



Power Box Ai-LB 10K

Installation Manual

Version:V01

For the latest Power Box ins

tallation documents in all supported languages, visit:

www.solplanet.net

WARNING

Read this entire document before installing or using Power Box . 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 Power Box, potentially rendering it inoperable.

PRODUCT SPECIFICATIONS

All specifications and descriptions contained in this document are verified to be accurate at the time of printing. However, because continuous improvement is a goal at AISWEI, we reserve the right to make product modifications at any time.

The images provided in this document are for demonstration purposes only. Depending on product version and market region, details may appear slightly different.

ERRORS OR OMISSIONS

To communicate any inaccuracies or omissions in this manual, please contact AISWEI.



ELECTRONIC DEVICE: DO NOT THROW AWAY

Proper Disposal of batteries is required. Refer to your local codes for disposal requirements

MADE IN CHINA

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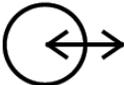
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IMPORTANT SAFETY INSTRUCTIONS:

This manual contains important instructions for the Power Box that must be followed during installation and maintenance of the system.

Power Box installation and service require knowledge of high voltage electricity and should only be performed by AISWEI Certified Installers. AISWEI assumes no liability for injury or property damage due to repairs attempted by unqualified individuals or a failure to properly follow these instructions. These warning and cautions must be followed when using Power Box.

These symbols indicate important safety information in this guide or on the equipment:

Symbol	Explanation
	Indicates a hazardous situation which, if not avoided, could result in injury or death.
	Indicates a hazardous situation which, if not avoided, could result in minor injury or damage to the equipment.
NOTE	Indicate an important step or tip that leads to best results, but is not safety or damage related.
	Indicates components that present risk of electrical shock.
	Indicates location of combined input/output connector on the equipment.
	Indicates location of grounding connection on the equipment.
	Discharge time is 5 minutes from de-energization.
	Indicates that user should refer to operating or installation instructions before proceeding.

General Information:

WARNING

Reading this entire document before installing or using Power Box. 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 Power Box, potentially rendering it inoperable.

WARNING

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

WARNING

Power Box installation must be carried out only by AISWEI Certified Installers who have been trained properly.

WARNING

Power Box is heavy. Use of Lift equipment is recommended.

WARNING

Use Power Box only as directed.

WARNING

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

WARNING

Before beginning the wiring portion of the installation, ensure that Power Box is switched off, and open any associated circuit breakers and disconnect switches (if applicable for the installation).

WARNING

Do not attempt to open, disassemble, repair, tamper with, or modify Power Box. Power Box and its components are not user serviceable. Batteries in Power Box are replaceable. Contact the AISWEI Certified Installer who installed the system for any repairs.

WARNING

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

⚠ WARNING

Do not insert foreign objects into any part of Power Box.

⚠ WARNING

Do not expose Power Box or its components to direct flame.

⚠ WARNING

Do not install Power Box near heating equipment.

⚠ WARNING

Do not immerse Power Box or its components in water or other fluids.

⚠ CAUTION

Do not use solvents to clean Power Box, or expose Power Box to flammable or harsh chemicals or vapors.

⚠ CAUTION

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

⚠ CAUTION

Do not place Power Box in a storage condition for more than one (1) month, or permit the electrical feed on the Power Box to be served for more than one (1) month, without placing Power Box into a storage condition in accordance with AISWEI's storage specifications.

⚠ CAUTION

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

⚠ CAUTION

Do not connect Power Box directly to photo voltaic (PV) solar wiring.

⚠ CAUTION

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

Environmental Conditions:

⚠ WARNING

Install Power Box in a location that prevents damage from flooding.

⚠ WARNING

Operating or storing Power Box in temperatures outside its specified range might cause damage to Power Box.

⚠ WARNING

Do not expose Power Box to ambient temperature above 50 °C or below -10 °C.

⚠ CAUTION

Ensure that no water sources are above or near Power Box, including downspouts, sprinklers, or faucets.

⚠ CAUTION

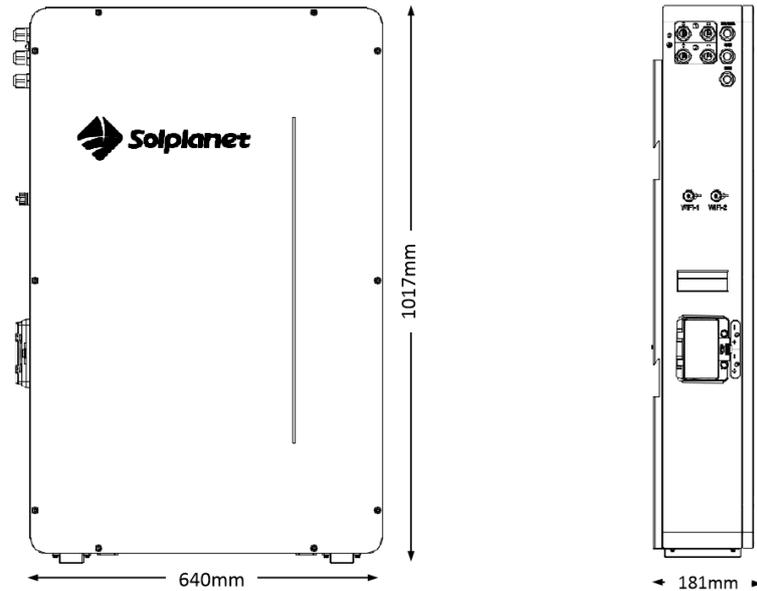
Ensure that snow does not accumulate around Power Box.

Revision History:

Date	Revision	Description	Owner
2022-09-16	V1.0	Initial Release	Jin Hu
2022-10-25	V1.1	1. Update packing list 2. Update storage temperature: -20 to 60°C	Jin Hu
2022-11-18	V1.2	1.Optimize storage temperature 2.Optimize installation steps	Jin Hu

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1. Specification



Technical Parameters	Ai-LB 10K
Cell Type	LiFePO4
Battery unit Model	LB51100A
Number of Battery Units	2 sets of LB51100A
Rated Capacity	200Ah
Rated Battery Energy	10.24 kWh
Rated Voltage	51.2 V
Working Voltage Range	44.8-57.6 V
Usable Battery Capacity	10.24 kWh
Parallel Quantity ¹	4 sets in parallel (40 kWh)
Nominal Current (Recommended) ²	0.5C, 100 A
Battery Depth of Discharge	90%
Battery Max Charge/Discharge Power	5.12kW/5.12kW
Available SOC Range	0% ~ 100%
SOC Transportation Range	50%
Operating Temperature	Charging Temperature: 0°C~55°C; Discharge Temperature: -20°C~55°C
Storage Temperature ³	-10°C ~ 50°C
Working Humidity	5~95%RH
Standard Charging Current	0.5C (100A)
Maximum Charging Continuous Current	0.5C (100A)
Rated DC Power	5.12kW

IP Grade	IP65
Recommended Indoor/Outdoor Usage	Indoor/ Outdoor
Weight	~116Kg (Not included wall mount)
Dimensions [W*D*H]	640*181*1017 mm (Not included connector)
Communication	CAN/RS485/Dry Contact/WiFi
Certificate (LB51100A)	TUV/IEC 62619/IEC62040/IEC61000/UN38.3
Certificate (Ai-LB10K)	TUV/IEC 62619/IEC62040/IEC61000/UN38.3
Calendar Life ⁴	10 Years
Cable Specification	Ai-LB 10K
Battery Cable Rating	100 A, each cable
Battery Cable Type	25 mm ² OR 4AWG

¹: For more parallel, please contact the engineer of supplier

²: Performance may be de-rating in extreme ambient environmental conditions

³: Recommended storage temperature 10°C~30°C;

⁴: Working Condition 0.5 C @ 25 deg C, 80% DoD, 1 cycle per day

2. Technical parameters

Key parameters are listed below

CASE:

NO.	Key Item	Specification	Remark
2.1	Material	SGCC Steel, 1.2mm Thickness	
2.2	Surface	Paint, Dove blue (RAL5014) ,Fine sand grain	
2.3	Weight	~28Kg	Refer to actual measurements
2.4	IP Level	IP65	
2.5	Dimension	WDH: 640*181*1017mm	Excluding connector

Bracket:

NO.	Key Item	Specification	Remark
2.6	Material	SGCC Steel, 1.5mm Thickness	
2.7	Surface	Paint,Dove blue (RAL5014) , Fine sand grain	
2.8	Weight	~2.0Kg	Refer to actual measurements
2.9	Dimension	WDH: 480x13.5x500mm	

Output Connector:

NO.	Key Item	Specification	Remark
2.10	Positive	2*PG19,White,IP67	Cable Diameter≤16mm

2.11	Negative	2*PG19,Blake,IP67	Cable Diameter≤16mm
2.12	Communication	3*PG19,Blake,IP67	Cable Diameter≤16mm

Power Box Panel Interface

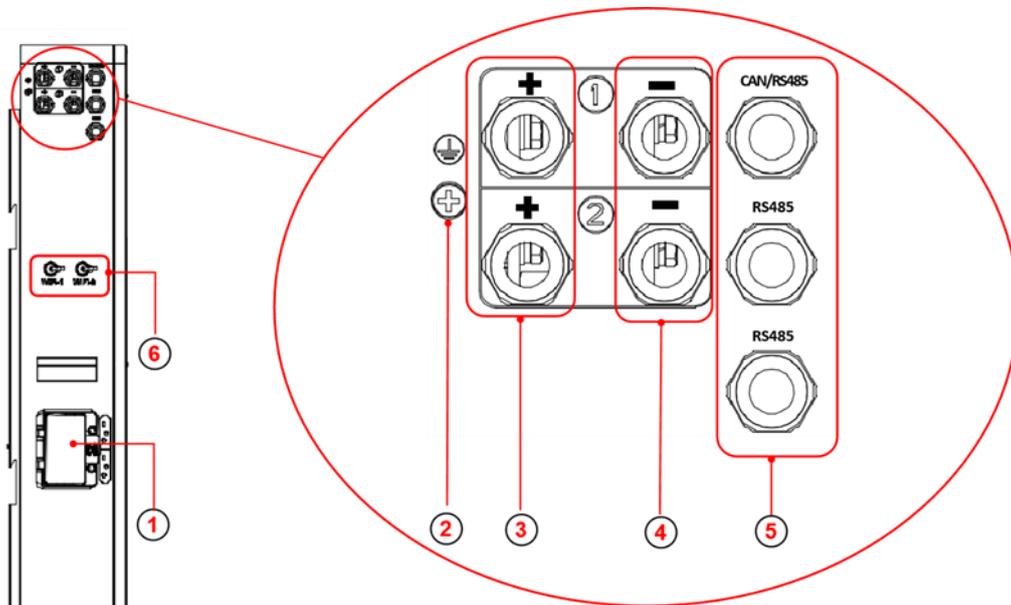
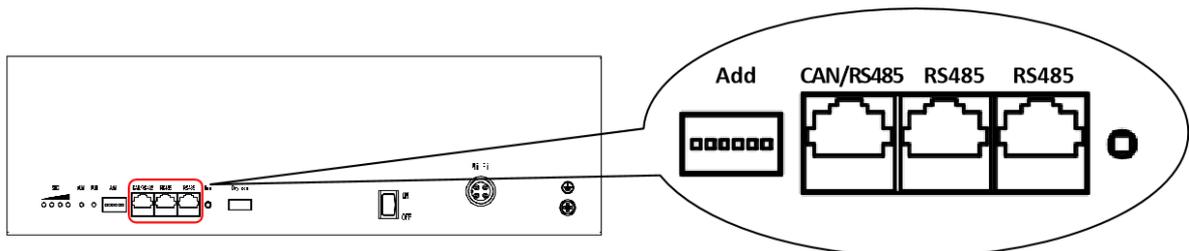


Fig. 2.1 Power Box Panel Interface

Item	Name	Model	Remarks
1	Breaker	NDB1-125, 2Px2	125A
2	GND Screw	M6	Yellow-Green, 10 AWG
3	2xPositive pole	PG19 Waterproof Head	Through Cable from φ8~15mm
4	2xNegative pole	PG19 Waterproof Head	Through Cable from φ8~15mm
5	3xCommunication Port	1xPG19 Waterproof Head	CAN To PCS
		2xPG19 Waterproof Head	RS485 Internal Connection
6	2xWIFI Socket	/	

Ai-LB 10K internal battery unit-LB51100A communication interface definition



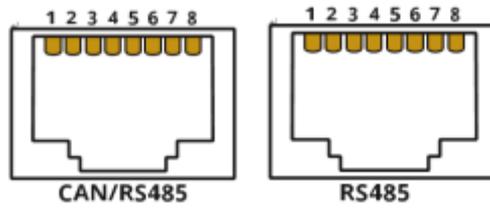


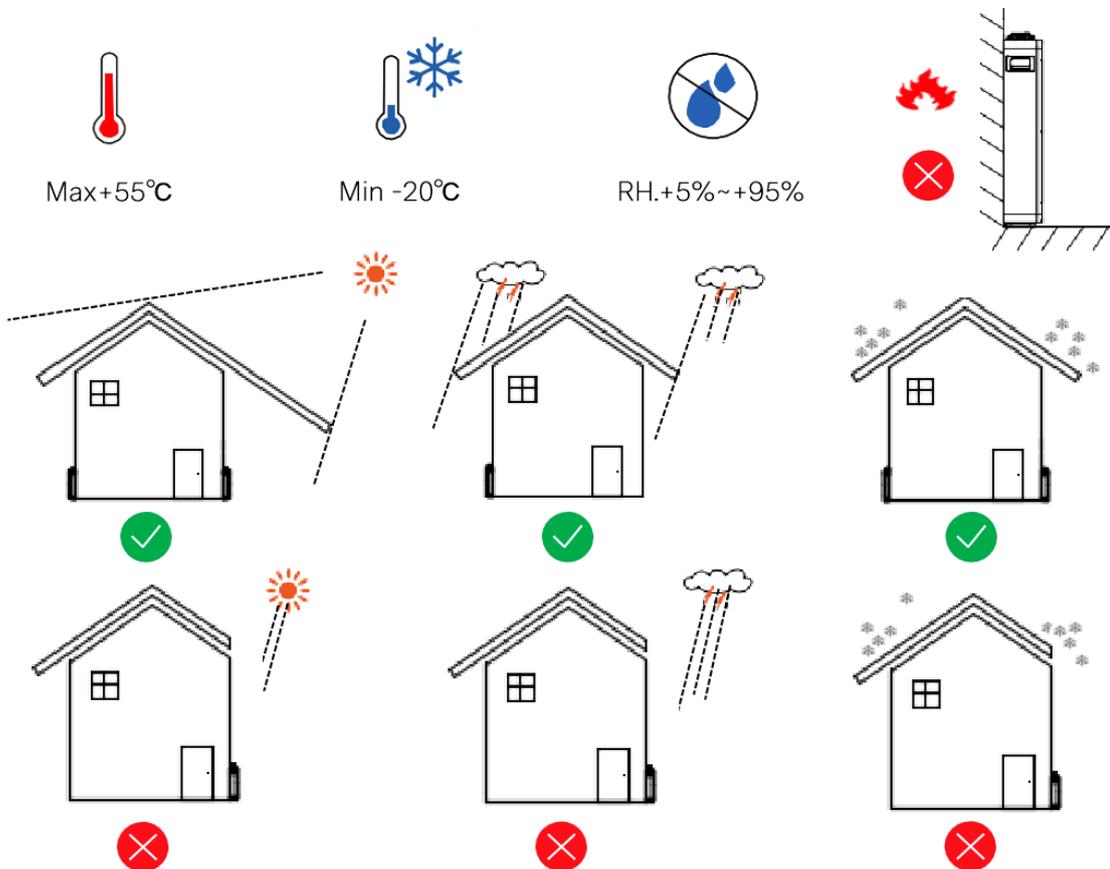
Figure 2.3 CAN/RS485 and RS485 connections

Name	Description
CAN/RS485x1	Pin 1: NA Pin 2,7: RS485-A Pin 3,6: RS485-B Pin 4: CAN-H Pin 5: CAN-L Pin 8: GND
RS485x2	Pin 1, 4, 5: NC Pin 2, 7: RS485-A Pin 3, 6: RS485-B Pin 8: GND

3. Installation preparation

3.1 Requirements for Installation Location

- ✧ A solid support surface must be available (e.g., concrete or masonry).
- ✧ The installation location must be inaccessible to children.
- ✧ The installation location must be suitable for the weight and dimensions of the Power Box.
- ✧ The installation location must not be exposed to direct solar irradiation.
- ✧ Keep away from metal conductive dust.
- ✧ Keep away from water source, heat source and inflammable and explosive articles
- ✧ The installation location must not be close to the fire.
- ✧ The altitude of the installation location should be less than 3000m.
- ✧ The operating temperature should be between $-20\text{ }^{\circ}\text{C} \sim +55\text{ }^{\circ}\text{C}$.
- ✧ The ambient humidity should be between 5-95%.

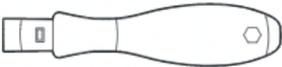
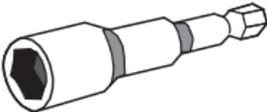
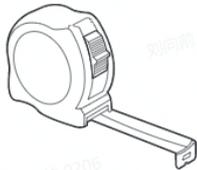


NOTE

Power Box includes a mounting bracket , that supports the unit in both floor- and wall-mount configuration, and includes shims to level the unit in floor-mount configurations. Do not use other hardware to anchor Power Box to the wall or floor.

3.2 Tools

The tools in the following table could be needed during the installation

		
Torque screwdriver	Phillips-screwdriver bit	Hex-key bit
		
Phillips-head screwdriver	Torque wrench	Wrench
		
Cylinder screwdriver bit	Scissor	tie
		
level	Electric Drill	Tape measure
		
Hammer	Twist drill	Marker pen

3.3 Safety Gear

Wear the following safety gear when dealing with the battery system. Installation personnel must meet the relevant requirements of international standards.

		
Insulated gloves	Safety goggles	Safety shoes

3.4 Dimensions and Space Requirements

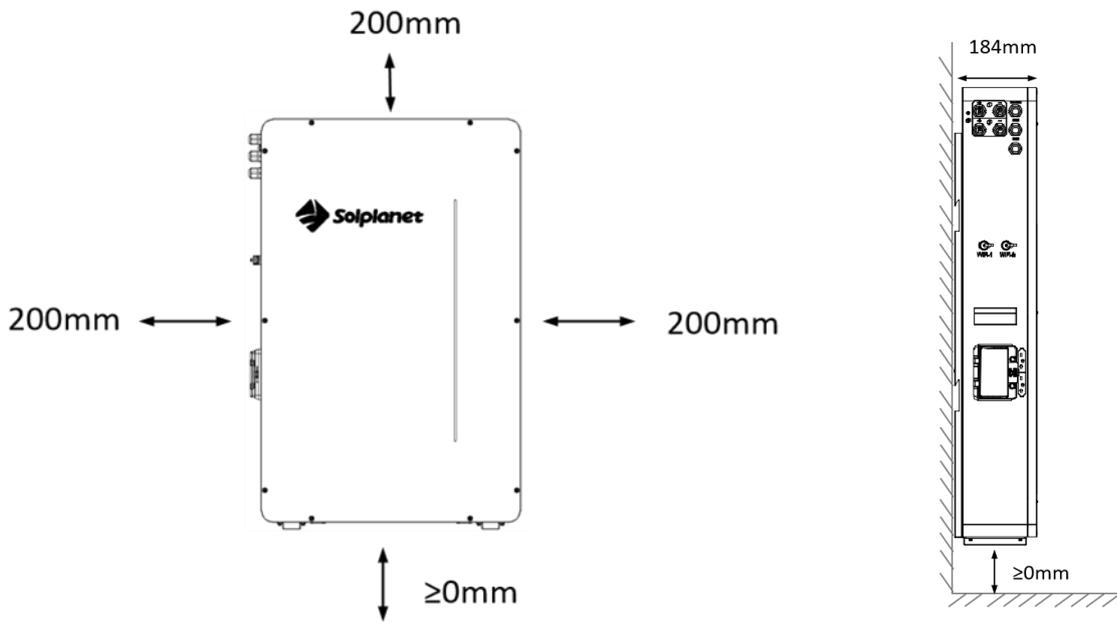


Figure 3.4.1

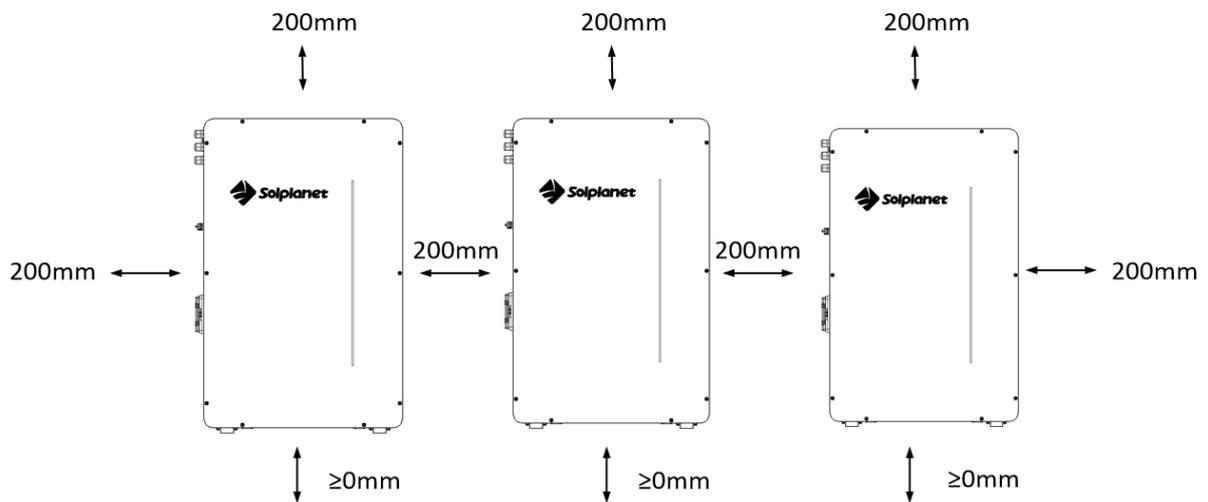


Figure 3.4.2

Space Requirements	
Min. clearance from left side	200 mm
Min. clearance from right side	200 mm
Min. clearance above Power Box	200 mm
Min. clearance between side-by-side Power Box	200 mm
Min. clearance at the bottom	≥0 mm
Max. slope	+/- 2 degree side-to-side +/- 5 degree front-to-back

3.5 Unpacking Inspection

When the equipment arrives at the installation site, loading and unloading should be carried out according to the rules and regulations, to prevent from being exposed to sun and rain.

Before unpacking, the total number of packages shall be indicated according to the shipping list attached to each package, and the case shall be checked for good condition.

In the process of unpacking, handle with care and protect the surface coating of the object.

Open the package, the installation personnel should read the technical documents, verify the list, according to the configuration table and packing list, ensure objects are complete and intact, if the internal packing is damaged, should be examined and recorded in detail.

Packing list is as follows

Item	Serial number	Specification	Quantity	Figure	Note
Battery System	①	Ai-LB10K 640x181x1017mm	1		Standard
Wall - mount	②	Bracket	1		Standard
Accessory Bag	③	Expansion Bolts:M6x80	4		
	④	Hexagonal Wrench	1		
	⑤	Wire Sealing Ring	3		

Output/ Parallel Cable (CA11-A)	⑥	Power Cable Negative (⑥-1) : Black Cable, 4AWG /L1.5m Positive (⑥-2) : Red Cable, 4AWG /L1.5m	2		Standard
	⑦	Communication Cable Battery to Inverter/ Battery to Battery Black/L2.5m/Double RJ45 Plug	1		
	⑧	Ground Cable Yellow, Green/L1m/Double OT M6	1		

4. Installation For Single Use

4.1 System Cable Connection Diagram

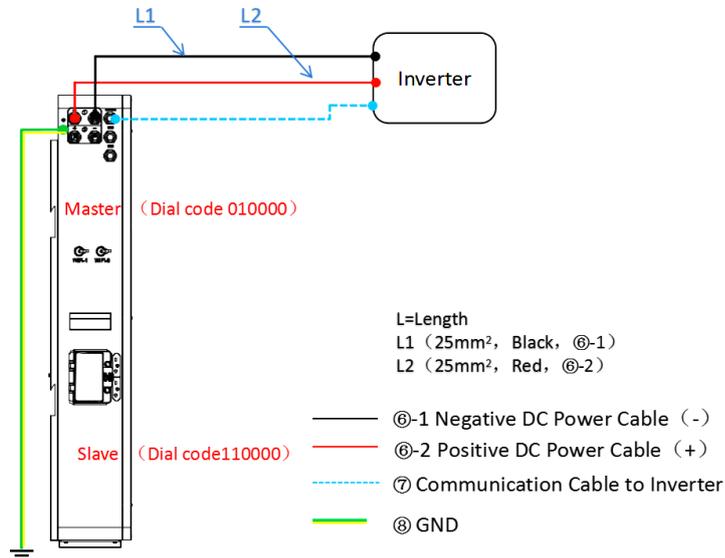


Fig. 4.1.1 Single-Set System Cable Connection Diagram(10kWh, Output Power 5kW)

4.2 Battery Ai-LB5K Fixation

NOTE

Make sure breaker on the enclosure is off.

4.2.1 Determine the installation position of the battery, and draw the installation hole position on the installation

surface according to the drawing:

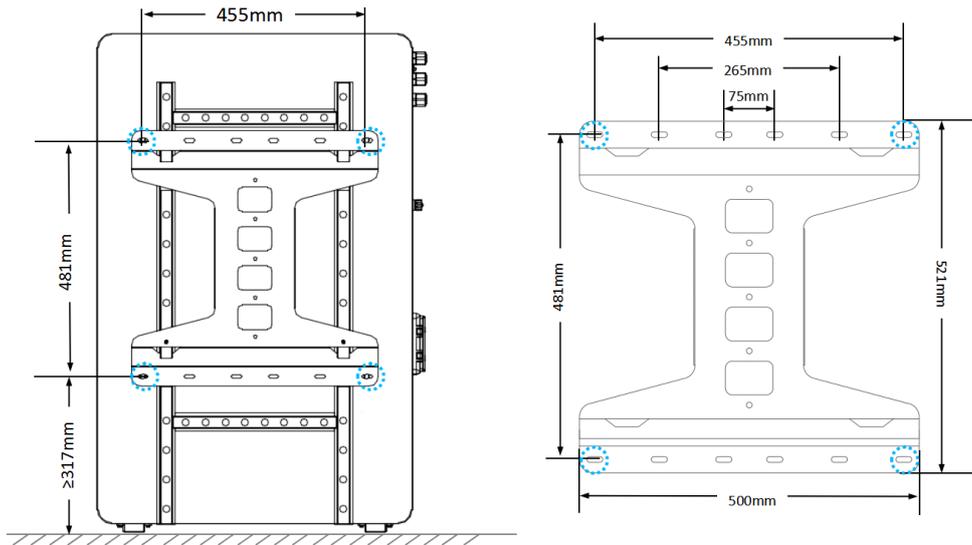
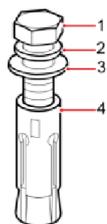


Figure 4.2.1

4.2.2 Drill holes on the mounting holes of 4pc ③expansion bolts(M6x80) with an electric drill, and then install the four expansion bolts into the mounting holes.

- (1) Use an impact electric drill to drill holes on the cement floor, and the drilling depth is between 80mm and 85mm.
- (2) Tighten the expansion bolt slightly and put it vertically into the hole. Knock the expansion bolt with a rubber hammer until all the expansion pipes enter into the hole.
- (3) Pre-tighten the expansion bolt.
- (4) Screw out the bolts and remove the spring washer and flat washer.

Expansion bolt structure



- (1) M6 Bolt (2) Spring Washer (3) Flat Pad (4) Expansion Pipe

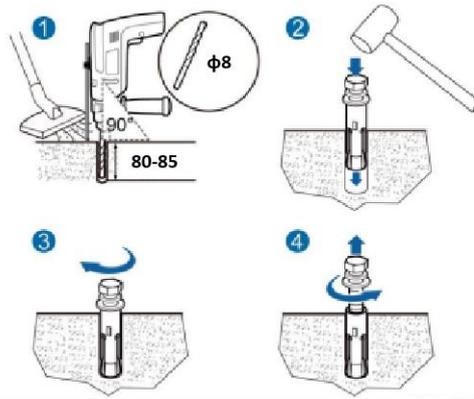


Figure 4.2.2

4.2.3 Fix the ②bracket with 4pcs bolts.

Lift the ①Ai-LB5K and hang it on the ②Backplane

The following image gives the indication of how it would be when single set installed.

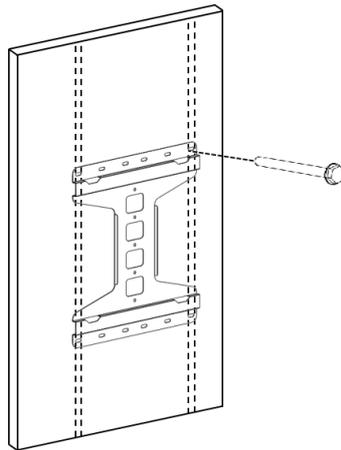


Fig. 4.2.3

NOTE

Please ensure that the ②bracket is horizontal after installation.

4.2.4 Lift the ①battery and hang it on the ②bracket.

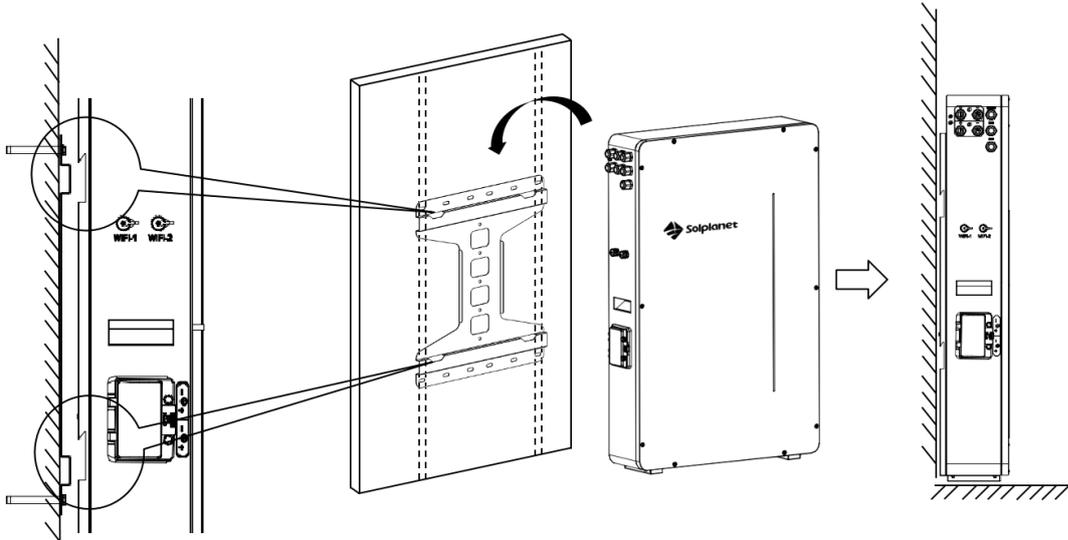


Fig.4.2.4 Assembling Demo

4.3 Cable Connection For Single Use

Procedure:

Step1. Use a screwdriver to fix the ⑧ground wire terminal to the battery ground point refer to Fig. 4.3.1.

Step2. Connect the pre-installed ⑥power cable and ⑦communication cable to the inverter refer to Fig. 4.1.1 .

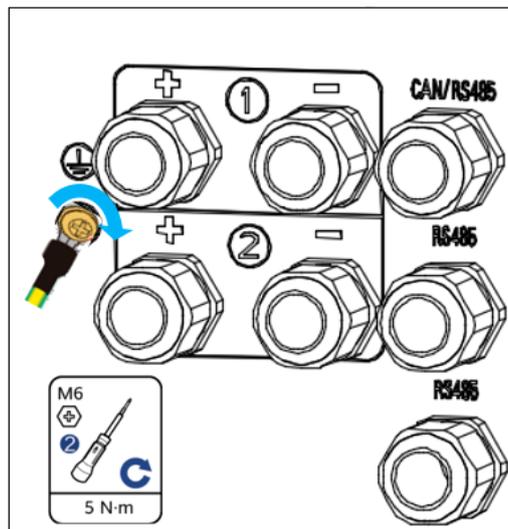


Fig. 4.3.1 Ground cable connection

4.4 Turn On the System

Step1. Open the circuit breaker protective cover and turn on the circuit breaker to “ON” side refer to Fig. 4.4.1 (Ensure that the inverter is connected to the PV module)

Step2. When battery establishes communication with the Inverter, the inverter can read the battery information.

Step3. Close the protective cover of the circuit breaker(Reverse the procedure for the open protective cover).

Step4. End.

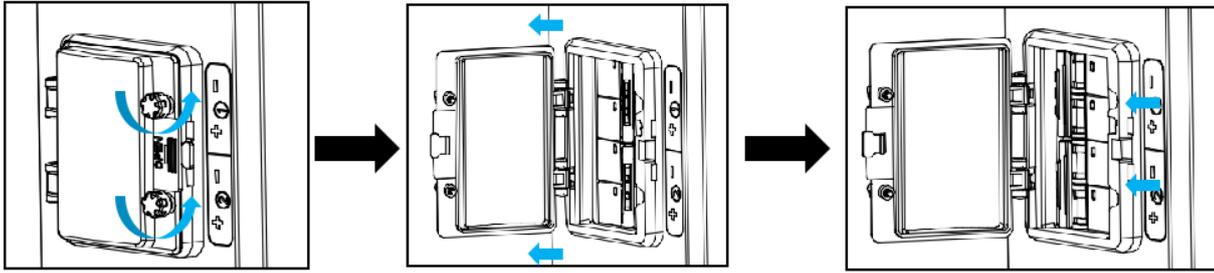


Fig. 4.4.1 Procedure for opening the circuit breaker protective cover

5. Installation For Parallel Use

5.1 System Cable Connection Diagram

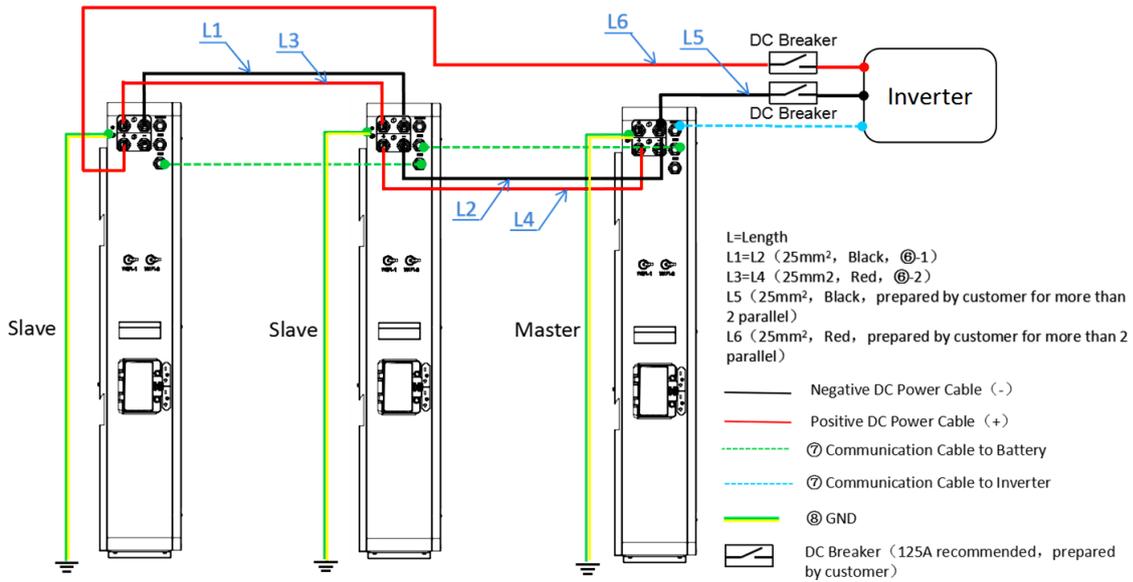


Fig.5.1.1 Multi-Sets Connection(Example: 3 Parallel,30kWh,Output Power 5kW)

(Battery ΔV should be less than 3V at first Parallel installation)

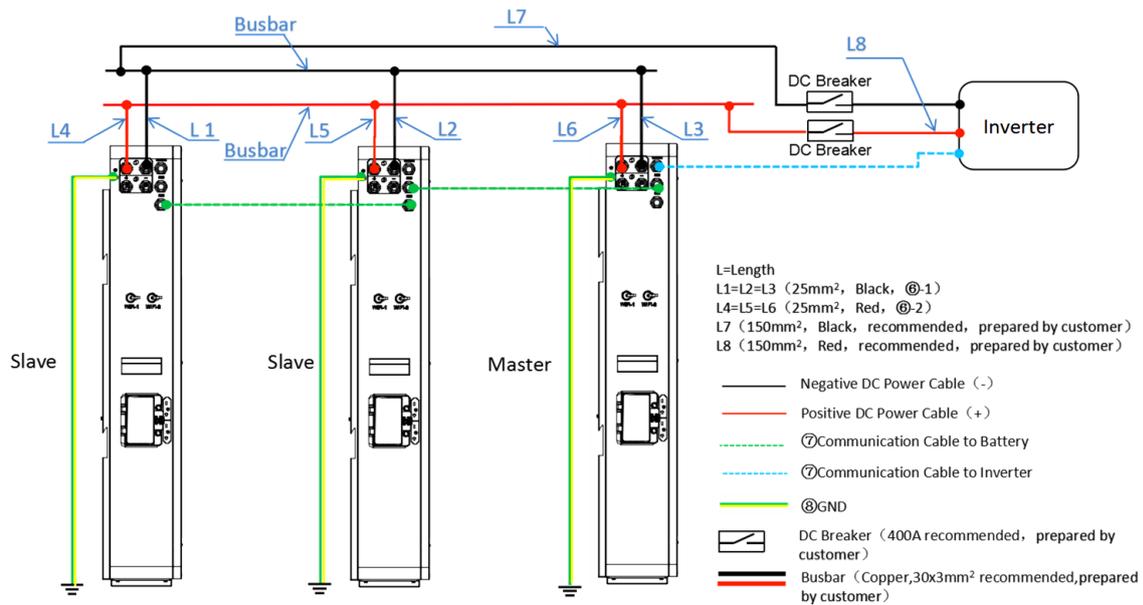


Fig.5.1.2 Multi-Sets Connection(Example: 3 Parallel,30kWh,Output Power 15kW)
 (Battery ΔV should be less than 3V at first Parallel installation)

5.2 Battery Fixation and Front Panel Removal

5.2.1 Fix the battery refer to 4.2.1 to 4.2.3.

5.2.2 Take down battery front panel refer to 5.2.1.

5.2.3 Turn the switch to “OFF” to turn off the internal battery refer to 5.2.2.

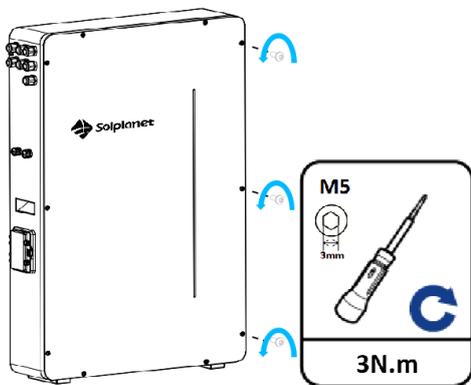


Fig.5.2.1 Take down battery front panel

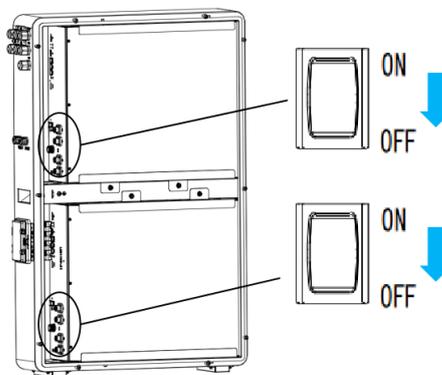
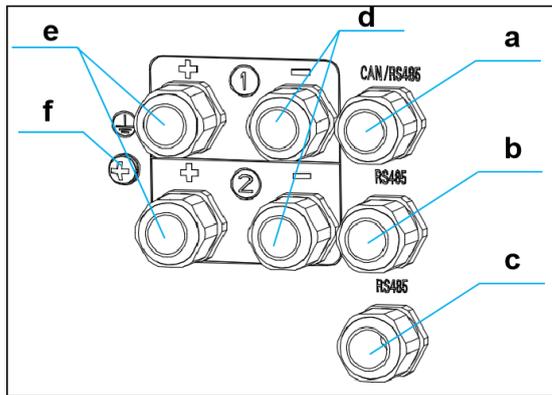


Fig5.2.2 Turn off the internal battery

5.3 Cable Connection For Parallel Use

5.3.1 Overview of the Connection Area



Item	Name	Model
a	CAN/RS485	PG19
b	RS485	PG19
c	RS485	PG19
d	2xNegative Port(-)	PG19
e	2xPositive Port(+)	PG19
f	GND	M6

5.3.2 Ground cable connection

Use a screwdriver to fix the ⑧ ground wire terminal to the battery ground point refer to Fig. 5.1.1.

5.3.3 Power Cable Connection

Multi-Sets in Parallel(LB51100A inside,3 Parallel as an example)

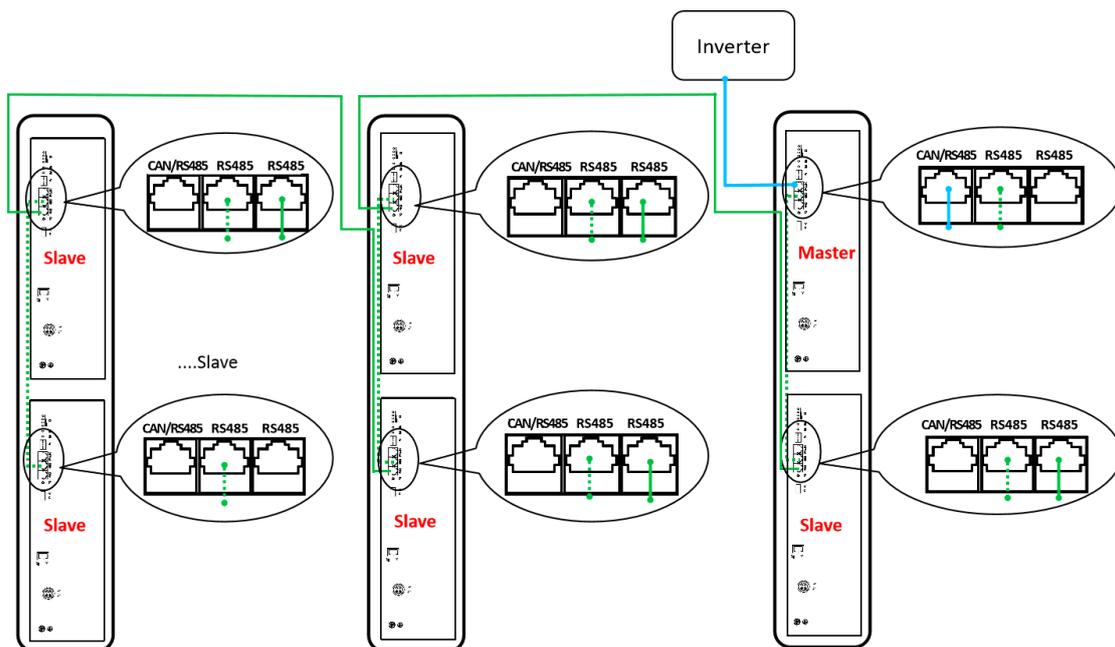


Fig. 5.3.1 Communication cable connection-3 Parallel(30kWh)

Procedure:

1. Make sure the breaker is off.
2. Take off the nut of the PG19.
3. Lead the communication cable through PG19.
4. Plug the communication cable to the corresponding RJ45 port, refer to Fig. 5.3.1 and Fig. 5.3.2.
5. Tighten nut of the PG19.

NOTE

The communication cable must pass through the ⑤ sealing ring.
The steps are reversed if remove the cable.

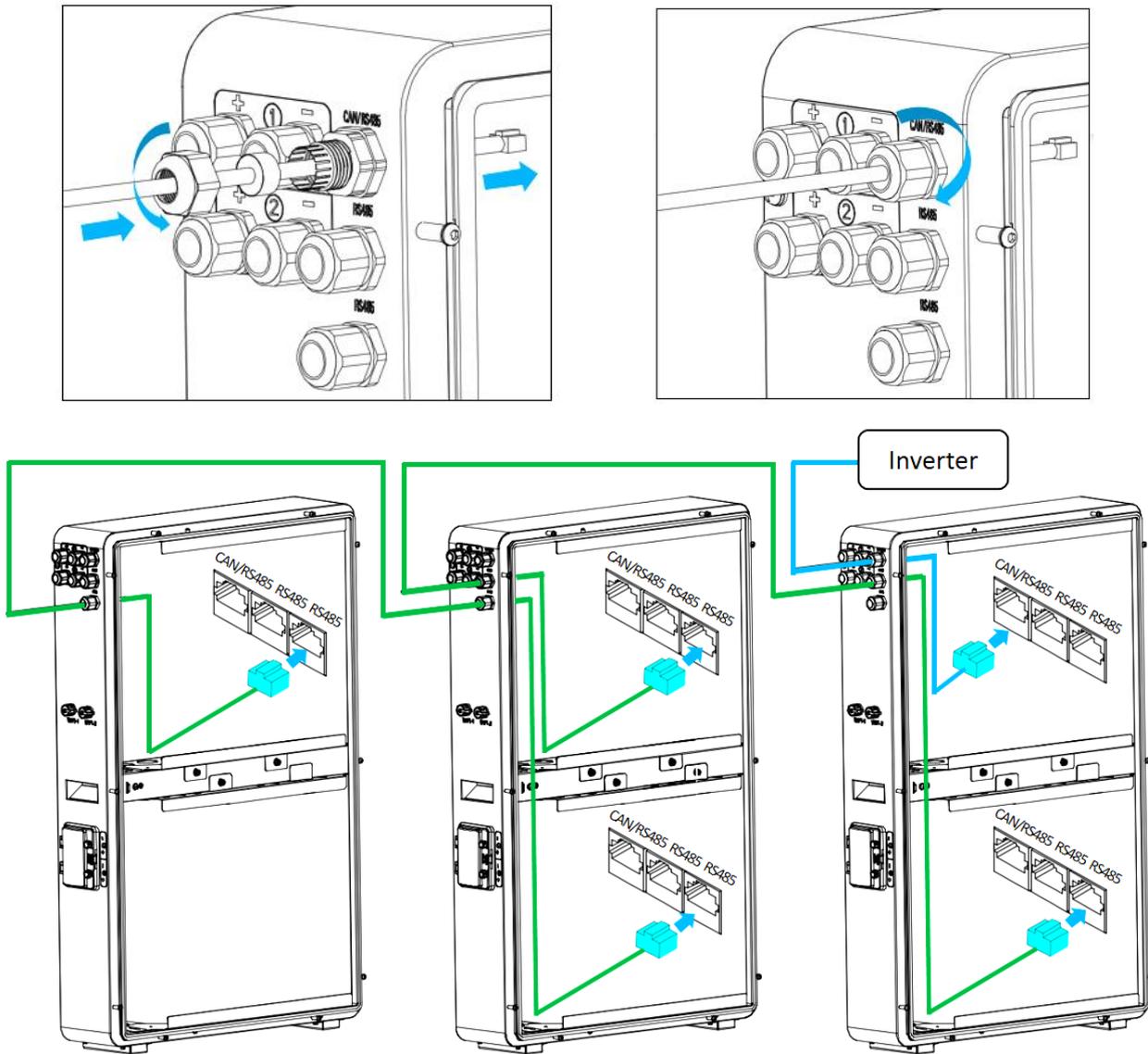


Fig.5.3.2 Communication cable connection

5.3.4 Power Cable Connection

Procedure:

1. Make sure the breaker and the internal battery switch are off.
2. If power cables are connected according to Fig.5.1.2, the pre-installed power cables are directly connected to the busbar.

3.If the power cable is connected according to Fig.5.1.1, insert the power cable into the corresponding PG 19, and then fix the power cable terminal refer to Fig. 5.3.4.

NOTE

Fig.5.3.3 shows the usage method of inserting power wire into PG head

- 1.Take off the nut of the PG19.
- 2.Lead the Power cable through PG19.
- 3.Fix the power cable terminal to the corresponding copper busbar inside.
- 4.Tighten nut of the PG19.

NOTE

The steps are reversed if remove the cable

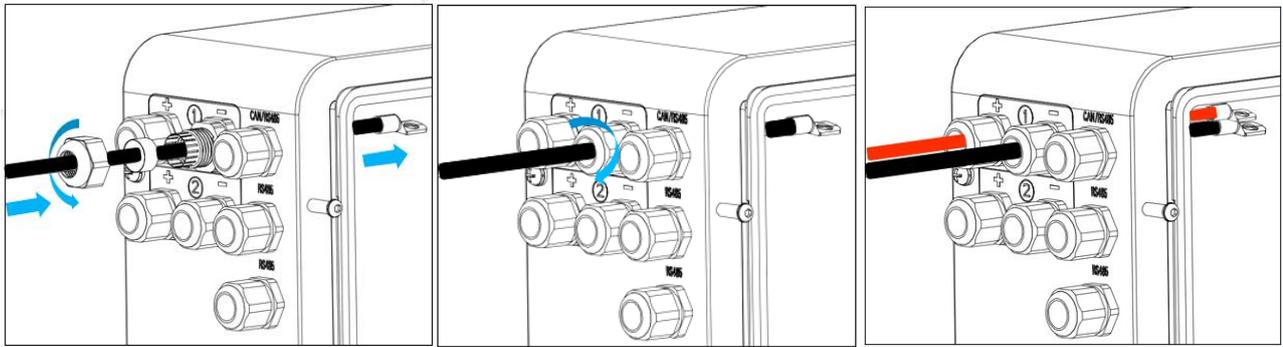


Fig.5.3.3 Power cable connection

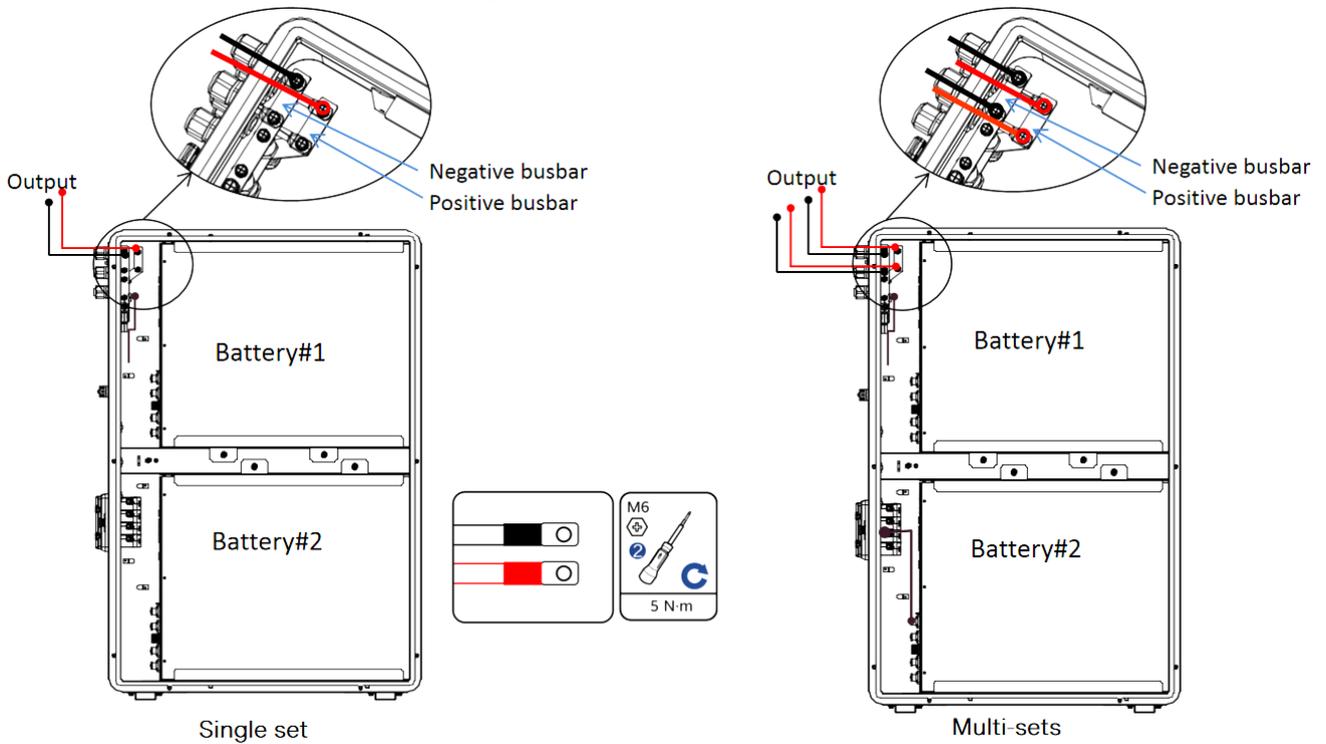


Fig. 5.3.4 DC Output Power Cable Wiring diagram

Additional:SC Terminal Power Cable Crimp Guide

1. Material List



2. Swipe outer isolation layer of DC cable.



3. Put wire Tail-Hood.



4. The red is used for the positive, and the black is for negative; The end of the cable is bunched at the terminal using a wire clamp.



5. Use isolation cap for unused DC plug.



6. Power cable ready for using.

5.4 Set up Master Pack and Slave Pack

Ai-LB 10K is consisted of 2 sets of LB51100A . Master Pack and Slave Pack LB51100A can be used as single unit as well as multi-units (in parallel) mode. The customer must inform supplier if multi-units mode is required. The Master Pack can be used individually, but Slave Pack cannot be used individually.

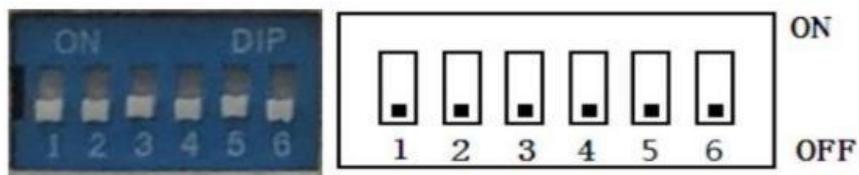


Figure5.4.1 Dial Diagram

Master/Slave dial code diagram:

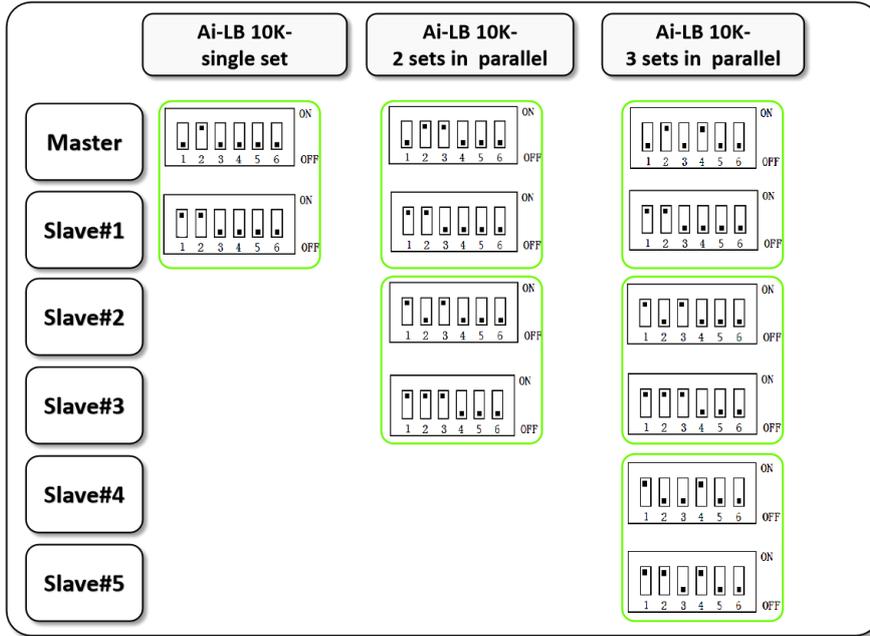


Figure5.4.2 Dial Diagram Setting

(If more than 6 LB51100A in parallel, please contact the engineer of supplier.)

Procedure:

1. Make sure the breaker and the internal battery switch are off.
2. Set the dial code refer to the Figure 5.4.2 and 5.4.3.

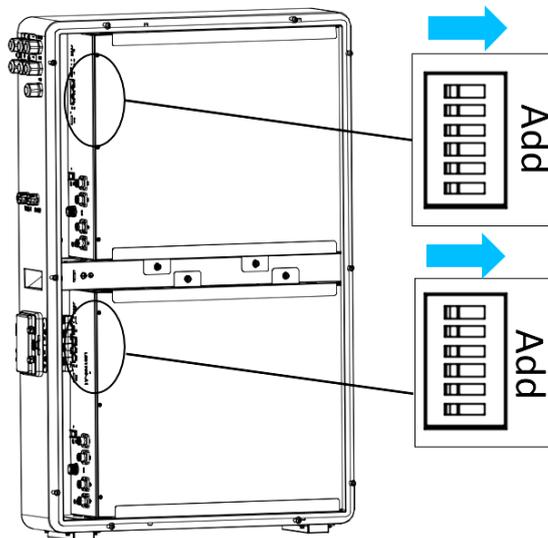


Fig. 5.4.3 Dial Diagram Setting Process

5.5 Turn On the System

1. Arrange the communication and power cable properly.
2. Ensure that all conduit or cable gland junctions are properly dealt.
3. Turn the internal battery switch to “ON” side.
4. Turn on the circuit breaker to “ON” side”.
5. When battery establishes communication with the Inverter, the inverter can read the battery information.

5.6 Reinstall the Front Panel and Close the Protective Cover.

1. Install the front panel refer to 5.6.1.
2. Close the protective cover of the circuit breaker (Reverse the procedure for the open protective cover).
3. End.

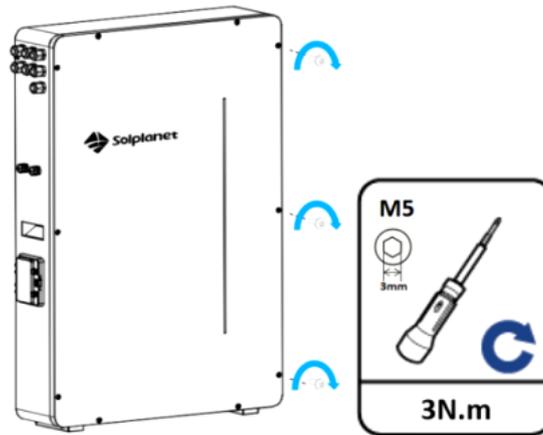


Fig.5.6.1 Install the front panel

5.7 Trouble Shooting

If Ai-LB 10K is not working correctly, perform the following steps:

- (1) For single use, please consult the engineer ;
- (2) For parallel use, please check the status of the LED on the panel of LB51100A. The indication status can be referred in **LB51100A User's Manual** in battery package.

5.8 Technical Support

Further support can be achieved via AISWEI Service Team. Please contact the sales person when needed. The following information is useful to have ready when contacting AISWEI:

- ✧ Owner Name
- ✧ Power Box part number and serial number
- ✧ Brief description of the issue

5.9 Maintenance

Power Box does not require pre-scheduled preventative maintenance. The only maintenance required by an owner is to keep the unit free and clear of debris, especially around the air intake and exhaust.

To clean Power Box , use a soft, lint-free cloth. If needed, the cloth can be dampened with mild soap and water only. Do not use cleaning solvents to clean Power Box , or expose Power Box to flammable or harsh chemicals or vapors.

6. Transportation and Storage

Transportation

It is forbidden to encounter serious vibration and shock during transportation.

Storage

If the system is not placed to use, the system must be properly stored. Otherwise, if any issues, AISWEI shall not be liable.

It should be stored in 60% SoC status.

It should be stored at ventilation environment, Temp. < 35 °C, ROH <65%.

It should be stored avoiding humid condition.

It should be stored in place where they can be monitored by professionals.

NOTE

A proper inspection shall be conducted every 3 months, to ensure no over-discharge of the battery (SoC is long time less than 0%) occurs. At over-discharge status, the battery-LB51100A would behavior as:

- The battery-LB51100A could not start-up when turning the power switch to the ON position;
- The battery-LB51100A output voltage is less than 40V when turned on;
- Indicators are off and battery-LB51100A can not communicate to the upper computer via RS485/USB converter.

Please contact the technical person where you purchase the battery -LB51100A from immediately once the above abnormal issues occur. And actions in terms of re-charging the battery-LB51100A(to the SoC 50%) is required before the field installation.

7. Disclaimer

It should be noted that supplier shall not be liable if any necessary materials are added to this user's manual without further inform of customers.

