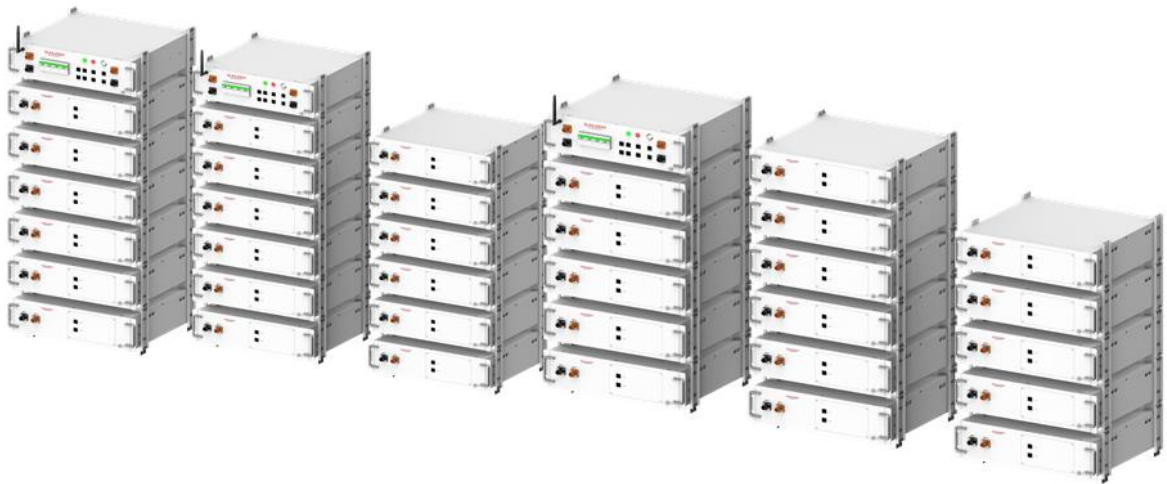




# User Manual

Rechargeable Li-ion Battery System

Model: CIESS-R-S series



Version: V 1.0

Sunwoda Energy Technology Co., Ltd.

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## 1 Security Statement

The product must be installed and maintained by specialized personnel in accordance with local standards and regulations and in strict accordance with the installation procedures in the manual. Before transporting, storing, installing, operating, using and maintaining the equipment, read and keep this manual carefully and use the product strictly following all cautionary statements in this manual. The safety precautions mentioned in this manual are provided only as a supplement to your local safety codes.

The items labeled "CAUTION", "WARNING", "NOTICE", "DANGER", etc. in this manual are not meant as an exhaustive list of safety statements that you should follow. There are also international, national or regional standards and industry practice requirements that you should comply with. The Company will not take responsibility for any type of damages caused by the violation of safety statement details or regulations on design, production and use.

The equipment should be used in an environment that conforms to the design specifications, otherwise equipment malfunction, abnormal functioning or component damage caused by irregular behavior will not be covered in the product's quality guarantee. The Company will also have no liability for personal injury, death, property damage, etc., arising from these activities.

Transportation, storage, installation, operation, use, maintenance and all other operations should be carried out in adherence to the appropriate laws, regulations, standards and normative requirements. No research into the implementing logic within the equipment, obtaining the software source code of the equipment, and other operations that illegally infringe on intellectual property rights, nor disclosure of the results of any performance tests of the equipment in any way is permitted.


In general, the company is not responsible for any of the following types of damages:

- Damage caused by deviation from the operating conditions

- emphasized in this user manual to use the equipment;
- Damage caused by deviation from the requirements of the operating instructions and safety warning in this user manual;
  - Damage to the equipment caused by non-compliance of the installation and use environment with international, national or regional use standards;
  - Damage to equipment caused by self-provided materials or tools that do not meet the requirements of local laws, regulations and relevant standards;
  - Damage to equipment caused by fire, earthquake, flood, volcanic eruption, mudslide, lightning strike, typhoon, tornado, hurricane, war, armed conflict, and other force majeure, extreme weather, and sudden violent events;
  - Equipment damage caused by unauthorized disassembly, product modification or even software code modification;
  - Damage caused by individual willfulness, negligence, gross error, mishandling, or other reasons not due to our company.

## 1.1 Safety Notes

### 1.1.1 Personal security

 Hazard
No energized operation is allowed during the installation process. Avoid installing and removing cables with power, the moment the core of the cable touches the conductor, it will generate electric arc, electric spark or fire and explosion, which can lead to fire or personal injury.
When equipment is energized, unregulated and incorrect operation may produce fire, electric shock, or explosion, resulting in injury, death, or property damage.
No watch, bracelet, bangles, rings, necklaces and other conductive objects shall be worn during operation to avoid being burned by electric shock.

Specific insulated tools are required during operation to avoid electric shock or short-circuit faults, and the voltage withstand level of the insulated tools must meet the requirements of local laws, regulations, standards, and specifications.

 Warning

Dedicated protective equipment, such as protective clothing, insulated shoes, goggles, helmets, insulated gloves, etc., must be used during the operation.

### 1.1.2 Electrical security

 Hazard

Before carrying out electric connections, make sure that the equipment is undamaged, otherwise it may cause electric shock or fire.

Unregulated or incorrect operation may cause accidents such as fire or electric shock.

Prevent foreign objects from entering the equipment during operation, as this may result in short-circuit failure or damage to the equipment, dropping of power supply to the load or power loss, and personal injury.

 Warning

When installing equipment with grounding requirements, the protective ground wire should be installed first; and when removing it, the protective ground wire should be removed last.

### 1.1.3 Environmental security

 Hazard

Do not place the equipment in an environment of flammable, explosive, corrosive gases or fumes, prohibit any operation in

such environment.

Do not store flammable or explosive materials around the equipment.

Do not place the equipment near sources of heat or fire, such as fireworks, candles, heaters or other heat generating devices, as heat exposure to the equipment may result in damage to the equipment or cause a fire.

Use special insulated tools during operation to avoid electric shock injury or short circuit failure, and the voltage withstand level of insulation must meet the requirements of local laws, regulations, standards or specifications.

 **Warning**

Install the equipment in an area away from liquids, avoid installing it under water pipes, air outlets and other locations that are prone to condensation; and avoid installing it under air conditioning outlets, vents, server room outlet windows and other locations that are prone to water leakage, in order to prevent liquids from entering into the interior of the equipment and causing equipment malfunctions or short-circuits.

Do not use objects to cover the equipment, block vents, or heat dissipation systems while the equipment is in operation to prevent heat damage to the equipment or fire.

### 1.1.4 Machinery security

 **Hazard**

Wear a helmet, safety belt and safety rope when working at height, and fasten them to a firm and sturdy structure; do not hang them from moving objects that are not firm or metal with sharp edges to prevent hooks slipping off and falling accidents.

 **Warning**

Tools need to be prepared and qualified by professional organizations, avoiding the use of tools with scars, unqualified

tests or beyond the validity period of the test to ensure the firmness of the tools, and not exceeding the load.

Before installing the equipment into the cabinet, first make sure that the cabinet has been fixed well to avoid the cabinet being tilted and collapsed due to the unstable center of gravity, resulting in the installer being smashed and the equipment being broken and other problems.

When pulling equipment out of the cabinet, be careful of unstable or heavy equipment that may be installed in the cabinet to avoid being crushed or smashed.

Do not drill holes in the equipment. Drilling holes can damage the sealing, electromagnetic shielding performance, internal components and cables integrity of the equipment, and metal shavings from drilling holes into the equipment can lead to a short circuit of the circuit board.

### 1.1.5 Battery Security

#### Hazard

Do not shield other loads to connect the positive and negative terminals of the battery directly, otherwise a short circuit will be caused. Battery short-circuit will instantly generate a large current and release considerable energy, causing battery leakage, smoke, flammable gas release, thermal runaway, fire or explosion. In order to avoid the short-circuit, do not maintain the battery with electricity.

Do not expose the battery to high temperatures or place it around heat generating devices, such as high temperature sunlight, ignition sources, power transformer, heater and so on. Overheating of the battery may cause leakage, smoke, release of flammable gases, thermal runaway, fire or explosion.

Avoid mechanically shocking, dropping, bumping, puncturing with hard objects and pressure shock to the battery,



which may result in battery damage or fire.

Do not dismantle, modify or damage the battery (e.g. inserting strange objects, extruding with external force, immersing in water or other liquids), which may cause battery leakage, smoke, release of combustible gases, thermal runaway, fire or explosion.

Do not touch the battery terminals with other metal objects, it may cause heat generation or electrolyte leakage.



 **Warning**











Battery installation and testing shall be equipped with fire protection facilities, such as fire sand, carbon dioxide fire extinguishers, etc., in accordance with construction standards and specifications. Before putting into operation, make sure that the fire fighting facilities are equipped in accordance with local laws, regulations and specifications.

Installation of the battery should be in an area away from liquids, never place it below air conditioning outlets, vents, machine room outlet windows, water pipes and other locations prone to water leakage, in order to prevent liquids entering the interior of the equipment to cause equipment malfunction or short-circuit.

Charge the battery in time after it is discharged, otherwise the battery may be damaged due to over-discharge.

## 1.2 Safety symbols

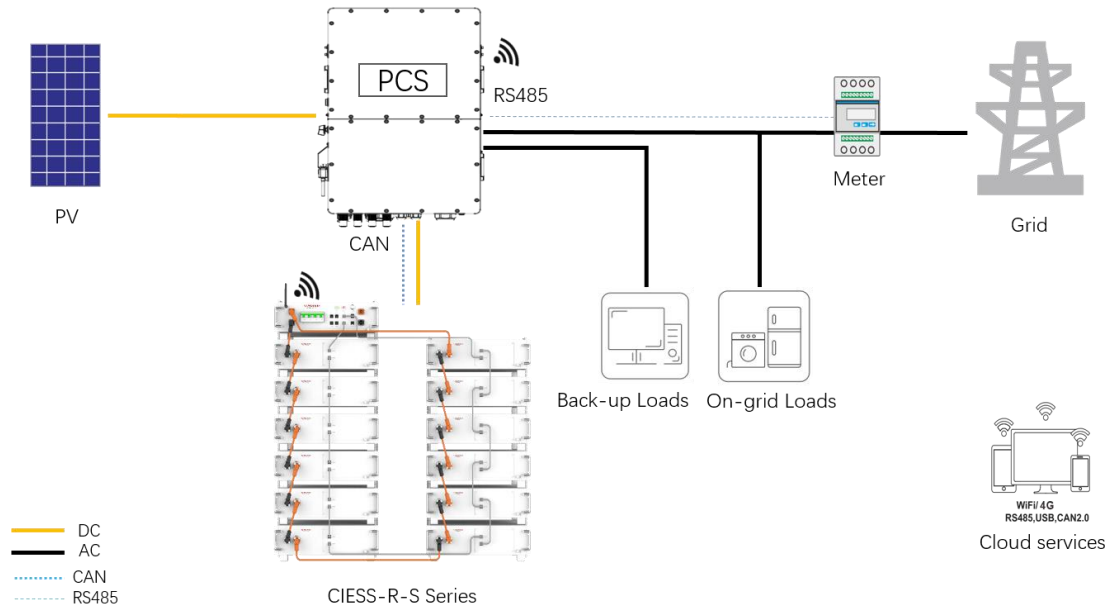
Sign	Illustration	Sign	Illustration
	Caution! Hazards caused by improper operation may result in moderate or minor injuries to persons, as well as damage to the		This equipment cannot be discarded with other household waste and must be taken to an appropriate facility for

	product!		recovery and recycling!
	Hazard: High voltage hazard, be careful		Recyclable!
	No open fire.		This faces upwards and cannot be tilted or placed upside down.
	No stepping on.		Read the manual carefully before use!
	The unit vents are hot, so be careful about touching them!		Ground protection!
	A 5-minute wait is required after power off to ensure that the machine is fully discharged!		Grounding sign!

## 2 System Instruction

### 2.1 About the System

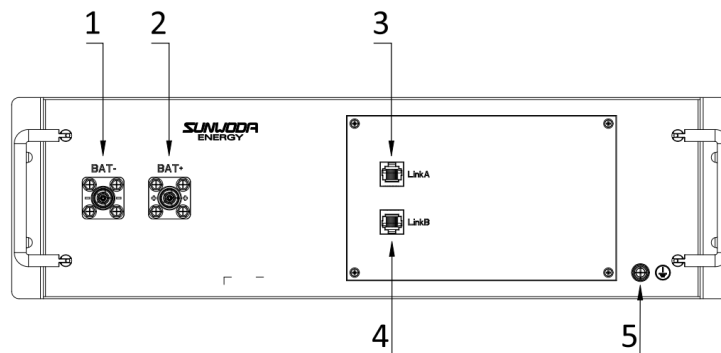
CISS R-S series Li-FePO<sub>4</sub> energy storage system adopts modularized design, featuring easy integration, easy configuration, easy extension, etc., which guarantees the security of user system and can be used in various application scenarios such as peak shaving, self-generation and self-consumption, demand management, off-grid power backup, optical storage and charging.



### Typical Application Scenario

This manual mainly introduces the elements of CIESS R-S series LiFePO4 battery energy storage system, installation method, operation approach, routine maintenance and common troubleshooting, and product specifications and parameters in detail. The modules involved in the product are: battery box module and control box module. When using this product, please make sure to use it with an energy storage inverter. You can select the energy storage inverter through the link provided by our company.

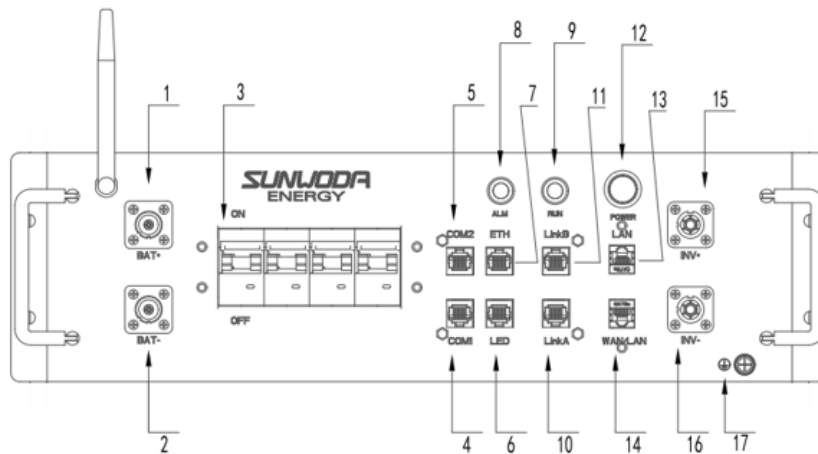
### 2.2 About the Battery Box



No.	Interface	Introduction
1	Negative terminals	Negative Output of Battery System
2	Positive terminals	Positive Output of Battery System

3	Link A	Communication port 1 of the daisy chain
4	Link B	Communication port 2 of the daisy chain
5	Earth Connection	Grounding Point

### 2.3 About the control box




No.	Interface	Instruction
1	BAT+	Positive Input of Battery System
2	BAT-	Negative Input of Battery System
3	Air Switch	Disconnect Switch for DC Main Circuit
4	COM1	CAN communication cable, parallel cable interface
5	COM2	CAN communication cable, parallel cable interface
6	LED	Reserved wiring port for LED light panel
7	ETH	Ethernet port
8	ALM	Warning light
9	RUN	Running light
10	Link A	Communication port 1 of the daisy chain
11	Link B	Communication port 2 of the daisy chain
12	POWER	Power on button for panel
13	LAN	Connection to the local area network
14	WAN/LAN	Connection to the wide area network

		(WAN)/local area network (LAN)
15	INV+	Connect to the positive terminal of PCS
16	INV-	Connect to the negative terminal of PCS
17	Earth Connection	Grounding point

## 2.4 Nameplate Introduction

The following nameplate is for reference only, specific values subject to the real thing.

SUNWODA ENERGY Rechargeable Lithium Iron Phosphate Battery System IFpP51/161/119[(16S)nS]E/-20+50/90		
Model	Nominal Voltage	Rated Energy
<input type="checkbox"/> CIESS 25-R-S	256.0Vd.c.	25 kWh
<input type="checkbox"/> CIESS 30-R-S	307.2Vd.c.	30 kWh
<input type="checkbox"/> CIESS 35-R-S	358.4Vd.c.	35 kWh
<input type="checkbox"/> CIESS 40-R-S	409.6Vd.c.	40 kWh
<input type="checkbox"/> CIESS 45-R-S	460.8Vd.c.	45 kWh
<input type="checkbox"/> CIESS 50-R-S	512.0Vd.c.	50 kWh
<input type="checkbox"/> CIESS 55-R-S	563.2Vd.c.	55 kWh
<input type="checkbox"/> CIESS 60-R-S	614.4Vd.c.	60 kWh
<input type="checkbox"/> CIESS 65-R-S	665.6Vd.c.	65 kWh
<input type="checkbox"/> CIESS 70-R-S	716.8Vd.c.	70 kWh
<input type="checkbox"/> CIESS 75-R-S	768.0Vd.c.	75 kWh
<input type="checkbox"/> CIESS 80-R-S	819.2Vd.c.	80 kWh
n: Number Of Battery Modules(n=5/6/7/8/9/10/11/12/13/14/15/16)		
Max. Charge/Discharge Current	100Ad.c.	
Protective Class	I	
Max. short circuit current	3000A/1ms	
Ambient Temperature	Charge:0~50℃ Discharge:-20~55℃	
Enclosure Type	IP20	
		
SN: <input type="text"/>		
Manufacturer: Sunwoda Energy Technology Co., Ltd. Web: <a href="http://www.sunwoda.com">http://www.sunwoda.com</a> MADE IN CHINA		

Product Name and Model





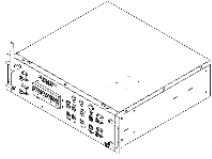
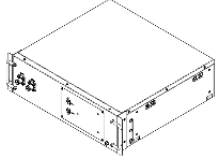
Product Technical Parameters

Safety Symbols and Certification Marks

Serial Number and Contact Information






## 2.5 Introduction of System Accessories

## 2.5.1 Basic accessories

Name	Illustration	Name	Illustration
M5*10 screw		Terminal Crystal Head with Resistor	
Aluminum bracket		Sheet metal bracket	
Control Box		Battery Box	

## 2.5.2 Wire Harness Introduction









### (1) Earth wire


Name	Material Number	Type	Illustration	Length
Grounding harness from control box to battery box:				
A Grounding Harness	5619100041311	CIESS 25~80- R-S		0.18m
Grounding harness from battery box to battery box:				
A Grounding Harness	5619100041311	CIESS 25~80- R-S		0.18m
B Grounding Harness	5619100061411	CIESS 35~80- R-S		1.5m
C Grounding Harness	5619100062081	CIESS 65~80- R-S		2.8m
Grounding harness from control box to the other grounding point, such as inverter:				
D Grounding	5619100060311*	CIESS 25~80-		8m

Harness *		R-S		
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Tips: "\*" indicates that the harness has an application in parallel mode.

## (2) Power wire









Name	Material Number	Type	Illustration	Length
Power harness from battery box to battery box:				
A Power Harness	5619100059301	CIESS 25~80-R-S		0.19m
B Power Harness	5619100059321	CIESS 35~80-R-S		0.9m
Negative power harness from control box to battery box:				
C Power Harness	5619100059311	CIESS 25~80-R-S		0.2m
Positive power harness from battery box to control box:				
D Power Harness	5619100061311	CIESS 25-R-S		1.18m
E Power Harness	5619100061391	CIESS 30-R-S		1.36m
F Power Harness	5619100059471	CIESS 35~60-R-S		1.01m
G Power Harness	5619100062001	CIESS 65/75/70/80-R-S		3m
Positive power harness from control box to inverter:				
H Power Harness	**	CIESS 25~80-R-S	**	**
Negative power harness from control box to inverter:				
I Power Harness	**	CIESS 25~80-R-S	**	**
Positive power harness from control box to combiner box:				
J Power Harness *	5619100059381*	CIESS 25~80-R-S		8m
Negative power harness from control box to combiner box:				

K Power Harness *	5619100059391*	CIESS 25~80-R-S		8m
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Tips: "\*" indicates that the harness is applied primarily in parallel mode.

\*\*\* indicates that the wiring harness may vary depending on the inverter brand, specifications, etc. See packing list for detailed material and material number;

### (3) Communication wire

Name	Metrial Number	Type	Illustration	Length
Link port communication harness from battery box to battery box:				
A communication Harness	5619100059331	CIESS 25~80-R-S		0.31m
B communication Harness	5619100059361	CIESS 35~80-R-S		0.9m
Link port communication harness from control box to battery box:				
A communication Harness	5619100059331	CIESS 25~80-R-S		0.31m
Link port communication harness from battery box to control box:				
C communication Harness	5619100061281	CIESS 25-R-S		1.34m
D communication Harness	5619100061401	CIESS 30-R-S		1.52m
E communication Harness	5619100059351	CIESS 35~60-R-S		0.85m
F communication Harness	5619100062021	CIESS 65~80-R-S		3m
COM port communication harness from control box to inverter:				
G	5619100061321	CIESS		3m



communication Harness		25~80- R-S		
H communication Harness*	5619100059371*	CIESS 25~80- R-S		8m
COM port communication harness from control box to control box:				
I communication Harness*	5619100062061*	CIESS 25/30- R-S		1.5m
J communication Harness*	5619100062051*	CIESS 35~60- R-S		4.5m
K communication Harness	5619100062071*	CIESS 65~80- R-S		5m

Tips: "\*" indicates that the harness is applied primarily in parallel mode.

### 3 Installation Guidance

#### 3.1 Cautionary notes

The product must be installed by a professional in accordance with local standards and regulations and in strict obedience to the manual installation procedures. Before starting the installation, please pay attention to the following:

- Whether the ambient temperature is within the designated range at the installation site: charging at 0~50°C, discharging at -20~55°C.
- The battery system needs to be installed on a flat and sufficiently load-bearing indoor floor; if the floor has limited flatness and load-bearing performance, it can be filled by means of making a foundation and adding load-bearing plates.
- Avoid installing equipment in environments that are close to

high-temperature heat sources or low-temperature cold sources.

- Avoid installing equipment in areas with excessive ambient temperature changes or extreme climates.
- Avoid installing the equipment in a strong interference environment.
- Avoid installing equipment in areas where children commonly congregate to prevent access by children.
- Avoid installing equipment in areas prone to waterlogging.
- Avoid placing flammable, explosive, or corrosive types of items around the equipment.
- Make sure there is a carbon dioxide, Novac 1230 or FM-200 fire extinguisher near the equipment. Use the recommended type of fire extinguisher. Water or ABC dry powder extinguishers should not be used to extinguish fires; firefighters must wear protective clothing and self-contained breathing apparatus before operating.
- The installation location should be well ventilated and avoid installing or operating the equipment in a smoky environment.
- Before installation, the battery system needs to be carried to the installation site. To prevent injury to personnel or damage to the equipment during the process, please note the following:

(1) Estimate the number of hands and lifting tools required according to the weight of the equipment to avoid damage to the equipment beyond the range of individually liftable weights.

(2) Ensure that the equipment is balanced during handling to avoid drops.

- Avoid installing equipment in extreme environments such as sun, rain and snow cover.
- Do not tilt or lay the product on its side.

### **3.2 System Assembly**

**⚠ Cautionary Notes:**

- Select an indoor site, before installation, make sure the ground is level, the floor load-bearing  $\geq 1500\text{kg/m}^2$ , and the horizontal distance between neighboring battery packs  $\geq 200\text{mm}$ .
- Installation must be completed by a professional in the following steps sequentially.
- Use the products and accessories delivered by our company, do not mix different brands of products at will.

**3.2.1 Assemble the basic bracket**

(1) Take 1 sheet metal bracket and 1 aluminum profile bracket to assemble 1 set of basic brackets with 2 M5\*12 screws in the manner shown in the figure (Fig. 3.1).

(2) Each box requires the assembly of 4 sets of simple brackets (1 group). The number of basic brackets to be assembled for different models is as follows (Table 3.1):

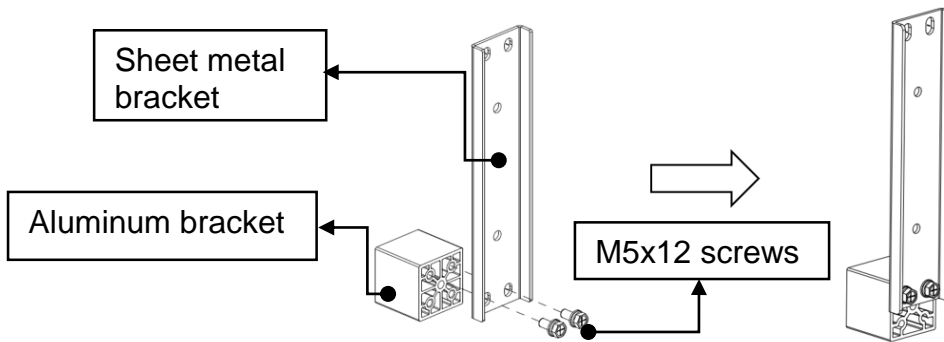


Fig. 3.1 Assemble the simple stand

Table 3.1 Number of basic brackets required for each product model

Type	Number	Type	Number
CISSS 25 R-S	6 groups/24 sets	CISSS 30 R-S	7 groups/28 sets
CISSS 35 R-S	8 groups/32 sets	CISSS 40 R-S	9 groups/36 sets

CISS 45 R-S	10 groups/40 sets	CISS 50 R-S	11 groups/44 sets
CISS 55 R-S	12 groups/48 sets	CISS 60 R-S	13 groups/52 sets
CISS 65 R-S	14 groups/56 sets	CISS 70 R-S	15 groups/60 sets
CISS 75 R-S	16 groups/64 sets	CISS 80 R-S	17 groups/68 sets

### 3.2.2 Assemble the simple bracket to the box

(1) Take the assembled basic bracket above and fix it to the side of the box with 2 M5\*12 screws per set.

(2) One box is assembled with 4 sets of simple brackets, and a total of 8 screws are consumed in the assembly of one box (Figures 3.2,3.3).

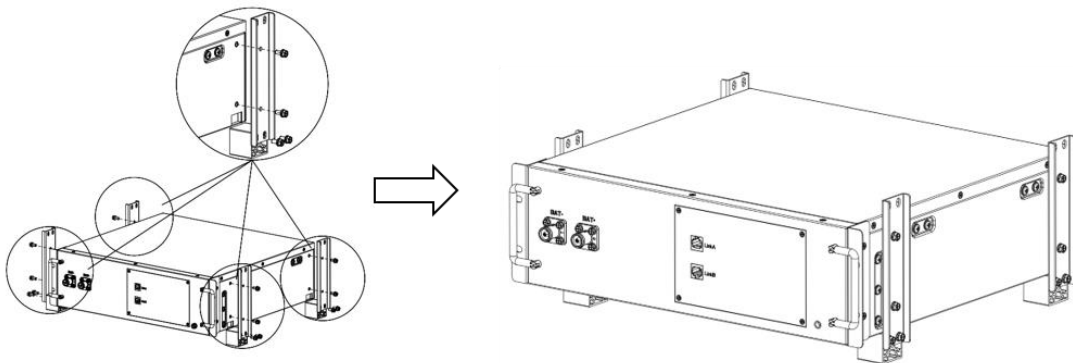


Figure 3.2 Assemble the basic bracket to the battery box

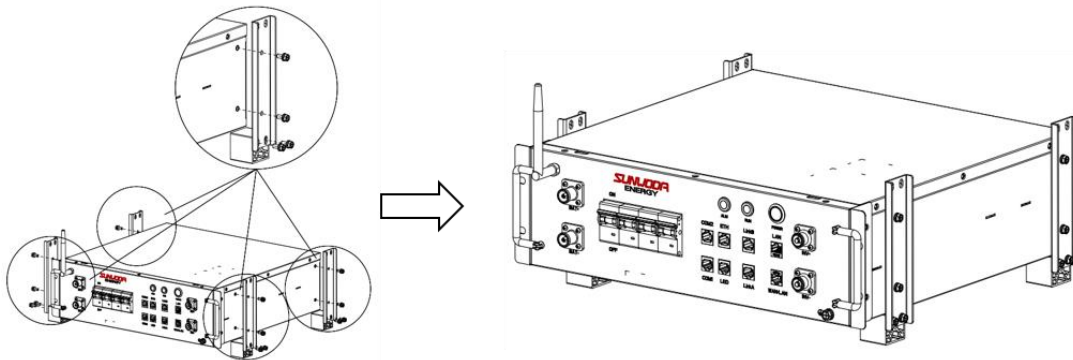


Figure 3.3 Assemble the basic bracket to the control box

### 3.2.3 Stack the Boxes

- (1) Pick an indoor flat surface and stack the boxes in rows starting with the battery ones;
- (2) Always fasten one box with 8 (2x4) M5\*12 screws before stacking the next box. At the end of the stack, the control box is always at the top of the column (Fig. 3.4,3.5).
- (3) Do refer to the stacking methods provided in this manual for case stacking.

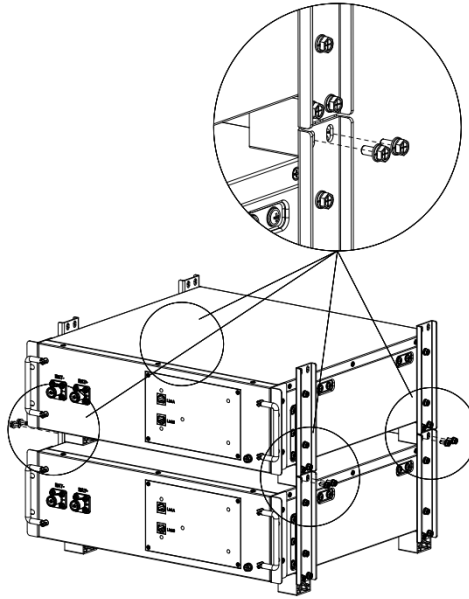
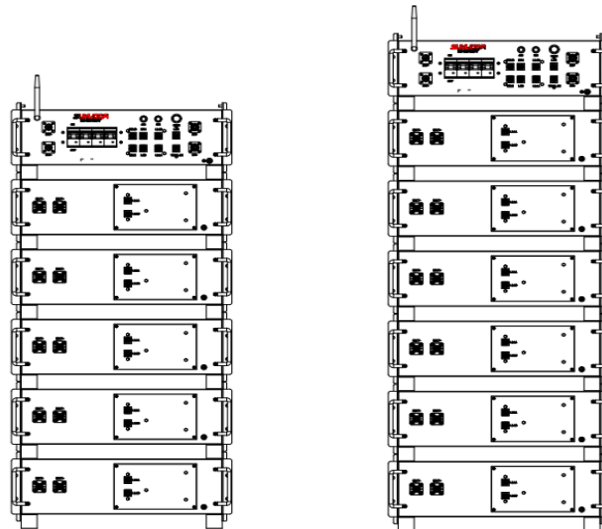


Figure 3.4 Fasten two boxes



CIESS 25-R-S

CIESS 30-R-S

CIESS 25~30-R-S

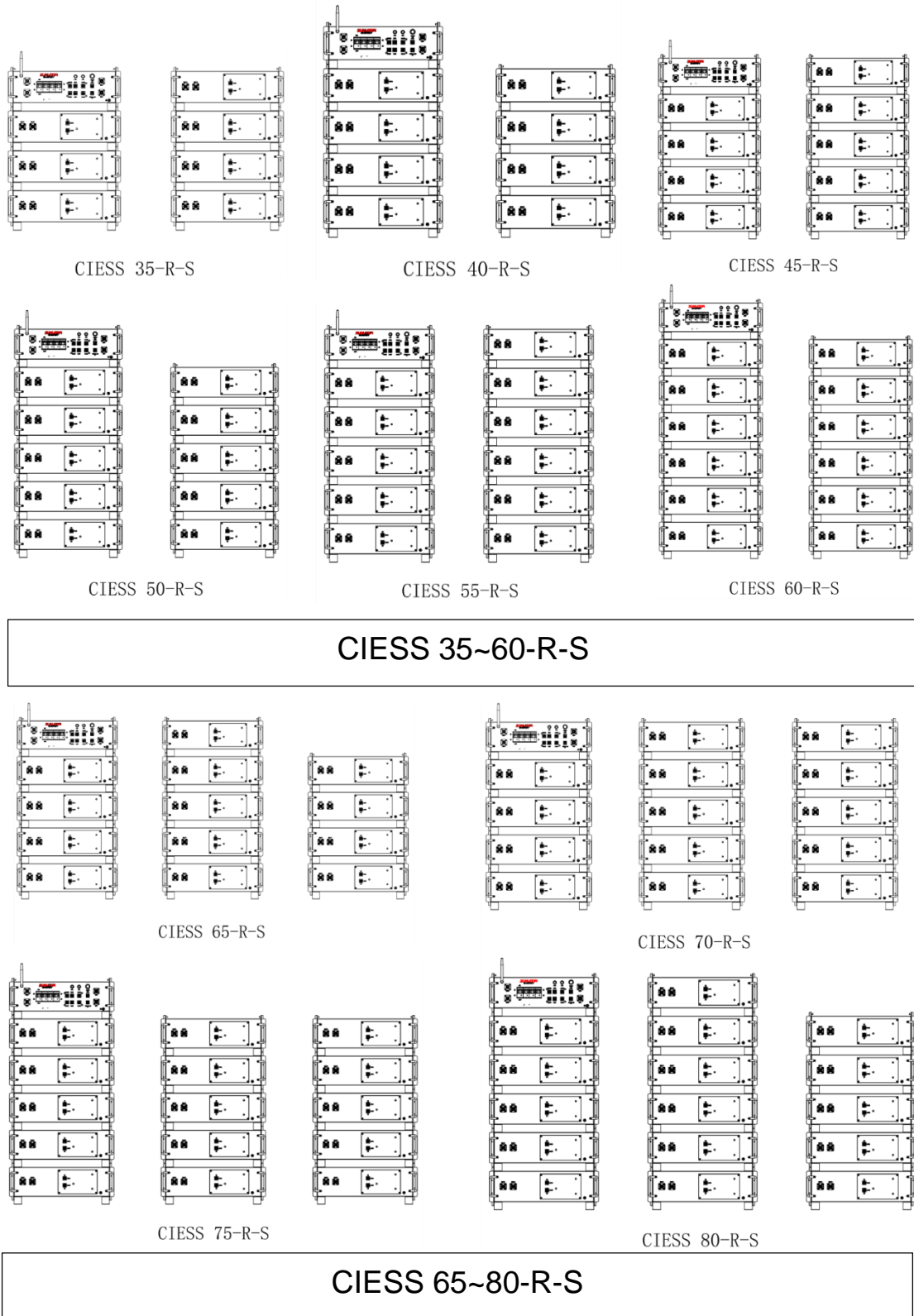


Figure 3.5 Stacking method for each model

### 3.3 Electric Connection

 **Cautionary Note:**

- Ensure that all switches remain disconnected and all equipment is turned off and de-energized before connecting the cables.
- Wiring must be completed by a professional in the following sequence.
- Use the cable equipment provided by our company and the required harness type, do not use wires arbitrarily.

### 3.3.1 Connect the earth harness

(1) Use A grounding harness (5619100041311) to connect ground protection points of two adjacent battery boxes. This type of harness is also used for the ground connection from battery box to control box (Figure 3.6).

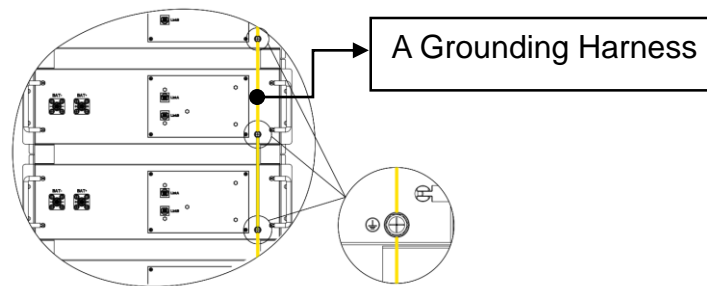


Figure 3.6 Earth connection of two adjacent battery boxes in one row

(2) If a single cabinet has multiple columns, the earth points for the 1st to 2nd columns is connected by B grounding harness (5619100061411), and the earth points for the 2nd to 3rd columns (if equipped) is connected by C grounding harness (5619100062081). See the following illustration for wiring locations (Figure 3.7):

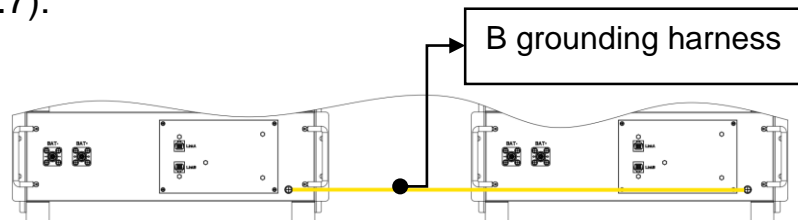


Figure 3.7a Earth connection from the 1st to 2nd columns

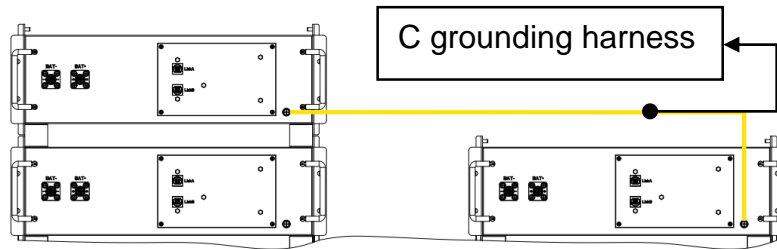


Figure 3.7b Earth connection from the 2nd to 3rd columns (if equipped)

(3) Use D grounding harness (5619100060311) to connect the battery system to other external grounding points such as an inverter (Fig. 3.8).

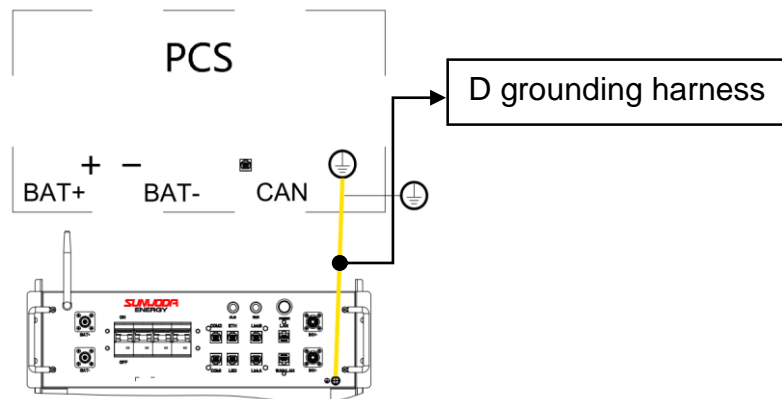
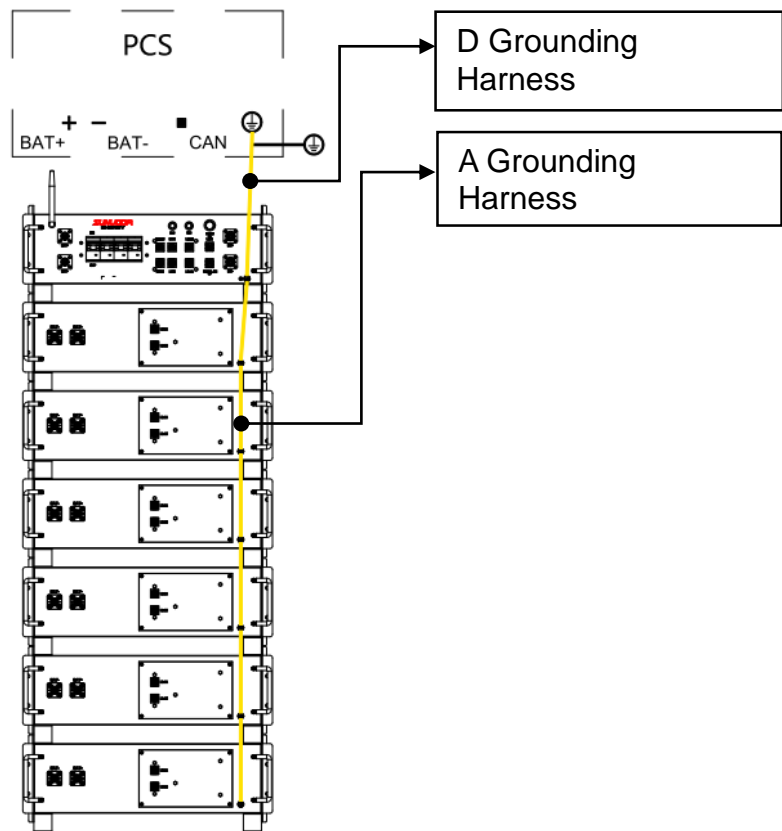


Figure 3.8 Earth connection from Control Box to one Inverter  
Table 3.2 Types of grounding harnesses

Type	Name	Material Number	Length	Amount
CISS 25~80-R-S	A Grounding Harness	5619100041311	0.18m	1pcs/1 battery box
CISS 35~80-R-S	B Grounding Harness	5619100061411	1.5m	1pcs/1 cabinet
CISS 65~80-R-S	C Grounding Harness	5619100062081	2.8m	1pcs/1 cabinet
CISS 25~80-R-S	D Grounding Harness	5619100060311	8m	1pcs/1 cabinet



(4) Final results of earth connection



CISS 30-R-S

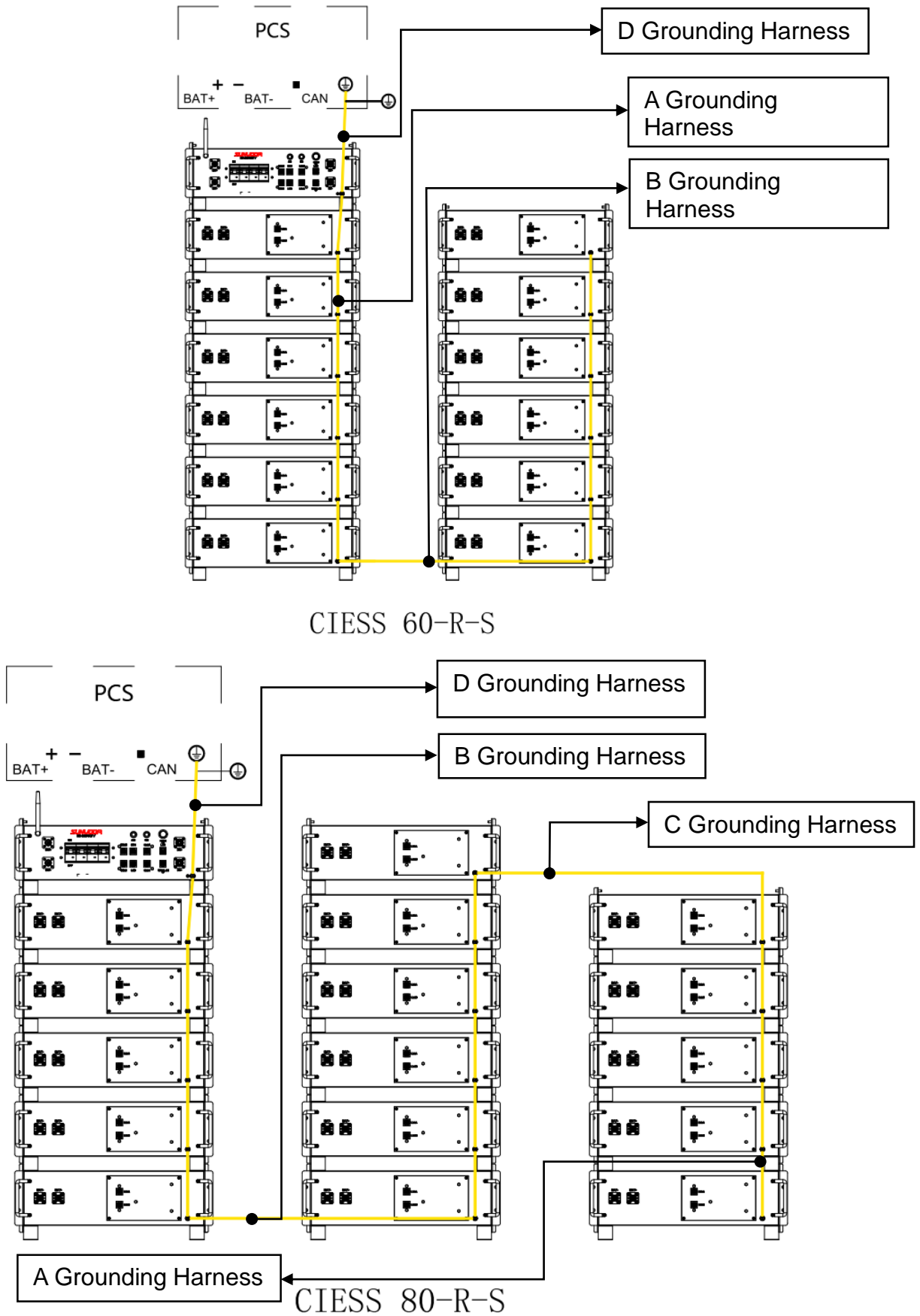


Figure 3.9 Illustration of the complete earth connection effect

(CIESS 30/60/80-R-S Models as an example)

### 3.3.2 Connect the power harnesses

#### A Connector Introduction

The connector structure of all power harnesses is shown below (Fig. 3.10). To use, please press and hold the red button of the plug, and release it when there is a clicking sound to complete the connection.

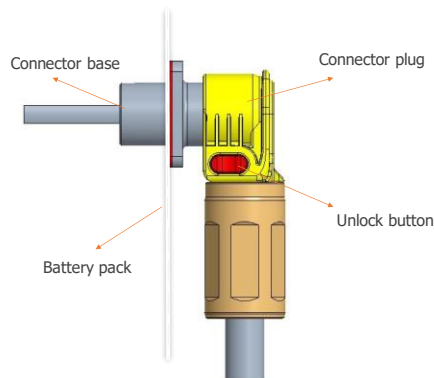


Figure 3.10 Header of the power harness

#### B Connect power harnesses between battery boxes

(1) Holding one A Power Harness (5619100059301), connect the wires from the "Bat+" terminal of the first battery box under the control box to the "Bat-" terminal of the next battery box without error (Figure 3.11).

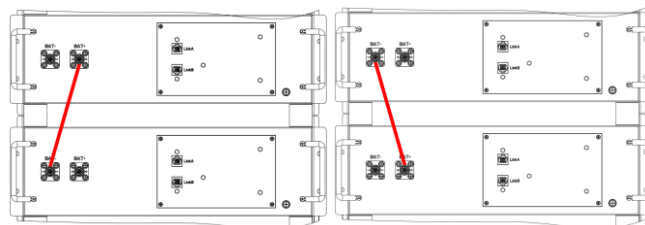


Figure 3.11 Connect the A Power Harness

(2) Repeat step (1) to connect all "Bat+" and "Bat-" terminals on the remaining battery boxes together serially.

(3) In the case of multiple columns for a single cabinet, the positive and negative terminals of two columns of battery boxes are

connected serially using the B Power Harness (5619100059321), see Figure 3.12 for wiring details. Table 3.3 shows the different power harnesses applied in different product types.

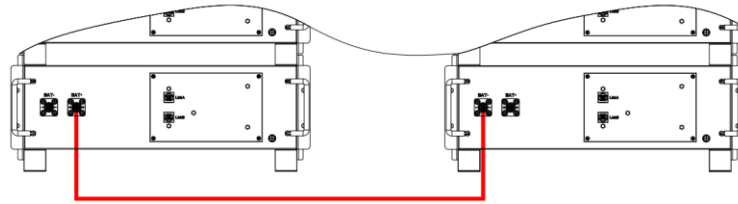


Figure 3.12a. Connect the B power harness from the 1st to 2nd columns

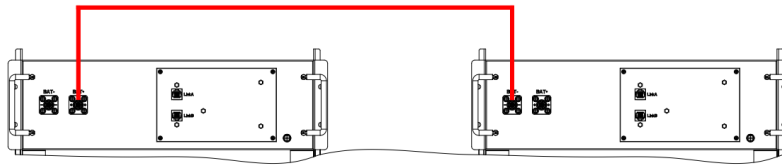


Figure 3.12b. Connect the B power harness from the 2nd to 3rd columns (if equipped)

Table 3.3 Application Range of Power Harnesses  
from Battery Box to Battery Box

Product type	Name	Material number	Length	Amount
CISS 25~80-R-S	A power harness	5619100059301	0.19m	1pcs/ 1 battery box
CISS 35~80-R-S	B power harness	5619100059321	0.9m	1pcs/ 1 column

### C Connect power harnesses between control and battery boxes

(1) Connect the negative power harness:

Take the C Power Harness (5619100059311) in hand and run the wires from the Control Box "Bat-" to the Battery Box "Bat-" terminal as shown in the diagram below (Figure 3.13).

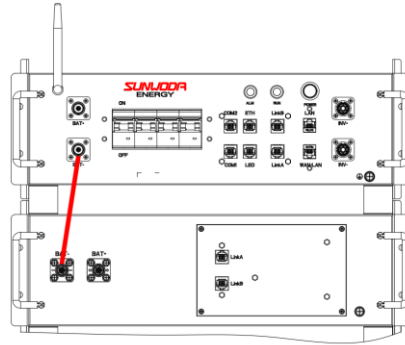


Figure 3.13 Connect the C power harness

(2) Connect the positive power harness:

Use the D/E/F/G power harness to wire from the "Bat +" terminal of the last battery box to the "Bat +" terminal of the control box. Different product models correspond to different types of harnesses (Table 3.4); see fig. 3.14 for the wiring of different product types.

Table 3.4 Battery Box to Control Box Positive Power Harness Type

Product type	Name	Metrial number	Length	Amount
CISS 25-R-S	D power harness	5619100061311	1.18m	1pcs/1 control box
CISS 30-R-S	E power harness	5619100061391	1.36m	1pcs/1 control box
CISS 35~60-R-S	F power harness	5619100059471	1.01m	1pcs/1 control box
CISS 65~80 -R-S	G power harness	5619100062001	3m	1pcs/1 control box

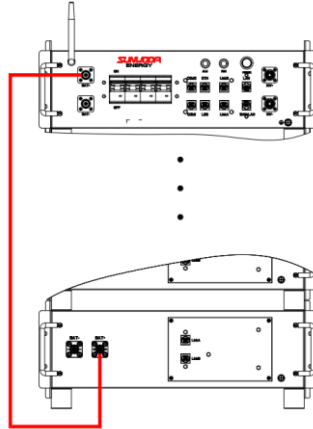


Figure 3.14a D/E Power Harness Connection  
Applicable types: CIESS 25/30-R-S

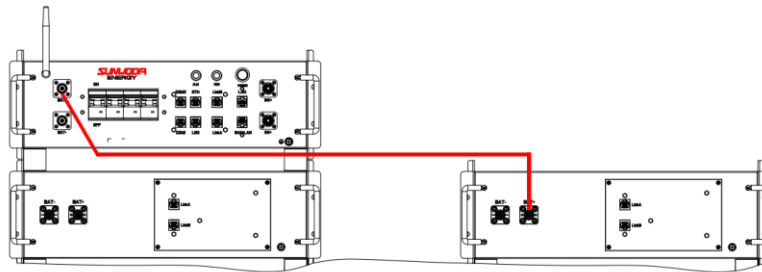


Figure 3.14b F Power Harness Connection  
Applicable types: CIESS 35~60-R-S

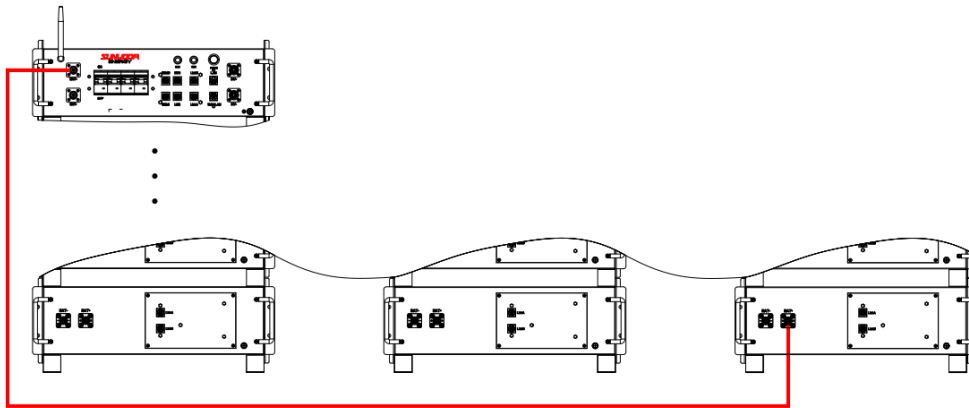


Figure 3.14c G Power Harness Connection  
Applicable types: CIESS 65~80-R-S

### **D Connect power harnesses from control box to inverter**

The connection method of the harness at the positive and negative terminals is shown in the following figure (Fig. 3.15):

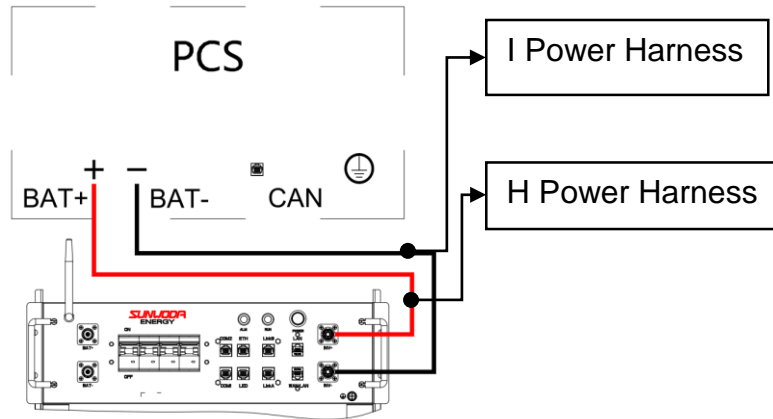
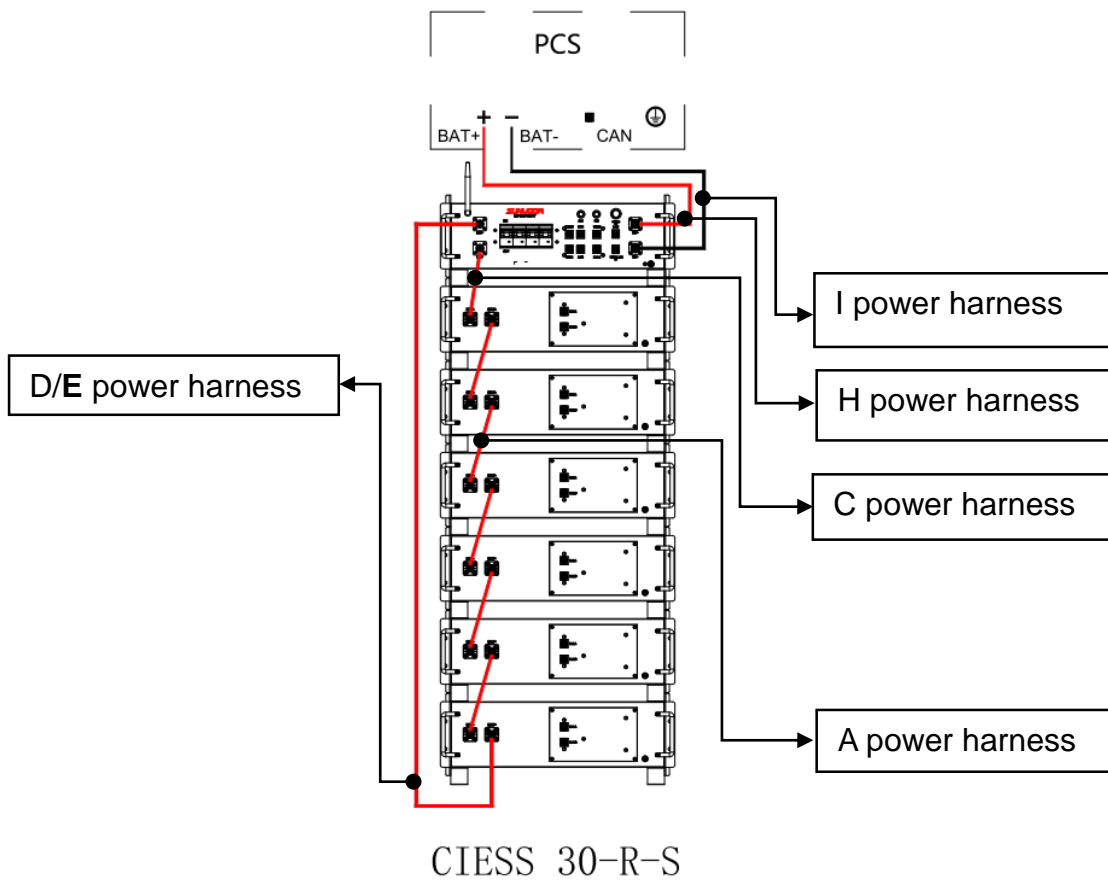
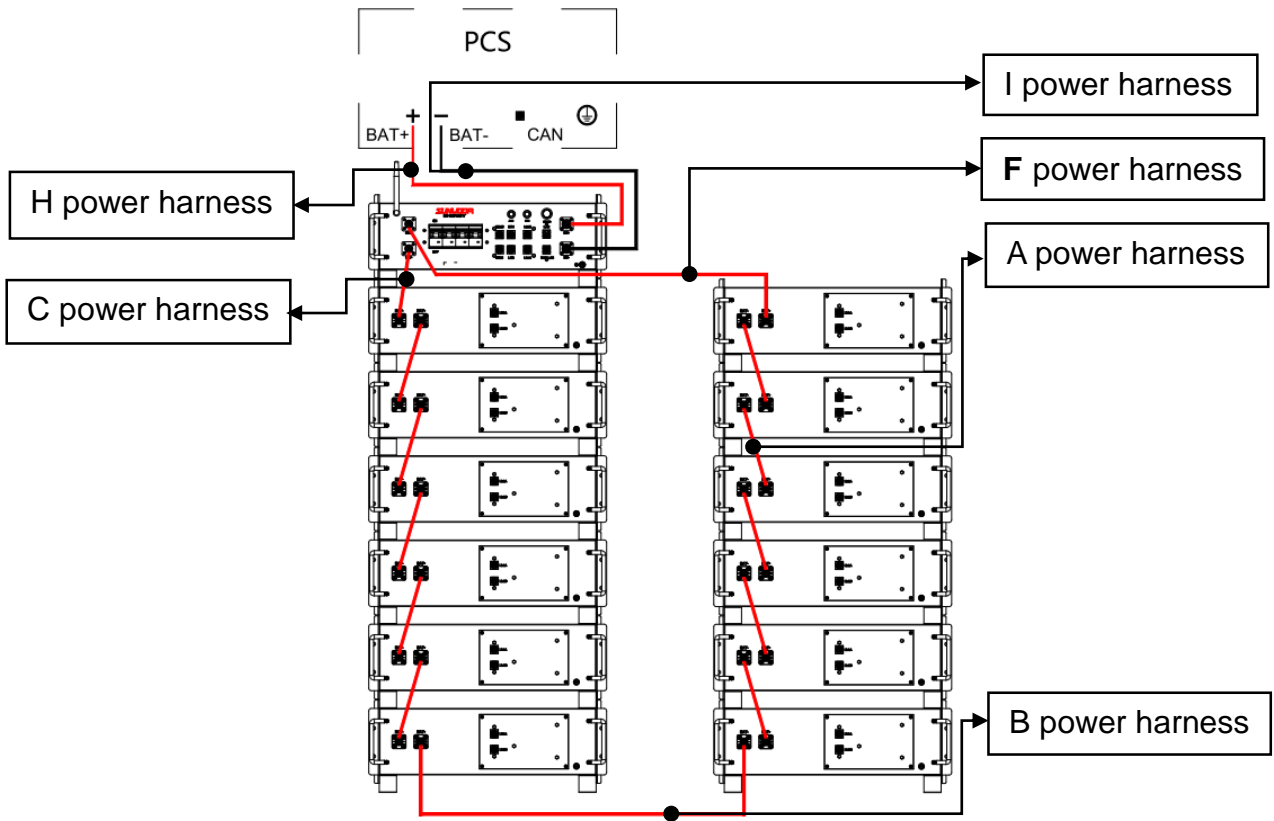


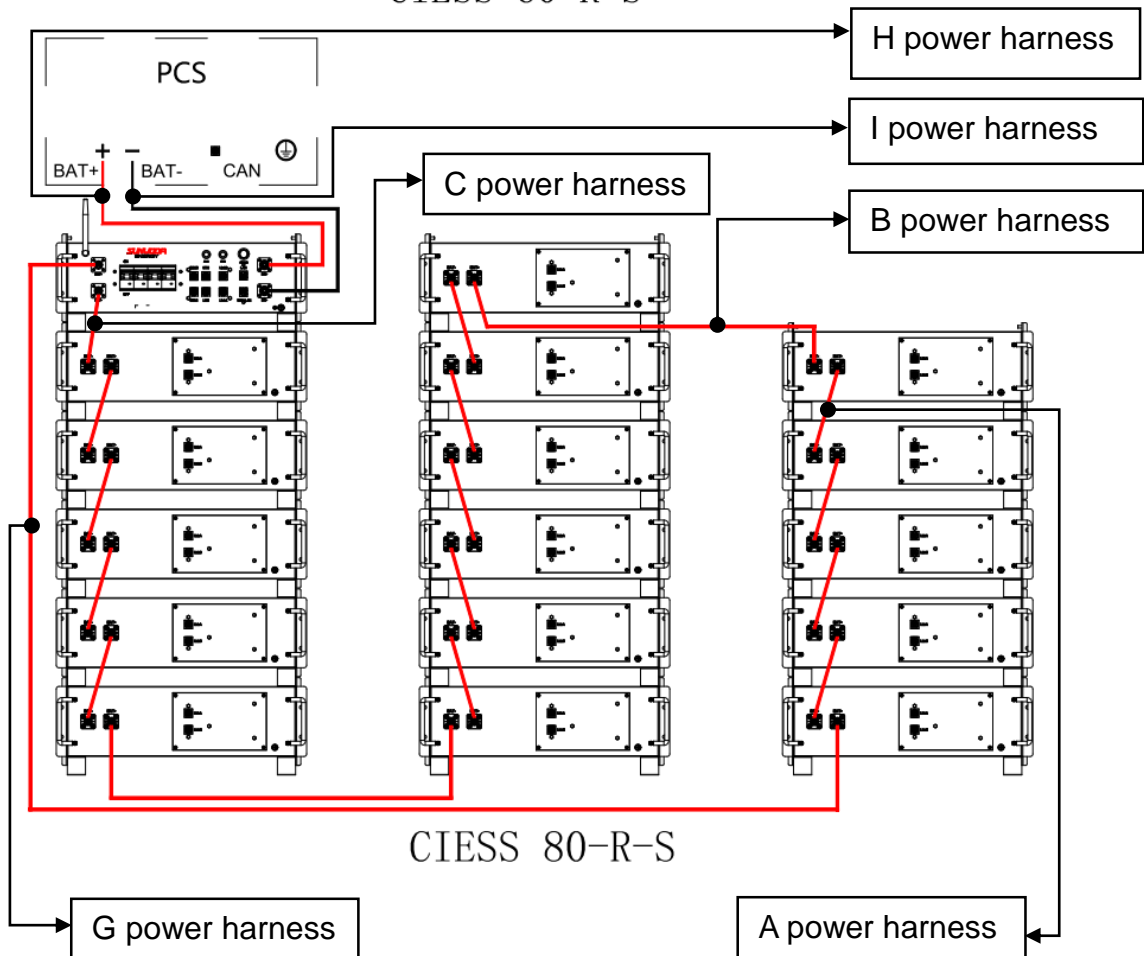
Figure 3.15 Power line connection from control box to inverter

### E Final wiring effects of power harnesses





CIESS 60-R-S



CIESS 80-R-S



Figure 3.16 Final effect of power line connection  
(CIESS 30/60/80-R-S Models as an example)

### 3.3.3 Connect the communication harness

#### A. Link port communication harnesses connection

The types of wiring harness involved in different models will vary depending on how the products are stacked. The types of wiring harness involved in different models and the wiring methods are shown in the following figure (Figure 3.17):

Tips:

① In the same column, the Link port communication harnesses from the battery box to the battery box are all A communication harnesses (5619100059331); the Link port communication harness from the control box to the battery box is also the A communication harness (5619100059331);

② The Link port communication harness between the two columns, from the battery box to the battery box, is the B communication harness (5619100059361);

③ The Link port communication harness from the battery box to the control box will vary depending on the product model (Table 3.5).

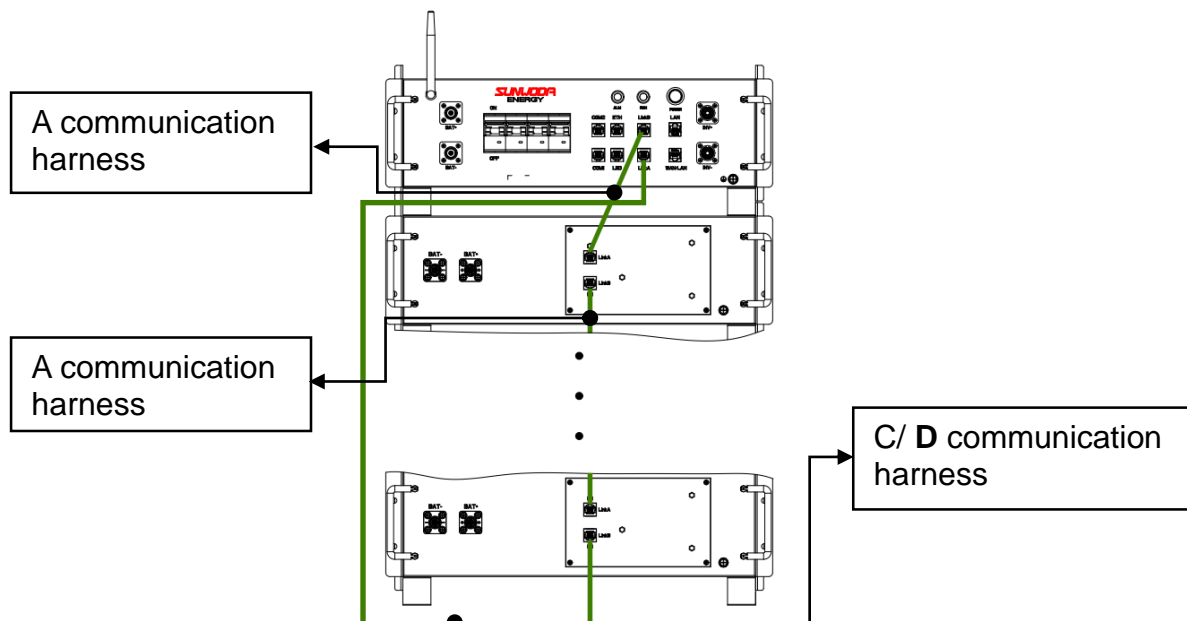


Figure 3.17a. Link Port Communication Harnesses Connection  
Applicable types: CIESS 25/30-R-S

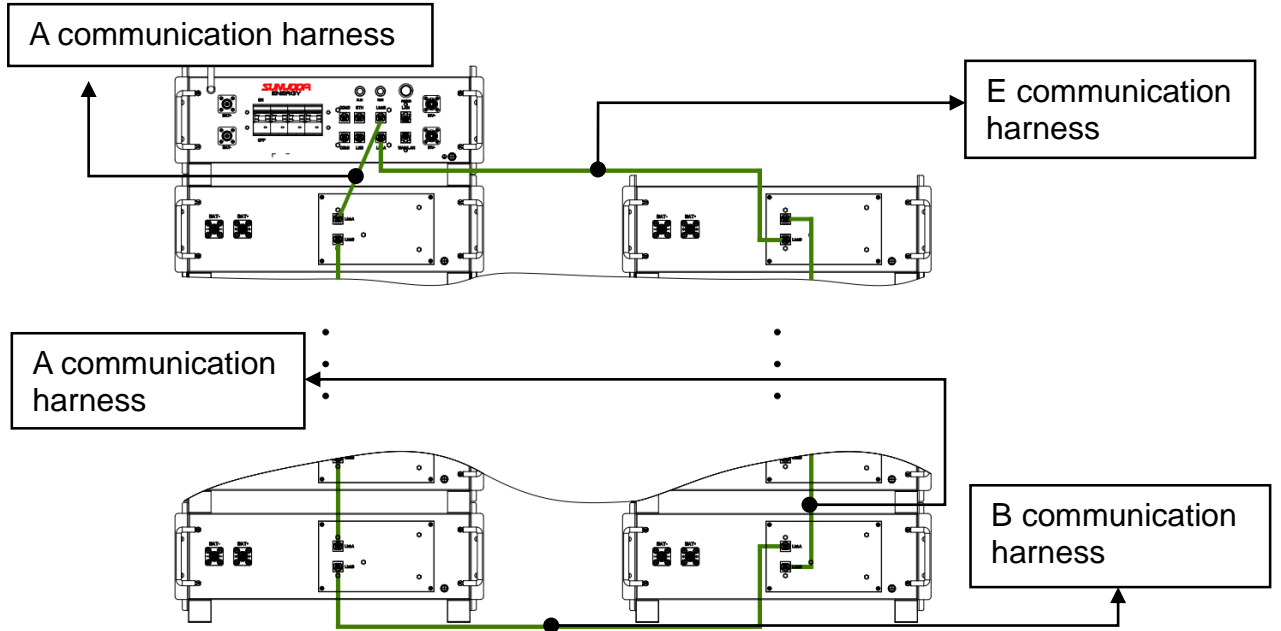


Figure 3.17b. Link Port Communication Harness Connection  
Applicable types: CIESS 35~60-R-S

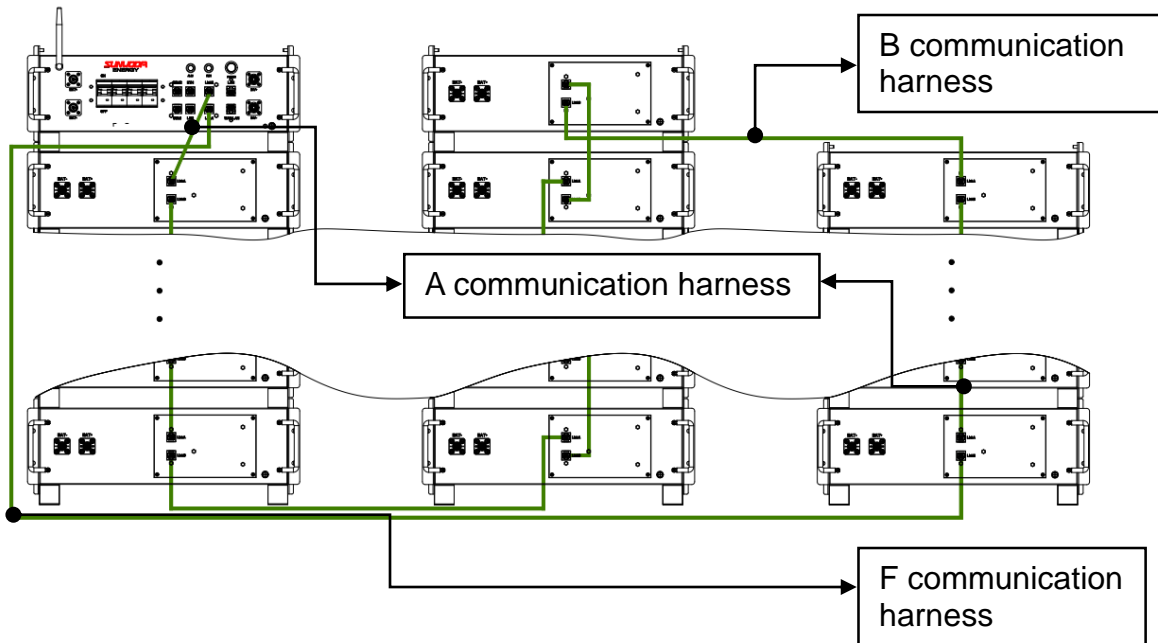


Figure 3.17c. Link Port Communication Harness Connection  
Applicable types: CIESS 65~80-R-S

Table 3.5 Application scope of Link port communication harness  
from battery box to control box

Type	Name	Material Number	Length	Amount
CISS 25 R-S	C communication harness	5619100061281	1.34m	1pcs/1 control box
CISS 30 R-S	D communication harness	5619100061401	1.52m	1pcs/1 control box
CISS 35~60 R- S	E communication harness	5619100059351	0.85m	1pcs/1 control box
CISS 65~80 R- S	F communication harness	5619100062021	3m	1pcs/1 control box

### B. COM port communication harness connection

Insert the terminal crystal head with resistor into COM 1 port on control box, and connect COM 2 of control box to CAN communication port of inverter with G communication harness (5619100061321), as shown in the figure (Fig. 3.18):

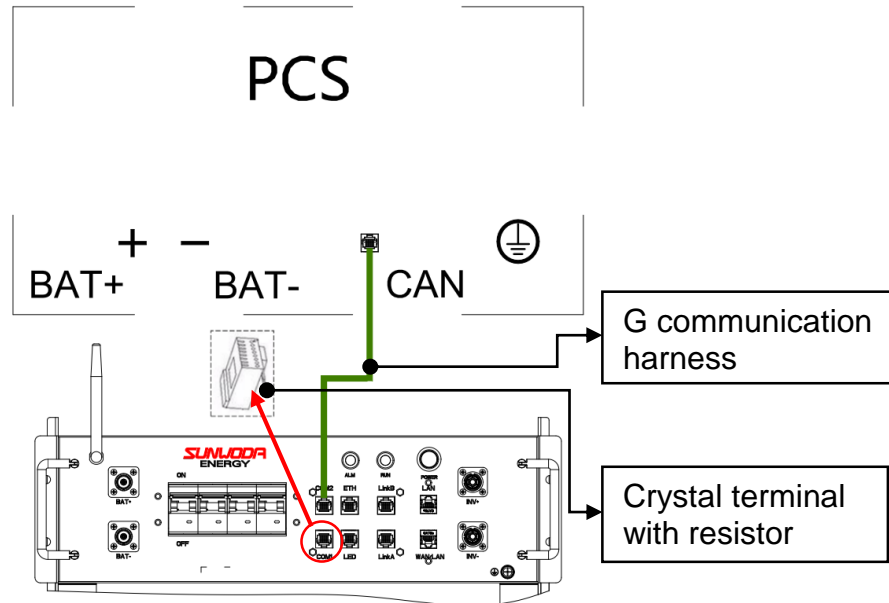


Figure 3.18 Connection of COM port communication harness

### C. Lan port communication harness connection

The LAN and WAN/LAN ports on the right side of the control box are the communication ports for data modules of the battery system. The LAN port is connected to PC for local data monitoring and the WAN port is connected to the router (Figure 3.19). When the equipment is purchased, please make sure to connect the WAN port on the control box to your household router for cloud data monitoring.

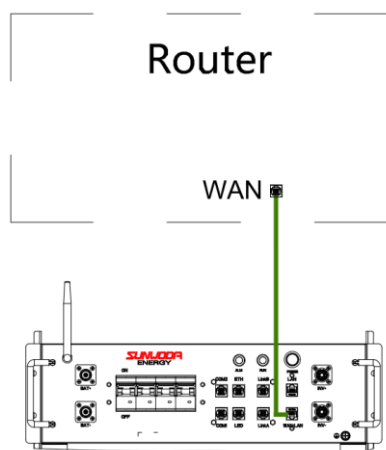
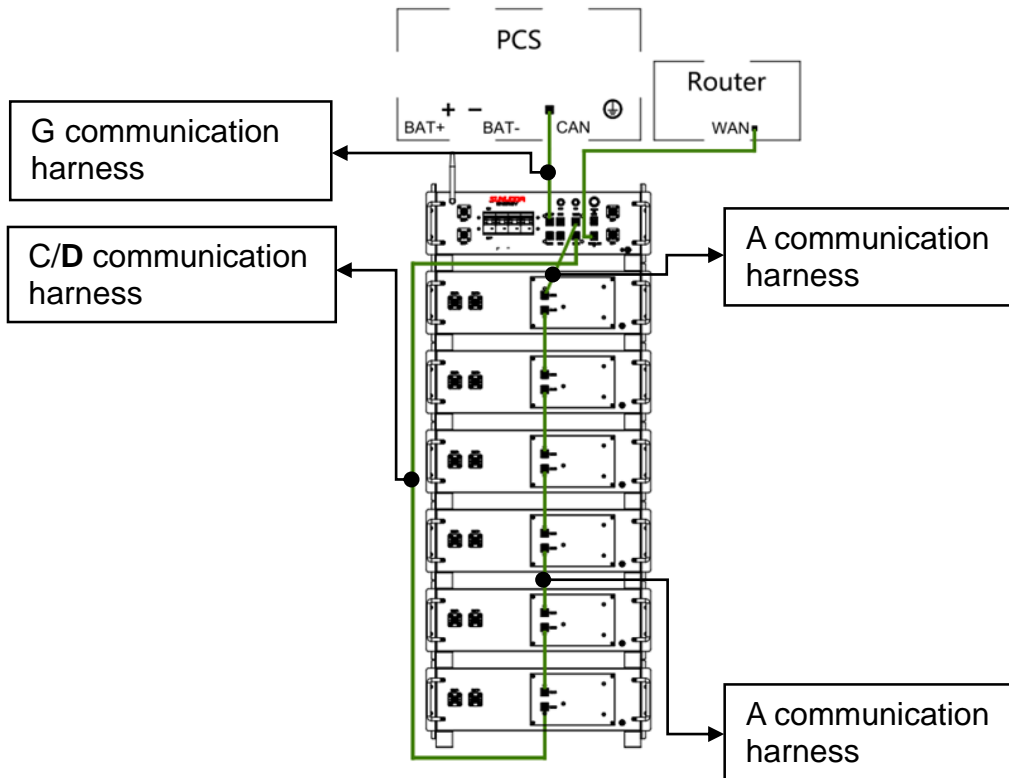
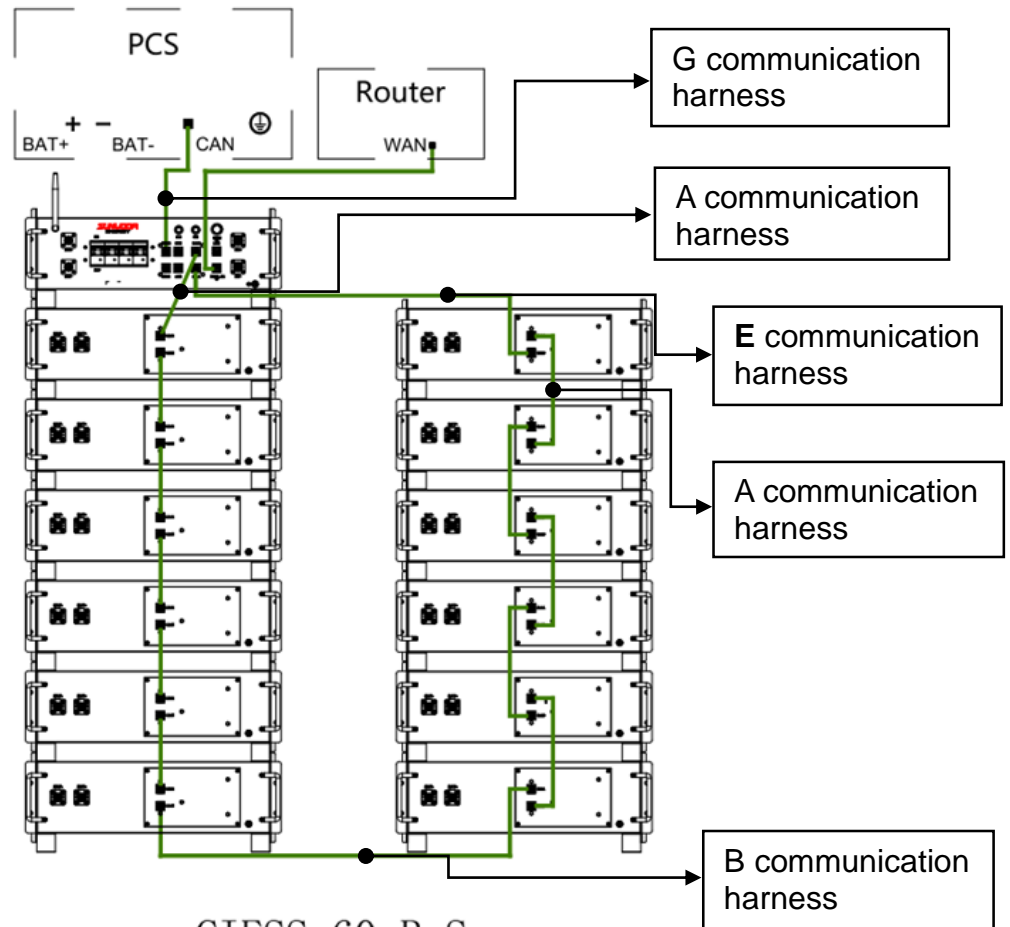


Figure 3.19 Connect the WAN port communication harness

### D. Final wiring effects of communication harnesses



CISS 30-R-S



CISS 60-R-S

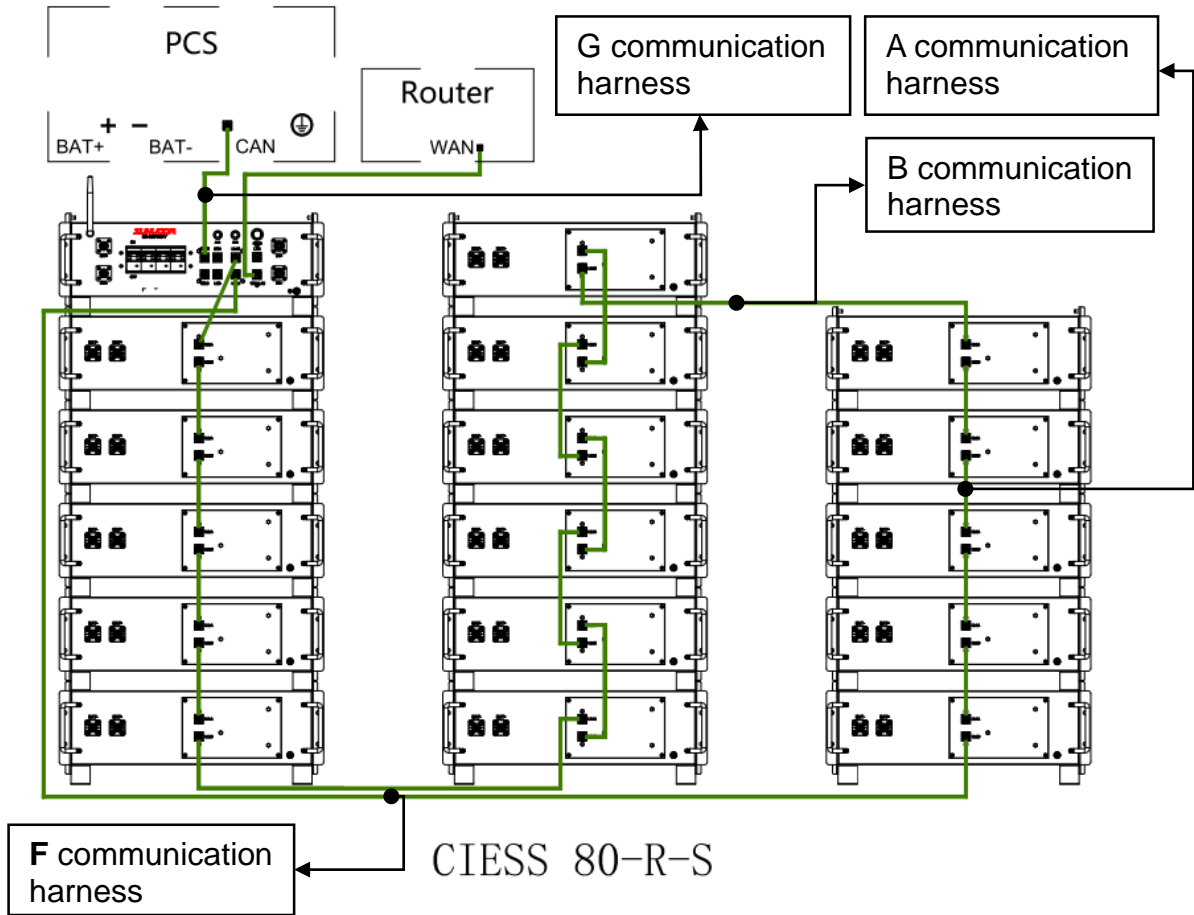


Figure 3.20 Communication Harnesses Final Connection Effect (CIESS 30/60/80-R-S Models as an example)

### 3.4 Parallel mode (Optional)

#### 3.4.1 Ground connection for parallel cabinet

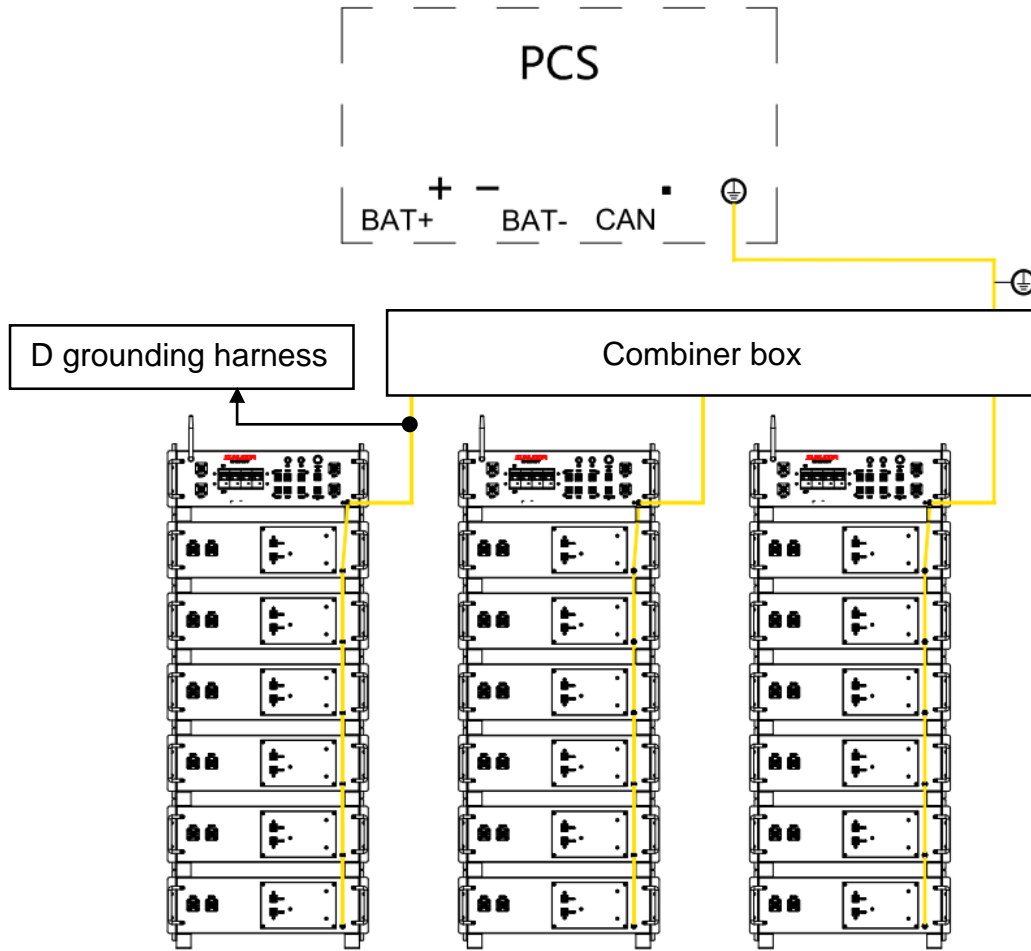


Figure 3.21a Parallel ground connections for CIESS 25/30-R-S (3-cluster parallel cabinets of CIESS 30-R-S as an example)

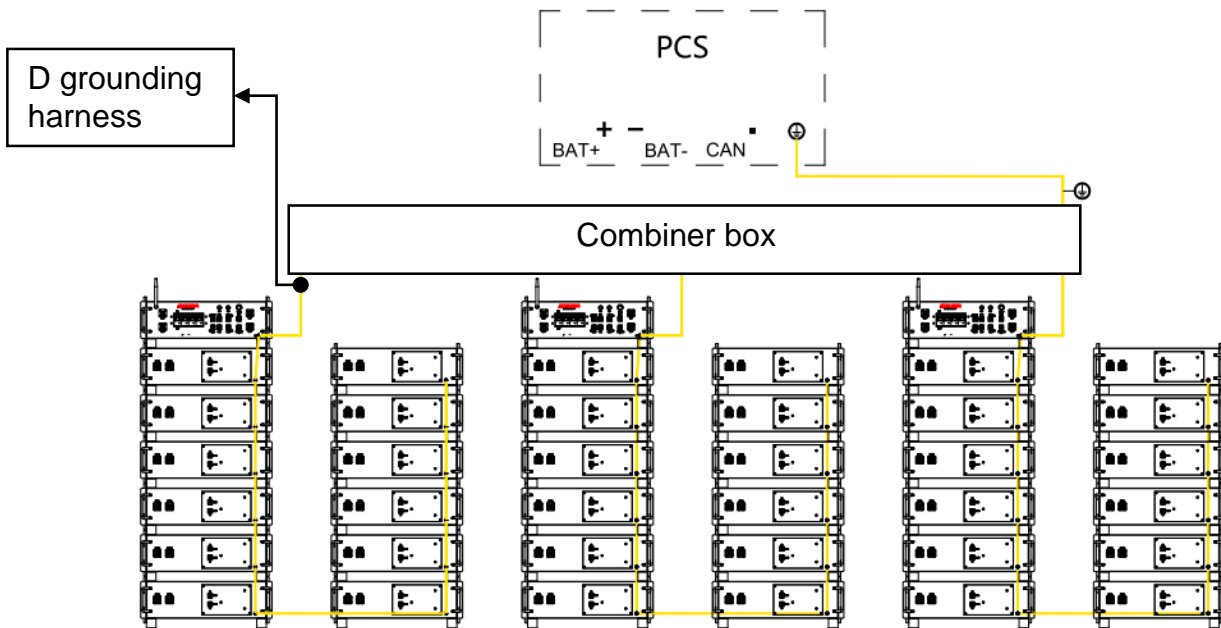


Figure 3.21b Parallel ground connections for CIESS 35~60-R-S (3-cluster parallel cabinets of CIESS 60-R-S as an example)

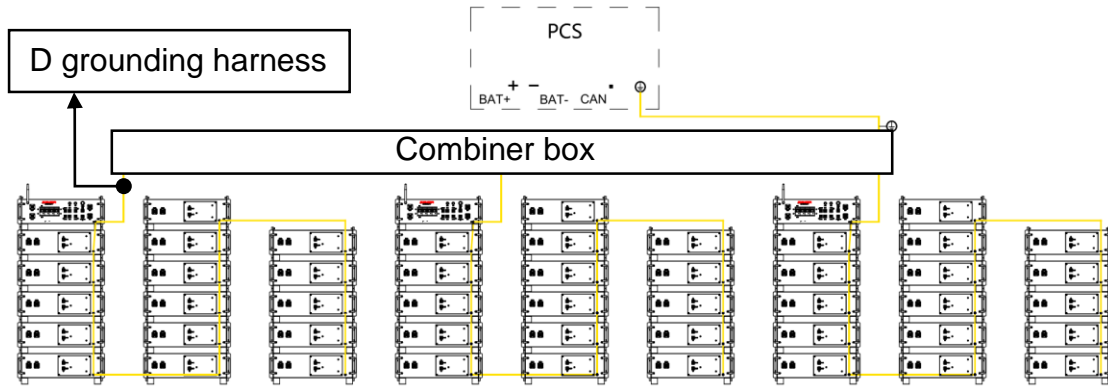


Figure 3.21c Parallel ground connections for CISS 65~80-R-S (3-cluster parallel cabinets of CISS 80-R-S as an example)

### 3.4.2 Power line connection for parallel cabinet

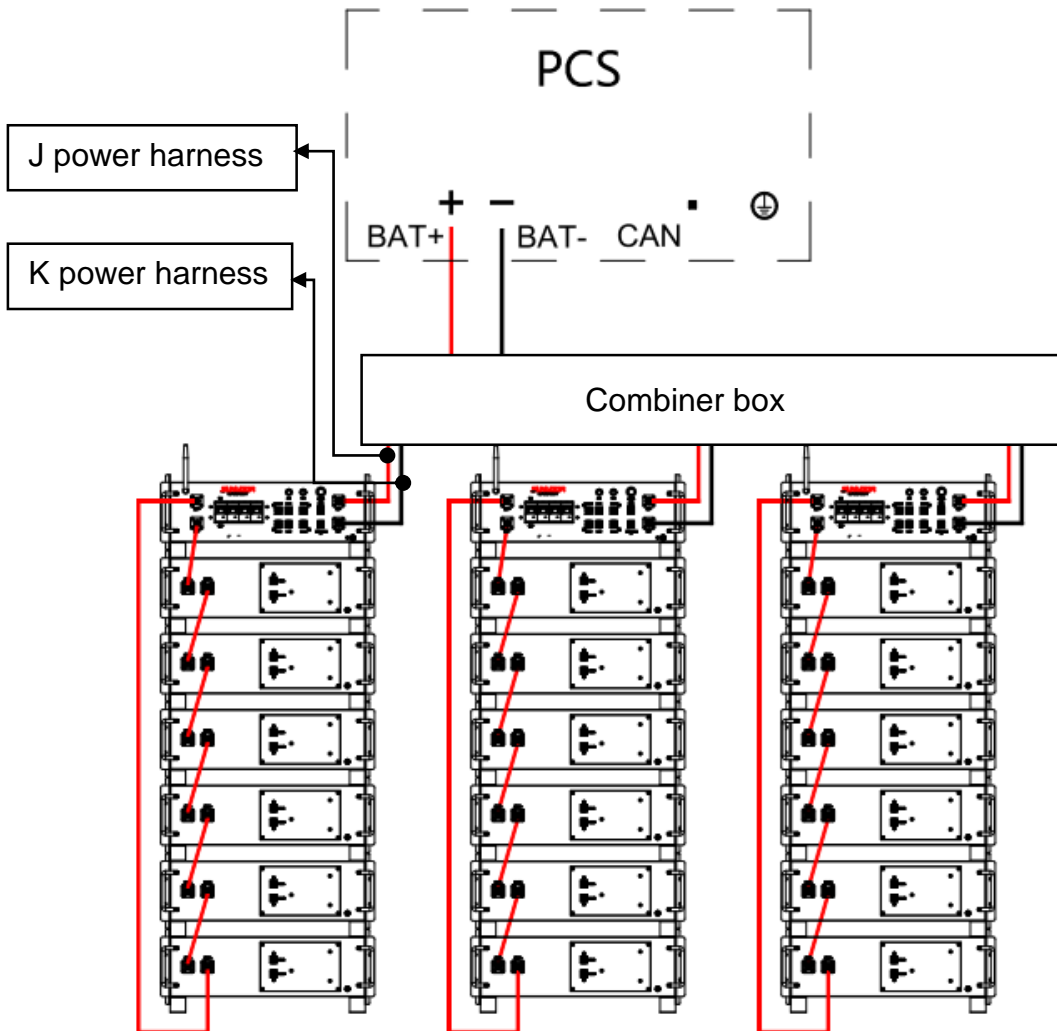


Figure 3.22a Parallel power line connections for CISS 25/30-R-S (3-cluster parallel cabinets of CISS 30-R-S as an example)



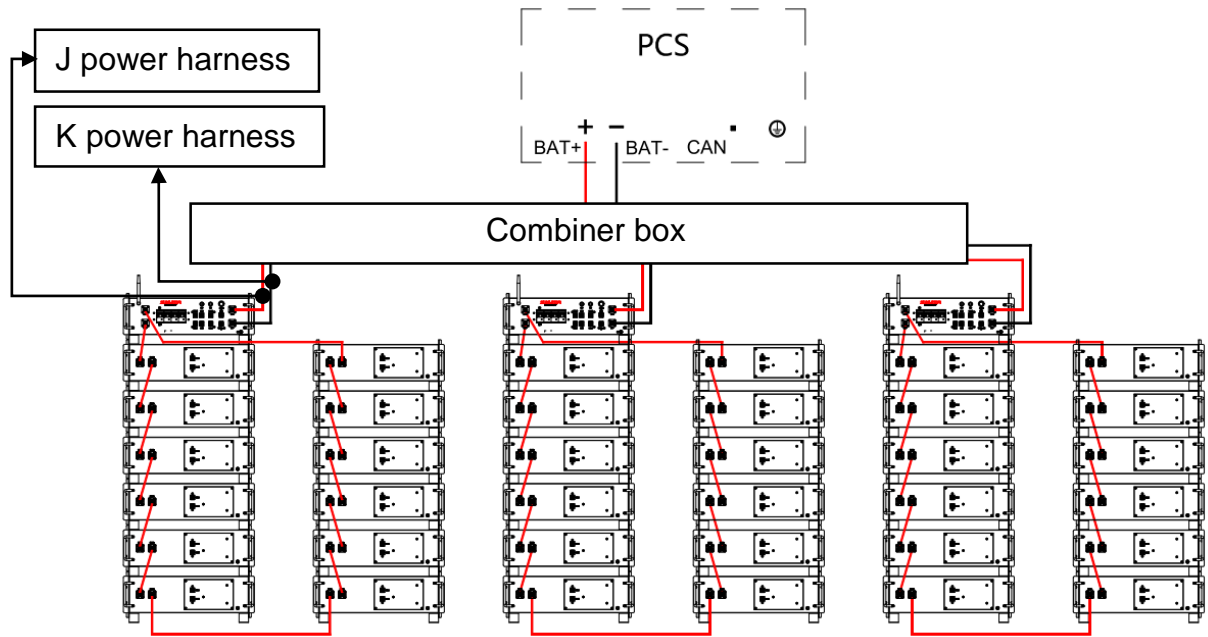


Figure 3.22b Parallel power line connections for CIESS 35~60-R-S  
(3-cluster parallel cabinets of CIESS 60-R-S as an example)

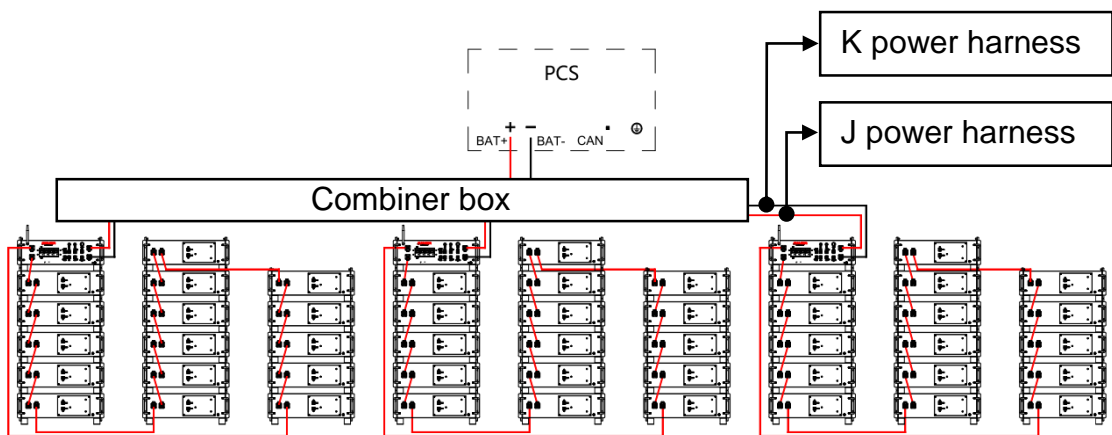


Figure 3.22c Parallel power line connections for CIESS 65~80-R-S  
(3-cluster parallel cabinets of CIESS 80-R-S as an example)

### 3.4.3 Communication line connection for parallel cabinet

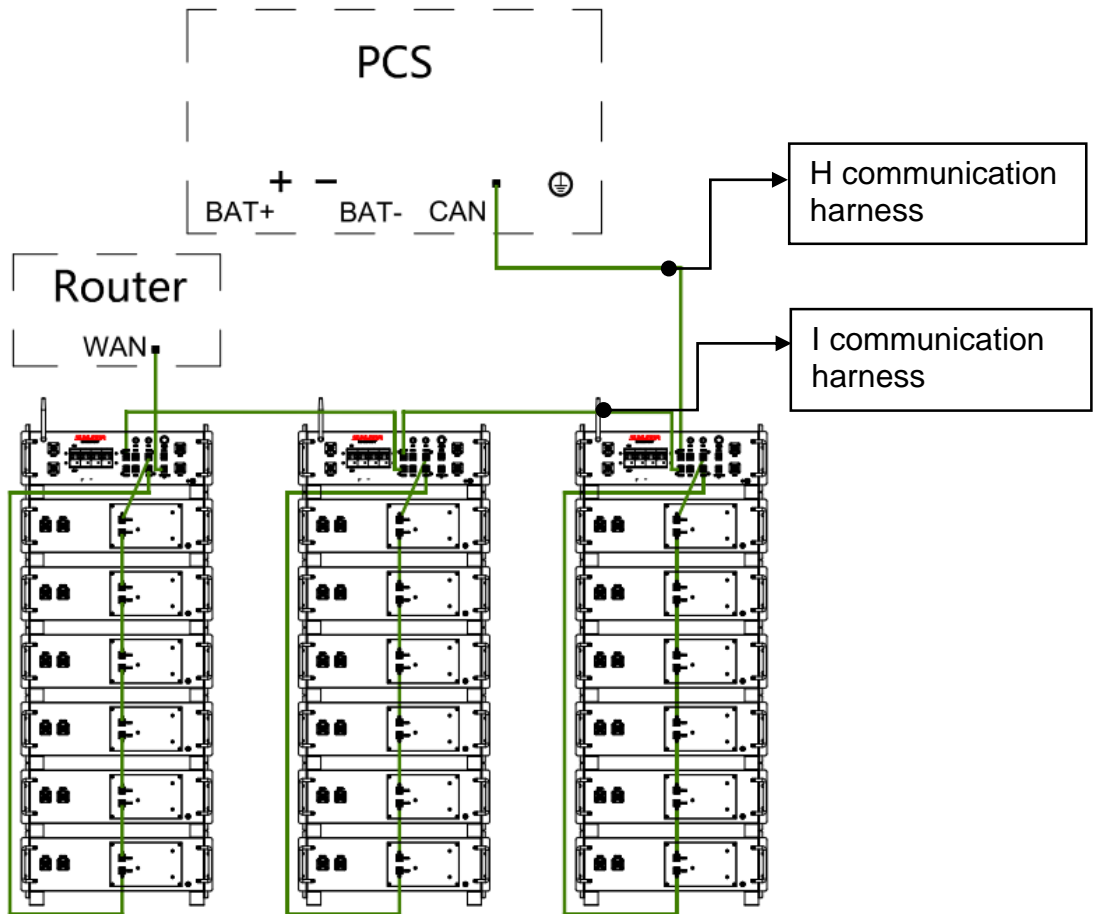


Figure 3.23a Parallel communication line connections for CIESS 25/30-R-S

(3-cluster parallel cabinets of CIESS 30-R-S as an example)

Note: At the router, connect the WAN port of one single battery system with the smallest SN code.

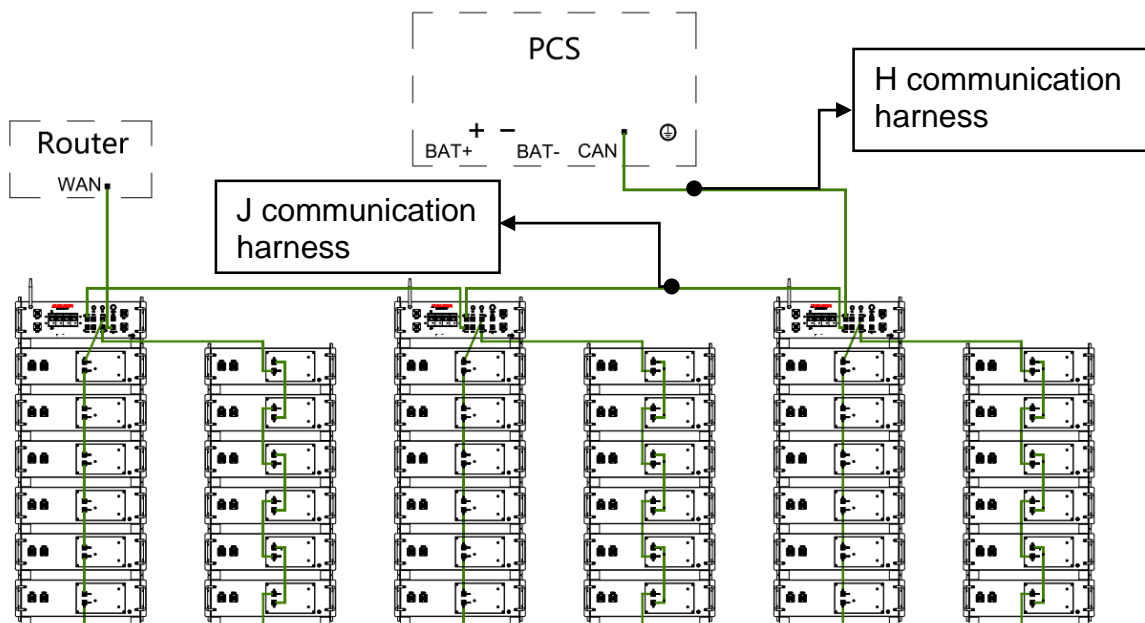


Figure 3.23b Parallel communication line connections for CIESS 35~60-R-S

(3-cluster parallel cabinets of CIESS 60-R-S as an example)

Note: At the router, connect the WAN port of one single battery system with the smallest SN code.

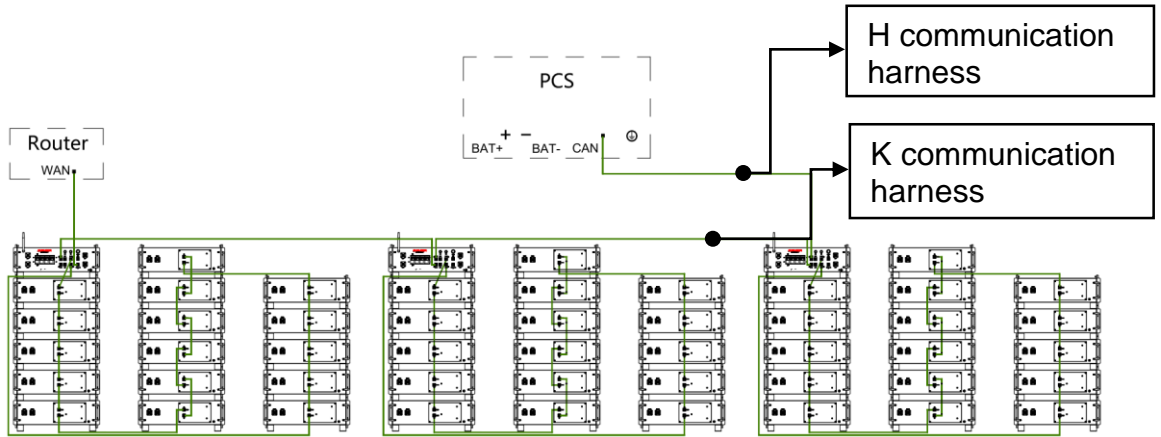


Figure 3.23c Parallel communication line connections for CIESS 65~80-R-S

(3-cluster parallel cabinets of CIESS 80-R-S as an example)

Note: At the router, connect the WAN port of one single battery system with the smallest SN code.

### 3.4.4 Complete Wiring Diagram for Parallel cabinets

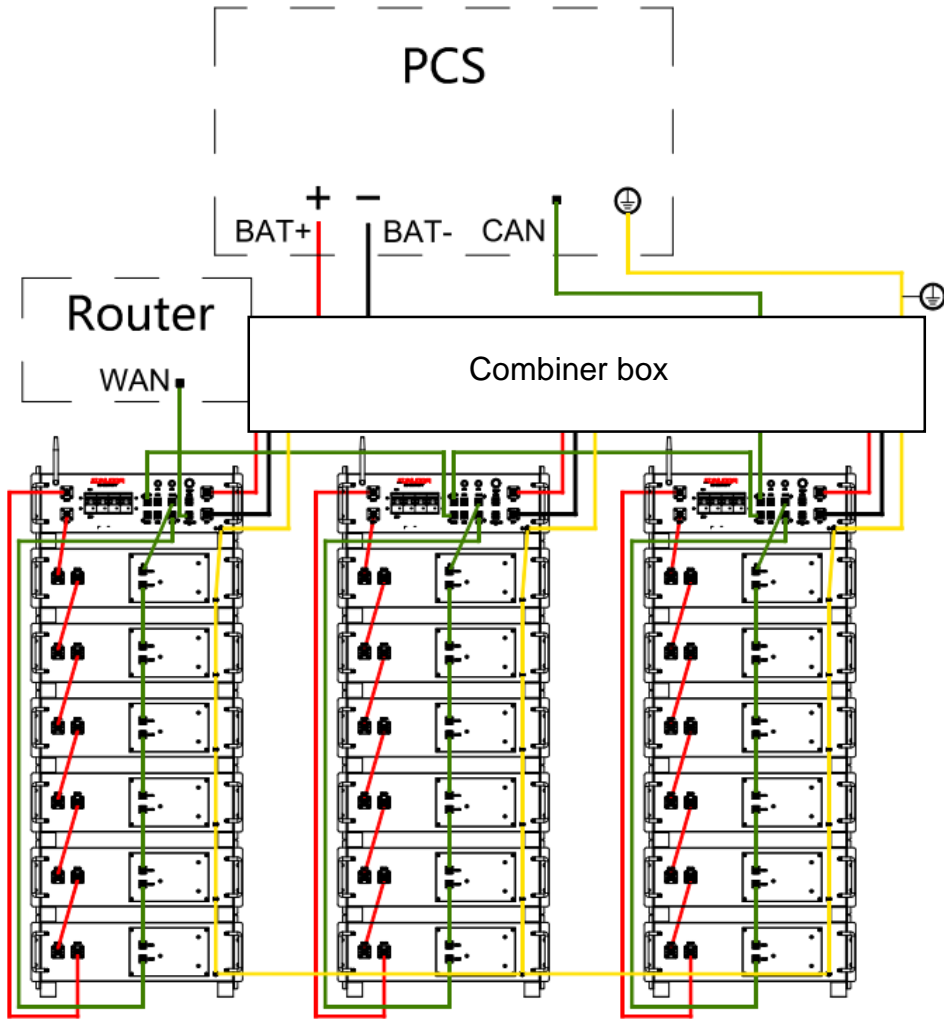


Figure 3.24a Harnesses Connection for CISS 25/30-R-S Parallel cabinets  
(3-cluster parallel cabinets of CISS 30-R-S as an example)

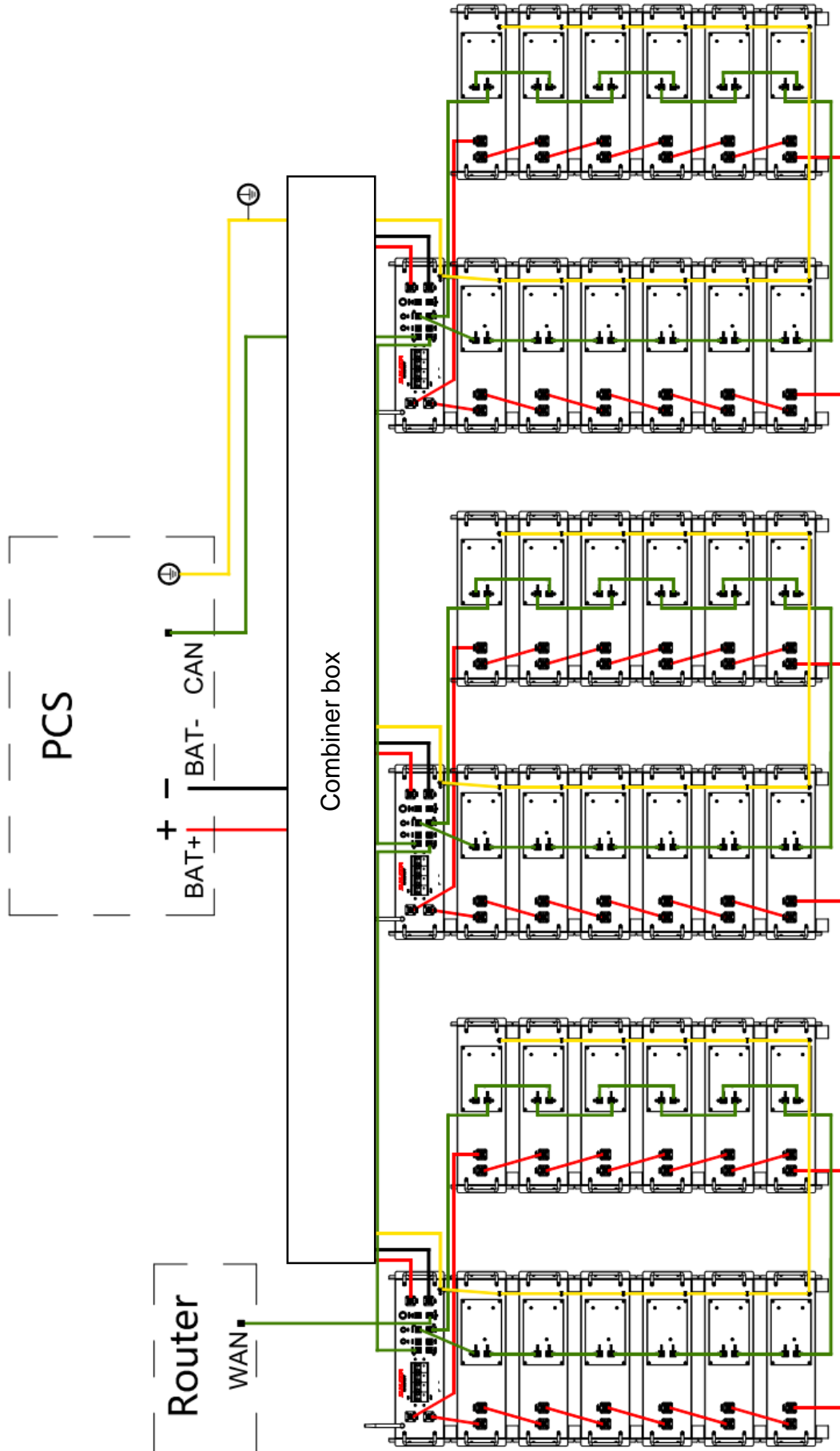


Figure 3.24b Harnesses Connection for CIESS 35~60-R-S Parallel cabinets  
(3-cluster parallel cabinets of CIESS 60-R-S as an example)

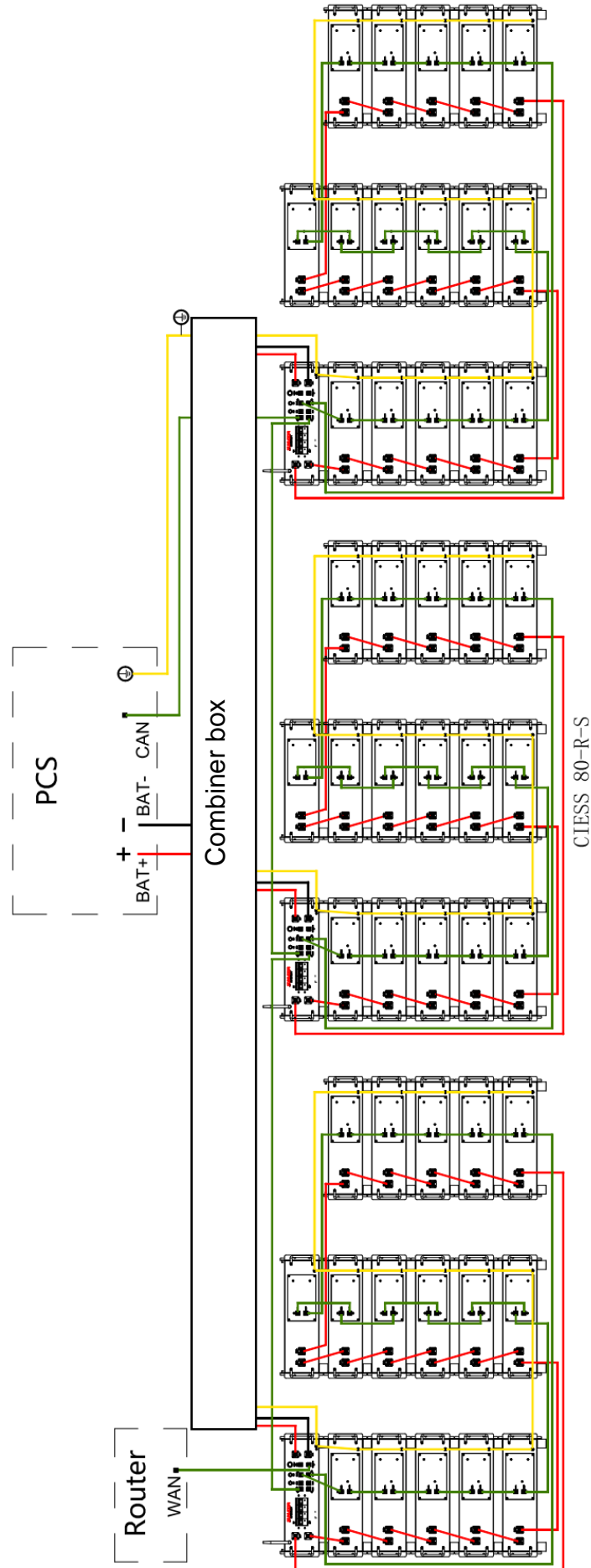


Figure 3.24c Harness Connections for CIESS 65~80-R-S Parallel cabinets  
(3-cluster parallel cabinets of CIESS 80-R-S as an example)

## 4 Operational guidance

### 4.1 Power-Up Guidelines

(1) Before powering up the system, ensure that the equipment is firmly installed, the installation location is convenient for operation and maintenance, the installation space is convenient for ventilation and heat dissipation, and the installation environment is clean and tidy.

(2) Before powering up the system, ensure that the ground wire, battery power wire, inverter power wire, communication wire, and inverter AC wire are connected correctly and securely.

(3) Before powering up the system, ensure that the cable ties meet the alignment requirements, are reasonably distributed, and are not damaged.

(4) Before powering up the system, ensure that all switches are disconnected.

### 4.2 System power-up

Step 1: Push up on the air switch to power up the system (Fig.4.1) .

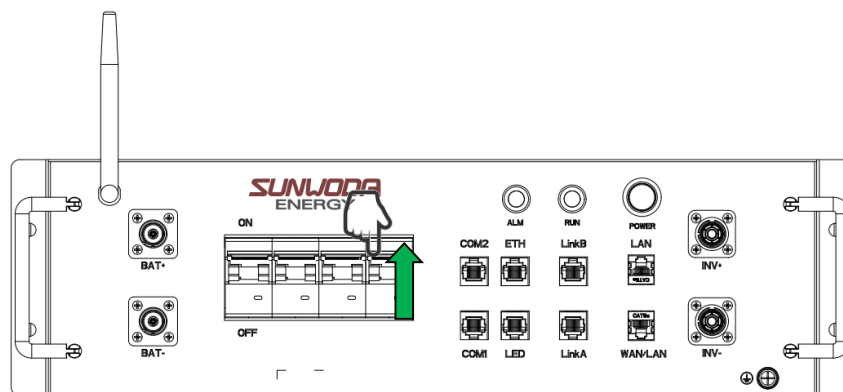


Figure. 4.1

Step 2: Press and hold the POWER button on the front side of the control box for 3S, the green running indicator will flash steadily at a frequency of 1 second 1 time to turn the battery system on(Fig.4.2).

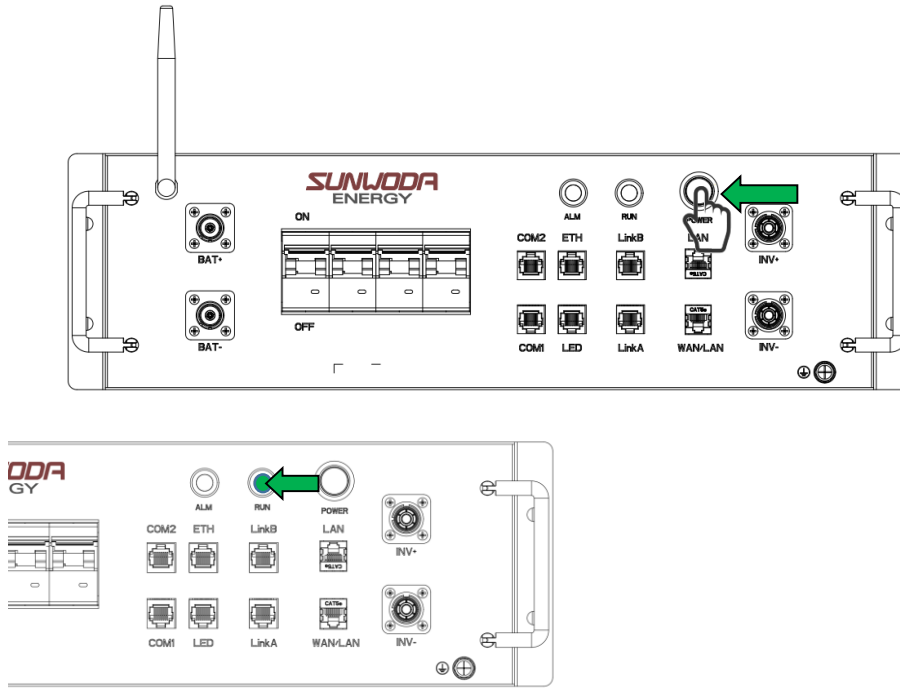


Figure. 4.2

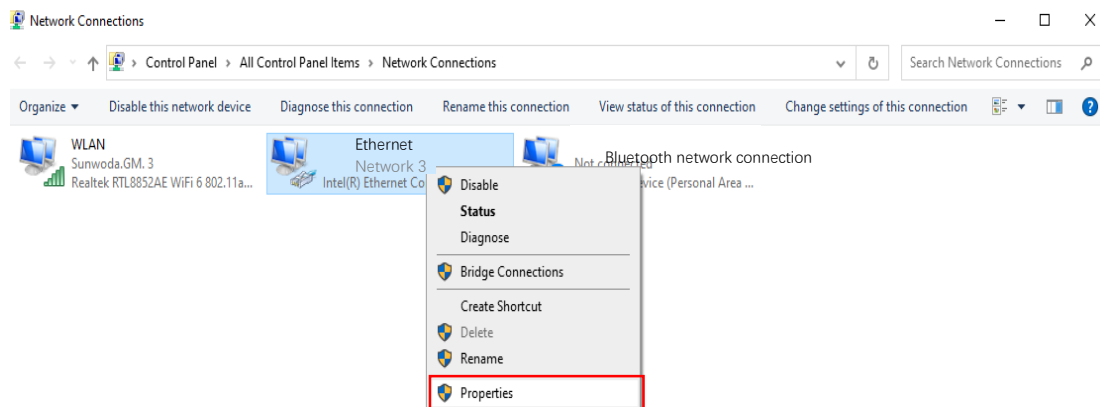
### 4.3 Setup data monitoring

Recommended to use Google Chrome, version 113.0.5672.93 (official version) (64-bit) or higher, Windows 10 for PC system version.

#### 4.4.1 Local Data Monitoring

4.4.1.1 Data module distribution and control box address assignment for single- cabinet.

(1) Change the IP of your computer PC to be automatically obtained by the following steps(Fig.4.3).





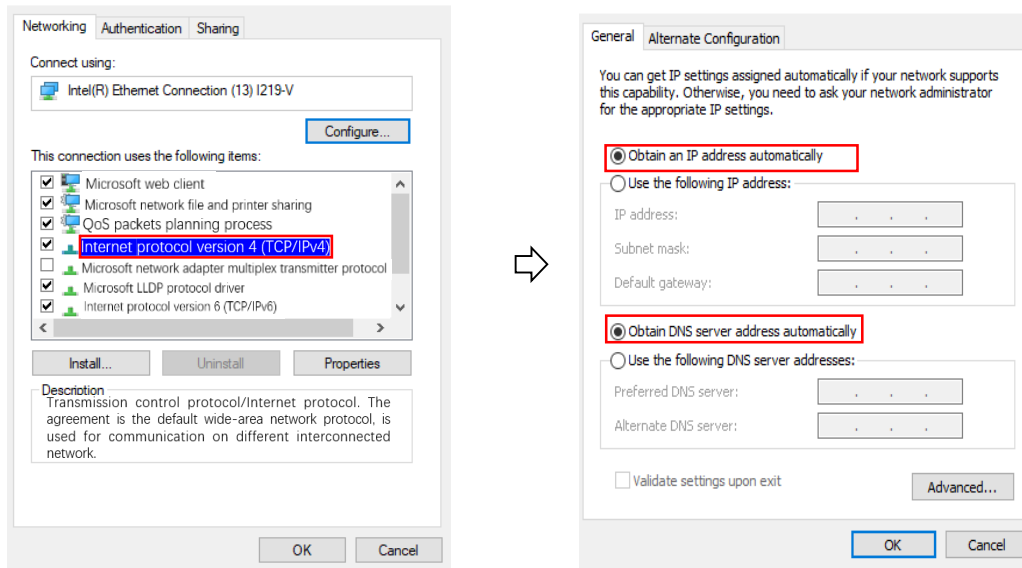


Figure. 4.3

(2) Connect the LAN port of the control box to the network port of the PC through the RJ45 network port connector (8P), open Google Chrome and enter the URL 192.168.5.5, user name: user, password: password (Fig.4.4).

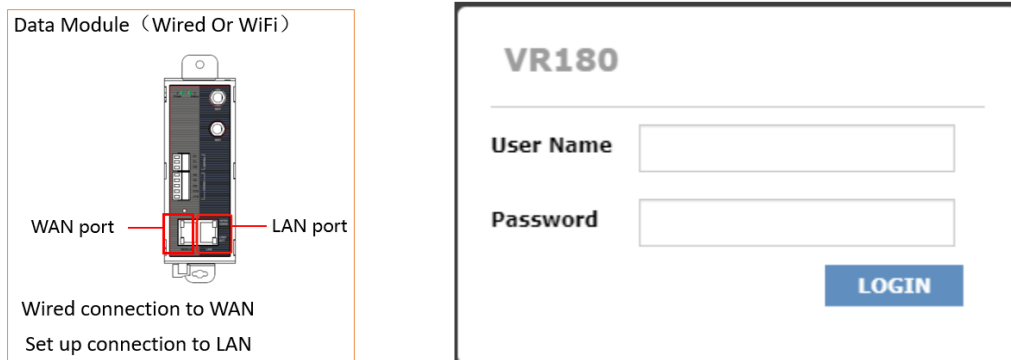


Figure. 4.4

(3) Set the network access method (recommended wired, master battery cabinet) in the following page (Fig 4.5), after setup is completed, if prompted to restart the device, please be patient (The WAN port of the control box is connected to the WAN interface with a standard network cable).

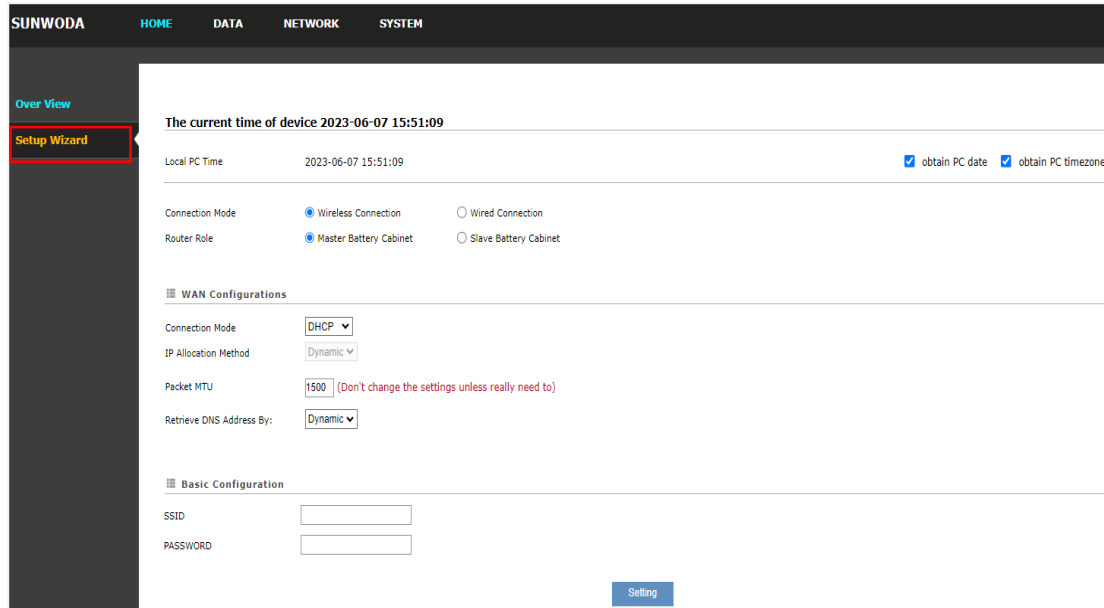


Figure 4.5

(4) Assign the address of the control box as "80" in the following screen (the stand-alone cabinet is the host by default), and click Set (Fig. 4.6) .

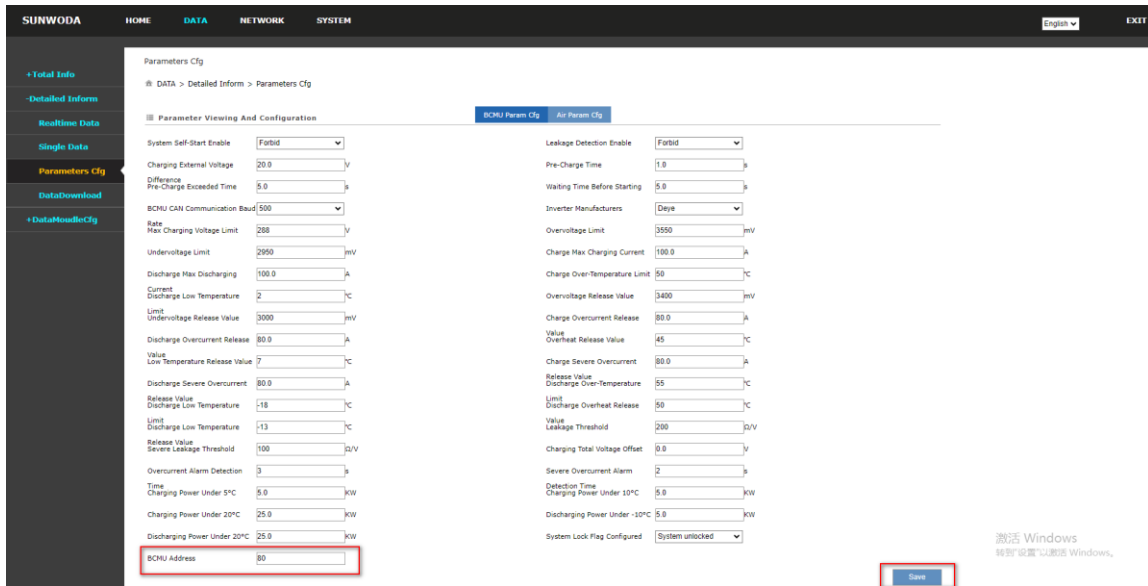


Figure 4.6

#### 4.4.1.2 Data module distribution and control box address assignment for three clusters of parallel cabinet

(1) Change the IP of your computer PC to be obtained automatically by following the steps below (Fig4.7).

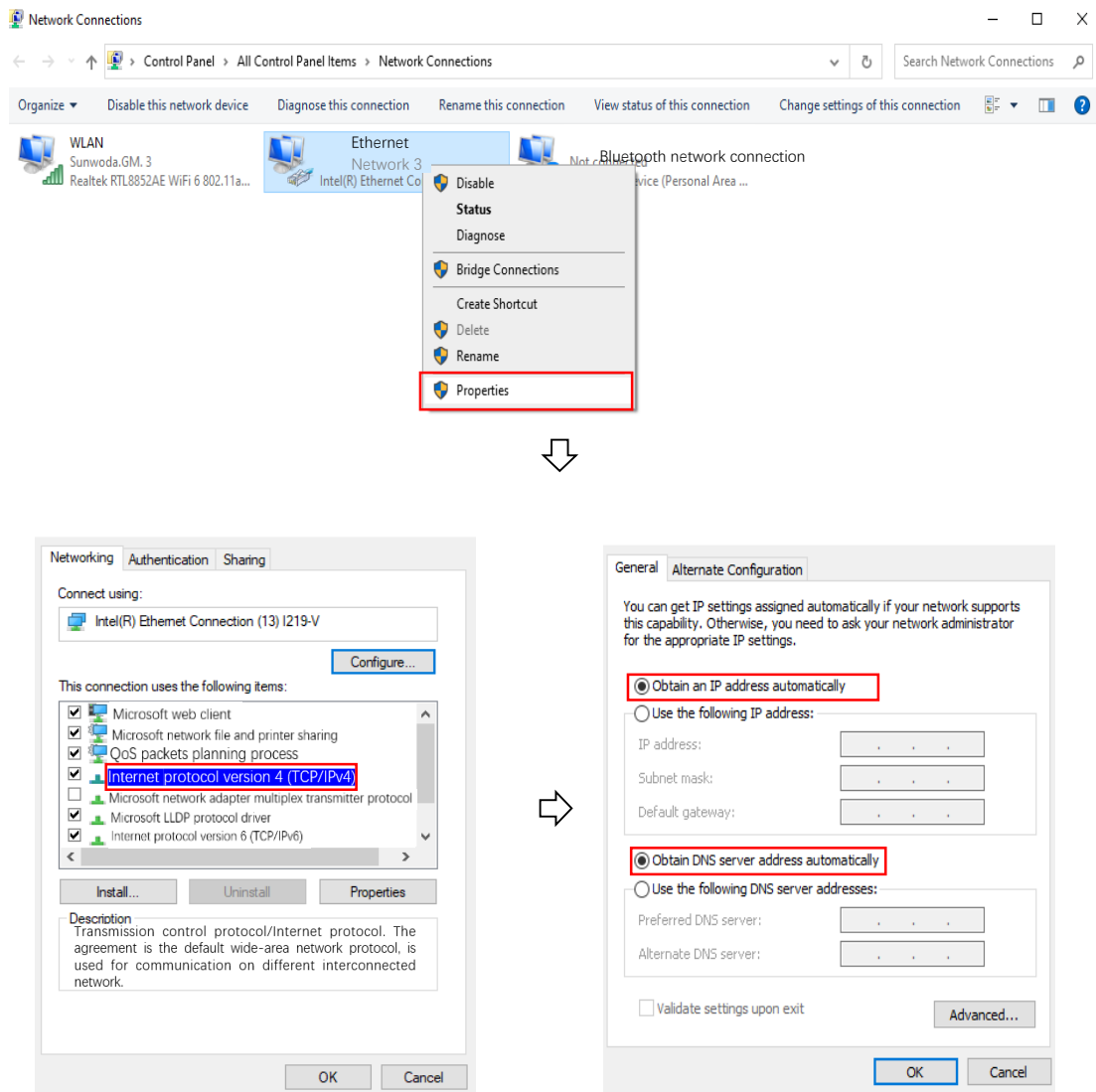


Figure.4.7

(2) Connect the LAN port of the control box of the main cabinet to the network port of the PC through the RJ45 network port connector (8P), open the Google Chrome browser and enter the URL 192.168.5.5, user name: user, password: password (Fig4.8).

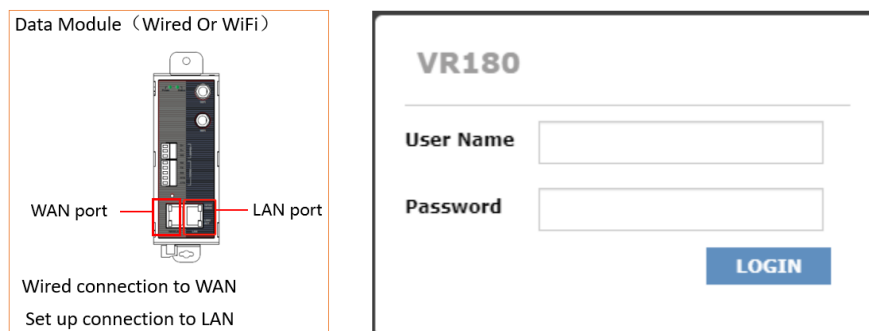


Figure. 4.8

(3) Set the network access method in the following page

(Fig4.9): wired, master cabinet, after the setup is completed, if prompted to restart the device, please wait patiently (the WAN port of the main cabinet control box is connected to the WAN interface with a standard network cable).

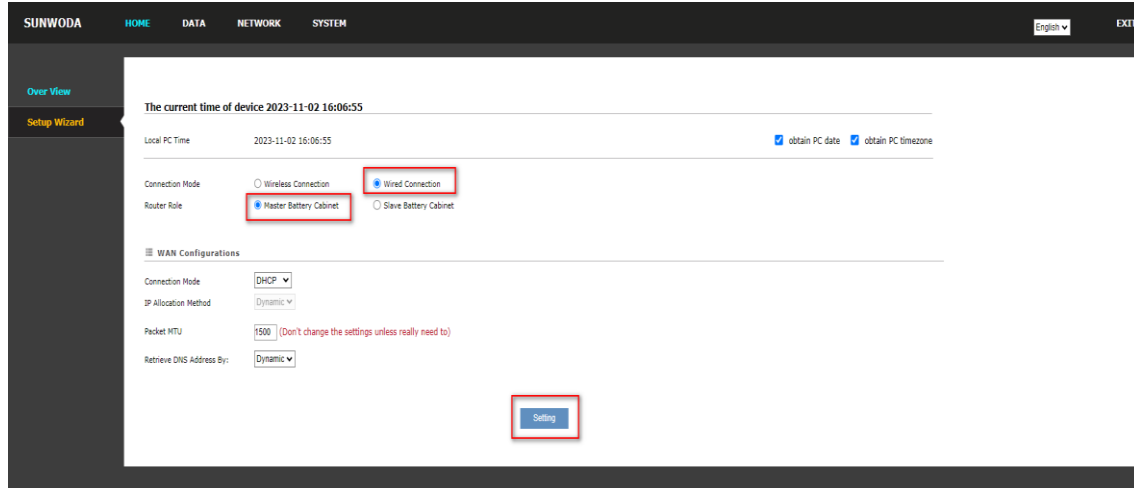


Figure 4.9

(4) Set the battery cabinet address to "80" on the following screen and click Set (Fig.4.10) .

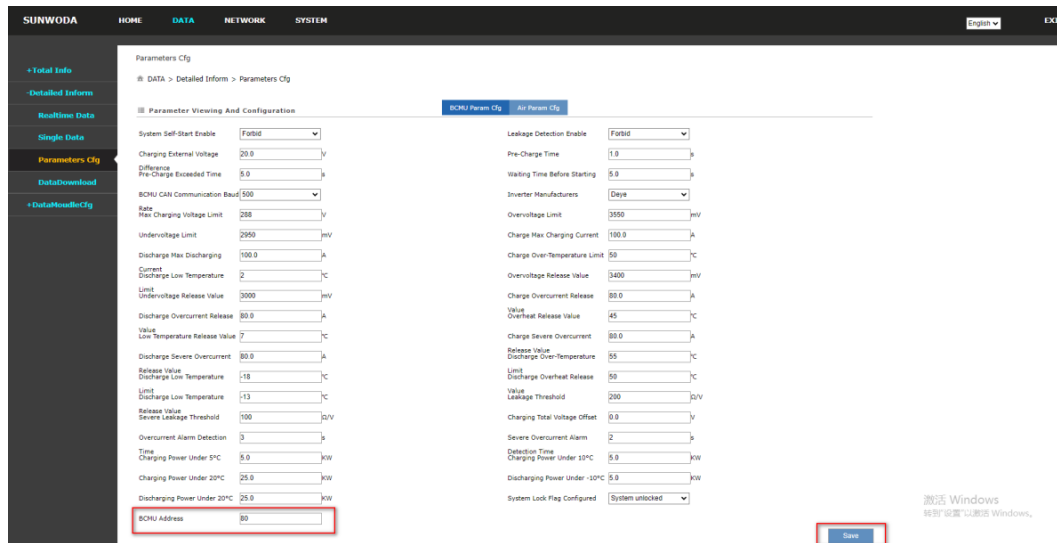


Figure 4.10

(5) Set up WiFi for the master cabinet on the following page (Fig.4.11) .

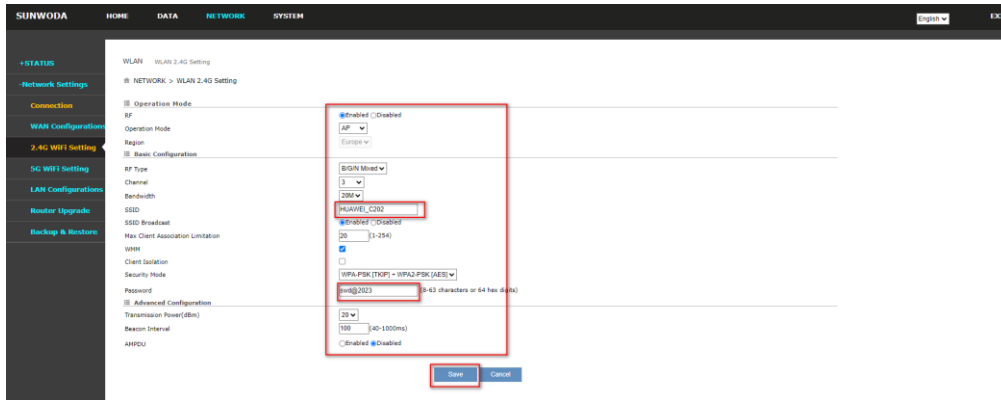


Figure. 4.11

(6) Connect one control box of slave cabinet LAN port to the PC computer network port through the RJ45 network port connector (8P), open the Google Chrome browser and enter the URL 192.168.5.5, user name: user, password: password.

(7) Set the network access method in the following page: Wireless, Slave Cabinet, and enter the LAN WIFI name and password emitted from the master cabinet in step (5) below, and click Set (Fig.4.12). After completion, if prompted to restart the device, please be patient. After successful setup, the IP automatically jumps to 192.168.6.5.

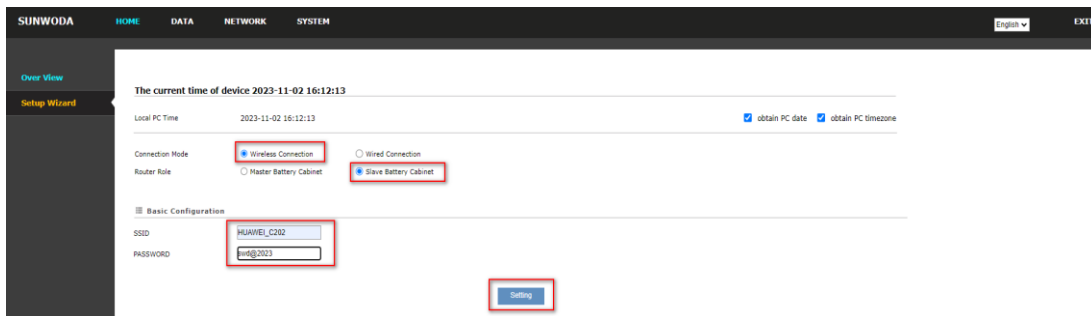


Figure. 4.12

(8) Set the battery cabinet address to "81" on the following screen, and click Set (Fig.4.13).

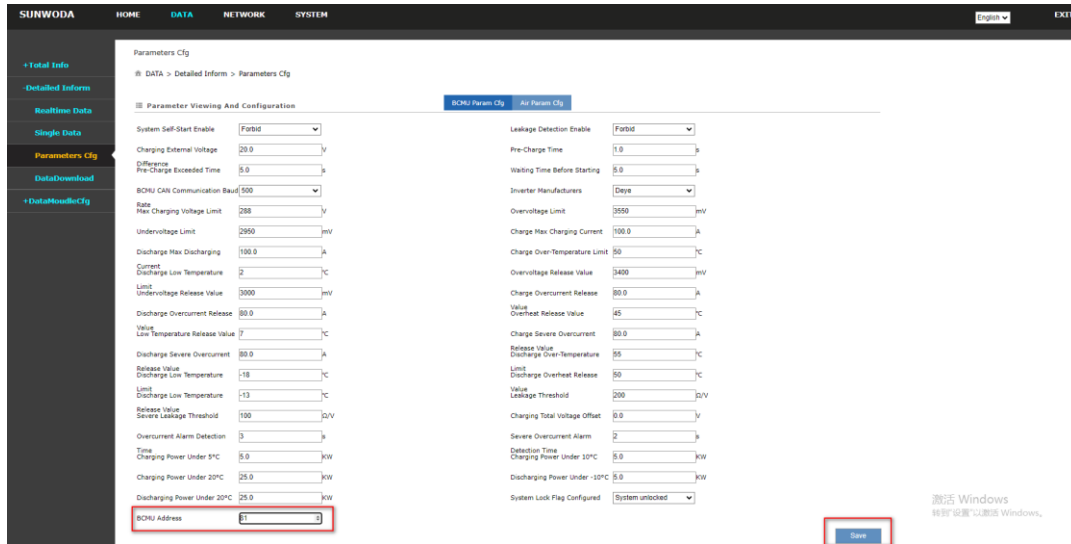


Figure. 4.13

(9) Connect the LAN port of the control box from No.2 slave cabinet to the network port of the PC through the RJ45 network port connector (8P), open the Google Chrome browser and enter the URL 192.168.5.5, user name: user, password: password.

(10) Set the battery cabinet into the network in the following page: wireless, slave cabinet, and enter the LAN WIFI name and password emitted from the master cabinet in step (5) below, click Set (Fig.4.14). After completion, if prompted to restart the device, please be patient. After successful setup, the IP automatically jumps to 192.168.6.5.

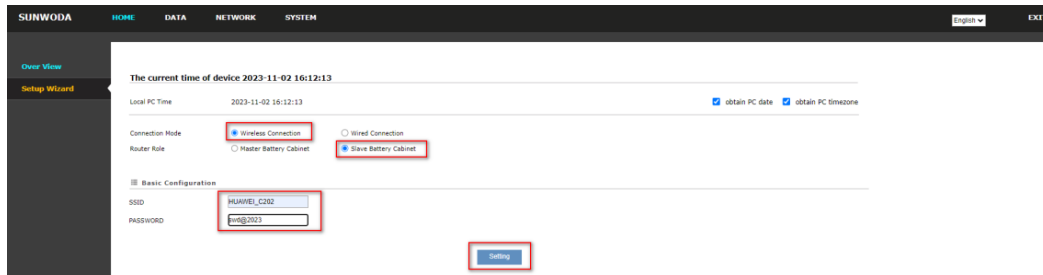


Figure. 4.14

(11) Set the battery cabinet address to "82" on the following screen and click Set (Fig.4.15).

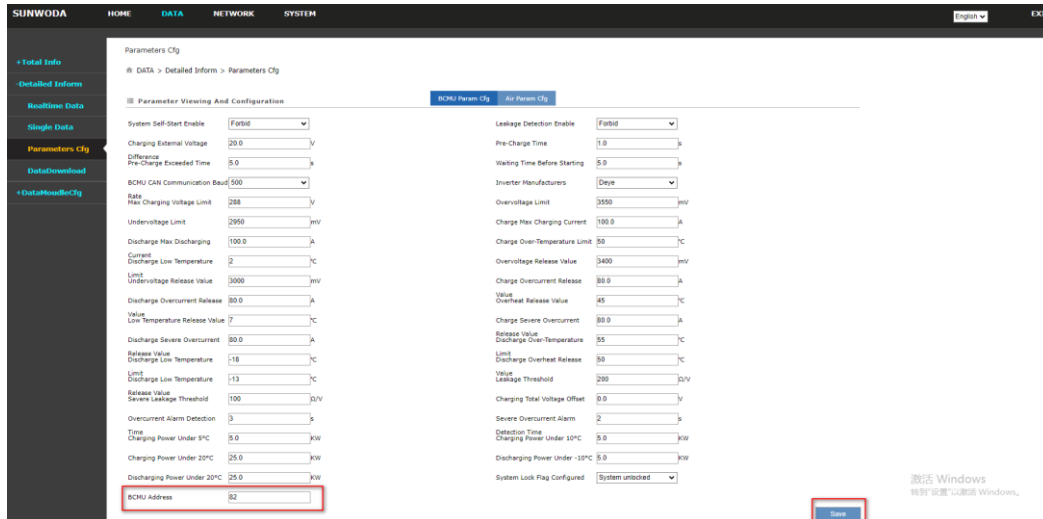


Figure 4.15

(12) After connecting the three clusters of DC-side parallel lines, turn on the computer in order, connect the LAN port of the control box of master cabinet (address 80) to the network port of the PC through the RJ45 network port connector (8P), open the Google Chrome browser and enter the URL 192.168.5.5, account number: user, password: password, and set up the cluster enable for the following page "7", click Setting (Fig. 4.16).

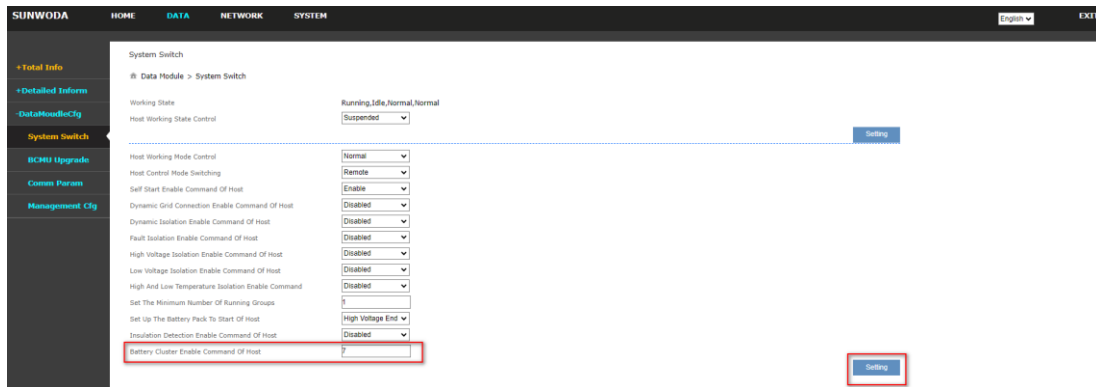


Figure 4.16

#### 4.4.1.3 Local Data Viewing

Connect the LAN port of the corresponding control box to the network port of the PC through the RJ45 network port connector (8P), open the Google Chrome browser and enter the corresponding IP address (master cabinet 80: 192.168.5.5; slave cabinet 81/82: 192.168.6.5).

Username: user, Password: password

You can view site data and real-time data on the following

pages (Fig.4.17) :

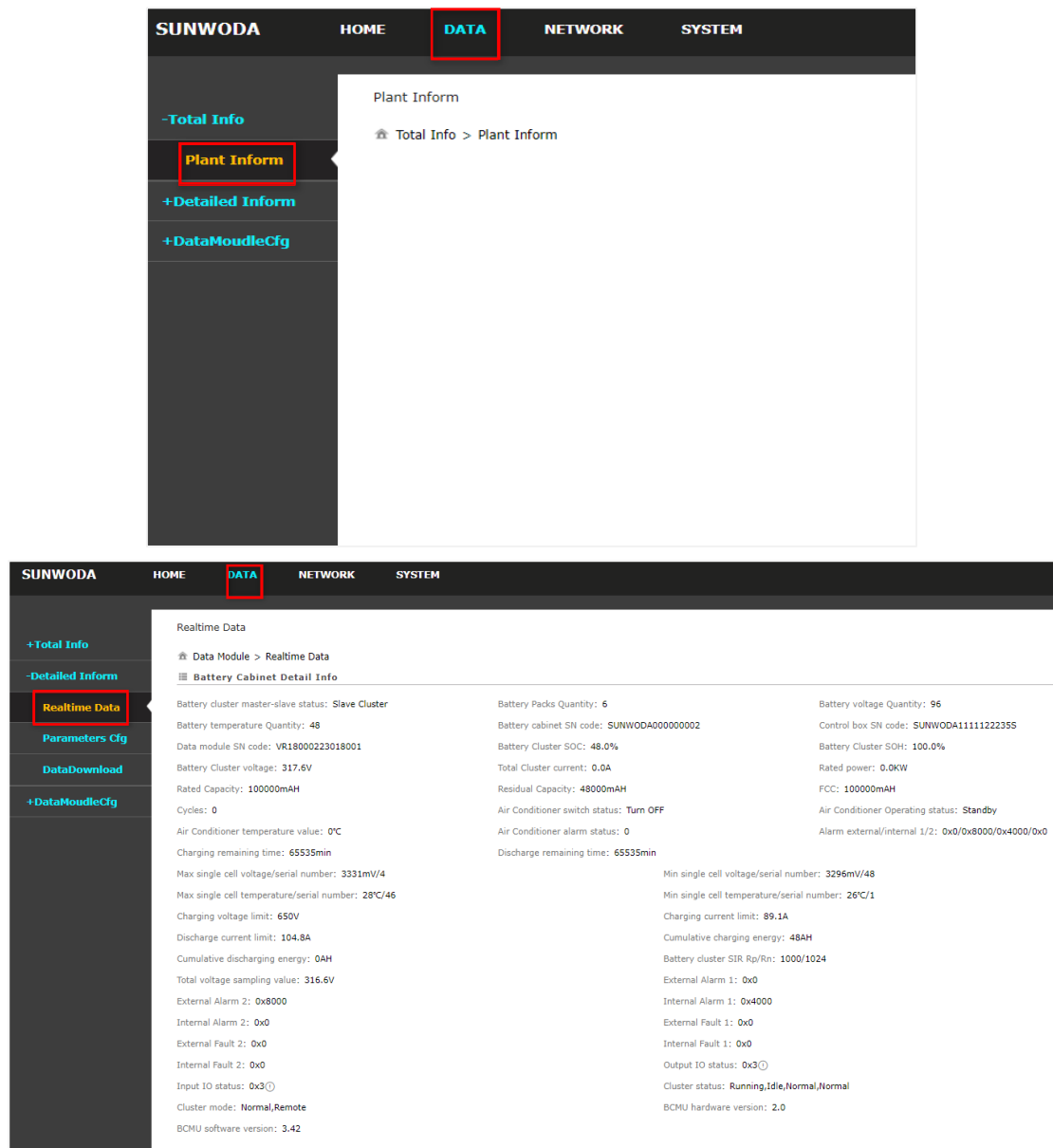


Figure 4.17

#### 4.4.1.4 Local data downloads

Recording data, event logging and real-time data downloads can be performed from the following page (Fig.4.18):



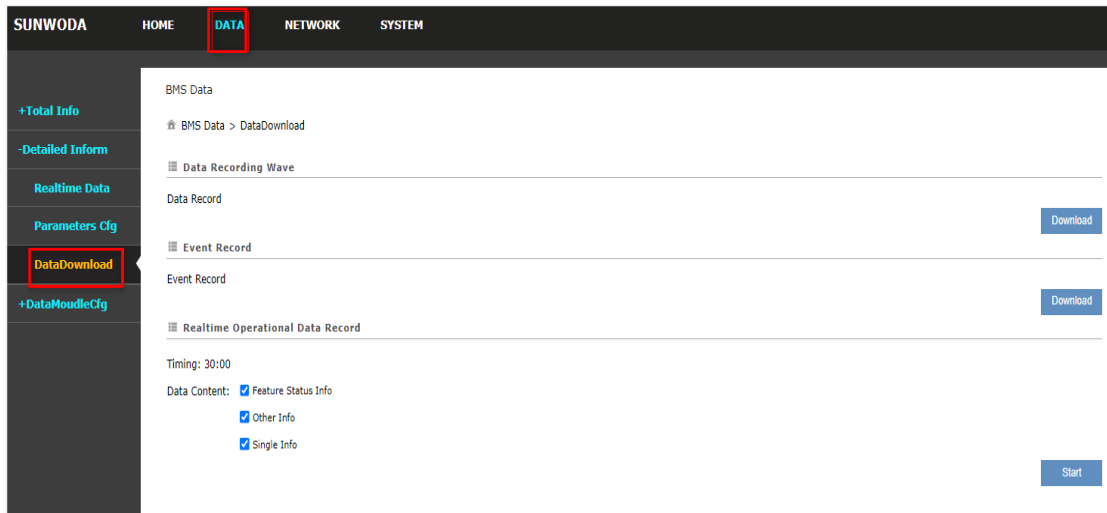


Figure 4.18

#### 4.4.1.5 Local start/stop control

BCMU start/stop control can be carried out through the following page (Fig.4.19).

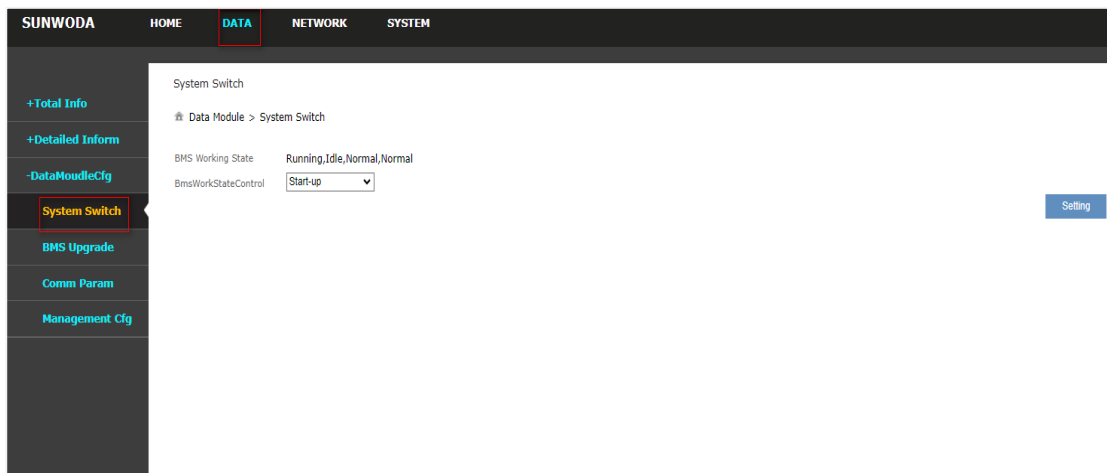
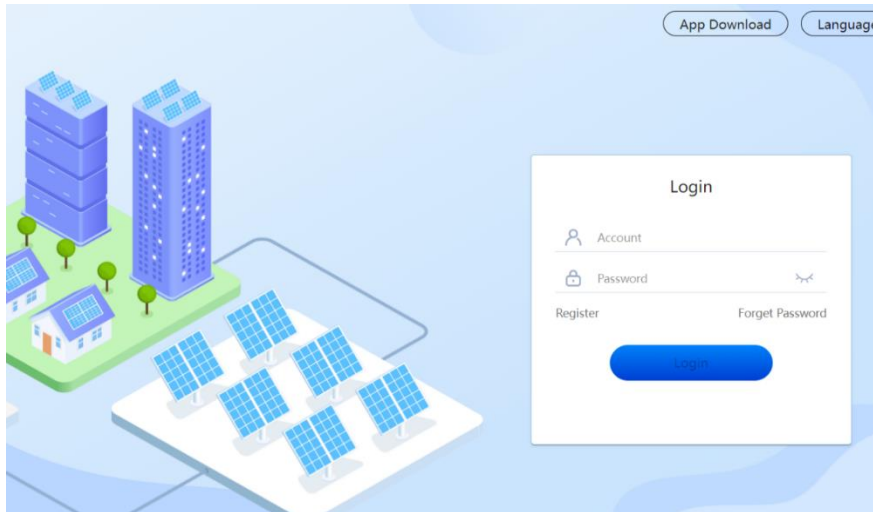


Figure 4.19

#### 4.4.2 Remote Data Monitoring

##### 4.4.2.1 Account Register

Go to the webpage <https://sunwoda.vidagrid.com/> to reach the following page, click and complete the registration (Fig.4.20).



End User

Account\*

Username

Password\*

Confirm Password\*

Country/Area

Phone Number

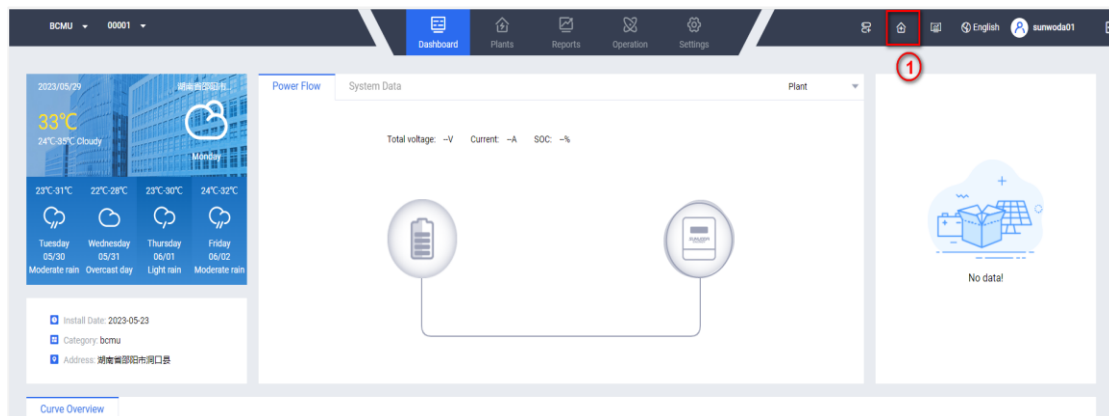
E-mail\*

Verification Code\*

Figure 4.20

#### 4.4.2.2 Adding sites and equipment

Login to the registered account, click Add Site in the red box location on the home page, and follow the steps below to complete the addition of the site and the master cabinet (address 80) equipment (Fig. 4.21).



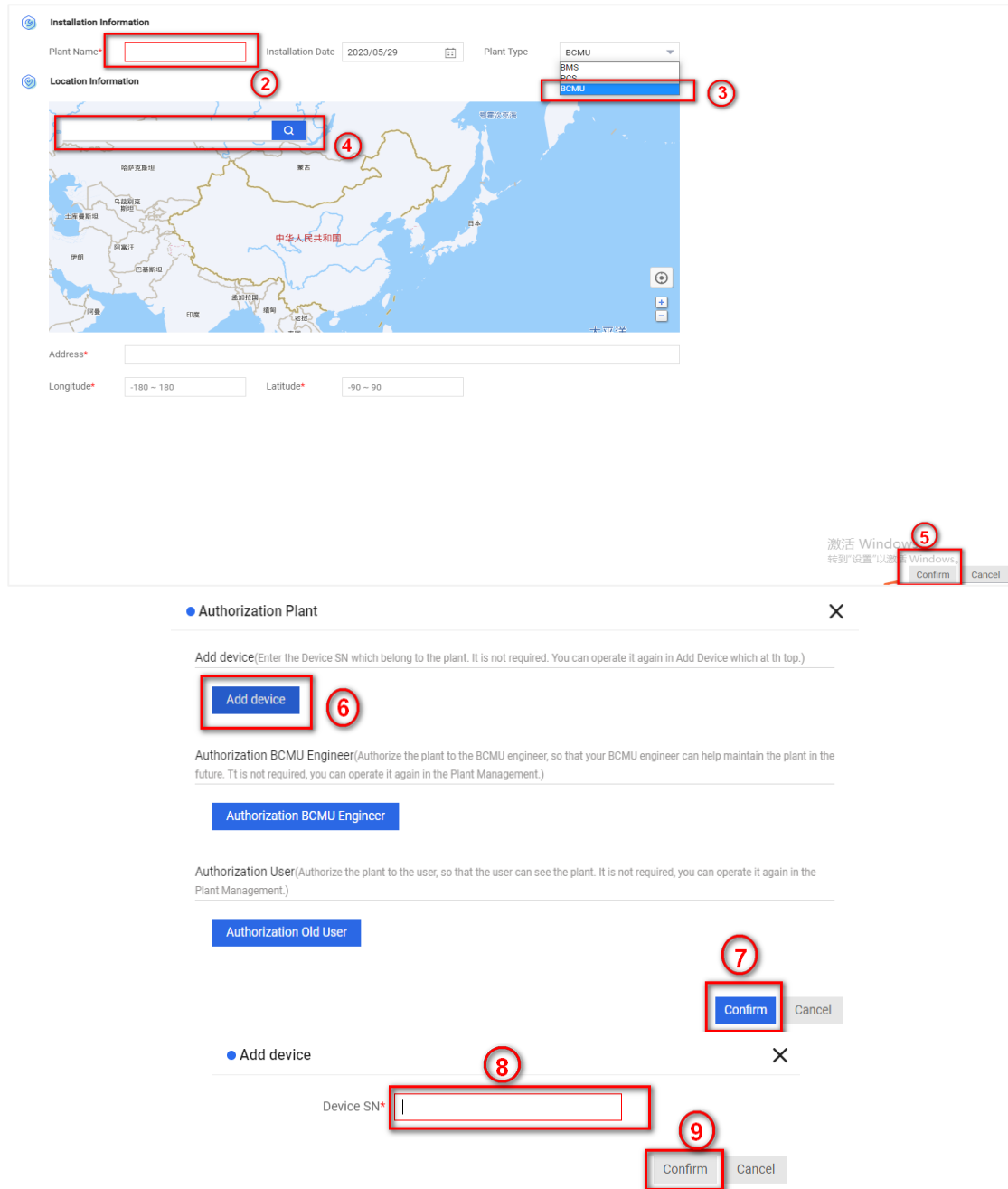


Figure. 4.21

Tips:

1. SN code should be obtained from the battery cabinet nameplate information, the length of 17 bits, remove the first character code, retain the last 16 characters as a valid SN code, enter the last 16 SN code here to bind, must ensure that the network configuration has been completed before binding SN (see 4.4.1.1 for more details).

2. For the system with three clusters, after completing the

above operation, please bind the SN code of "81" and "82" devices from the slave cabinets at the corresponding stations in the current interface. SN code should be obtained from the nameplate information of the corresponding slave cabinet. Remove the first character of the 17-digit SN code and retain the last 16 digits as the valid SN code ( Fig.4.22 ) .

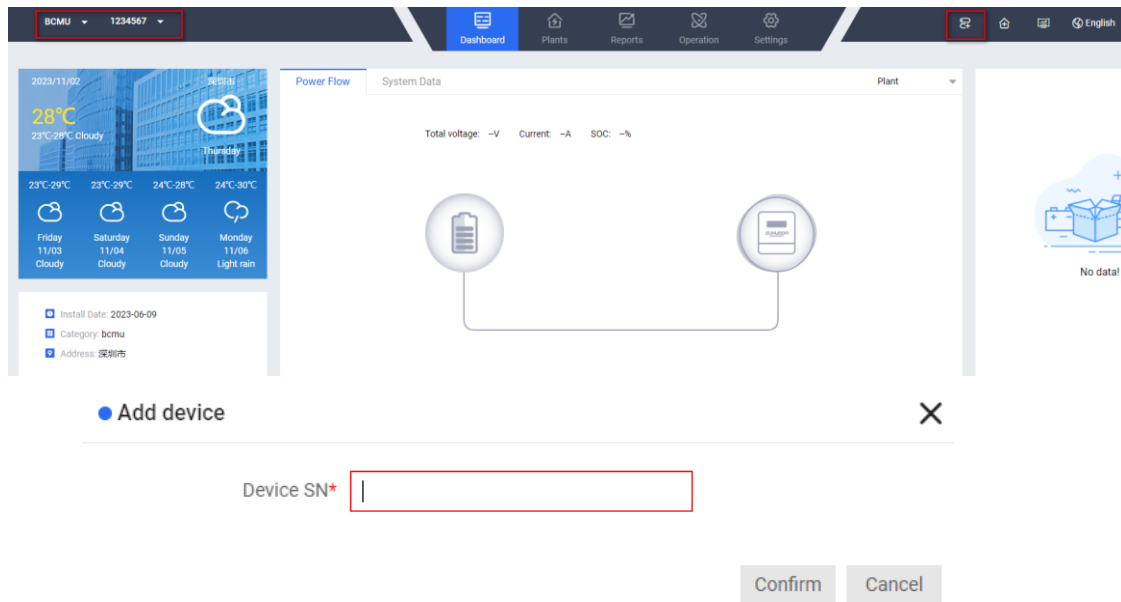


Figure 4.22

#### 4.4.2.3 Remote Data Monitoring

(1) After adding the equipment, select the newly built site and equipment in the current interface, you can refer to the location of the red box for energy flow, system data, equipment details and historical data viewing and exporting (Fig. 4.23) .

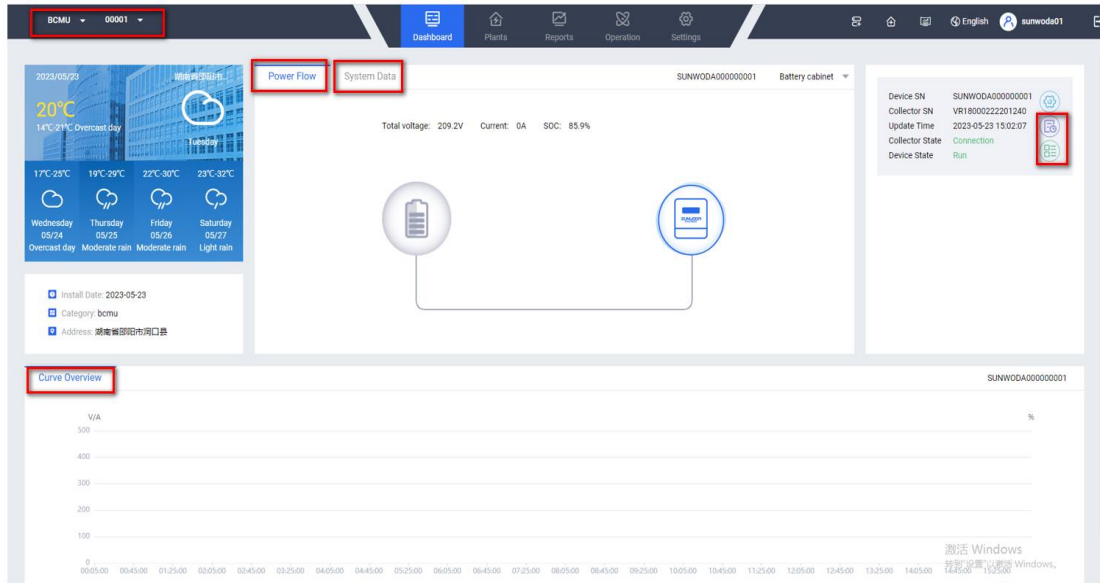


Figure 4.23

(2) You can refer to the location of the red box on the following page to view the site and equipment information (Fig. 4.24) .

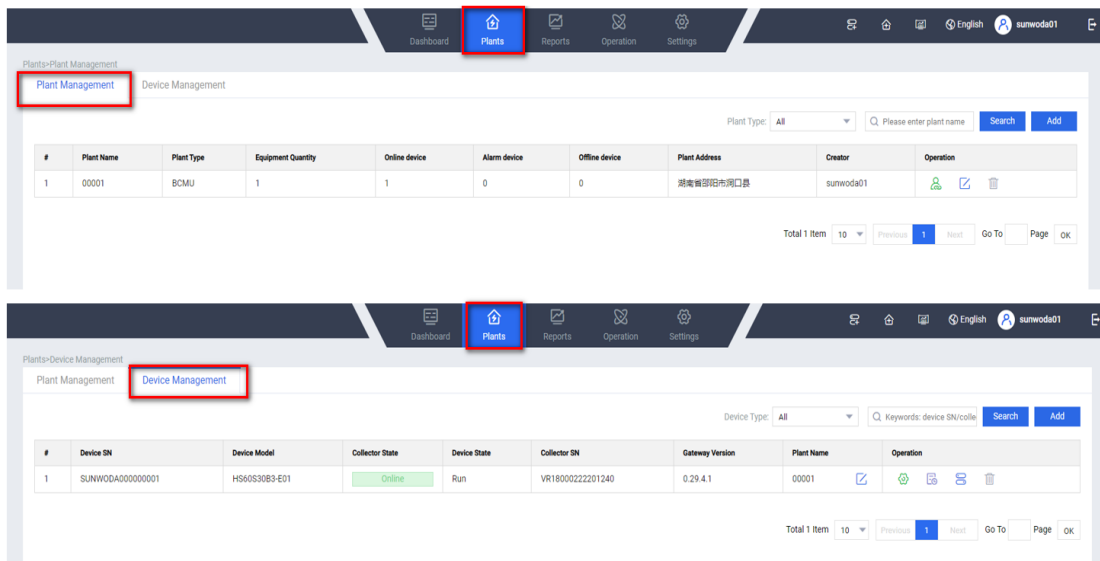


Figure 4.24

(3) You can refer to the location of the red box on the following page for viewing and exporting energy and power reports for the relevant sites and devices (Fig. 4.25) .

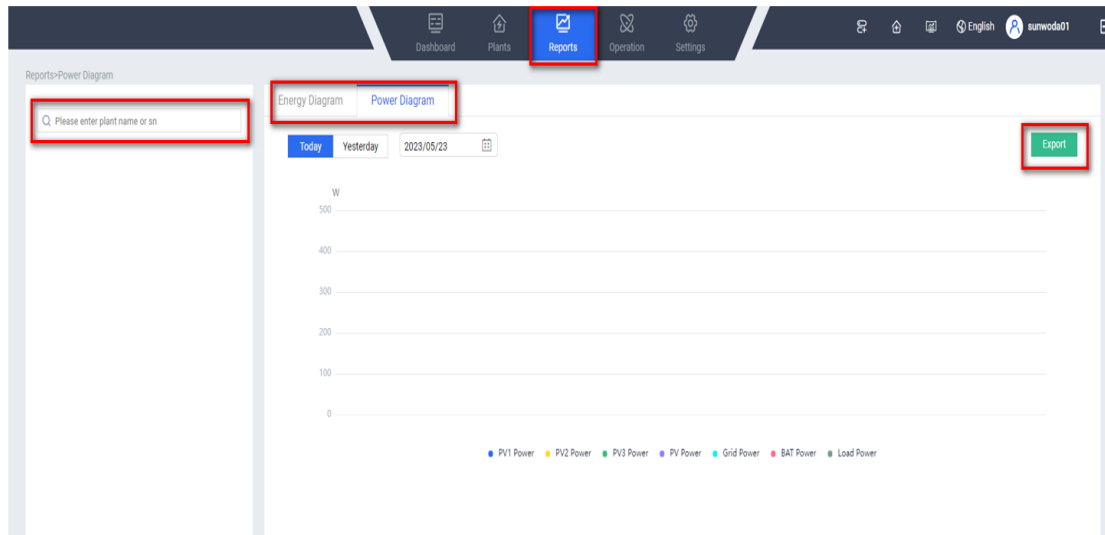


Figure 4.25

### 4.4 System shutdown

Press and hold down the POWER key on the front side of the control box for 3 seconds, the running indicator goes out, pull its air switch down to place it in the off state, then the system shuts down (Fig.4.26).

NOTE: Before powering down the battery system, make sure there is no load on the AC side of the inverter and that the circuit breaker between the battery system and the inverter is disconnected.

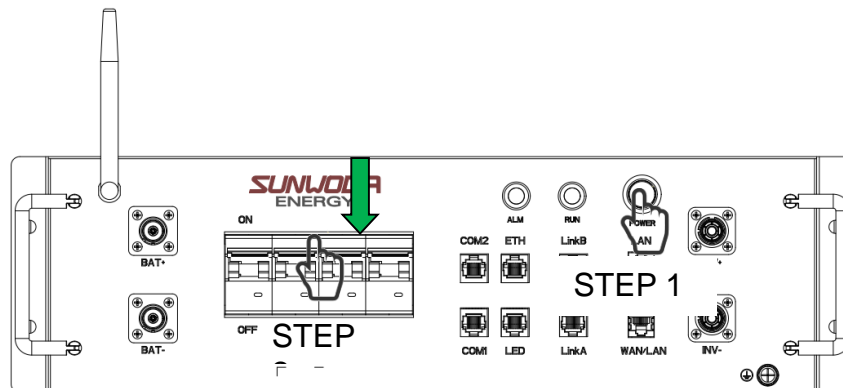


Figure 4.26

### 4.5 Introduction to Indicator Lights

Red light	Green light	Instruction
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Not on	1s blinks 1 time	Initialization state, Starting state, Stopping state
Not on	On	Running state
On	Not on	Fault state

## 5 System maintenance

### Hazard

Operating the equipment with electricity may result in damage to the battery system or a risk of electric shock. When operating and maintaining the battery system, de-energize the battery system.

### Warning

If you find any problems that may affect the battery system or the energy storage inverter system, please contact the after-sales personnel, private disassembly is prohibited.

If you find that the internal copper wire of the conductive wire is exposed, it is forbidden to touch it, high voltage is dangerous, please contact the after-sales personnel, privately disassembled is forbidden.

If other emergencies occur, please contact the after-sales personnel at the first time to operate under the guidance of the after-sales personnel, or wait for the after-sales personnel on-site operation.

### 5.1 System maintenance

(1) The system needs to be recharged every 6 months from the factory.

(2) When the device is not used for a long period of time, it is necessary to charge the battery to between 45% and 55% of its capacity and disconnect the battery output to avoid discharging the battery.

(3) During the storage period of the system, the system should

be inspected periodically by a professional to check whether the wiring is loose or detached, or to clean the surface and the interior of the system; if any defects are found, please contact the dealer promptly.

## 5.2 Troubleshooting

Fault type	Cause of fault	Solutions
Battery cannot be turned on	Battery voltage is too low.	Please contact the after-sales service for battery maintenance, do not blind charge by yourself;
	The control box circuit breaker is not closed.	Close the circuit breaker;
	Button press time is too short.	Press the button for 3s or more;
	Power button disabled.	Replace the button;
Discharge time was too short	Battery power is low.	Maintaining a higher state of charge, which means a higher SOC of the battery system;
	Equipment overload.	Check load status and remove non-critical loads;
	Capacity loss due to battery aging.	Confirm the SOH status, and if abnormal, contact the after-sales service;
	Outside the specified	No treatment is required and the



	environmental range, the system derates by itself.	system recovers on its own when the environment is restored;
Unable to charge or discharge	Internal fault	Please contact the after-sales service, please do not disassemble the device by yourself;
	Battery Feedback Charge/Discharge Protection Fault	Identify the corresponding cause of the malfunction in conjunction with the Battery Indicator Function Status table;
	Battery overdischarge to SOC protection value	Charge the battery to restore it after the PCS modifies the lower limit value of the SOC;
	Battery overheating	Wait for the system temperature to return to the normal range;
	Communication with BMU	Check whether the connection of battery communication harnesses is reliable then restart the system;
Communications anomaly	Communication with PCS	1. Check whether the PIN pin wiring is correct; 2. check whether the BMS protocol parameters are correct;




		<p>3. check whether the PCS battery option setting is correct;</p> <p>4. Check whether the CAN bus matching resistance is appropriate;</p>
Insulation Abnormal	Enablement configuration is not reasonable	<p>1. Confirm whether the PCS has insulation detection and reasonably configure the BMS enabling parameters;</p> <p>2. Confirm whether it is a multi-cluster parallel cabinets, and the insulation detection cannot be fully enabled when the multi-cluster parallel cabinet is in use;</p>
Red LED light	Startup failure	Check whether the pre-discharge logic and PCS capacitor are reasonable, please contact our after-sales service for details;
	Power-up failure	Check whether the system parameters are consistent with the application scenario requirements;
	Other	According to the fault

		message (function code) displayed on the PCS side, check the PCS function fault table to find out the corresponding fault cause;
Enclosure electrocution	System is not effectively grounded	Connect the system grounding terminal effectively and reliably to each ground protection point as required by the installation manual;
Inverter does not start	Battery voltage too low or SOC below shutdown protection value	After starting the inverter through the grid, charge the battery;
Batteries cannot be charged from the grid	There is no "Grid Charging Allowed" selected in the Battery Setting screen or "Grid Charging Allowed" in the Time of Use setting screen.	1. Check whether the Grid Charge of Battery Setting is enabled in the LCD screen of PCS; 2. Check whether the Grid Charge of Time of Use in System Work Mode on the LCD screen of PCS is enabled;
	Battery protection against faults	If the error light is on, please contact the after-sales staff to deal with it, do not

		disassemble it by yourself;
	Grid abnormality	Check whether the grid voltage is normal;

## 6 Transportation and storage requirements

### 6.1 Transportation Requirements

 Hazard
Prohibit rough loading and unloading, violent vibration, shock or extrusion, prevent sunlight and rain, otherwise it may lead to short-circuit, damage (liquid leakage, rupture, etc.), fire or explosion of the battery.
 Warning
Make sure the equipment is balanced during handling and avoid dropping it.
Do not handle the battery through its terminals, bolts or cables to avoid damage to the battery.
When handling, carry the battery in the required direction, and prohibit inverting, tilting, dropping, mechanical impact, rain, snow and falling into water.
 Attention
Batteries are certified to UN38.3 and this product is classified as a Class IX hazardous material.
Comply with the international rules for the transportation of dangerous goods and meet the regulatory requirements of the transport regulatory authorities of the country of origin, route and destination of the transportation.
Transportation should be by sea or by road in good condition, railroads and air freight are not supported. Bumps and inclines should also be minimized during transport.
Before transportation, you must check that the packaging

of the battery is complete and undamaged, and that there is no odor, leakage, smoke, fire, etc. Otherwise, transportation is prohibited.

When handling the battery, hold it gently and put it down, do not bump the battery, and pay attention to personal safety.

The transportation packing box must be firm, and care should be taken during loading and unloading and transportation to put it down carefully and gently and take good moisture-proof measures.

#### Prerequisites

Carrying heavy loads must be balanced and smooth; moving speed should be even and low; positioning requirements are smooth and slow, to avoid any impact or fall, such as scratching the surface of the equipment or damage to the equipment components and cables.

When carrying heavy loads, special care should be taken on workbenches, slopes, staircases and areas that are prone to slipping, and when carrying heavy loads over thresholds, ensure that the door is wide enough to allow the equipment to pass through in order to prevent bumping or bruising of fingers.

When using a forklift to move, the forklift must be forked in the center position to prevent tipping over. Before moving, please use the rope to fasten the equipment on the forklift; when moving, it needs to be guarded.

The tilt angle of the cabinet should be in accordance with the requirements shown in the drawings, the tilt angle  $\alpha \leq 15^\circ$  with packaging, and the tilt angle  $\alpha \leq 10^\circ$  after removing the packaging.

When carrying equipment by hand, wear protective gloves, labor insurance shoes and other safety gear to avoid injury.

## 6.2 Storage Requirements

 Warning

The battery should be stored indoors. No direct sunlight or rain, dry and well ventilated, clean surroundings, no large amounts of infrared and other radiation, no organic solvents or corrosive gases, no metal conductive dust, etc., away from heat and fire sources.

If the battery is bulging, deformed, broken or leaking, it shall be scrapped without regard to the storage time.


When storing the battery, it should be placed correctly according to the identification of the packing box, and it is strictly prohibited to place it upside down, sideways, or tilted, and stacked in accordance with the stacking requirements on the outer packaging.

The site must be equipped with fire fighting facilities that meet the requirements, such as fire sand and fire extinguishers.

 Attention

Batteries are recommended to be used in a timely manner. For batteries that have been stored for a long period of time, please carry out a regular replenishment treatment, otherwise the batteries may be damaged.

The ambient air must not contain corrosive or flammable gases and must not be tilted or stored upside down.

 Prerequisites

During storage, relevant proof of compliance with product storage requirements, such as temperature and humidity log data, photos of the storage environment, and inspection reports, need to be kept.

Store in a clean, dry place and protect from dust and moisture. Do not expose to rain or ground water.

Storage Environmental Requirements:  
 Recommended storage temperature: 20°C to 30°C.  
 Relative humidity: 5% RH to 80% RH.  
 Dry, ventilated and clean. Avoid contact with corrosive

organic solvents, gases and other substances.

Avoid direct sunlight. The distance from the heat source should not be less than two meters.

Battery maintenance is required at a maximum interval of 6 months from the date of shipment from the manufacturer; the requirements for the replenishment interval after battery discharge are as follows:

Ambient temperature (30,40]°C should be recharged within 15 days; ambient temperature  $\leq 30^{\circ}\text{C}$  should be recharged within 30 days.

45% to 55% SOC is recommended for the storage charge state.

## Appendices

System technical specifications						
Battery Module Parameters						
Module type	B051100S02					
Module Rated Voltage (V)	51.2					
Module energy (kWh)	5.12					
Module size (W*D*H, unit: mm)	443*410*135					
Module weight (kg)	45					
System parameters I						
System Model	CIESS 25-R-S	CIESS 30-R-S	CIESS 35-R-S	CIESS 40-R-S	CIESS 45-R-S	CIESS 50-R-S
Battery Pack Quantity	5	6	7	8	9	10
Rated voltage (V)	256	307.2	358.4	409.6	460.8	512
Min. voltage	224	268.8	313.6	358.4	403.2	448
Max. voltage	284	340.8	397.6	454.4	511.2	568
Voltage range (V)	224-284	268.8-340.8	313.6-397.6	358.4-454.4	403.2-511.2	448-568
Rated energy (kWh)	25	30	35	40	45	50
Usable energy (kWh)	22.5	27	31.5	36	40.5	45
Maximum charge/discharge current (A)	100/100	100/100	100/100	100/100	100/100	100/100
Weight (kg)	248	294	340	386	432	478
Dimension(W*D*H,unit:m m)	480*410*1040	480*410*1210	1180*410*700	1180*410*870	1180*410*870	1180*410*1040
Cycle life	6000 cycles (25°C, 0.5C/0.5C, 90% DOD, 70% EOL)					
Communication	CAN/RS485/WiFi/ETH					
Expandability	Support three systems in parallel					
Shell protection grade	IP20					
Cooling	Natural Cooling					
Ambient Temperature Requirements	Charging:0-50°C;Discharging:-20-50°C					
Humidity requirements	10%~95%RH					
Altitudes	< 2000m					
Short-circuit protection	Yes					
Over-current protection	Yes					
Overcharge protection	Yes					
Overdischarge protection	Yes					
Overvoltage protection	Yes					
Low voltage protection	Yes					
Overtemperature protection	Yes					
certificates	UN38.3/CE/IEC62619					



System parameters II						
System Model	CIESS 55 R-S	CIESS 60 R-S	CIESS 65 R-S	CIESS 70 R-S	CIESS 75 R-S	CIESS 80 R-S
Battery Pack Quantity	11	12	13	14	15	16
Rated voltage (V)	563.2	614.4	665.6	716.8	768	819.2
Min. voltage	492.8	537.6	582.4	627.2	672	716.8
Max. voltage	624.8	681.6	738.4	795.2	852	908.8
Voltage range (V)	492.8-624.8	537.6-681.6	582.4-738.4	627.2-795.2	672-852	716.8-908.8
Rated energy (kWh)	55	60	65	70	75	80
Usable energy (kWh)	49.5	54	58.5	63	67.5	72
Maximum charge/discharge current (A)	100/100	100/100	100/100	100/100	100/100	100/100
Weight (kg)	524	570	616	662	708	754
Dimension(W*D*H,unit: mm)	1180*410*1040	1180*410*1210	1880*410*870	1880*410*870	1880*410*1040	1880*410*1040
Cycle life	6000 cycles (25°C, 0.5C/0.5C, 90% DOD, 70% EOL)					
Communication	CAN/RS485/WiFi/ETH					
Expandability	Support three systems in parallel					
Shell protection grade	IP20					
Cooling	Natural Cooling					
Ambient Temperature Requirements	Charging:0-50°C;Discharging:-20-50°C					
Humidity requirements	10%~95%RH					
Altitudes	< 2000m					
Short-circuit protection	Yes					
Over-current protection	Yes					
Overcharge protection	Yes					
Overdischarge protection	Yes					
Overvoltage protection	Yes					
Low voltage protection	Yes					
Overtemperature protection	Yes					
certificates	UN38.3/CE/IEC62619					

# **SUNWODA** ENERGY

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