above table, or contact Solinteg to purchase terminals of other specifications.

- ② Peel off the battery cable insulation sleeve for 10 mm.



Figure 5-2

- ③ Disassemble the connector in the accessory bag.

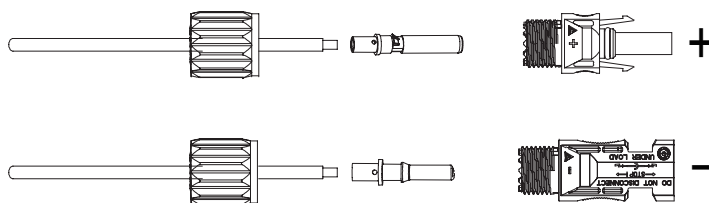


Figure 5-3

- ④ Insert the battery cable through the battery connector nut into the metal terminal and press the terminal with a professional crimping plier (pull back the cable with some power to check if the terminal is well connected to the cable).

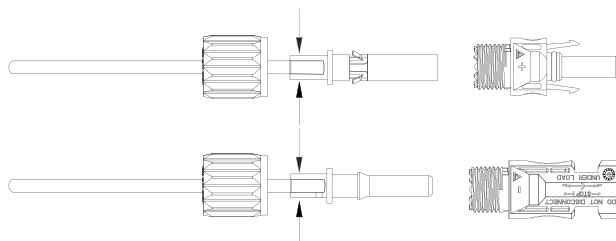


Figure 5-4

- ⑤ Insert the positive and negative cables into the corresponding positive and negative connectors, pull back the battery cable to ensure that the terminal is tightly attached in the connector.
- ⑥ Use an open-end wrench to screw the nut to the end to ensure that the terminal is well sealed.

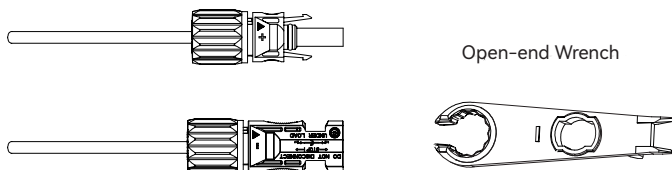


Figure 5-5



WARNING

- ① Before making the battery connector, please make sure the polarity of the cable is correct.
- ② Use a multimeter to measure the voltage of the battery pack and make sure the voltage is within the inverter limitation and the polarity is correct.

⑦ Insert the positive and negative connector into the inverter battery terminals respectively, and a “click” sound represents the assembly in place.

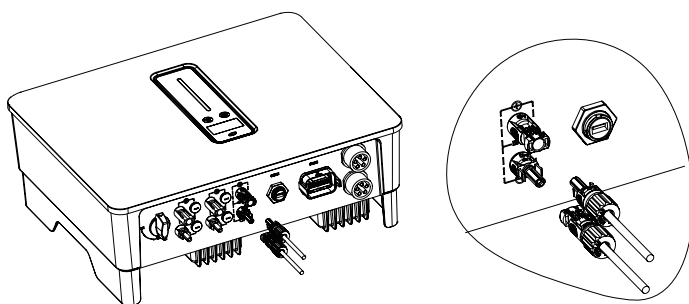


Figure 5-6

⑧ Insert the positive and negative connector into the battery power terminals respectively, and a “click” sound represents the assembly in place.

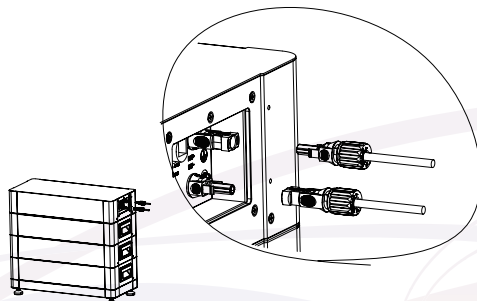


Figure 5-7

5.3 Communication Cable Connection

Please insert one side of the communication cable to the "Inverter COM" port in the BMS module, and refer to the inverter user manual to connect the other side.

RJ45 terminal connection sequence and definition as below.

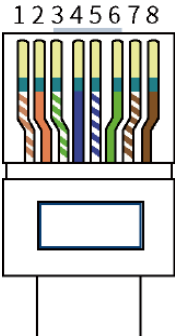
	No.	Color	Service COM	Inverter COM
	1	Orange & White	RS485_A	/
	2	Orange	RS485_B	/
	3	Green & White	/	/
	4	Blue	/	CAN_H
	5	Blue & White	/	CAN_L
	6	Green	RS232_RX	/
	7	Brown & White	RS232_TX	/
	8	Brown	RS232_GND	/

Figure 5-8 RJ45 terminal connection sequence and definition

6 Commissioning

6.1 Start Battery

- ① Turn on the Breaker on the BMS module left side.

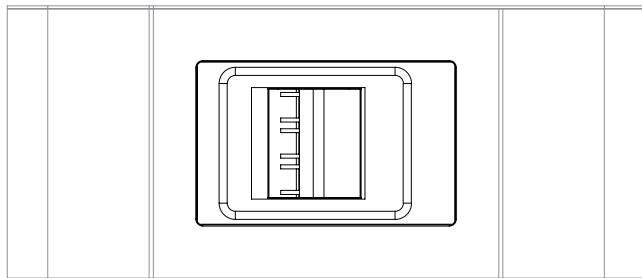


Figure 6-1

- ② Hold down the POWER button for 5 seconds until the indicator lights up.

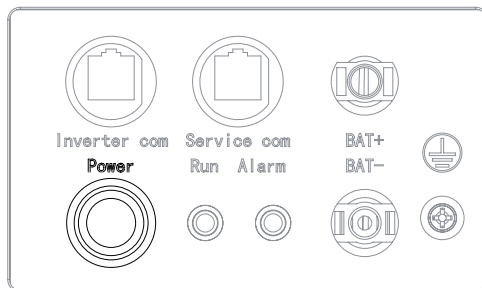


Figure 6-2

- ③ Observe the status indicator, green light flashing indicates the normal output.



NOTE

The above steps are only for battery startup. For details about system startup, please refer to commissioning steps of the inverter user manual.

6.2 Stop Battery

- ① Shut off the inverter (Refer to the inverter user manual).
- ② Hold down the POWER button for 5 seconds until the indicator flashing.
- ③ Turn off the Breaker on the BMS module.

7 Troubleshooting

7.1 Maintenance



Risk of battery damage or personal injury due to incorrect service!



Keep non-qualified persons away!

A temporary warning sign or barrier must be posted to keep non-qualified persons away while performing electrical connection and service work.



Restart the battery only after removing the fault that impairs safety performance.

Never arbitrarily replace any internal components.

For any maintenance support, please contact Solinteg. Otherwise, Solinteg shall not be held liable for any damage caused.



Servicing of the device in accordance with the manual should never be undertaken in the absence of proper tools, test equipment or the latest revision of the manual which has been clearly and thoroughly understood.

Maintenance of electrical components:

Item	Project	Checkpoint	Methods	Repair Condition	Repair Solution
1	Electrical	Check whether the voltage output is normal.	Multi-meter	The battery voltage exceeds the preset range.	Contact the dealer or manufacturer.
2	Failure to check	Check whether the light is normal.	Visual inspection	Warning	
3	Cable	Insulation, terminal		Insulation crack, aging, the terminal is peeling or corroded.	Replace the cable, replace the terminal board.

Battery Maintenance:

Item	Frequency	Project	Solution
1	Every month	Working environment	Keep away from heat sources and direct sunlight.
1		Visual inspection	If there is damage, leakage or deformation, isolate the faulty battery pack, take photos and replace the battery.
2	Every quarter	Visual inspection	Clean appearance with cotton cloth. Be careful when cleaning.
2		Connection status	Check each terminal for loose bolts and tighten again. Check the cable temperature.
3	Half a year	Measure and record voltage	Collect discharge data at least once every six months in the first year. In the second year, discharge data were collected every three months. Check the historical records through the RS232 port. If the alarm information shows that the battery is frequently overcharged, the battery has reached the charging and discharging protection point. This may lead to insufficient time for power preparation. It is recommended to replace the battery immediately.

7.2 Troubleshooting

If any battery fault occurs, record the fault information, shut down the battery according to the shutdown procedure, and contact the distributor or Solinteg. Do not handle the fault by yourself.

8 Appendix

8.1 Technical Parameters

Model	EBS-5150-5	EBS-5150-7	EBS-5150-10
Nominal Capacity (kWh)	5.12	7.68	10.24
Usable Energy (kWh)	4.6	6.9	9.2
Nominal Capacity (Ah)	50	50	50
Nominal Voltage (V)	102.4	153.6	204.8
Voltage Range (V)	89.6~115.2	134.4~172.8	179.2~230.4
Maximum Charge/ Discharge Current (A)	50	50	50
Recommend Continuous Charge/ Discharge Current (A)	25	25	25
Weight (kg)	90	123	156
Dimension[W*D*H] (mm)	708*315*505	708*315*640	708*315*775
Protection Degree	IP54		
Cycle Life	6,000 cycles @80% DOD		
Charging Temperature Range (°C)	0~55		
Discharging Temperature Range (°C)	-10~55		
Relative Humidity	5%-95% (No condensation)		
Altitude (m)	2000		
Battery Type	LiFePO4		
Module Connection	Series / Hard Connection with Positioner		
Installation Method	Stackable		
Module Number	2	3	4
Communication Protocol/Connector Type	CAN/RJ45		
Certification	CE/IEC62619/UN38.3		

Model	EBS-5150-12	EBS-5150-15	EBS-5150-17	EBS-5150-20
Nominal Capacity (kWh)	12.8	15.36	17.92	20.48
Usable Energy (kWh)	11.52	13.8	16.13	18.4
Nominal Capacity (Ah)	50	50	50	50
Nominal Voltage (V)	256	307.2	358.4	409.6
Voltage Range (V)	224~288	268.8~345.6	313.6~403.2	358.4~460.8
Maximum Charge/ Discharge Current (A)	50	50	50	50
Recommend Continuous Charge/ Discharge Current (A)	25	25	25	25
Weight (kg)	189	222	255	288
Dimension[W*D*H] (mm)	708*315*910	708*315*1045	708*315*1180	708*315*1315
Protection Degree	IP54			
Cycle Life	6,000 cycles @80% DOD			
Charging Temperature Range (°C)	0~55			
Discharging Temperature Range (°C)	-10~55			
Relative Humidity	5%~95% (No condensation)			
Altitude (m)	2000			
Battery Type	LiFePO4			
Module Connection	Series / Hard Connection with Positioner			
Installation Method	Stackable			
Module Number	5	6	7	8
Communication Protocol/Connector Type	CAN/RJ45			
Certification	CE/IEC62619/UN38.3			

MHS-3~8K-30 series suitable battery ranges from EBS-5150-5 to EBS-5150-20.

MHT 4~12K-25 series suitable battery ranges from EBS-5150-7 to EBS-5150-20.

8.2 Contact Information

Should you have any question about this product, please contact us.

We need the following information to provide you the best assistance:

- Model of the device
- Serial number of the device
- Date of the device
- Fault code/name
- Brief description of the problem

China (HQ)

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