BSB-ESS-51.2V-280Ah-HV-Luxury
Manual

Document version 01
Release date 2025-11-22

Important safety instructions

Please keep this manual for future use

This manual includes all the safety, installation, and operation instructions for this product. Please read all instructions and precautions in the manual very carefully before installation to use.

- Do not place this product within the reach of children.
- Do not install this product in hostile environments such as wet, greasy, flammable and explosive or heavily dusty areas.
- Utility service input and AC output are high voltage, do not touch the junction.
- The shell of the product is hot when it is working, do not touch it.
- Please do not open the terminal protection cover when the equipment is working.
- It is recommended that a suitable fuse or circuit breaker be installed on the exterior of this product.
- After installation, check that all wiring connections are tight to avoid dangerous heat build-up due to false connections.
- The battery energy storage system can only be installed and operated in an enclosed space. The working environment temperature range is -20℃~ 55℃ (Discharge-20℃-55℃ ; Charge：0℃-55℃) , and the maximum humidity is 85%. The battery module shall not be exposed to the sun or placed directly beside the heat source.
- The battery module shall not be exposed to a corrosive environment.
- When installing the battery energy storage system, ensure that it stands on a sufficiently dry and flat surface with sufficient bearing capacity.
- The battery energy storage system must be installed in a fireproof room. This room must have no fire source and must be equipped with an independent fire alarm device, which complies with local applicable regulations and standards. According to local applicable regulations and standards, the room must be separated by the T60 fire door. Similar fire-proof requirements apply to other openings in the room (such as windows).
- Compliance with the specifications in this manual is also part of proper use.

The product is prohibited to be used in below situation:

(1) Used in medical devices.

(2) Mobile use on land or in the air.

(3) Used as a UPS system.

Contents

1.Basic information ---- 1
1.1 Validity ---- 1
1.2 Safety ---- 1
1.3 Target group ---- 1
1.4 Battery Module Introduction ---- 2
1.5 High Voltage Box Introduction ---- 3
1.6 Tool meter preparation ---- 4
1.7 Do not handle or move after assembling to avoid tipping over ---- 4
1.8 Accessories list ---- 5
1.9 Battery pack parameters ---- 6

2.Rack installation ---- 7
2.1 Notice ---- 7
2.2 Installation steps ---- 7
2.3 System power-on ---- 9
2.4 Assembly drawing ---- 10
2.5 Assembly drawing ---- 11
2.6 Inspection after installation ---- 12

3.Battery cluster connected to inverter ---- 14
3.1 Single battery cluster connected to inverter ---- 14
3.2 Two battery clusters connected to the inverter ---- 15

4.Communication inrerface description ---- 16

5.Inverter connect to battery cluster ---- 17

6.System Operations ---- 17
6.1 Power on steps ---- 17
6.2 Shutdown steps ---- 17

1.Basic information

1.1 Validity

This document is used for quick start-up of the lES Battery: BSB-ESS-51.2V-280Ah-HV-Luxury The information in this user manual is subject to change due to product updates or other reasons. We reserve the right to explain the details of the change.

1.2 Safety

The battery is a high voltage DC system, and it must be operated by authorized person. Read all safety instructions carefully before operating any work and observe them at all times when working on the system.

Incorrect operation or work may cause:

- Injury or death to the operator or a third party;
- Damage to the system hardware and other properties

Note before installation

- Check the battery to see if it has an intact appearance, complete contents, and the correct model.
- Use insulating tools and wear personal protective equipment (PPE) when operating the equipment.
- Follow the installation, operation, and configuration instructions. The manufacturer shall not be liable for equipment damage or personal injury if you do not follow the instructions.

Note in installation and maintenance

- The DC cables connected to the system may be live. Touching non-insulation live DC cables parts may result in death or serious injury due to electric shock.
- Disconnect the battery from a voltage source and make sure it can not be reconnected before checking on the battery.
- Do not remove any power cable on load(in charging or discharging status).
- Wear suitable personal protective equipment for all work on the system.

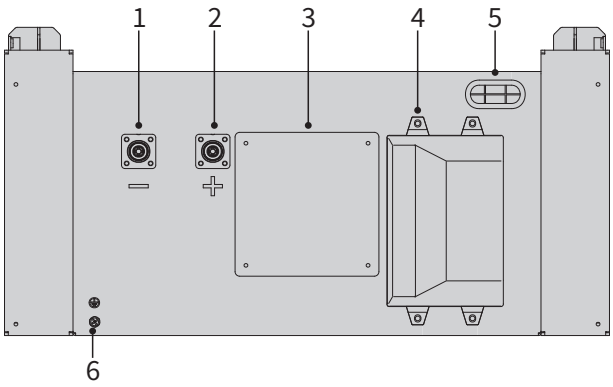
Check before Power On

- The equipment is installed in a clean and flat place that is well-ventilated and easy to operate
- Ensure that the PE cable, the battery power copper bar, the inverter power cable, the communication cable, and the AC cable are connected correctly and securely.
- Cable ties are intact, and routed properly and evenly.

1.3 Target group

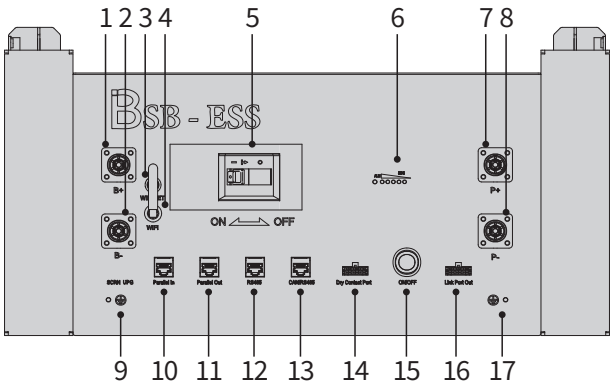
- Instructions in this document can only be performed by qualified persons who must have the following knowledge and skills.
- Knowledge of basic electrical systems and safety requirements.
- Knowledge of lithium batteries work and PCS.
- Knowledge of following local connection requirements and safety regulations.
- Knowledge and skills in the installation and commissioning of Solar or battery energy storage system.

1.4 Battery Module Introduction



serial number	symbol	defined declaration
1	B-	Negative
2	B+	Positive
3	/	FAN
4	/	BMU
5	/	Samping line outlet
6	⏚	Ground

1.5 High Voltage Box Introduction



serial number	symbol	defined declaration
1	B+	Positive
2	B-	Negative
3	/	WIFI RESET
4	/	WIFI
5	/	DC CIRCUIT BREAKER
6	/	SOC LED
7	P+	Output positive
8	P-	Output negative
9	⏚	Ground
10	Parallel In	Parallel operation Input
11	Parallel Out	Parallel operation Output
12	RS485	RJ45 Debug Port
13	CAN/RS485	Inverter connetion
14	Dry Contact Port	Dry Contact Port
15	ON/OFF	Power key
16	Link Port Out	PACK Communication
17	⏚	Ground

1.6 Tool meter preparation

Use insulation tools to separate signal lines from strong current or high voltage lines to avoid electric shock. The recommended list of tools to prepare before installation is as below:

・Installation tool list

Photo	Name	Photo	Name
	Impact drill		Torque socket wrench
	Torque wrench		Diagonal plier
	Crimping plier		Wire stripper
	Torque screwdriver		Multimeter
	Cable tie		Insulating tape
	Herringbone ladder		Rubber hammer

・Personal protective equipment list

Photo	Name	Photo	Name
	Safety gloves		Safety shoes
	Protective goggles		Dust mask

・Mechanical equipment list

Photo	Name	Photo	Name
	Electric forklift	1 unit	Load-bearing 3T
	Manual forklift	1 unit	Load-bearing 2T

1.7 Do not handle or move after assembling to avoid tipping over

Note

- To avoid turnover, fix the racked box to the forklift with a rope before moving.
- Move the rack carefully, as any impact or drop may cause damage to the rack. Once the box is placed, carefully remove the packaging to avoid scratching the rack. Keep the rack stable during the disassembly and assembly.
- If the rack installation environment is poor and long-term storage is required after unpacking, please take dust-proof measures.
- Ship the battery modules separately.
- Do not handle or move after assembly to avoid tipping over
- ESENER does not assume any warranty or replacement responsibility for product damage caused by improper transportation or human factors.

Operating steps

- Use a forklift to transport the rack, battery box, and related accessories to the specified location.
- Check whether the appearance and packaging of the rack, battery box, and related accessories are intact.
- Remove the outer packaging.
- Check whether the rack, battery box, and related accessories are intact.
- After confirming the rack is intact, move it to the specified location.

1.8 Accessories list

Name	Specifications	Number
Screw	M5*12 mm	2 pcs
Power line	EVW 35mm² L=120mm Black	1 pcs
Power line	EVW 35mm² L=1850mm Orange	1 pcs
Power line	EVW 35mm² L=850mm Orange	3 pcs
Power line	EVW 35mm² L=2.5m Black	1 pcs
Power line	EVW 35mm² L=2.5m Orange	1 pcs
Communication cable 1	6Px2-800mm-6Px2-2.2S-1.0	3 pcs
Communication cable 2	Peicheng-6Px2-400mm-6Px2-2.2S-1.0	1 pcs
Ground bar connection wire	RV 4mm² Yellow / Green L=600mm RNB5.5-6	3 pcs
Yellow-green line	RV 4mm² Yellow / Green L=2500mm RNB5.5-6	1 pcs
Reticle	Inverter communication line L=2.5m Gray	1 pcs
Desiccant	100g	1 pcs
Specification	Customer Instruction Manual	1 pcs

1.9 Battery pack parameters

Model	BSB-ESS-51.2V-280Ah-HV-Luxury	BSB -ESS-51.2V-280Ah-HV-Luxury Assembly
Performance		
Nominal voltage	51.2V	204.8V~768V(4~15 battery pack)
Nominal capacity	14.336kWh	Max 243.712kWh
Cell technology	LFP (LiFePO4)	LFP (LiFePO4)
Charging protection voltage	57.6V	Max 1000V
Discharge protection voltage	46.4V	Min 130V
Operating voltage	46.6V-57.6V	130V-1000V
Standard charging & discharging	≤ 50A	≤ 50A
Maximum continuous charging & discharging	120A	120A
Communication		
Display	SOC status indication, Alarm indication, LED display	
Communication	CAN	
General Specification		
Dimension (W*D*H)	530(W)*834(D)*270(H)mm	2140(W)*834(D)*1125(H)mm
Weight Approximate	≈135kg	≈2060kg
Discharging temperature range	-20~55℃	-20~55℃
Charging temperature range	0~55℃	0~55℃
Storage Temperature	-10～45℃	-10~45℃
Environmental humidity	5%-85%	5%-85%
Protection rating	IP20	IP20
Cycle life	6000 Cycles @ 80% DOD / 25℃/ 0.5C， 70% EOL	
Scalability	Yes	
Application	ON Grid / ON Grid + Backup / OFF grid	
Compatible PCS	CAN: 1:Deye 2:Luxupower 3:Solis 4:PYLON 5:Solax 6:MEGAREVO 7:KOYOE 8:G00DWE 9:AFORE 10:ATESS 11:SOFAR 12:INVT_BD 13:GROWATT	
Standard Compliance		
Certificates	UN38.3/MSDS	

[1] DC Usable Energy, test conditions: 90% DOD, 0.2C charge & discharge at 25°C. System usable energy may vary due to system configuration parameters.

[2] The current is affected by temperature and SOC.

[3] Condition apply.Refer to warranty Letter.

2.Rack installation

2.1 Notice

- Insufficient or no grounding may cause an electric shock. Device malfunctions, and insufficient or no grounding may cause device damage and life-threatening electric shocks.
- Note: Before installing the battery, please turn the manual switch of the high-voltage control box to the off position.
- Remember that this battery is heavy! Please be careful when lilting out from the package.

2.2 Installation steps

Step 1: As shown in the figure 1 &figure 2, install and fix the 4 supporting foot cups to the bottom of the battery pack.

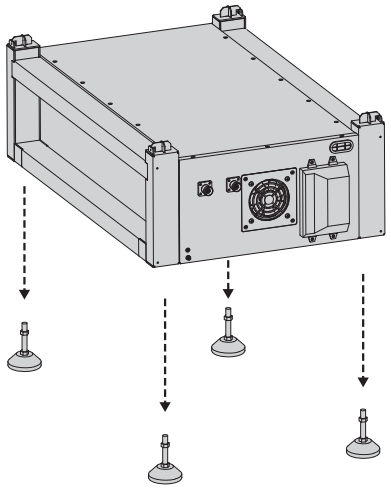


Figure 1

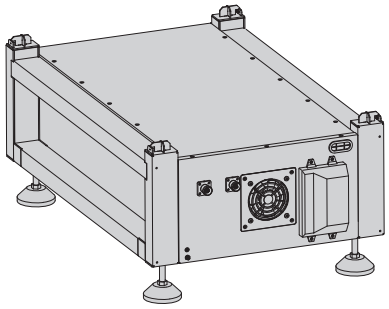


Figure 2

Step 2:As shown in the figure 3 &figure 4, stack the battery pack above the battery pack with the foot cup installed.

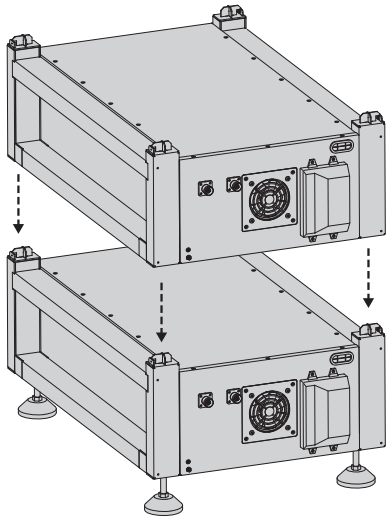


Figure 3

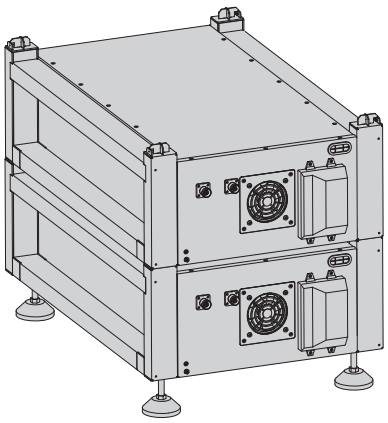


Figure 4

Step 3: As shown in the figure 5 &figure 6, stack them in sequence to four layers.

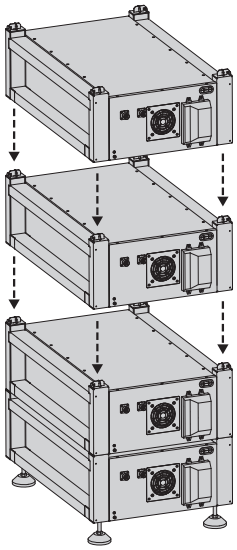


Figure 5

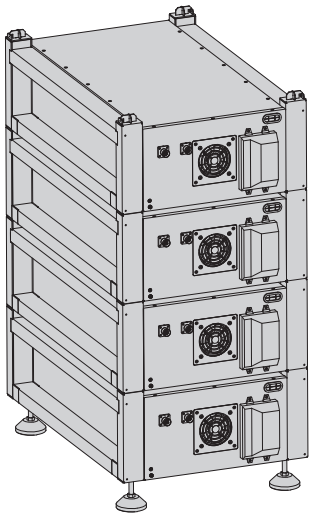


Figure 6

Step 4: As shown in the figure 7 &figure 8, place the stacked four layers side by side in sequence.

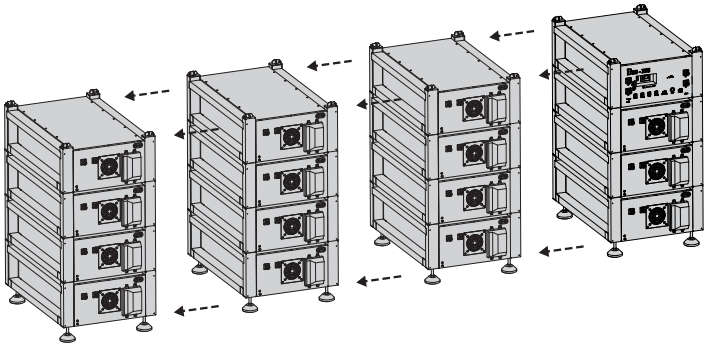


Figure 7

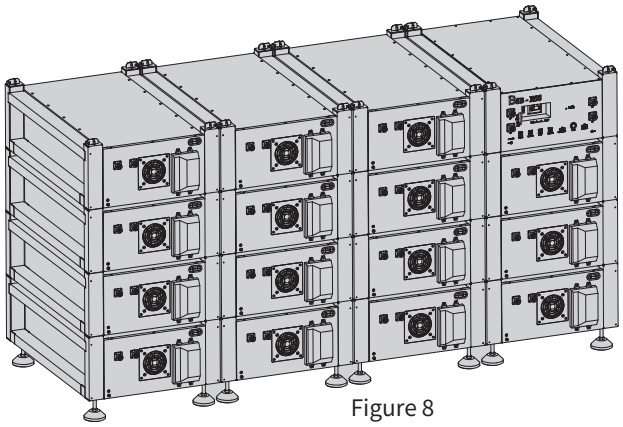


Figure 8

2.3 System power-on

Step 1: Connect the ground wire from high-voltage box to battery packs in numerical order,as shown in Figure 9.

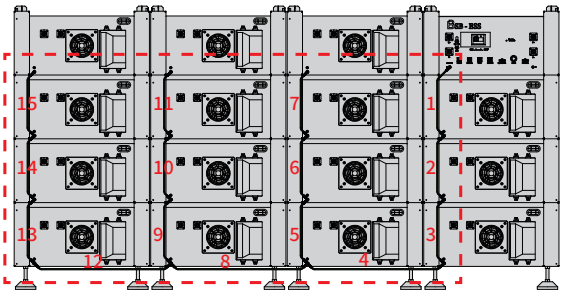


Figure 9

Step 2: Connect the high-voltage box "LINK Port Out" and PACK1 "J3" with the communication cable. Connect the PACK1 "J4" and PACK2"J3"with the communication cable, and then connect the PACK2 "J4" and PACK3 "J3" with communication cable, and so on, as shown in Figure 10.

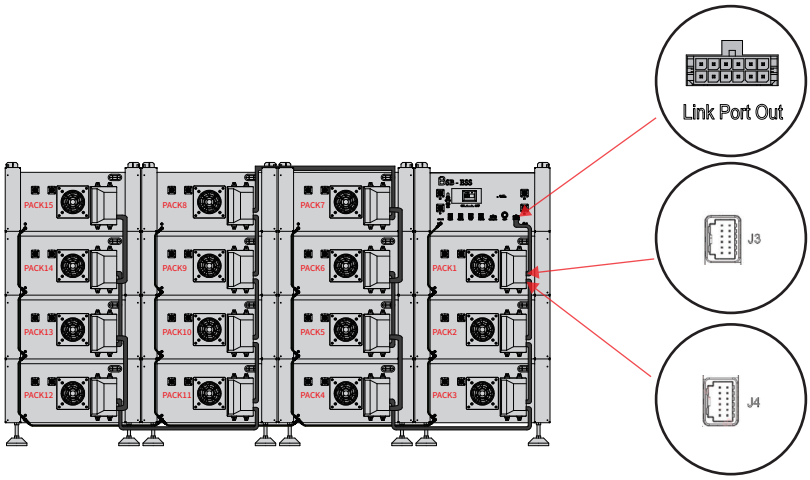


Figure 10

Step 3: Connect the power cables, connecting the high-voltage box B- to the negative terminal of the first battery pack in numerical order. Then, connect the positive terminal of the first battery pack to the negative terminal of the second battery pack, continuing sequentially. Finally, connect the positive terminal of the last battery pack to the high-voltage box B+, as shown in Figure 11.

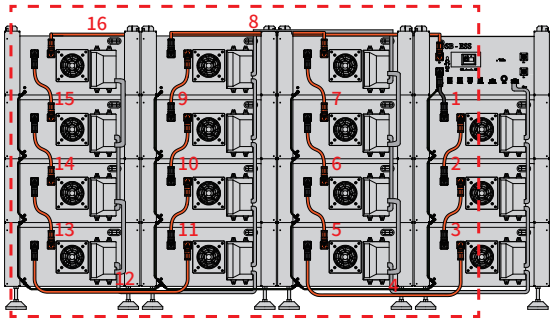


Figure 11

2.4 Assembly drawing

When installing the ground wire, it is recommended to connect it to the mains ground wire for sharing. If not possible, a grounding steel rod can be inserted into the ground at least 1.5 meters or more.

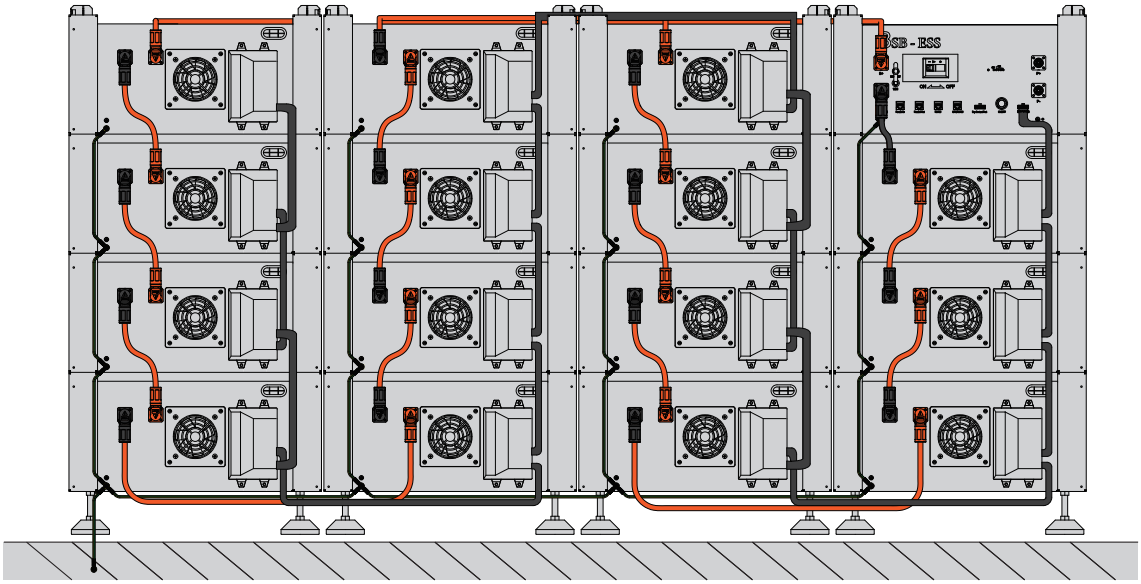


Figure 12

2.5 Assembly drawing

Step 5: As shown in the figure 13 &figure 14, assemblying the top cover on the top layer in sequence.

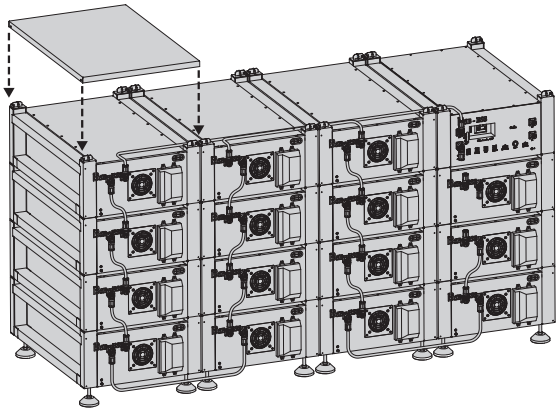


Figure 13

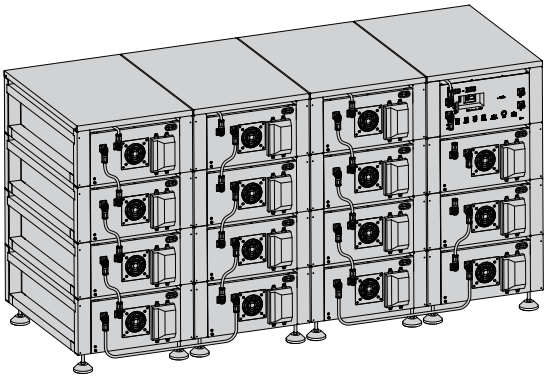


Figure 14

Step 6: As shown in the figure 15 &figure 16, assemblying the decorative cover in front of the battery pack, fixing it with 4*M4 screws, and completing the assembly in sequence.

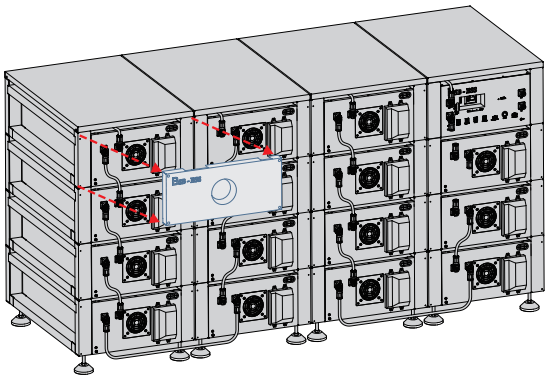


Figure 15

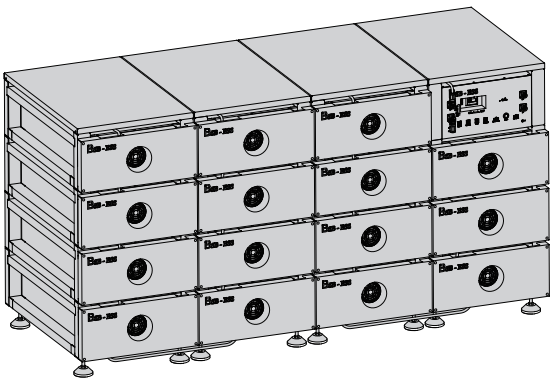


Figure 16

Step 7: As shown in the figure 17, assemble the entire cluster.

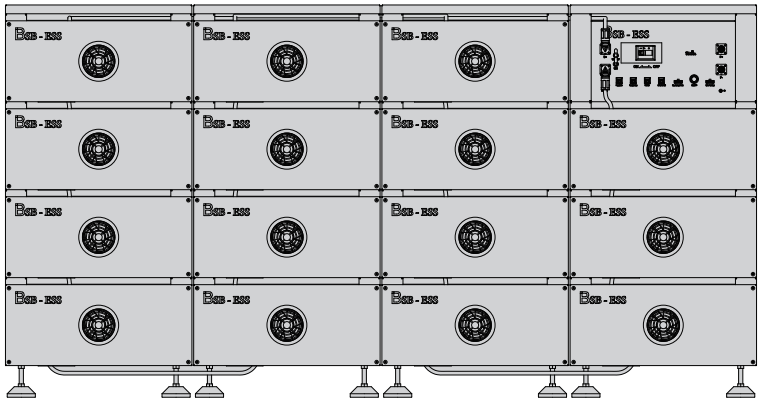


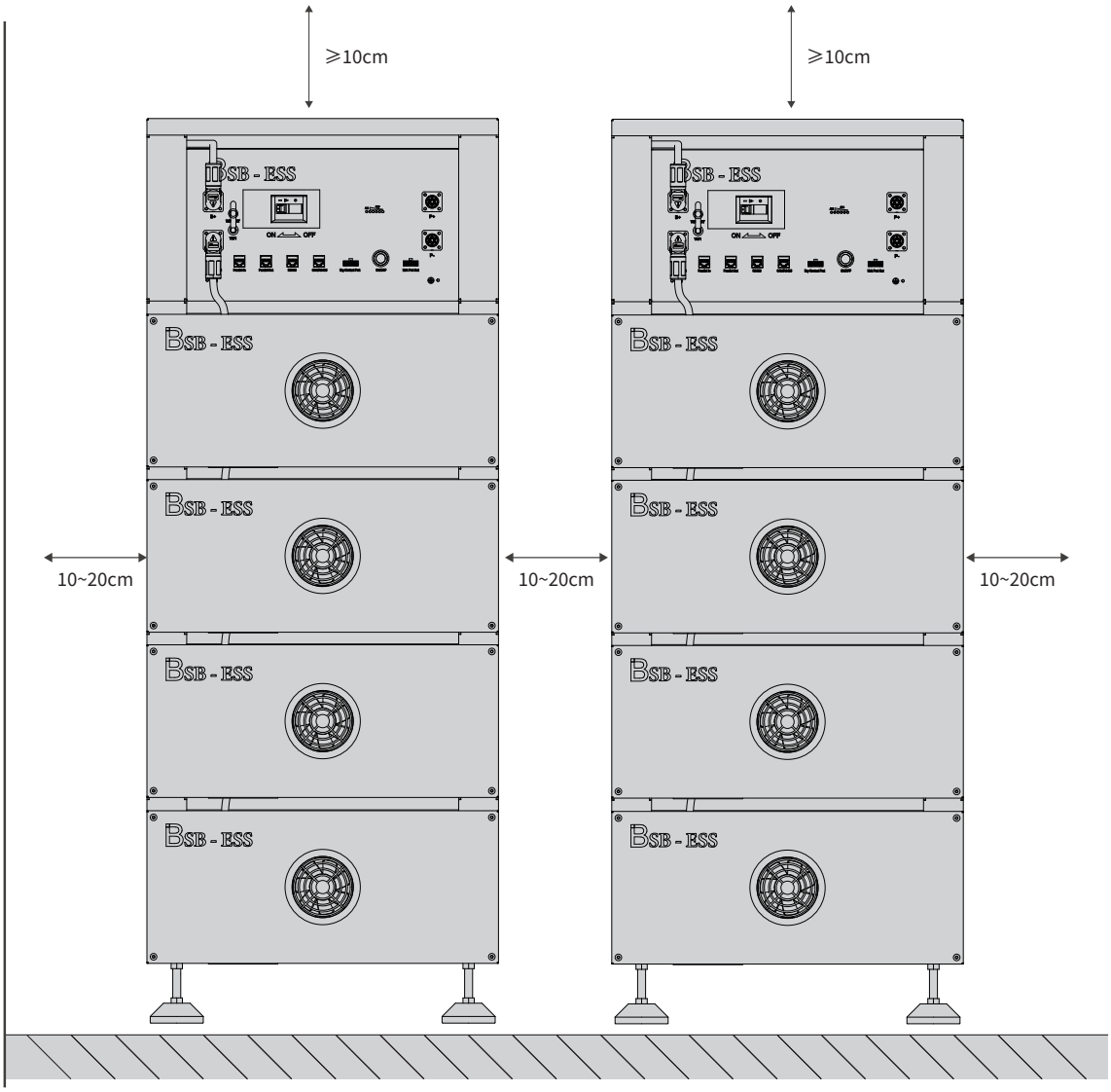
Figure 17

2.6 Inspection after installation

Task	Criteria
1	Stacked installation is firm and will not tip over due to vibration.
2	The cable arrangement is reasonable and meets the user requirements.
3	Both ends of the cable need to be marked. and the markings are simple and easy to understand.
4	The cable tie shall be even, and no sharp corners at the shear.
5	The connecting cables between the batteries are fixed, and the screw fastening needs to ensure that the spring washer is flattened.
6	The resistance between the grounding wire and the grounding rod in the computer room is less than 0.1 Ω.
7	The polarity of the battery cluster and inverter connection ends are correct.

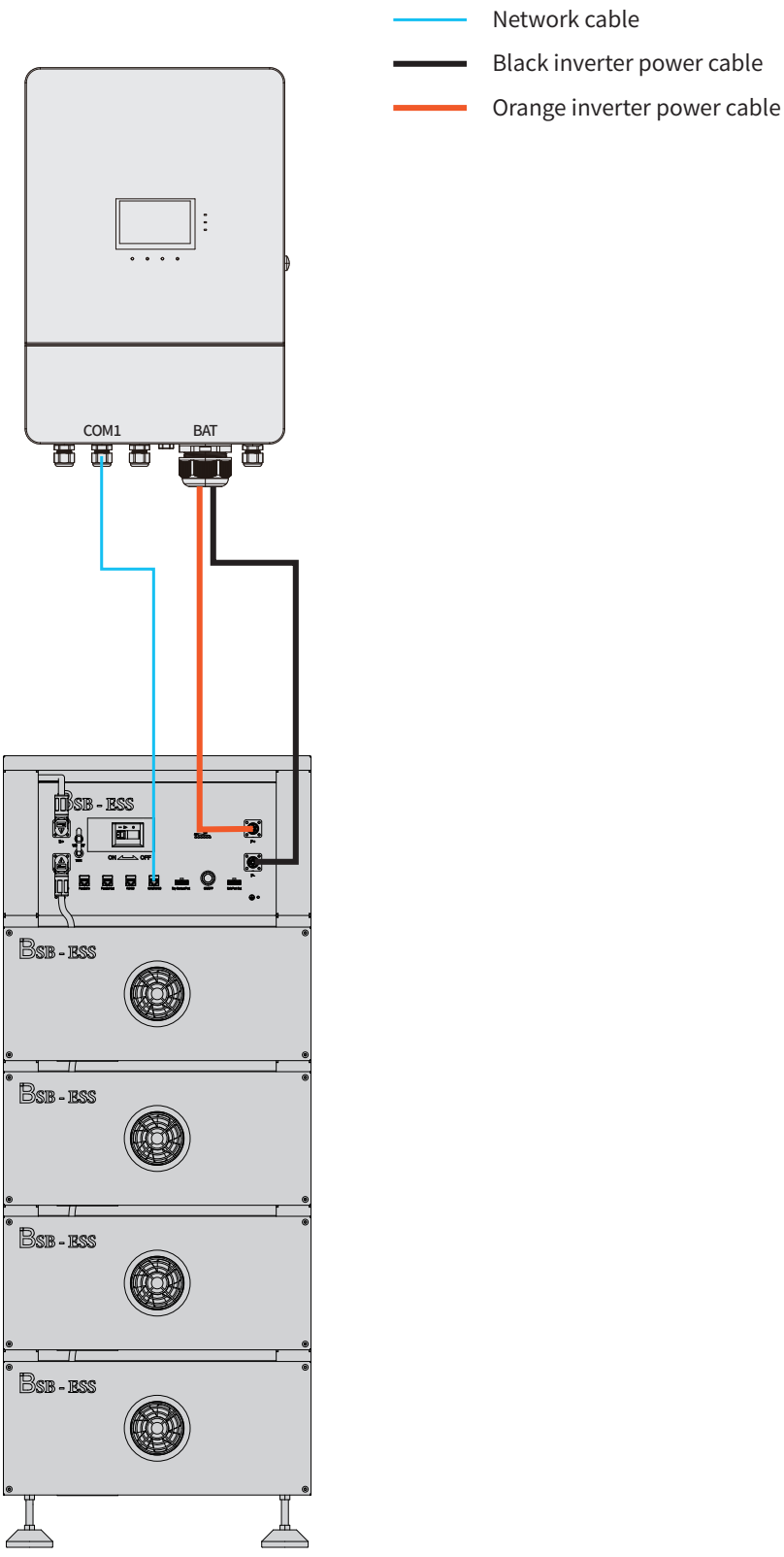
2.7 Minimum product installation distance

The minimum distance to the surrounding building when the battery is installed is 10cm, and the minimum distance between the two products is 10cm.



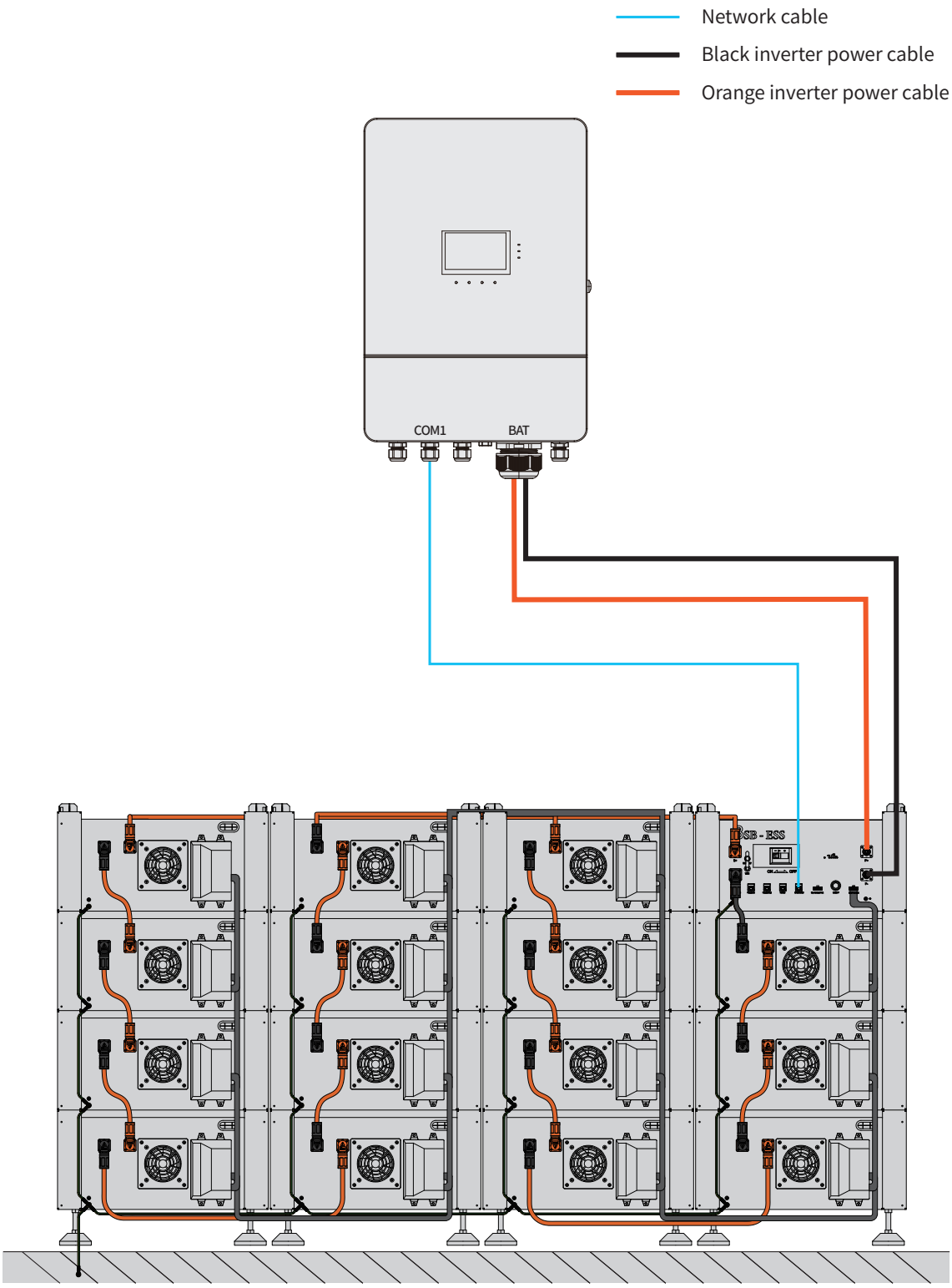
3.Battery cluster connected to inverter

3.1 Single battery cluster connected to inverter

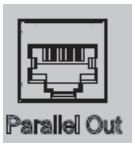
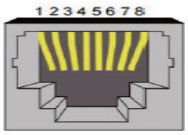


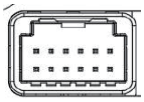
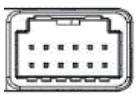
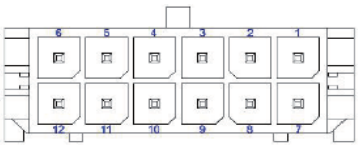
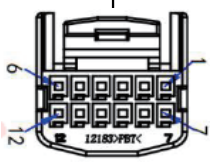
*The single battery cluster minimum Q'ty includes 4 battery modules.

3.2 ESS connected to the inverter



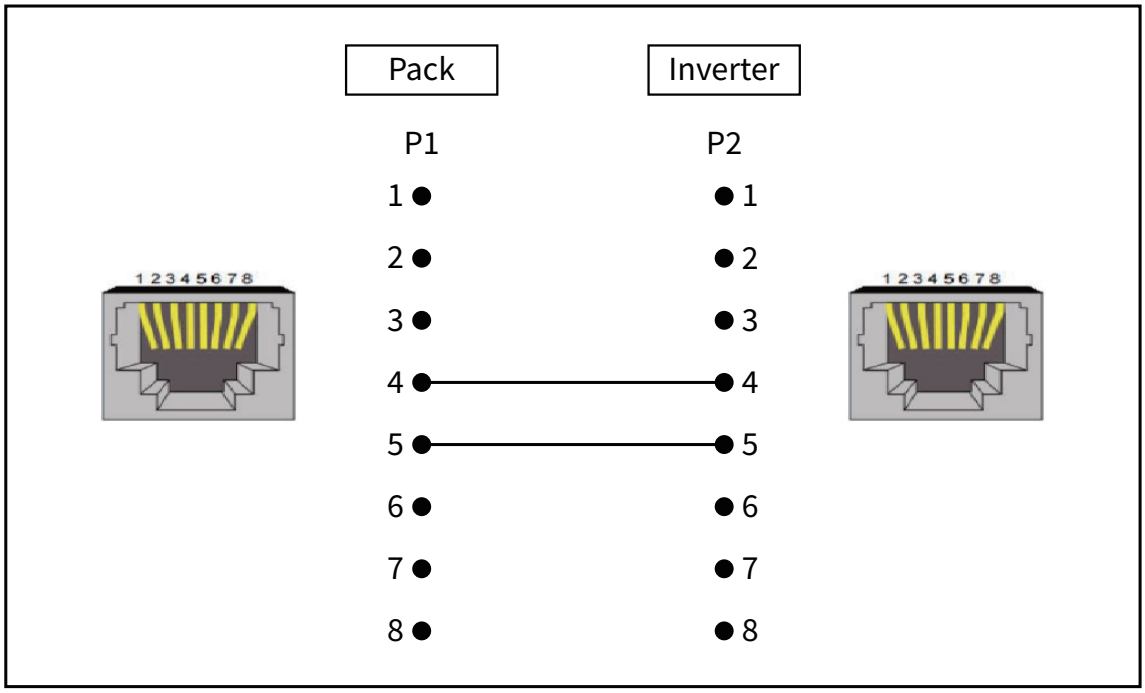
4.Communication interface description

Definition of Pcs communication interface		Upper computer debug		parallel In		parallel OUT	
1	RS485-B3	1	RS485-B1	1	N C	1	N C
2	RS485-A3	2	RS485-A1	2	N C	2	N C
3	GND_A3	3	GND_A1	3	ADDr_IN	3	ADDr_out
4	CAN-H3	4	N C	4	CAN-H2	4	CAN-H2
5	CAN-L3	5	N C	5	CAN-L2	5	CAN-L2
6	GND_A3	6	GND_A1	6	CAN-GND	6	CAN-GND
7	RS485-A3	7	RS485-A1	7	N C	7	N C
8	RS485-B3	8	RS485-B1	8	N C	8	N C
							
							

Definition of BCU communication interface				Definition upper of the BMU interface				Definition lower of the BMU interface			
1	DN-OP	1	DC24V+	1	UP_IN	1	DCIN+	1	DN_OP	1	DCIN+
2	CAN-L1	2	DC24V+	2	CAN_L	2	DCIN+	2	CAN_L	2	DCIN+
3	CAN-H1	3	DC24V+	3	CAN_H	3	NC	3	CAN_H	3	NC
4	PGND	4	DC24V+	4	PGND	4	DCIN-	4	PGND	4	DCIN-
5	VO	5	DC24V+	5	VO	5	DCIN-	5	VO	5	DCIN-
6	N C	6	DC24V+	6	RS485A	6	RS485B	6	RS485A	6	RS485B
											
											

5.Inverter connect to battery cluster

(Can use standard cable)



6.System Operations

6.1 Power on steps

- Toggle the high-voltage box DC CIRCULT BREAKER to "ON".
- Press the POWER KEY of high-voltage box for 5seconds,the POWER KEY lights round 3~5s,and then it extinguishes.
- Wait for about 20S, there is no abnormality in the self-test of the high-voltage box, and the machine will

6.2 Shutdown steps

- Disconnect the external load.
- Press the POWER KEY of high-voltage box round 5s, toggle the DC CIRCUIT BREAKER to "OFF".

Document version 01
Release date 2025-11-22