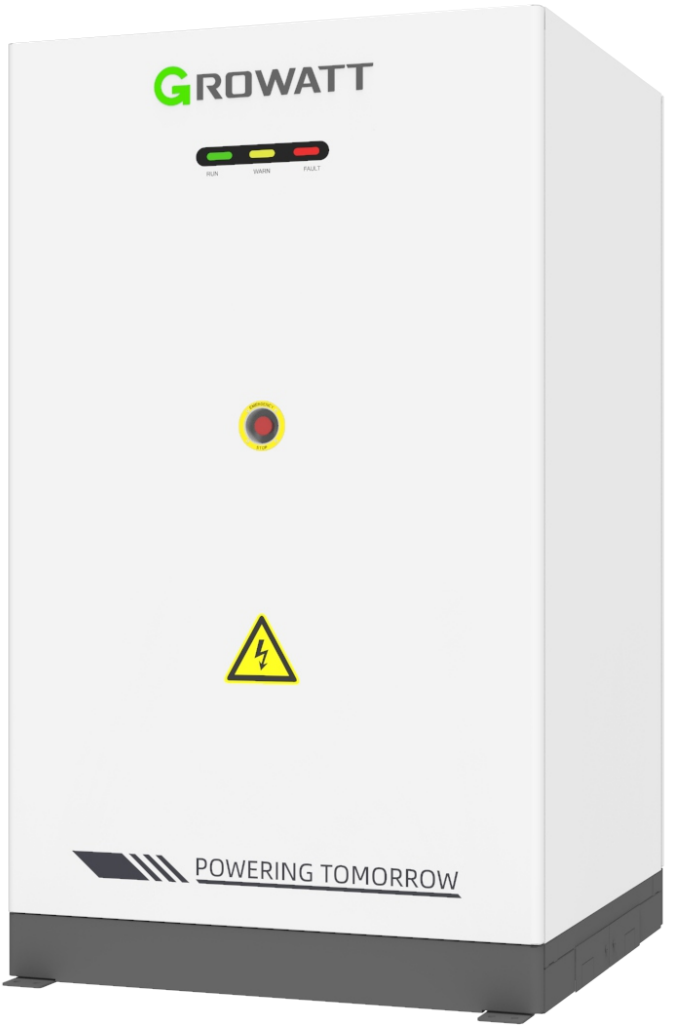
ACE 209H-2H Quick Guide



Shenzhen Growatt New Energy Co., Ltd

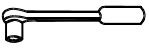
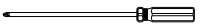
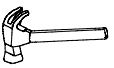
Installation environment

Max.+55℃

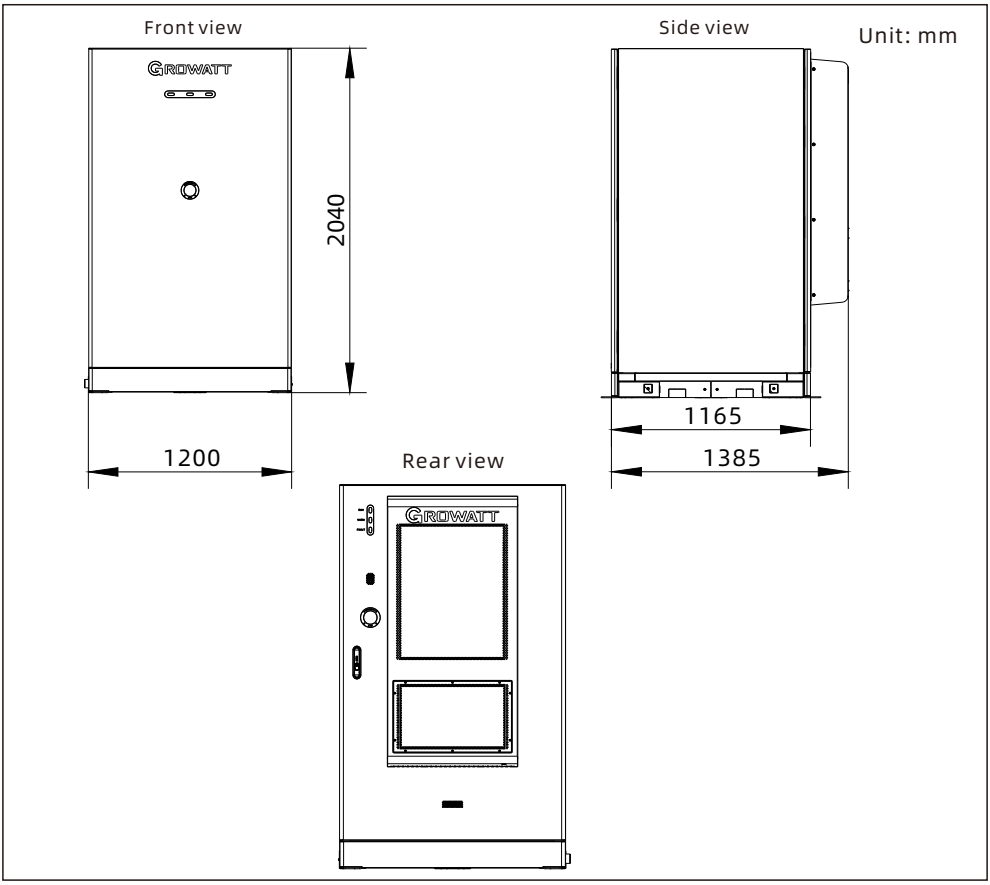
Min.-25℃

RH+5%~+95%

Installation tool

 Socket wrench	 Screwdriver	 Impact drill
Drill bit	 Claw hammer	 Forklift

Appearance & Dimensions



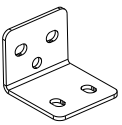
1. Inspection upon delivery

1-1 Check the scope of delivery

No.	Item	Qty	No.	Item	Qty
1	Battery cabinet	1	6	User Manual	1
2	Expansion bolt	8	7	Certificate of Conformity	1
3	RSD protective cover	4	8	Sealing mud	1
4	Anchor bracket	4	9	Desiccant	2
5	Quick Guide	1			

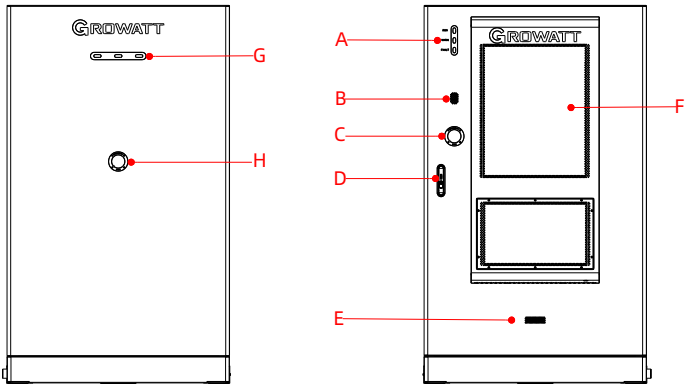
1-2 Check the accessories

List of the installation kit

Anchor bracket and expansion bolt	
	

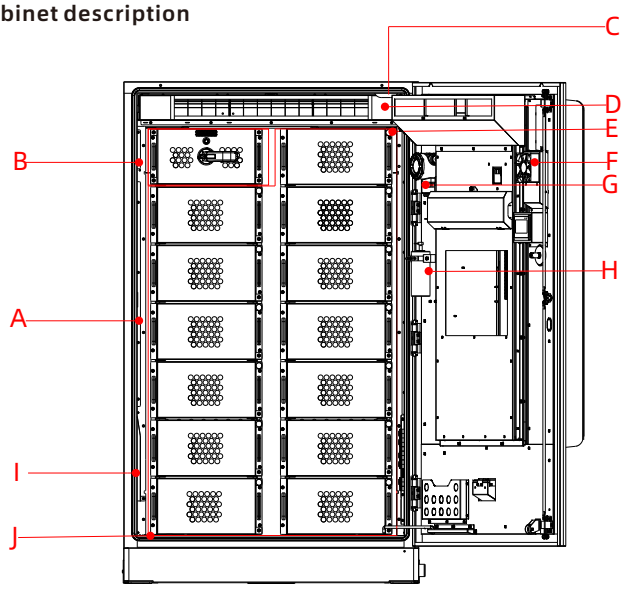
2. Battery cabinet introduction

2-1 Panel description



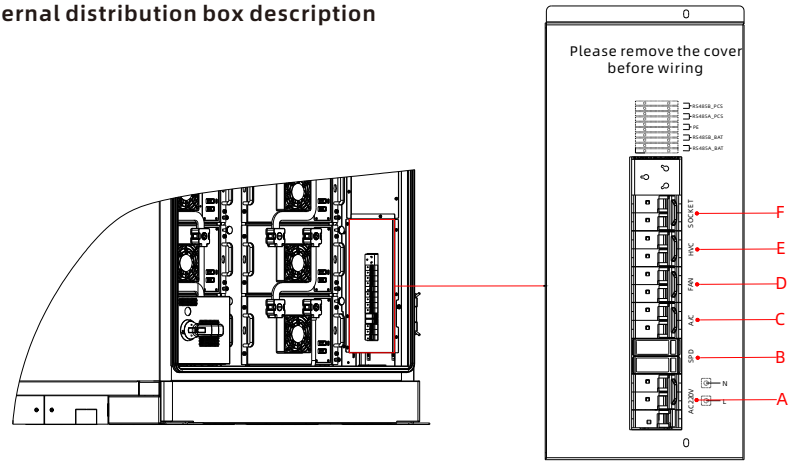
No.	Component	Description
A\G	LED indicator	Indicates the operating status of the energy storage system Green: running normally; yellow: alarm; red: fault
B	Hydrogen exhaust vent	Exhausts hydrogen
C\H	Emergency stop switch	Emergency power off
D	Lock	Safety gear
E	Hydrogen exhaust air inlet	Air inlet
F	Air conditioner	Energy storage system temperature control device

2-2 Intra-cabinet description



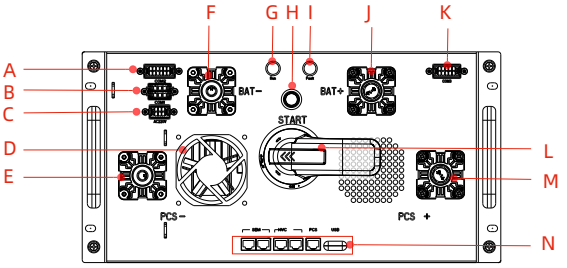
Position	Module	Description	Position	Module	Description
A	Battery PACK	Energy storage device	F	Hydrogen exhaust fan	Used to exhaust combustible gases in the cabinet
B	High voltage box	Battery charge/discharge control device	G	Combustible gas detection sensor	Used to detect combustible gases in the cabinet
C	Smoke sensor	For smoke detection	H	Aerosol	For fire extinguishing
D	Temperature sensor	For temperature detection	I	PCS transfer connector	For connecting the PCS and the high voltage box
E	Access control sensor	Monitor the opening and closing status of the cabinet door	J	Water leak sensor	For water leakage detection

2-3 Internal distribution box description



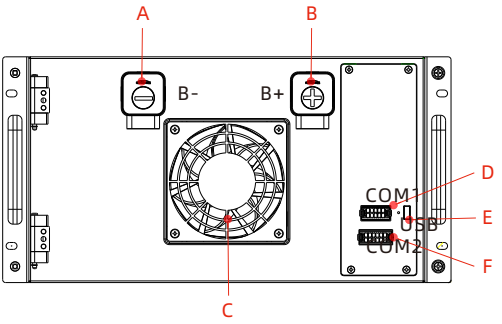
Position	Module	Description	Position	Module	Description
A	AC220V	220V AC power input terminal	D	FAN	Power supply terminals for the fans of the battery cabinet and PACKs
B	SPD	SPD (Surge Protective Device) input control terminal	E	HVC	High voltage box (HVC) power supply input terminal
C	A/C	A/C power supply input terminal	F	SOCKET	SOCKET AC socket (GB) (reserved)

2-4 Internal high voltage box panel description



Position	Module	Description	Position	Module	Description
A	COM2 communication terminal	Connecting to panel indicators, tripping control board and emergency stop switch, etc.	H	Start button	To power on the energy storage system
B	COM1 communication terminal	Connecting to the RS485 communication port and the 24V power supply port of the EM (Environmental Monitor) board.	I	Warning indicator	Raise warnings when exceptions occur in the energy storage system
C	AC power supply port	Auxiliary AC 220V power input	J	BAT+ power terminal	Connecting the positive battery terminal of the battery cluster
D	Cooling fan (optional)	Optional, for heat dissipation inside the high voltage box	K	COM3 communicatio n terminal	Connecting to the communication port of the BM board and the 24V power supply port of the BM
E	PCS- power output terminal	Connecting to the negative battery terminal of the PCS	L	Switch-disconnector	Connect/disconne ct the DC power of the battery cabinet
F	BAT- power terminal	Connecting to the negative terminal of the battery cluster	M	PCS+ power output terminal	Connecting to the positive battery terminal of the PCS
G	Running indicator	Indicates the operating status of the energy storage system	N	CM COM common wiring terminals	Connecting to communication terminals of PCS, SEM

2-5 Internal battery pack panel description

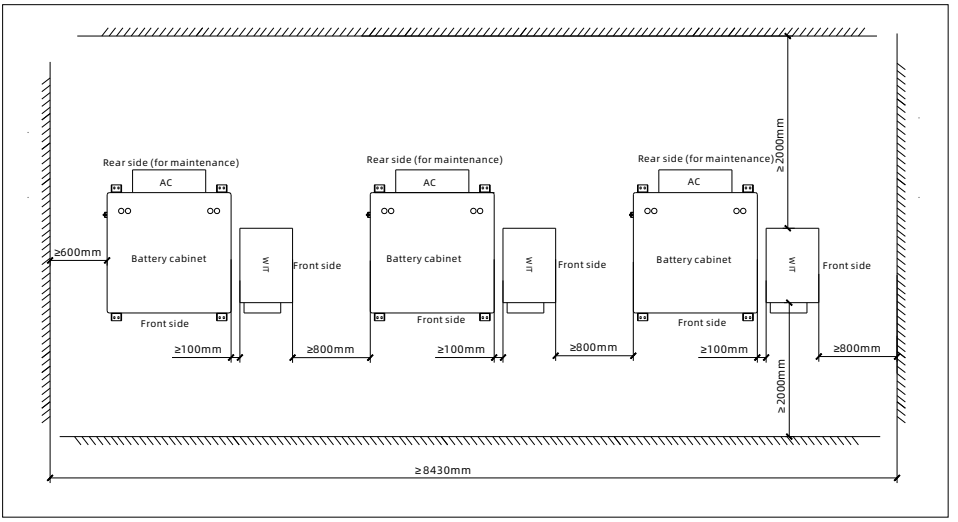


Position	Module	Description	Position	Module	Description
A	Negative battery PACK terminal (black)	Negative battery PACK connector	D	COM1 communication terminal	For communication between battery PACKs, and between the battery PACK and the high voltage box.
B	Positive battery PACK terminal (orange)	Positive battery PACK connector	E	USB port	For BM upgrade with the USB flash drive
C	Cooling Fan	For battery heat dissipation	F	COM2 communication terminal	For communication between battery PACKs, and between the battery PACK and the high voltage box.

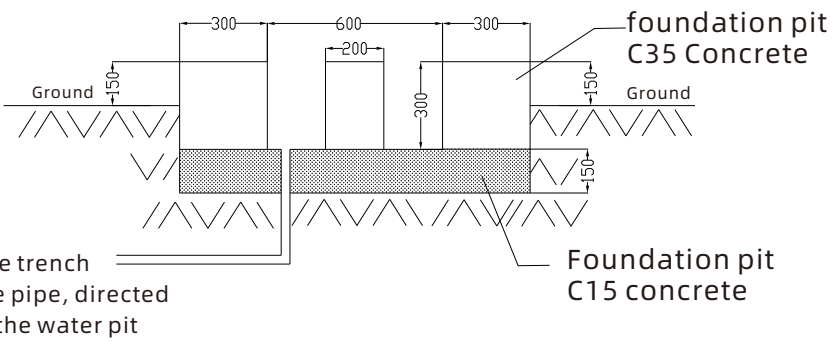
3. Basic installation requirements

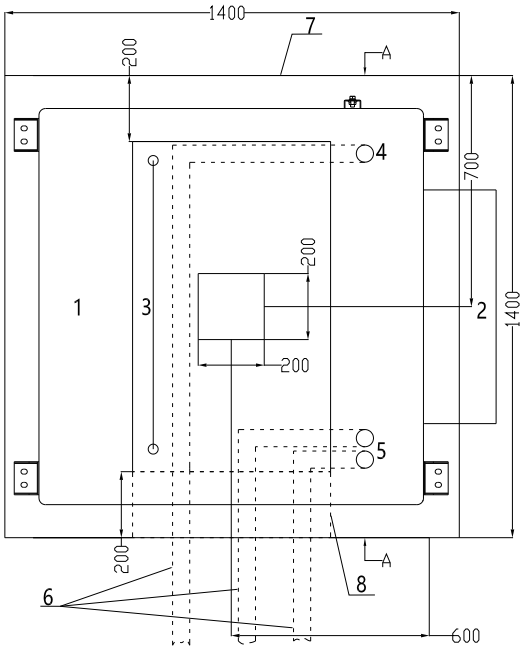
3-1 Safety clearance requirements

Take three cabinets connected in parallel as an example:

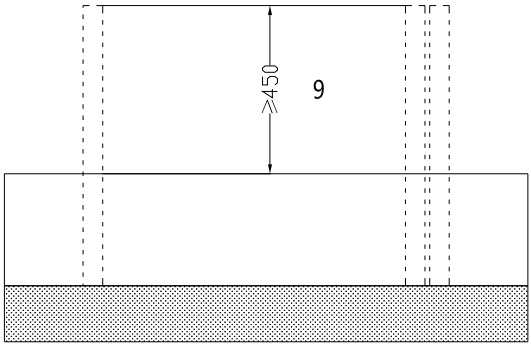


3-2 foundation





A-A



No.	Description	No.	Description
1	Front side of the cabinet	6	Pre-buried the PVC pipe with a diameter of 50 mm
2	Rear side of the cabinet	7	Apply waterproof paint to the entire surface of the foundation, circled with the black/ yellow hazard tape
3	Drainage pipe, diameter: 30 mm	8	Dotted line area, the cable outlet side to be sealed with cement after pre-burying the pipes
4	Auxiliary control circuit cable routing hole	9	For reserving cables with a length of over 450 mm
5	AC input/output cable routing holes		

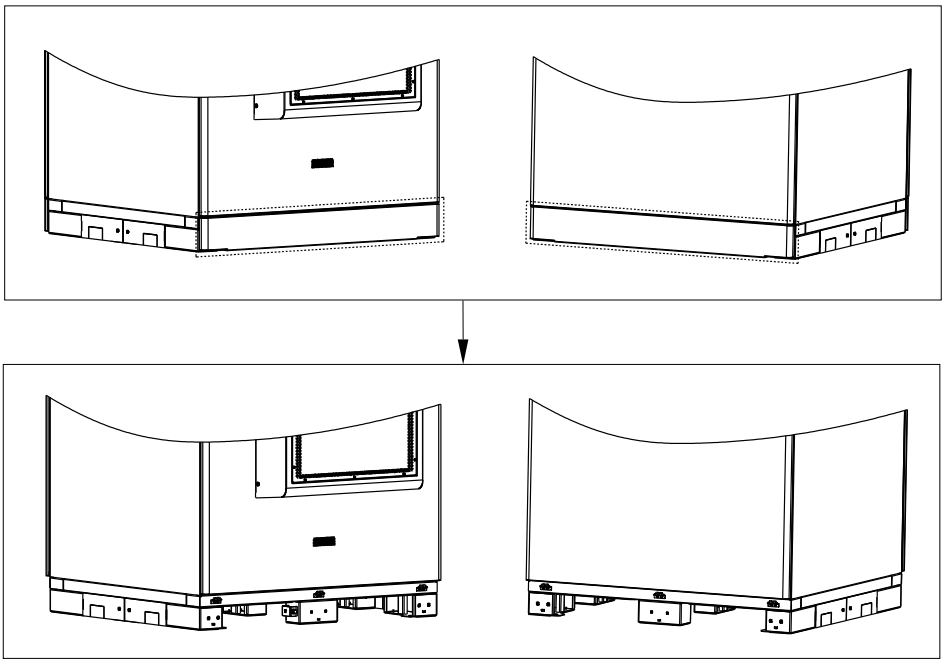
⚠ Note:

- Before the excavation for the proposed foundation is commenced, conduct soil compacting and foundation reinforcement treatment. Regarding site selection, select the highest point to prevent device damage due to standing water.
- The mounting pier should be made of concrete and its load-bearing capacity should not be less than 2000kg/m2.
- Set up the grounding conductor and grounding pole following the conventional grounding network construction of transformer station. The grounding resistance should be less than 4 Ω.
- It is recommended to use the 50 * 4 mm galvanized flat steel bar to form the grounding network. Determine the length based on the on-site conditions.
- Pre-bury the galvanized flat steel bar along the cable trench.
- General detection should be carried out before the foundation construction. Conduct the slope or deep foundation pit support according to the field conditions and geological survey when excavating the foundation to ensure construction safety.
- Refer to the electrical drawings for those unnoted pre-buried elements, grounding and pre-buried pipes. Construct the foundation strictly following the electrical diagrams and related drawings provided by the manufacturer to avoid secondary excavation.
- Ensure that the foundation surface is level using a level. The bottom surface inside the foundation should be slightly sloped for drainage purpose.
- Once the excavation commences, do not pile loads within 5 m of the edge of the pit to avoid landslides.

4. Transportation and installation

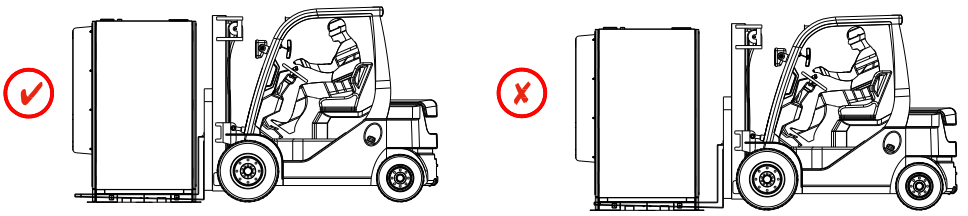
4-1 Remove the decorative panel

Step 1 Remove the decorative panels on the front and rear sides of the base to expose the positions for forklifting. Put away the panels as you need to re-install them upon completion of transportation.



4-2 Transport the battery cabinet with a forklift

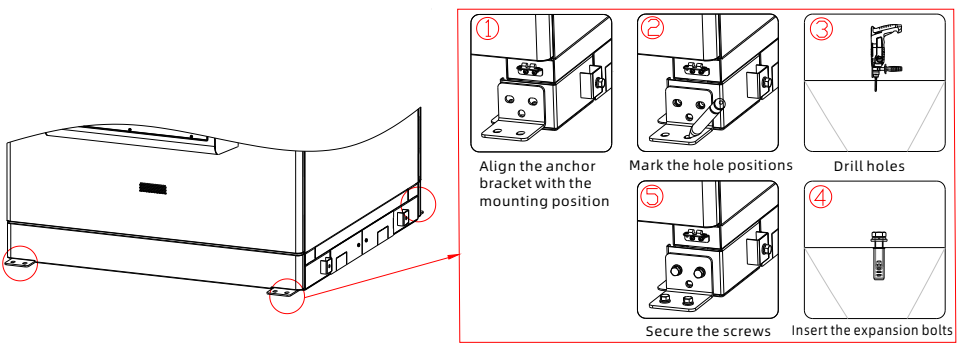
Step 2 When using a forklift to move the equipment, place the forks under the equipment as far as possible to over 95% of the length of the forks.



4-3 Secure the battery cabinet

Step 3 After moving the equipment to the mounting location using a forklift, re-install the decorative panels.

Step 4 In case that the cabinet is unstable, use the leveling plate to level it, then secure it with the anchor brackets.

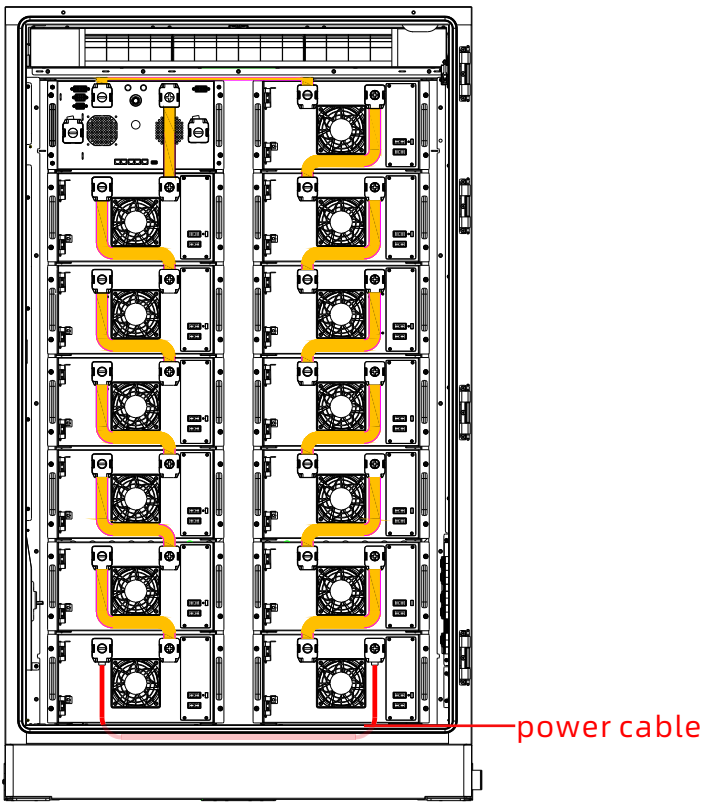


In case that the cabinet is unstable, use the leveling plate to level it.

5. Cable connections

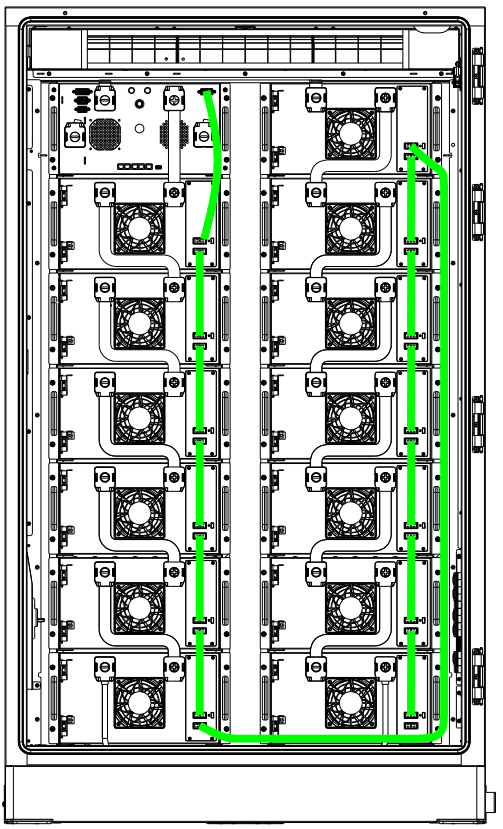
5-1 Install the copper bars and power cables of the battery packs

Step 1 Install the battery pack copper bars and connect the cascading cables between the battery clusters (pre-installed before delivery).



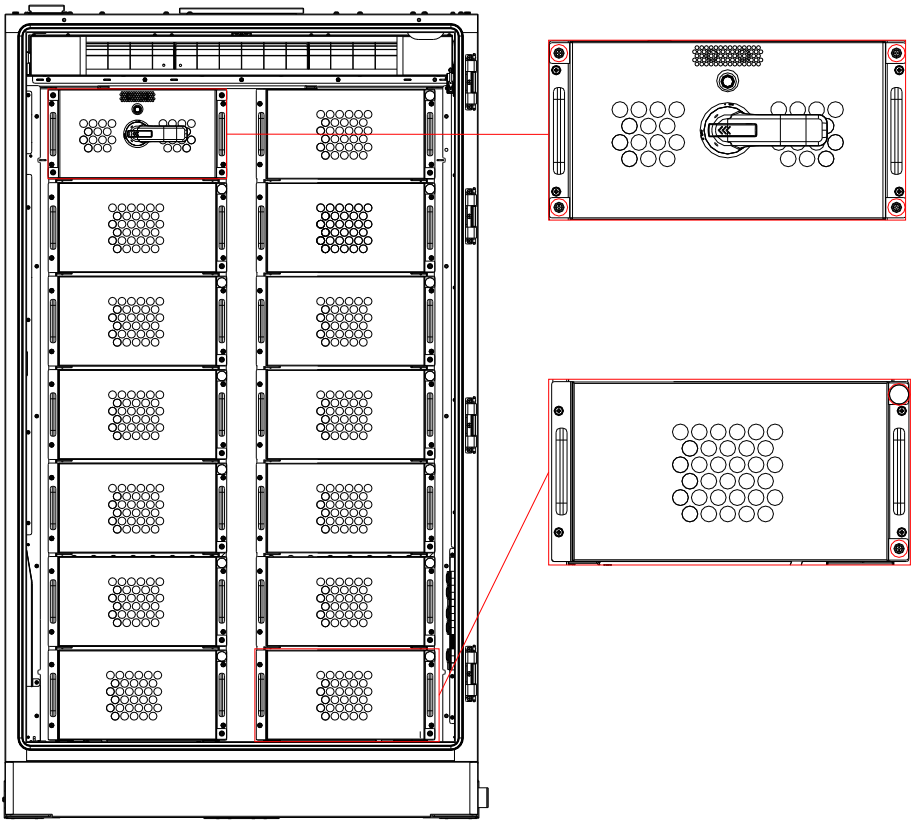
5-2 Connect the power cables and communication cable of the battery packs

Step 2 Connect the power cables and communication cable of the battery packs (pre-installed before delivery).



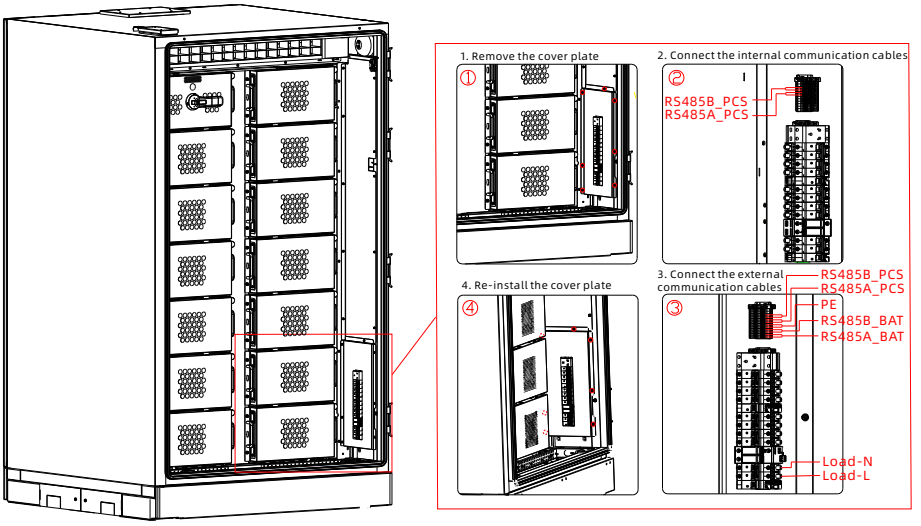
5-3 Install the panels of the high voltage box and the battery packs

Step 3 Install the panels of the high voltage box and the battery packs



5-4 Install the power cables and communication cables between the PCS and cabinet

Step 4 Connect the communication cable

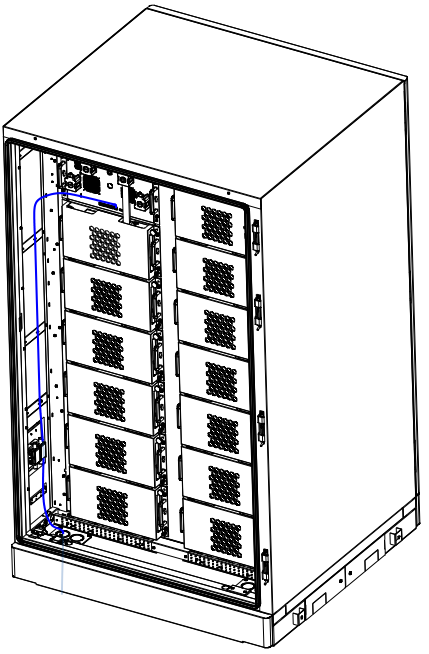


Cable requirements:

1. PE: single-core outdoor copper cable (prepared by users)
2. DC power cable: single-core copper cable (delivered with the package)
3. AC auxiliary power supply cable: two-core (L, N) copper cable (delivered with the package)
4. Communication cable between PCS and battery: CAT5e shielded network cable (prepared by users)
5. Communication cable between PCS and SEM: CAT5e shielded network cable (prepared by users)
6. Communication cable between battery and SEM: CAT5e shielded network cable (prepared by users)

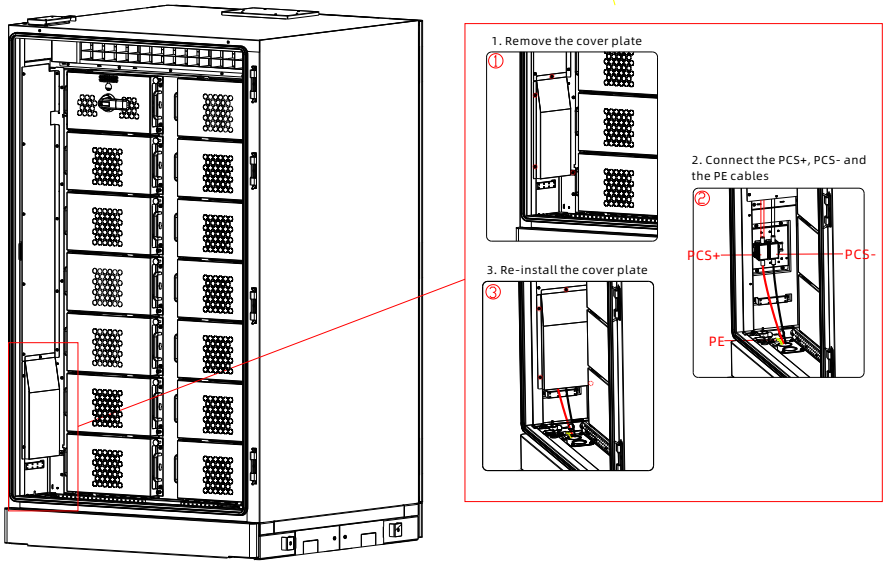
5-5 Install the communication cable between battery cabinet and PCS

Step 5 Connect the communication cable between battery cabinet and PCS (pre-installed at the top of the battery cabinet).



5-6 Install the PCS cables

Step 6 Connect the battery power cables between the PCS and battery cabinet.

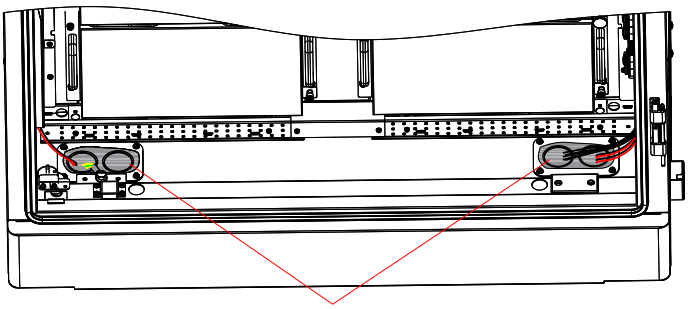


Cable requirements:

1. PCS+: UL1015/1AWG/Red/SC50-10 terminal (delivered with the package)
2. PCS-: UL1015/1AWG/Black/SC50-10 terminal (delivered with the package)
3. PE: UL10269/1AWG/Yellow & Green/SC50-10 terminal (delivered with the package)

5-7 Seal the cable routing holes

Step 7 Upon completion of cable connections, seal the cable routing holes with the sealing mud delivered with the package.



Seal the cable routing holes with the sealing mud

6. Check before power-on

6-1 Routine check

No.	Checking item	Acceptance criteria
1	Equipment appearance	• The equipment is intact, free from damage, rust or paint loss. If the paint flakes off, please re-paint the spotted area. • Equipment labels are clear and damaged labels should be replaced in time.
2	Cable appearance	• The cable sheath is properly wrapped with no visible damage. • The cable conduits are intact.
3	Cable connection	• Cables are connected at the designate positions. • Wiring terminals are prepared as required and connected reliably. • Labels on both end of each cable is clear and facing toward the same direction.
4	Cable routing	• Electrical cables and extra low voltage cables are routed separately. • The cables are neat and tidy. • Cable tie joints are evenly cut without burs. • Leave the cable slack at bending points to avoid stress. • Cables are routed neatly without twists or crossovers in the cabinets.
5	Battery pack copper bar	• The copper bar is not deformed, and the plastic dip coating is not damaged.
6	Switch	• The switch of the distribution cabinet is OFF. • The switch of the high voltage box is OFF

6-2 Battery cabinet installation inspection

Cabinet inspection

No.	Checking item	Acceptance criteria
1	Installation	• Installation complies with the design requirements. • The cabinet is level and each door opens properly.
2	Appearance	• The surface of the cabinet is free from cracks, dents and scratches. If the paint flakes off, re-paint the spotted area.
3	Cabinet grounding	• Each cabinet has at least two grounding points, and is grounded reliably. The resistance of a bond shall be less than or equal to 4Ω.
4	Label	• Labels are correct, clear and complete.

6-3 Intra-cabinet inspection

No.	Checking item	Acceptance criteria
1	Circuit breaker	The circuit breakers are OFF.
2	Copper bar	The copper bar is not deformed, and there are no foreign objects on the copper bar.
3	Cable	The bolts for securing the cables have been tightened and no loose cable connections.
4	Cable routing hole sealing	The cable routing holes are sealed.
5	PACK	All PACKs are intact.
6	Foreign object	Foreign objects, e.g. tools and installation leftovers are removed from the cabinet.
7	Distribution area baffle	The distribution area baffle is free from cracks, dents, scratches, openings and looseness.
8	SPD	The SPD indicator is green.
9	Subcomponents (EM, environmental sensors, aerosol, air conditioner, fans, etc.)	All subcomponents are intact.
10	Cabinet grounding	The grounding conductor is reliably connected to the cabinet's grounding terminal board or copper bar.

7. 7 Power on/off the system

7-1 Power on procedure

1	Test the voltage between BAT+ and BAT- with a multimeter.	Voltage range: 655.2 - 854.1V
2	Turn on the load switch-disconnector of the high voltage box.	
3	Turn on the switches of HVC, air-conditioner, fan, etc. in turn	
4	Turn on the main breaker of the auxiliary power supply in the AC distribution box	The AC distribution box is powered on (AC220V)
5	Turn on the AC side distribution circuit breaker of the PCS.	
a: Before turning on the internal switches of the battery system auxiliary power supply, ensure that the AC auxiliary power supply voltage is within the normal range (220V±10%).		

7-2 Commissioning

Prerequisites

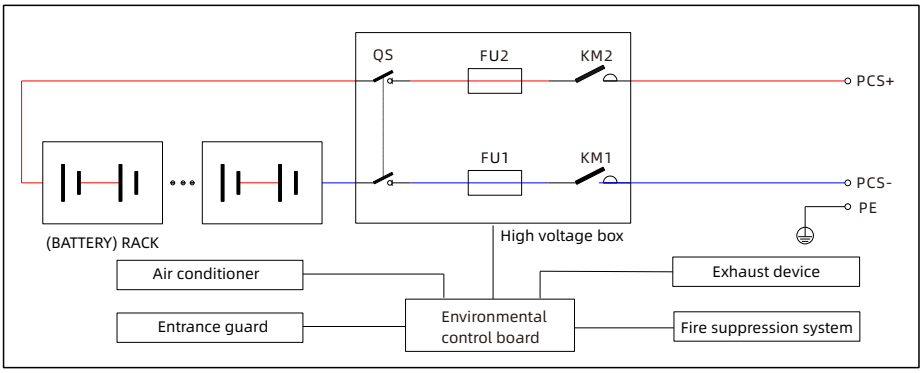
1). All onsite devices have been commissioned.
2). The system has been powered on and no alarm/fault is reported.
3). The commissioning tools are available on site.
4). Wait until the air conditioner has adjusted the temperature of the cabinet and the cells in the battery packs to the pre-set range (5℃~25℃).

7-3 Power-off procedure

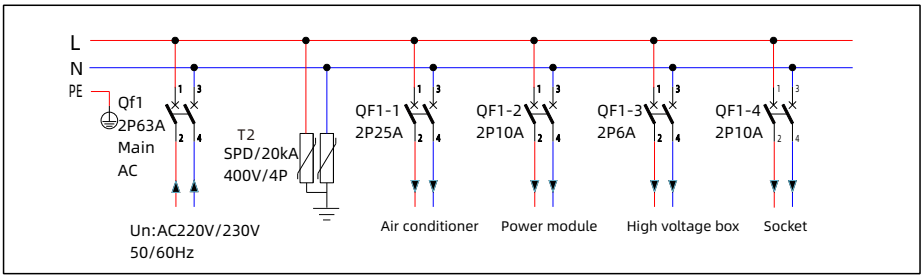
1	Turn off the AC side distribution circuit breaker of the PCS.
2	Turn off the main breaker of the auxiliary power supply in the AC distribution box.
3	Turn off the switches of the HVC, air conditioner, fan, and other components in turn.
4	Turn off the load switch-disconnector of the high voltage box.

8. Electrical schematic

SYSTEM SCHEMATIC DIAGRAM



AC AUXILIARY POWER SUPPLY SCHEMATIC DIAGRAM



9. Service and contact

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