

CHS2 series

C&I Energy Storage System

CHS2-(29.9K-50K)-(T4-T6)-X

CHS2-30K-T6-X-LV

User Manual



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Warranty

Check the product warranty conditions and terms on the SAJ website: <https://www.saj-electric.com/>.

About this document

This user manual provides introductions and instructions of operating, maintaining, and troubleshooting the following SAJ product:

- CHS2 Series

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Note: Illustrations in this document show only essential details and may differ from the actual product.

Target Audience

This document is applicable to the personnel that transport, install, and operate on the product. The personnel are required to have the following qualifications:

- A certain level of expertise in electronics, electrical wiring, and mechanical knowledge in electrical and mechanical schematics.
- Being familiar with the composition and working principles of the product and its upstream and downstream equipment.
- Professional training related to the installation and commissioning of electrical equipment.
- The ability to respond urgently to dangers or emergencies that may arise during installation or commissioning.
- Being familiar with relevant standards and regulations in the country or region where the project is located.
- Being familiar with the contents in this manual.

Use of the Manual

Read the user manual carefully before any installation, operation and maintenance and follow the instructions during installation and operation. Always keep the printed manual available for future reference.

Levels of Warning Messages



Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a hazardous situation which, if not avoided, will result in serious injury or moderate injury.



Indicates a hazardous situation which, if not avoided, will result in minor or moderate injury.



Indicates a situation which, if not avoided, can result in property damage.

Revision history

Version	Date	Changes
V2.1	2026-09-29	• 2.1.2. Dimensions (on page 11): Added the bottom view dimension. • 5.2.2. Parallel deployment (on page 46): Added RCD related description. • 5.9. Connect the PV cables (on page 70): Added PV Voc related descriptions.
V2.0	2026-07-10	• 2.1.1. Model description (on page 10) • 7. Commissioning on elekeeper App Version 5.0 (on page 77) • 10.1. System (on page 125)
V1.0	2026-05-13	2.3. Electrical connection diagrams (on page 24)
V0.0	2025-02-27	First version.

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1. Safety instructions

1.1. Inverter safety instructions

Personal Safety



DANGER

Risk of personnel hazard or equipment damage due to improper operations

Improper operations performed on energized equipment by unqualified personnel may lead to equipment failure or safety hazards.

- Only qualified and trained professionals who are familiar with electrical installation and local codes may install, maintain, or repair the equipment.
- Before any operation, read the safety precautions thoroughly and always follow the standard procedures during operation. Non-standard and improper operations on the energized equipment may cause fire, electric shocks, or explosion.
- Do not reconstruct or alter the equipment, add components, or change the installation sequence without permission. Any unauthorized operation including modification of product functionality of any form may cause lethal hazard to the operator, third parties, the units or their property.
- Before any operation, remove conductive objects such as watches, bracelets, bangles, rings, and necklaces to prevent electric shocks.
- During operation, do not open the housing or touch electrical terminals.



WARNING

Risk of personal injury due to direct contact with the components or housing

Direct contact with hazardous moving or hot components during the inverter's operation may lead to personal injury.

- Do not touch a running fan with your hands, components, screws, or any other tools.
- During operation, do not touch heat sink area with bare hands as the inverter surface may become hot.



CAUTION

Risk of equipment damage and personal injury

If you detect any unusual odors, hear abnormal noises, or notice smoke during operation, immediately shut down the unit and disconnect all power sources.



NOTICE

Risk of equipment malfunction and safety hazards

Failure to follow proper guidance and neglect of regular monitoring prevents the timely identification and prevention of potential issues.

- Read the entire user manual before installation and keep it at hand for future reference.
- Regularly check the status via the monitoring interface to promptly detect any abnormalities.

Electrical Safety

DANGER

Risk of high voltage and electric shock

Before any operation, disconnect the inverter from all AC and DC power sources and wait at least 5 minutes to allow internal capacitors to discharge.

WARNING

Risk of overheat, fire and equipment damage

Obstructing ventilation or allowing foreign objects to enter the equipment may lead to fire hazards.

- During operation, ensure that the ventilation vents or heat dissipation systems are not obstructed or covered by other objects to prevent fire due to high temperature.
- During operation, prevent foreign matter from entering the equipment. Otherwise, equipment short-circuits or damage, load power derating, power failure, or personal injury may occur.
- Do not place any foreign objects or liquid containers on the inverter.

Environment Requirements

DANGER

Risk of severe electrical shock

- A lightning strike can induce a sudden and massive power surge, which poses severe hazard to both personnel and equipment.
- Installation, operation, and maintenance is prohibited during thunderstorms.

Mechanical Safety

NOTICE

Risk of equipment failure or physical injury

Installing or operating an inverter with pre-existing physical damage compromises safety and functionality.

- Before unpacking the inverter, check the outer packing materials for damage, such as holes and cracks, and check the inverter model. If any damage is found or the inverter model is not what you requested, do not unpack the package and contact your supplier as soon as possible.
- Before installation, inspect the equipment for any visible damage or signs of transportation damage. If damage is found, do not install or use the equipment.

1.2. Battery safety instructions

1.2.1. General guidelines

The lithium-ion battery energy storage systems (BESS) present a higher risk of fire due to several factors inherent to their chemistry and operation. The electrolyte in battery packs is flammable, toxic, and volatile. Thermal runaway in battery packs can produce flammable gases, along with harmful gases such as carbon monoxide (CO) and hydrogen fluoride (HF).

For the safety and integrity of battery packs, it is essential to follow the guidelines below:

- Do not expose battery packs to high-temperature environments or place them near heat-emitting devices such as direct sunlight, fire sources, transformers, or heaters. Overheating of battery packs can lead to fire or explosion.
- It is strictly prohibited to disassemble, modify, or damage battery packs (such as inserting foreign objects, immersing in water or other liquids), as this can cause leakage, overheating, fire, or explosion of the battery pack. Any attempts to modify battery without the permission from SAJ will void the limited warranty for the battery.

1.2.2. Battery pack fault handling



Risk of Injury from Battery Leak

Contact with a faulty or leaking battery pack can cause severe injury.

- Never touch leaked electrolyte or inhale any fumes. If you detect leakage, unusual odors, or signs of damage, do not approach. Immediately contact qualified personnel.
- Qualified personnel must wear full protective gear, including safety goggles, chemical-resistant gloves, a gas mask, and protective clothing, before handling a leaking battery.

The electrolyte is corrosive, and contact can cause skin irritation and chemical burns. If exposed to the electrolyte, take the following measures immediately:

- Inhalation : Evacuate the contaminated area immediately, breathe fresh air; seek medical assistance immediately.
- Eye contact : Immediately rinse the eyes with copious amounts of water for at least 30 minutes without rubbing; seek medical help immediately.
- Skin contact : Wash the affected area thoroughly with plenty of water and soap; seek medical assistance immediately.
- Ingestion : Seek medical help immediately.

1.2.3. Handling of dropped battery packs

When a battery pack has fallen (whether packaged or not), but there is no obvious deformation, damage, unusual odor, smoke, or fire, take the following actions immediately:

- Evacuate the personnel from the area.
- Professional personnel should use mechanical tools to transfer the battery pack to an open and safe location; allow the battery pack to rest for 1 hour while monitoring its temperature to ensure it remains within $\pm 10^{\circ}\text{C}$ of room temperature.
- Contact SAJ service engineer.

If the dropped battery pack exhibits any obvious unusual odor, damage, smoke, or fire:

- Immediately evacuate all personnel from the area.
- Contact professional personnel and call emergency services promptly.

- Under safe conditions, professional personnel should use firefighting equipment to extinguish fires.
- Stop using the battery pack immediately after it has fallen, and contact SAJ service engineer for assessment.

1.3. Safety symbols

Symbol	Description
	Danger: Electrical shock hazard This device is directly connected to public grid and thus all work to the system shall only be carried out by qualified personnel.
	Danger: Hot surface The components inside the battery will release a lot of heat during operation. Do not touch metal plate housing during operating.
	Danger: Risk of electric shock from energy stored in capacitor. Do not open the cabinet door until 5 minutes after disconnecting all sources of supply.
	Warning: No open flames Do not place or install near flammable or explosive materials.
	Caution Keep the product out of reach of children.
	Caution: Check the user manual before service If an error has occurred, refer to the troubleshooting instructions to remedy the error.
	Caution This device shall NOT be disposed of in residential waste.
	Caution This battery module shall NOT be disposed of in residential waste.
	CE Mark Equipment with the CE mark fulfills the requirements of the Low Voltage Directive and Electro Magnetic Compatibility.
	RoHS compliant mark Equipment with the RoHS mark does not exceed the allowable amounts of the restricted substances defined in Restriction of Hazardous Substances in Electrical and Electronic Equipment.
	RCM compliant mark Equipment with the RCM mark is in compliance with AS/NZS 4417.1 & 2 and the EESS.
	Recyclable

1.4. Emergency

Despite its careful and professional protection design against any hazards, damage of the battery may still be possible. The causes, potential hazards, and handling measures of damaged batteries are as follows.

Risk of Electrolyte Leakage and Hazardous Gas Release

- **Causes:** Battery rupture may occur due to mechanical damage or excessive internal pressure, resulting in the leakage of electrolyte and the release of hazardous gas.
- **Hazards:** The battery electrolyte is corrosive and flammable. Toxic gases released can cause irritation to the skin and eyes, as well as discomfort upon inhalation.
- **Response Measures:**
 - **General Handling Procedures for a Damaged Battery:**
 - Do not open the damaged battery.
 - Avoid causing further damage (e.g., shock, impact, crushing, or trampling).
 - Keep the damaged battery away from water sources, unless water is necessary to prevent an energy storage system fire.
 - Do not expose the damaged battery to direct sunlight to prevent internal overheating.
 - **Emergency Procedures for Electrolyte Leakage or Gas Release:**
 - Eye contact: Rinse eyes with a large amount of running water and seek medical advice.
 - Contact with skin: Wash the contacted area with soap thoroughly and seek medical advice.
 - Inhalation: If you feel discomfort, dizziness, or vomiting, seek medical advice immediately.
 - Fire response: If a fire occurs within the battery pack area, extinguish it using an FM-200 or Carbon Dioxide (CO₂) fire extinguisher. Always wear a gas mask to avoid inhaling toxic gases and harmful combustion products.
 - If the fire is not caused by battery and has not yet spread to the battery, use an ABC-type fire extinguisher.

Risk of Fire and Explosion

- **Causes:** Batteries present a risk of fire or explosion if subjected to damage, misuse, or improper handling.
- **Hazards:** Such incidents can result in rapid fire spread, the release of toxic fumes, and potential projectile hazards from battery rupture.
- **Response Measures:**
 - If a fire has just occurred, try to disconnect the battery circuit breaker, and cut off the power supply first, but only if you can do so without endangering yourself.
 - If the battery is already on fire, do not attempt to extinguish the fire. Evacuate the crowd immediately.
 - If a fire occurs within the battery pack area, extinguish it using an FM-200 or Carbon Dioxide (CO₂) fire extinguisher. Always wear a gas mask to avoid inhaling toxic gases and harmful combustion products.
 - If the fire is not caused by battery and has not yet spread to the battery, use an ABC-type fire extinguisher.

1.5. Recycling and disposal



NOTICE

This product should not be disposed as a residential waste.

Some components inside the equipment can be recycled and reused, while others may pose a pollution risk to the environment. Please contact a locally authorized professional recycling agency for the proper handling of the product and its internal components.

2. Product information

2.1. Product introduction

CHS2 Series is a high-performance Commercial & Industrial (C&I) Energy Storage System (ESS) equipped with advanced battery technology, ideal for large residential, small-scale industrial, and commercial applications. Designed to efficiently store energy for later use, the ESS features an integrated Battery Management System (BMS). This BMS optimizes battery performance while safeguarding against operation beyond its safe parameters, ensuring stability and durability. Meanwhile, one CHS2 cabinet can be deployed with three CB2 energy storage systems at maximum for system expansion.

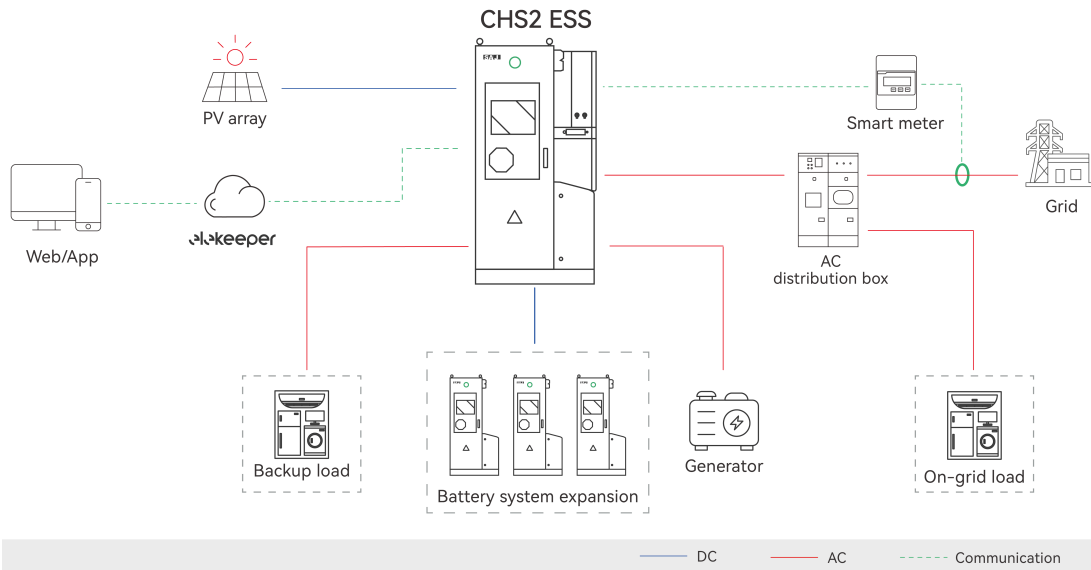


Figure 2.1. System application

2.1.1. Model description

Take **CHS2-50K-T6-X** as an example:

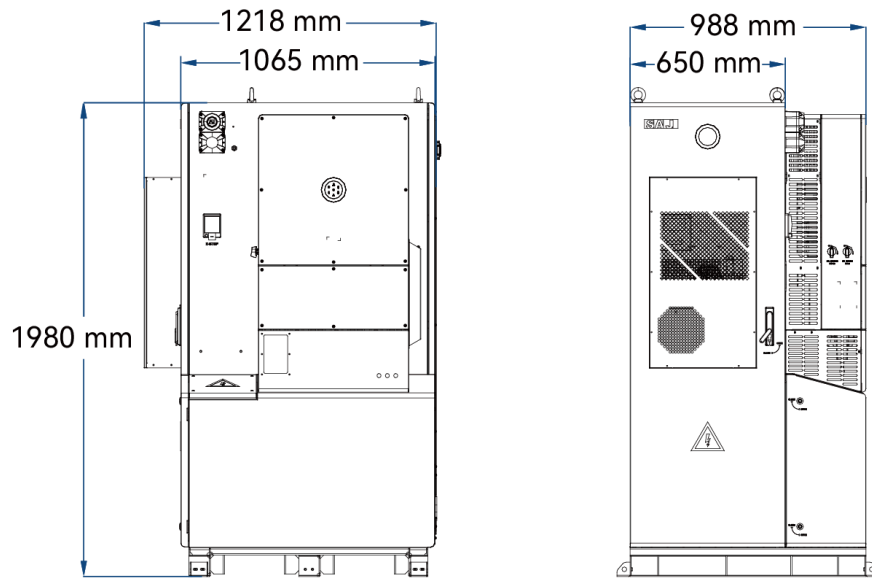
CHS2-50K-T6-X

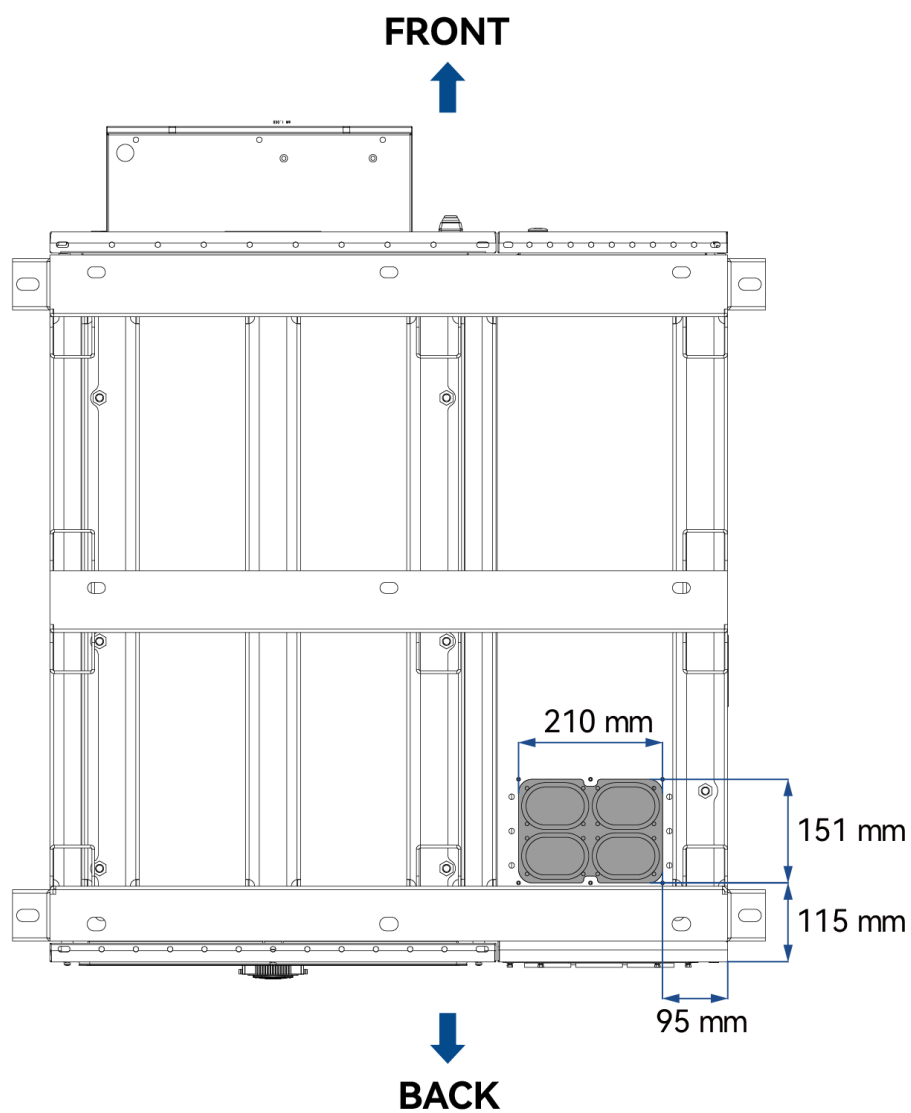
① ② ③ ④

- ① The product name.
- ② The rated power of the storage system in kW. The value includes 29.9, 30, 49.9, and 50.
- ③ T6 means three phases with 6 MPPTs. The value includes T4 and T6.
- ④ The battery rated voltage, rated capacity, and usable energy.
The value of **X** includes 204.8V/280Ah/51.5kWh, 256.0V/280Ah/64.4kWh, 307.2V/280Ah/77.3kWh, and 358.4V/280Ah/90.2kWh.
- ⑤ When field **-LV** is present, it indicates a low-voltage model.

Product models

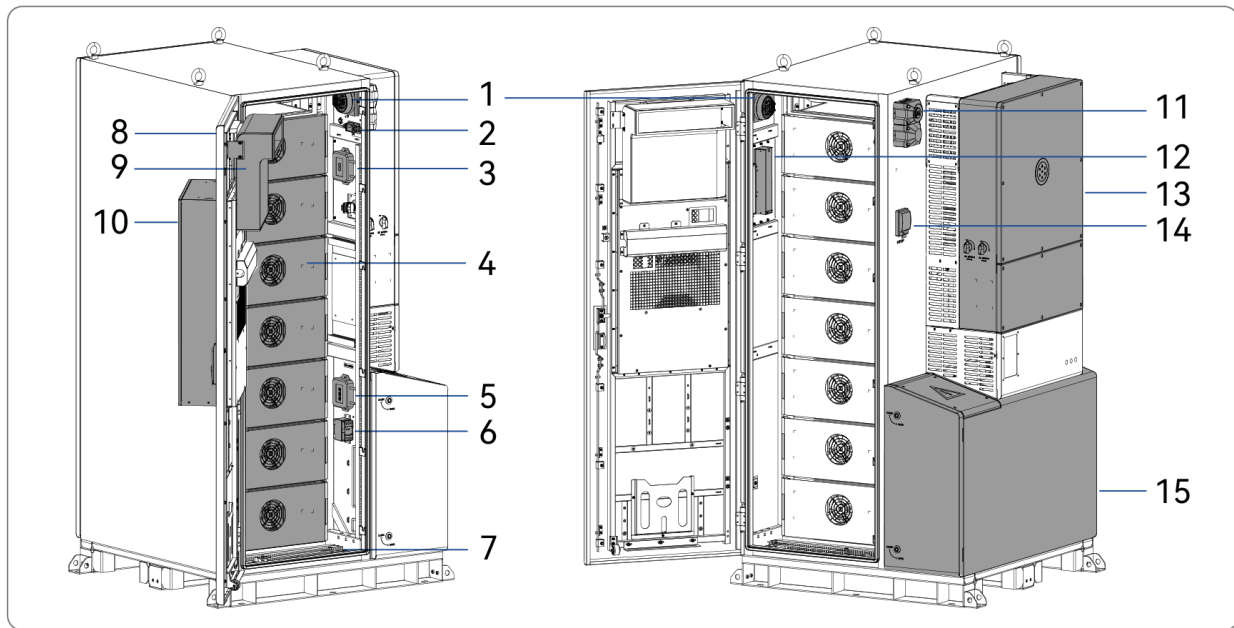
- CHS2-29.9K-T4-X
- CHS2-30K-T4-X
- CHS2-49.9K-T6-X
- CHS2-50K-T6-X
- CHS2-30K-T6-X-LV

2.1.2. Dimensions



2.1.3. Product components

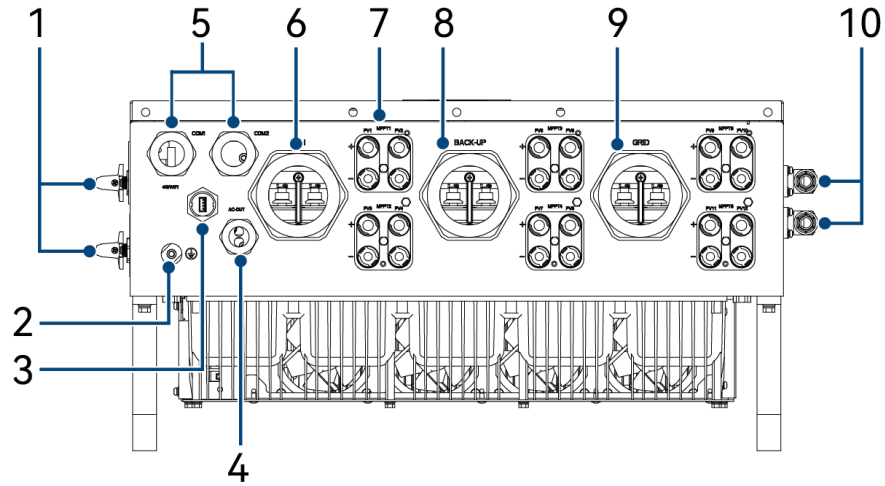
CHS2 cabinet components



Callout	Description
1	Smoke sensor
2	Limit switch
3	Carbon monoxide sensor
4	Battery modules
5	Temperature and humidity sensor
6	Electrode-type water-immersion sensor
7	Electrode plate connected to the water-immersion sensor
8	LED indicator showing the battery system SOC
9	Air conditioner vent
10	Air conditioner
11	Audio-visual fire alarm
12	Light
13	CH2 inverter
14	Emergency stop
15	Battery control unit and wiring compartment

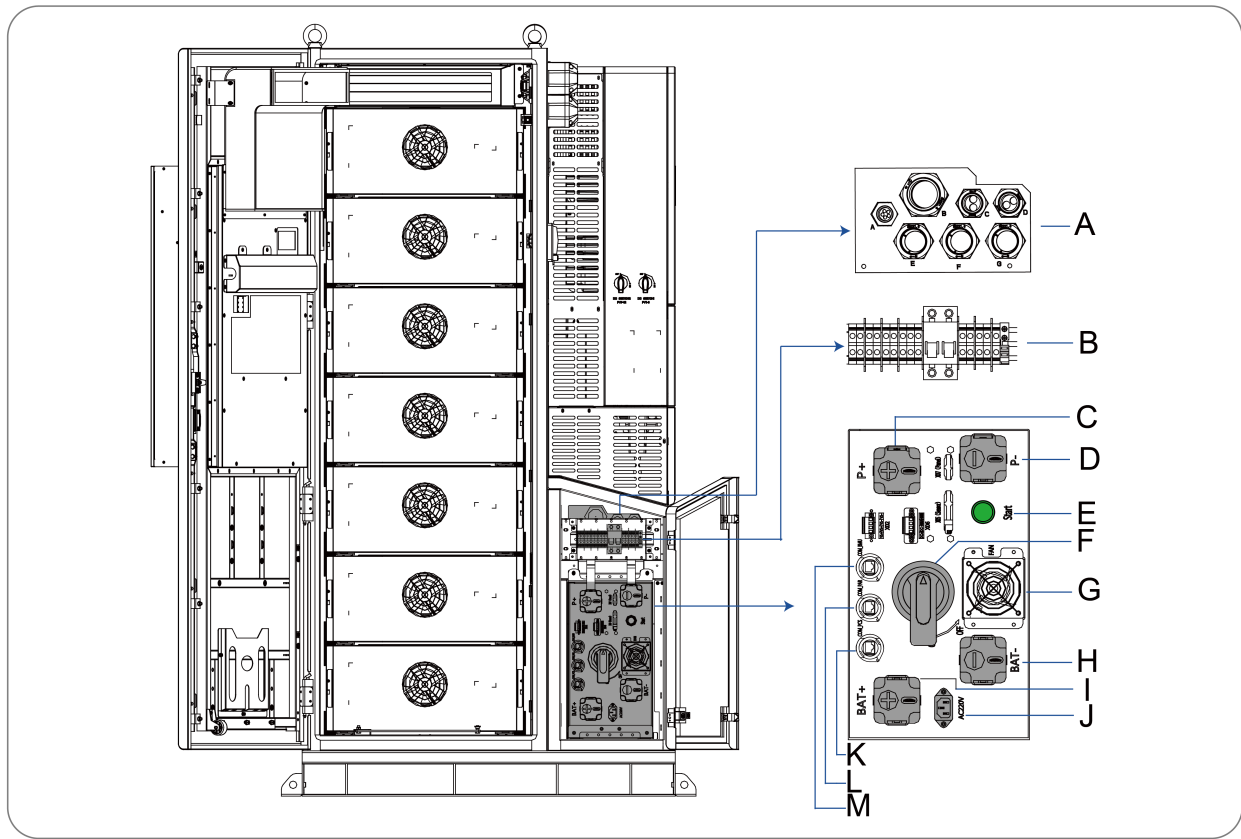
2.1.4. Electrical terminals

Inverter



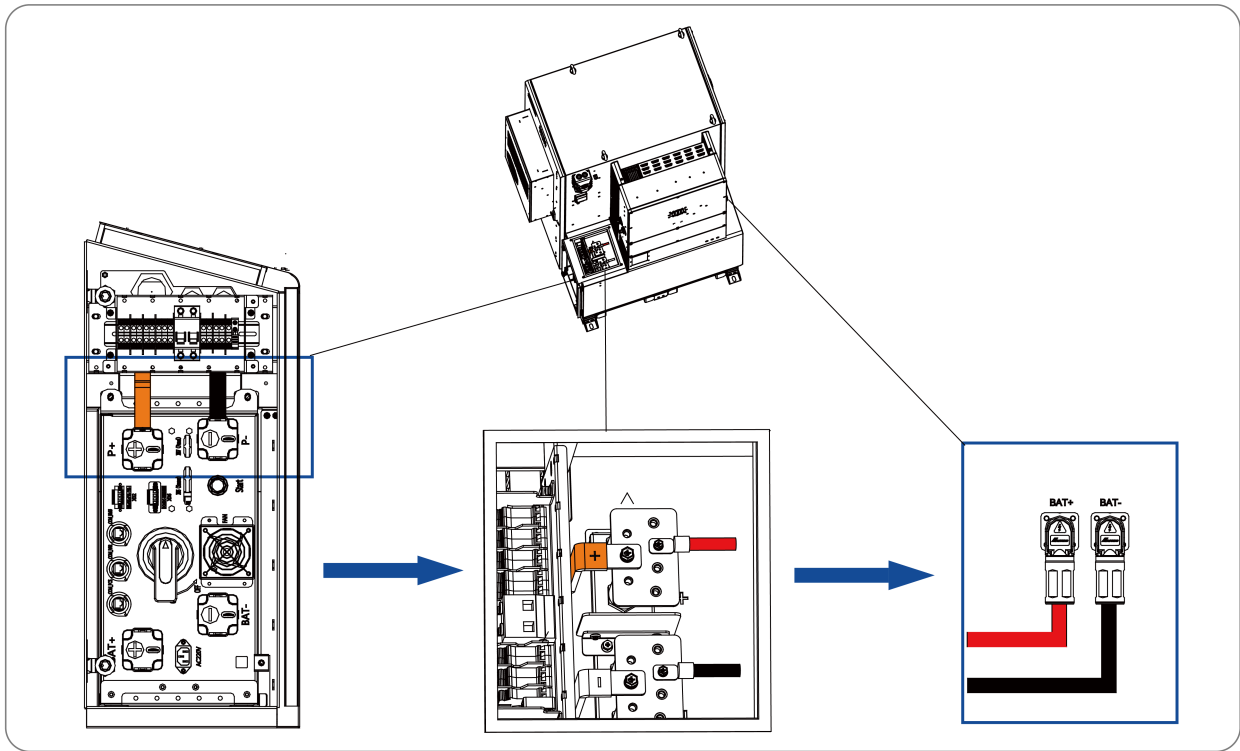
Callout	Silkscreen	Description
1	/	The PV switches.
2	/	The grounding cable connection port.
3	4G/WIFI	The communication module connection port.
4	AC-OUT	The connection port for 220V AC power supply cable.
5	COM1, COM2	The communication connection ports.
6	GEN	The external generator connection ports.
7	MPPT1-MPPT6	The PV connection ports.
8	BACK-UP	The AC back-up connection ports.
9	GRID	The grid connection port.
10	BAT+, BAT-	The battery connection ports.

Battery control unit

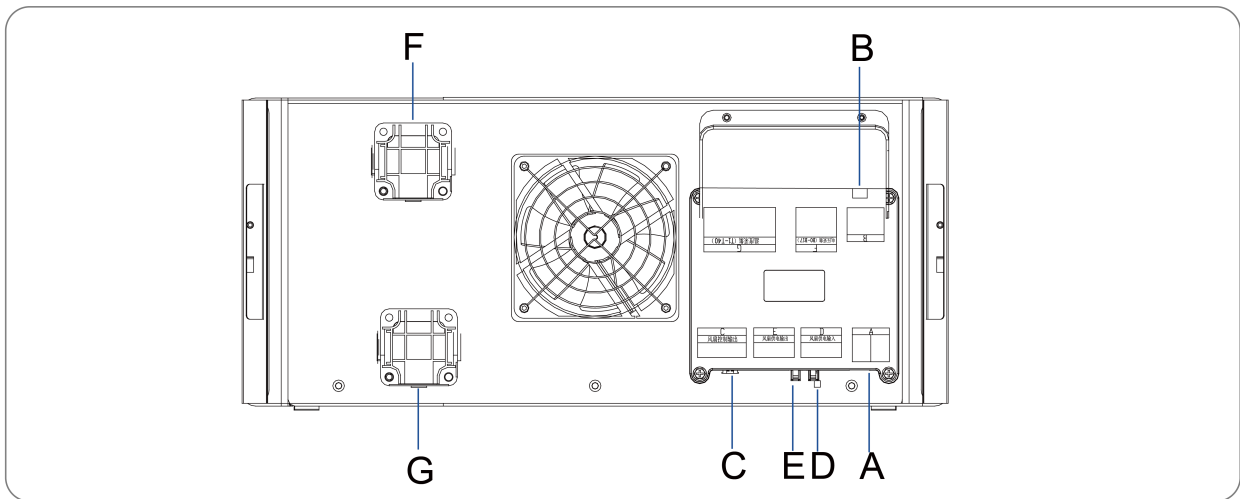


Callout	Silkscreen	Description
A	A, B, C, D, E, F, G	The ports for cable connections to/from the CH2 inverter and the expansion CB2 systems. All the battery power cables are connected before delivery. The installers need to connect the AC power cables to the grid, the DC power cables to the PV arrays, and the communication cables to the external systems on-site.
B	/	The AC circuit breaker.
C	P+	The positive port for DC input and output from/to the inverter.
D	P-	The negative port for DC input and output from/to the inverter.
E	Start	The Start button.
F	/	The main switch that controls the connection between the battery modules and the battery control unit.
G	FAN	The fan for system cooling. The 24V DC power supply cables from X02 and X06 to the battery modules are connected before delivery.
H	BAT-	The negative port for DC input and output from/to the first battery module.
I	BAT+	The positive port for DC input and output from/to the last battery module.
J	AC220V	The 220V AC power supply for the air conditioner. The cables are connected before delivery.
K	COM_PCS	The communication port connecting to the BMS_1 port of the inverter. The cable is connected before delivery.
L	COM_PAR	The communication port connecting to the expanded battery system.
M	COM_BMU	The communication port connecting to the battery module.

The following figure shows the battery connections before delivery:



Battery module



Callout	Silkscreen	Description
A	A	The communication input port.
B	B	The communication output port.
C	C	The fan control output port.
D	D	The fan power input port.
E	E	The fan power output port.
F	/	The positive port of battery connection.
G	/	The negative port of battery connection.

2.1.5. LED indicators

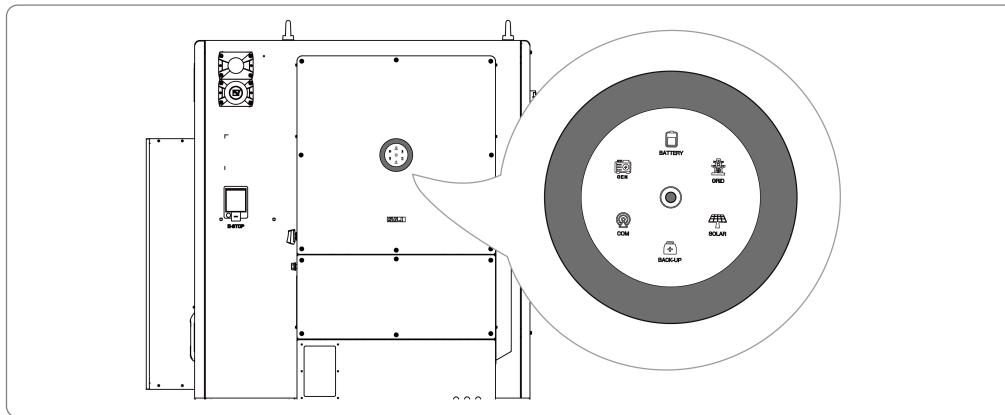


Figure 2.2. LED panel

LED indicator	Status	Description
	LED off	The inverter is powered off.
	Breathing	The inverter is at the initial state or standby state.
	Solid	The inverter is running properly.
	Breathing	The inverter is upgrading.
	Solid	The inverter is faulty.
	Solid	The inverter is importing electricity from the grid.
	On 1s, off 1s	The inverter is exporting electricity to the grid.
	On 1s, off 3s	No importing or exporting.
	Off	Off-grid.
	Solid	The battery is discharging.
	On 1s, off 1s	The battery is charging.
	On 1s, off 3s	Low SOC.
	Off	The battery is disconnected or inactive.
	Solid	The inverter is connected to the grid.
	On 1s, off 1s	Counting down to grid connection.
	On 1s, off 3s	The grid is faulty.
	Off	No grid.

LED indicator	Status	Description
 SOLAR	Solid	The PV array is running properly.
	On 1s, off 1s	The PV array is faulty.
	Off	The PV array is not working.
 BACK-UP	Solid	The AC side load is running properly.
	On 1s, off 1s	The AC side consumption is overloaded.
	Off	The AC side is turned off.
 COM	Solid	The communication with both the BMS and the meter is working.
	On 1s, off 1s	The meter communication is working, but the BMS communication is lost.
	On 1s, off 3s	The BMS communication is working, but the meter communication is lost.
	Off	Lost communication with both the BMS and the meter.
 GEN	Solid	The power input of the generator is connected.
	On 1s, off 1s	The power output of the generator is connected.
	Off	Disconnected from the generator.

2.1.6. Communication terminals

The following figure shows the systems and devices that can be connected to the CHS2 system.

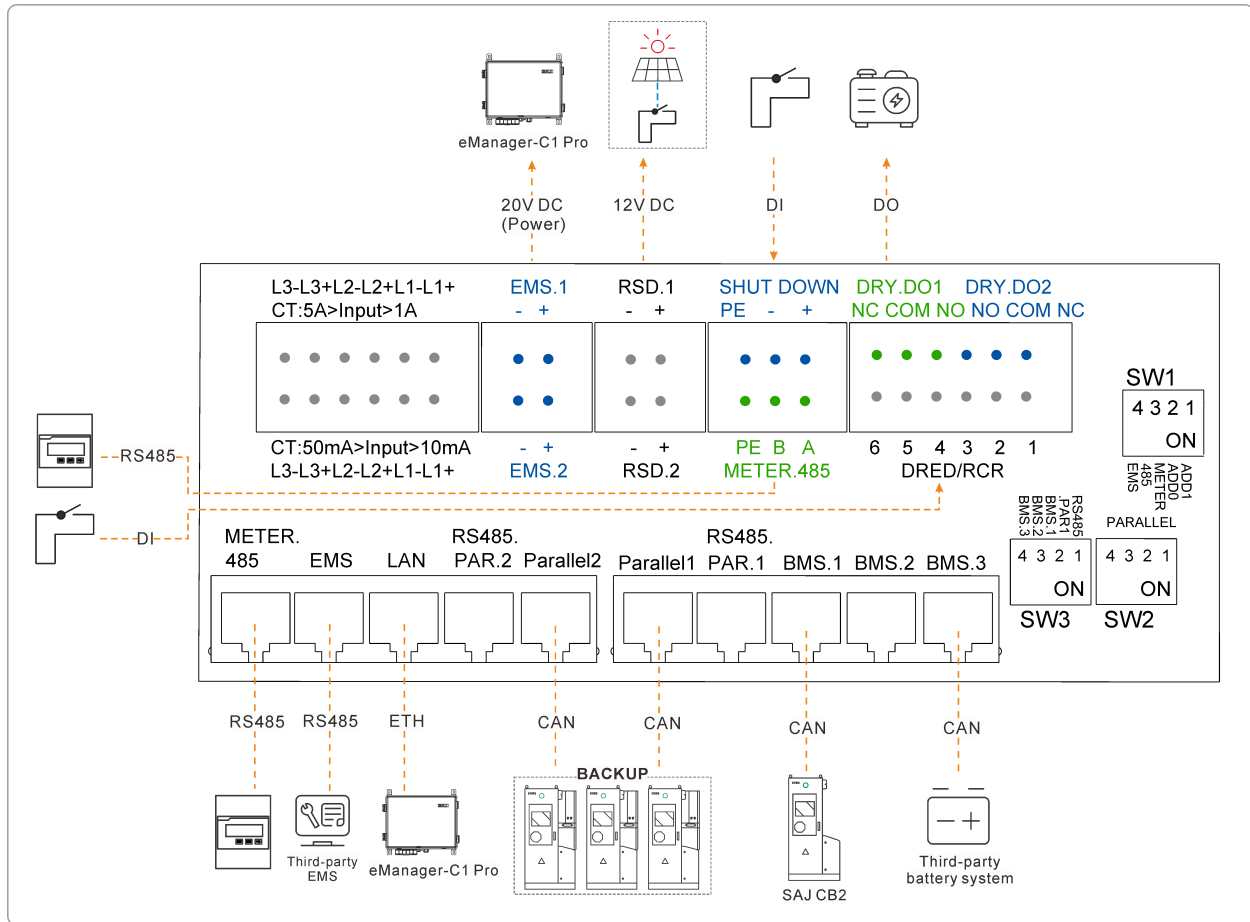


Figure 2.3. Communication connection overview

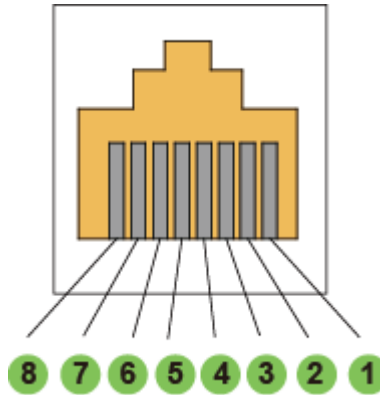
Communication terminal descriptions

Terminal type	Silkscreen	Communication protocol	Description
6-pin connector	CT:5A>Input>1A	RS485	Reserved for RS485 communication connection to CTs whose input current ranges from 1A to 5A.
6-pin connector	CT:50mA>Input>10mA	RS485	Reserved for RS485 communication connection to CTs whose input current ranges from 50mA to 10mA.
2-pin connector	EMS.1 EMS.2	20V DC	For providing EMS 20V DC power supply in parallel deployment.
2-pin connector	RSD.1 RSD.2	12V DC	For 12V DC power supply to the fast shutdown module of the photovoltaic system. The module can control the fast shutdown and startup of the PV system.
3-pin connector	SHUT DOWN	DI	For external DI connections to shut down the inverter in emergency situations.
3-pin connector	METER.RS485	RS485	For meter RS485 connection.

Terminal type	Silkscreen	Communication protocol	Description
3-pin connector	DRY.DO1	DO	For diesel generator connection to control the start and stop of the generator in single deployment.
3-pin connector	DRY.DO2	DO	Reserved NO dry output terminal 2 for programmable relay output.
6-pin connector	DRED/RCR	DI	For demand response modes (DRM) or ripple control receiver (RCR) devices connection.
RJ45	METER.485	RS485	For meter RS485 connection.
RJ45	EMS	RS485	For RS485 communication with the third-party EMS.
RJ45	LAN	ETH	For LAN communication with the SAJ EMS.
RJ45	RS485.PAR.1 RS485.PAR.2	RS485	RS485 communication ports reserved for future use.
RJ45	Parallel1	CAN	For CAN communication connection between CH2 inverters in parallel deployment with the backup loads connected.
RJ45	Parallel2	CAN	
RJ45	BMS.1	CAN	For CAN communication connection from the SAJ CB2 battery system.
RJ45	BMS.2	CAN	CAN communication port reserved for future use.
RJ45	BMS.3	CAN	For CAN communication connection from the third-party battery systems.

Table 2.1. Communication terminals

See the RJ45 pin descriptions below:

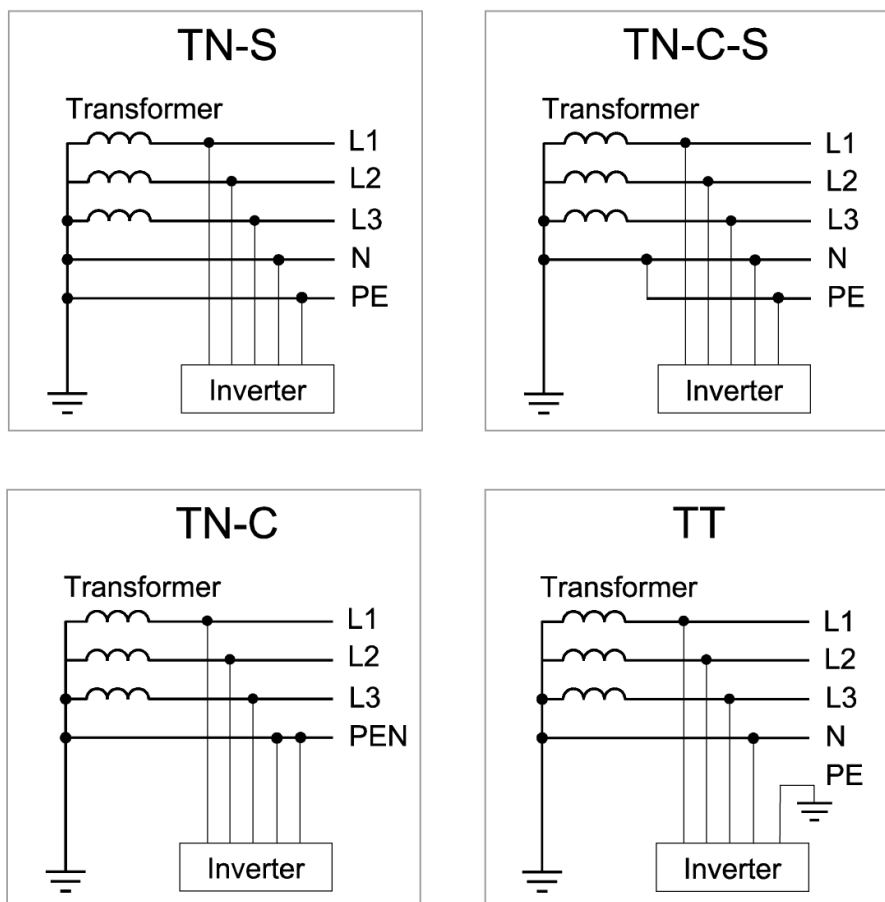


EMS		RS485.PAR.1/RS485.PAR.2		METER.485	
1	NC	1	NC	1	RS485-B
2	NC	2	NC	2	RS485-A
3	NC	3	NC	3	NC
4	NC	4	NC	4	RS485-B
5	NC	5	NC	5	RS485-A
6	NC	6	NC	6	NC
7	RS485-A	7	RS485-A	7	RS485-A
8	RS485-B	8	RS485-B	8	RS485-B
BMS.1/ BMS.2/ BMS.3		Parallel 1/ Parallel 2		LAN	
1	Shut down - BMS	1	SYN B	1	TX_D1+
2	GND_S	2	SYN A	2	TX_D1-
3	NC	3	SYN B	3	RX_D2+
4	CANH	4	SYN A	4	BI_D3+
5	CANL	5	SYN B	5	BI_D3-
6	NC	6	SYN A	6	RX_D2-
7	NC	7	CANL	7	BI_D4+
8	NC	8	CANH	8	BI_D4-

Table 2.2. RJ45 pin definitions

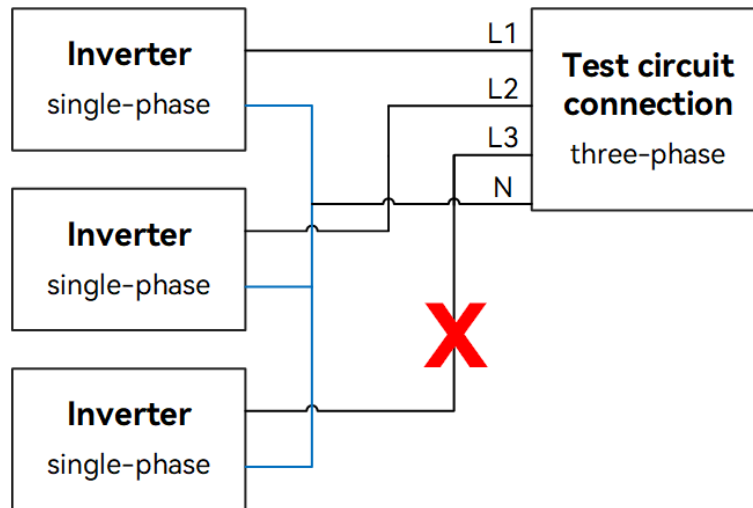
2.2. Grid integration types

CHS2 series systems support the following grid configurations:



Multiple inverter combination

The CHS2 inverter has not been tested to Section 5 of AS/NZS 4777.2:2020. Multiple inverter combinations should not be used or external devices should be used in accordance with the requirements of AS/NZS 4777.1.

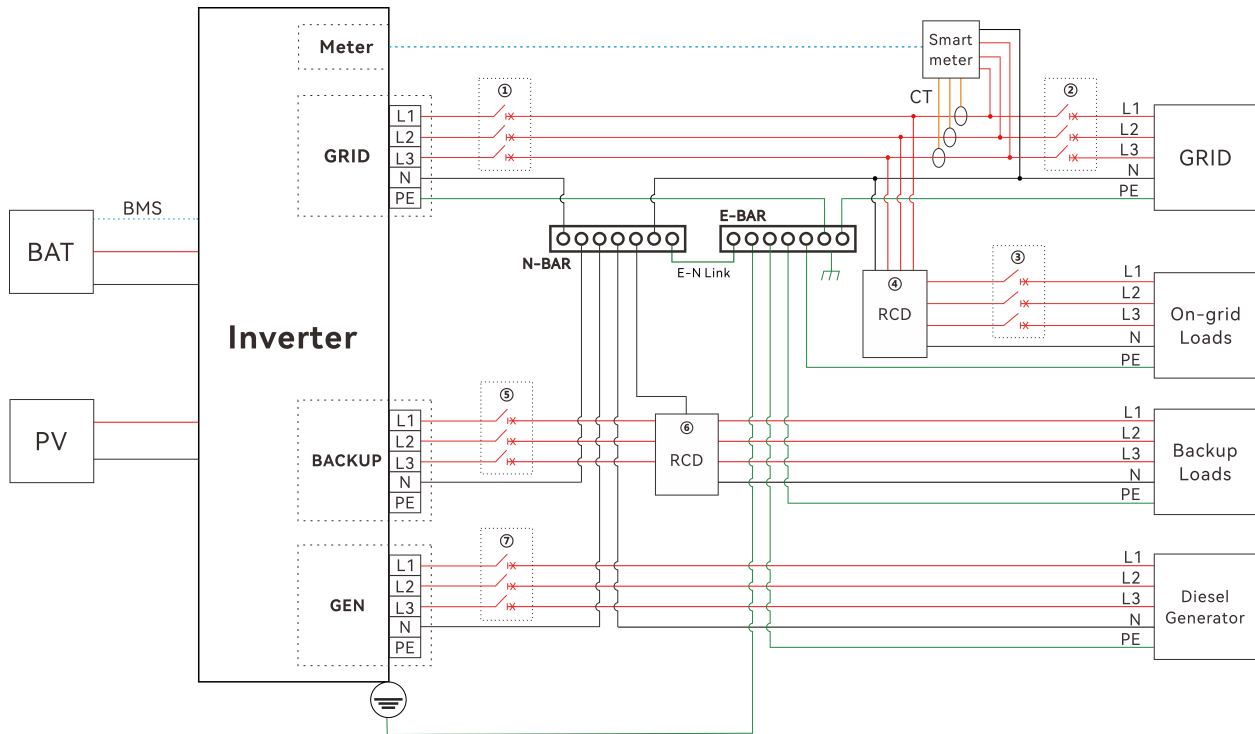


2.3. Electrical connection diagrams

E-BAR and N-BAR based connection diagram

The following figure shows the system connection applicable in Australia and New Zealand.

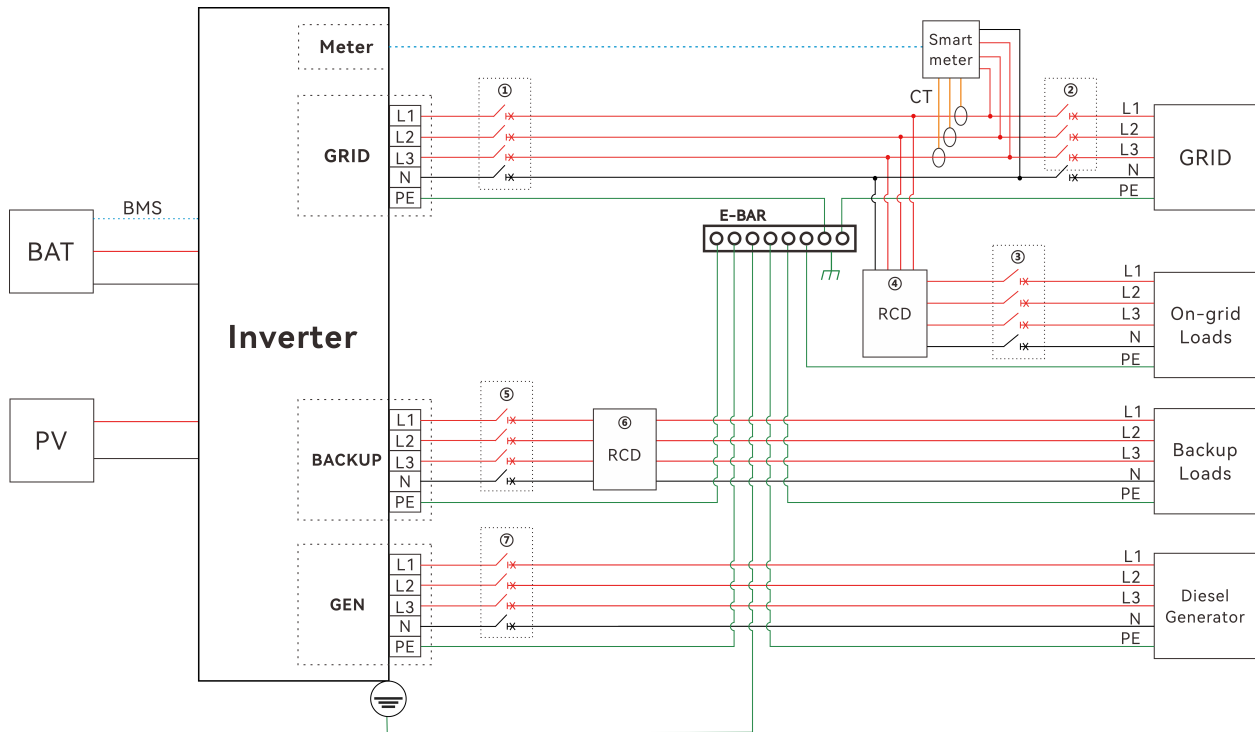
- To comply with AS/NZS3000, the neutral (N) cables of the grid and backup-load sides must be be connected together.
- Do not connect the PE terminal of the **BACK-UP** port.
- The E-BAR and the N-BAR must be connected as illustrated.



E-BAR based connection diagram

The following figure shows the system connection for the grid system without special requirements.

Note: The backup PE line and earthing bar must be grounded properly. Otherwise, the backup function may be inactive during blackout.



Recommended circuit breakers and RCD

Circuit breaker

Prepare the inverter AC circuit breakers according to the recommended specifications below:

Number	Circuit breaker	Recommended rated current (A)
①	Inverter GRID - with BACK-UP connection	- CHS2-29.9K-T4-X: 100 - CHS2-30K-T4-X: 100 - CHS2-49.9K-T6-X: 200 - CHS2-50K-T6-X / CHS2-30K-T6-X-LV: 200
	Inverter GRID - without BACK-UP connection	- CHS2-29.9K-T4-X: 63 - CHS2-30K-T4-X: 63 - CHS2-49.9K-T6-X: 100 - CHS2-50K-T6-X / CHS2-30K-T6-X-LV: 100
⑤	Inverter BACK-UP	- CHS2-29.9K-T4-X: 63 - CHS2-30K-T4-X: 63 - CHS2-49.9K-T6-X: 100 - CHS2-50K-T6-X / CHS2-30K-T6-X-LV: 100

Number	Circuit breaker	Recommended rated current (A)
⑦	Inverter GEN	The rated current must be larger than the rated output current of the diesel generator, but no larger than 200A.

Table 2.3. Recommended AC breaker specifications

 **NOTICE**

Do not connect multiple inverters to one AC circuit breaker.

Residual current device (RCD)

The inverter is integrated with a RCMU that can detect the real time external current leakage. When the detected current exceeds the limitation, the inverter will be disconnected from the grid quickly.

An external residual current device (RCD) can be connected with the inverter to protect the system from current leakage when it is required by regional or local regulations.

Number	RCD	Compatible RCD type	Recommended rated current (mA)
④	On-grid loads RCD	A or B	300
⑥	Inverter BACK-UP RCD	A or B	300

Table 2.4. Recommended RCD specifications

Prepare the other circuit breakers and RCDs according to the actual grid requirement and local regulations.

2.4. Work mode

CHS2 series systems support the following working modes:

AI Mode

The working mode operates with AI Saving enabled. The system leverages AI-powered intelligent scheduling based on forecasts of PV generation, load demand, and electricity pricing to optimally allocate energy sources and usage, minimizing electricity bills and maximizing grid-export revenue.

Maximum Self-Consumption

When solar power is sufficient, the electricity generated by the PV system is first supplied to the load. Any surplus energy is stored in the battery, and excess electricity is then exported to the grid. When solar power is insufficient, the battery discharges to supply power to the load.

Time-of-Use (TOU) Mode

In the TOU (time-of-use) mode, the system imports from or exports to the grid during the set period. In this mode, advanced settings like back-mode and peak shaving are available for various power consumption requirements and local grid policies.

Note: In this mode, for the non-charging or non-discharging periods, enable the option of **Self-Consumption Mode** on the App so that the system can work in self-consumption mode when the system is not charging or discharging. If this option is disabled during these periods, the system will be at the bypass status and provides no power to the backup loads.

Micro-Grid Mode

The PV system only supplies power to the loads until the battery reaches the set SOC value. In this case, the system can start up the diesel generator automatically to supply power to the battery and the loads.

Virtual Power Plant (VPP) Mode

In this mode, the system works according to the scheduling strategy from the VPP platform and related controllers.

3. Transportation and storage

DANGER

- Observe all safety symbols displayed on the packaging prior to transportation.
- Maintain stable driving conditions throughout transportation to prevent the inverter from colliding or dropping. Otherwise, the internal power components may be damaged, potentially causing short circuits or explosions upon subsequent power-up.
- Ensure that transport vehicles are not overloaded and that weight is distributed evenly.
- Do not drill holes into the product or its housing for any transportation-related purpose. Such modifications can damage the structural integrity and functionality of the device.
- Do not store or transport the equipment in damp, flammable, or explosive environments.

WARNING

- When moving the equipment, use the original packaging or dedicated handling tools to avoid muscle strain from lifting heavy objects alone.
- Wear suitable protective gloves when manually handling equipment.
- When lifting the inverter, grip it firmly at the designated handles and support the base. Keep the unit level to avoid dropping.
- Do not unpack the inverter packaging if it is not used immediately.
- Do not store the inverter in areas exposed to direct sunlight, rain, strong electric fields, or high humidity. Such conditions can cause overheating, electrical failure, or corrosion.
- Do not store inverters near chemically corrosive substances or in locations prone to pests or rodents. These can cause irreversible damage to housing and internal components.
- Do not stack heavy objects on top of the inverter enclosure during storage.
- Do not tilt or invert the packaging. Maintain the upright orientation as indicated on the carton to prevent internal displacement or component stress.

CAUTION

- Store the cabinet in a dry and ventilated environment. Keep it at least 600 mm away from heat sources.
- For storage period less than 3 months, keep it in an environment with storage temperature from -20°C to +40°C with humidity lower than 85% RH.
- For long-term storage longer than 3 months but shorter than 6 months, put it in an environment with storage temperature from -20°C to +25°C with humidity lower than 85% RH.
- For long term storage without installation, contact SAJ technical support to charge the battery to no less than 50% SOC every six months.

NOTICE

- It is recommended to retain the original packaging for future relocation or return for repair.
- The battery remains 40% SOC when it is sent from the factory.
- Before long-term storage (exceeding 6 months), ensure the storage environment meets requirements and periodically inspect the packaging integrity. Check for environmental damage, pest intrusion, or packaging degradation.

3.1. Transportation equipment

The installers need to prepare proper equipment for transporting and lifting the product. For example, a forklift or a crane.

Forklift

Use a forklift to move or lift the cabinet.

The forklift must meet the following requirements:

- The load capacity must be greater than two tons.
- The length of the fork blades must be greater than 1.2 meters. Use fork extensions if needed.
- The fork blades can slide under the bottom of the cabinet for lifting and moving.

Follow specific guidelines below to move or lift the cabinet:

- Adjust the distance between the fork blades to ensure load stability.
- The fork blades must extend longer than the depth of the cabinet to avoid falling.

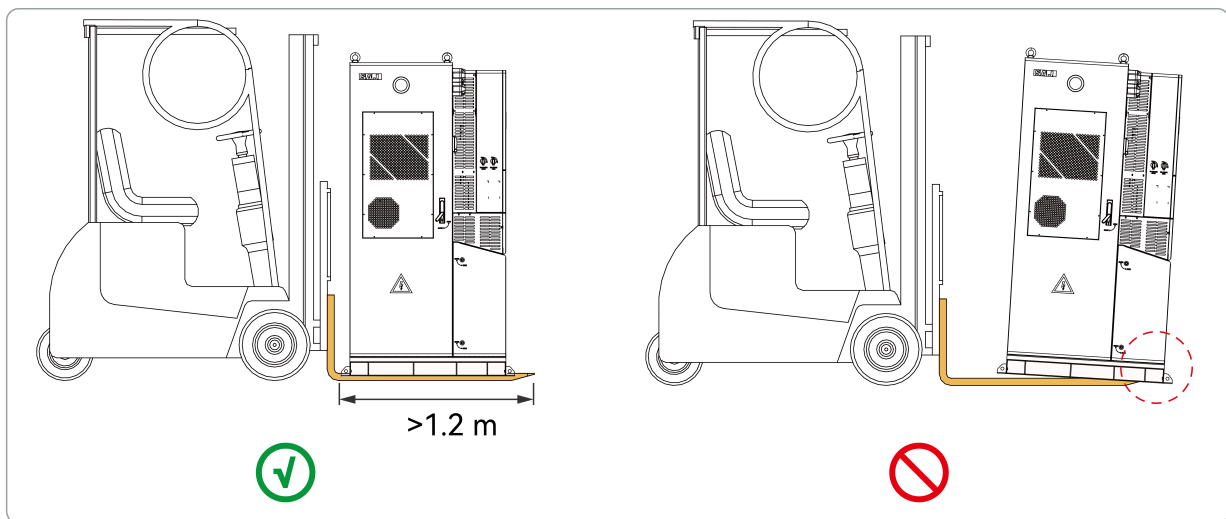


Figure 3.1. Moving with forklift

Crane

- The load capacity of the crane must be larger than two tons; the slings must be strong enough to lift and move the inverter.
- Recommend using fiber slings to avoid scratching the painting on the inverter surface.

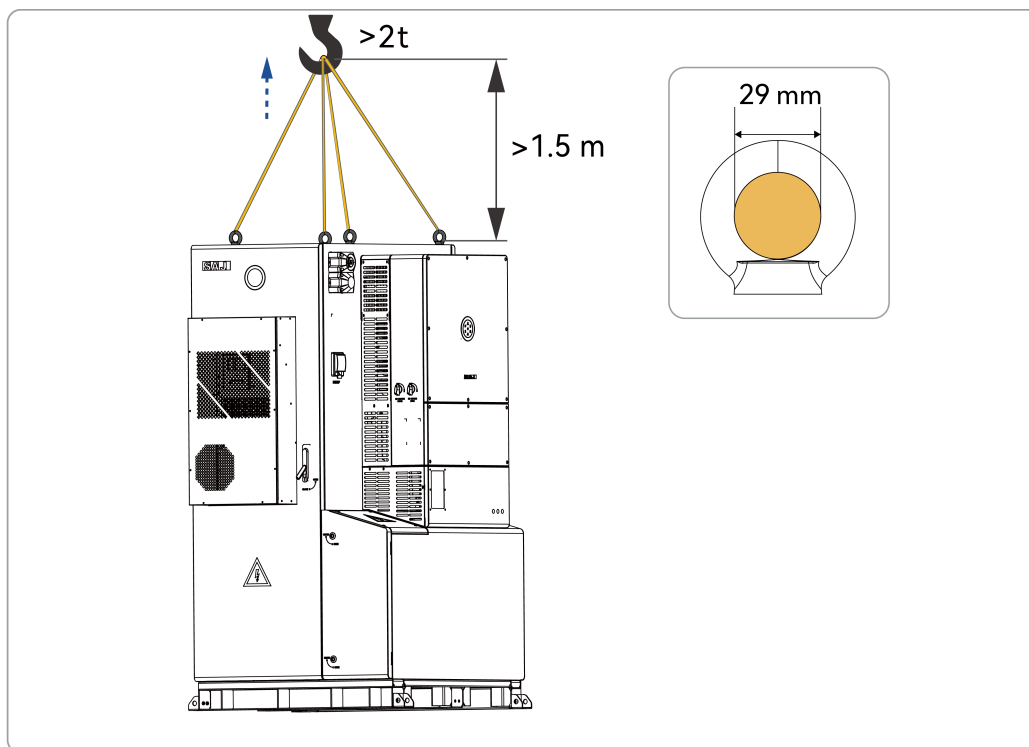


Figure 3.2. Moving with crane

4. Installation instructions

4.1. Installation preparation

Read the following sections to determine the installation site.

The safety regulations vary in different countries and regions. Follow local safety regulations.

4.1.1. Precautions

For safety, be sure to read all the safety instructions carefully prior to any work and observe the appropriate rules and regulations of the country or region where you install the product.



DANGER

Danger to life due to potential fire or electric shock.

Do not install the product near any inflammable or explosive items.



NOTICE

This equipment meets the pollution degree.

- Inappropriate or unharmonised installation environment may jeopardize the life span of the product.
- The installation site must be well ventilated.

4.1.2. Installation environment requirement

It is strongly suggested to install the product in an outdoor location, that is more than 2000 meters from the coast. When selecting the installation location, follow the guidelines below:

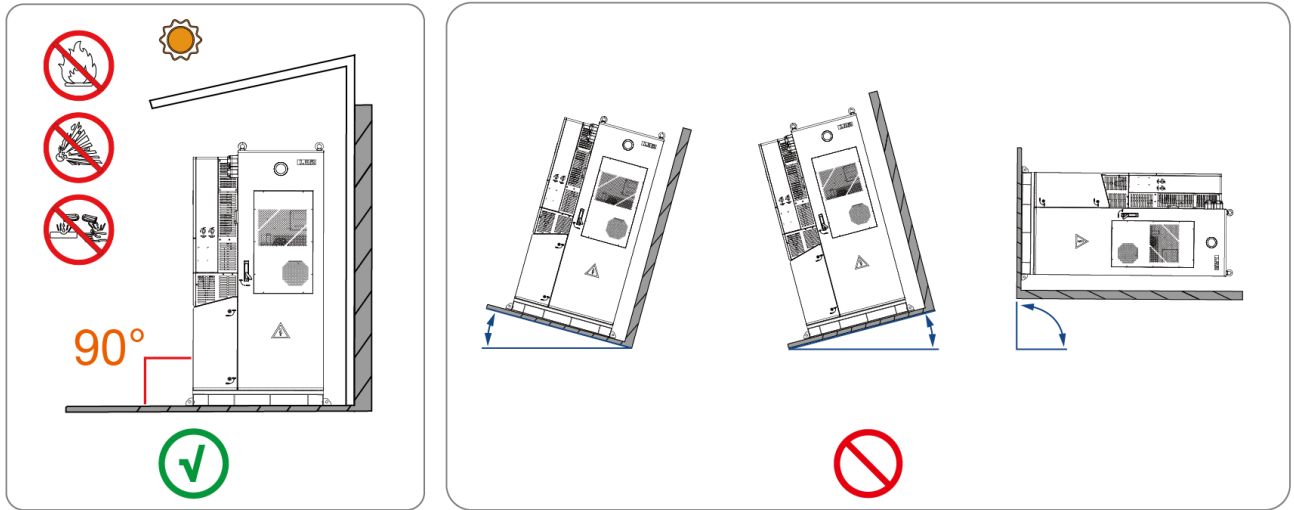
- Consult the dealer or SAJ technical support when the distance from the installation location to the coast is between 500 and 2000 meters. Do not install the product within 500 meters from the coast.
- Do not install the product in areas affected by salt damage or pollution which can lead to corrosion of the equipment.
- Do not install the product in areas with moderate or heavy dust pollution, metallic dust pollution, saline-alkali land, corrosive gas pollution, or corrosive rainwater pollution.
- Keep the air inlet and outlet at the installation site clear. If natural airflow is insufficient, add extra ventilation and consult SAJ for assistance.
- The installation environment must be free of inflammable or explosive materials.
- The product must be installed in a place away from any heat source. For energy storage systems, keep the system at least two meters away from any heat source.
- Do not install the product at a place where the temperature changes extremely.
- The height of the product from the ground should be considered to prevent the equipment from soaking in water. The specific height is determined by the site environment.

4.1.3. Plan the installation site

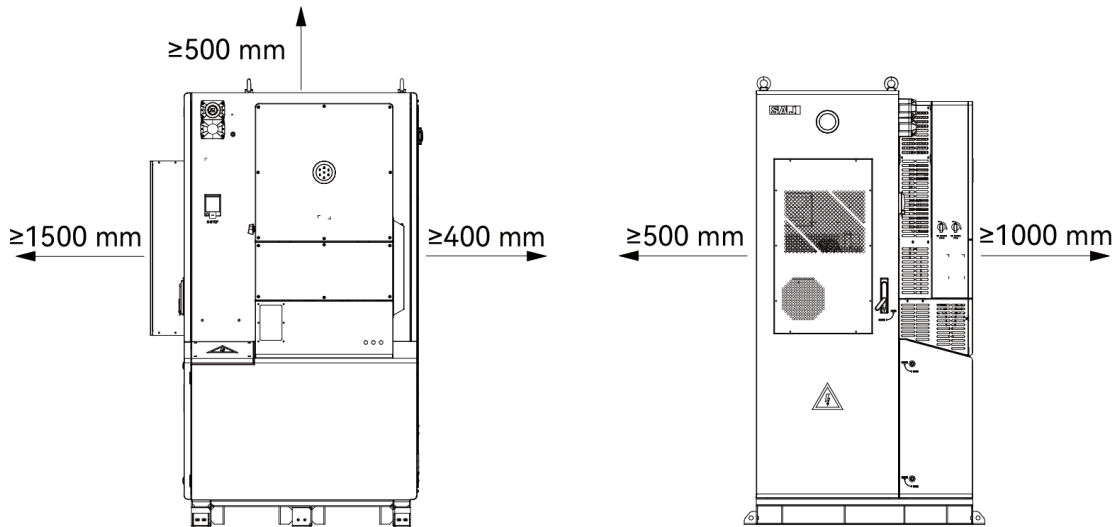
This device is equipped with an air conditioner for cooling and provides the ingress protection of IP 55 (Battery) and IP66 (Inverter). The device can be installed either indoors or outdoors. For outdoor installation, the pollution degree classification needs to be IP44 at the minimum.

Recommend installing a canopy at the installation site to ensure optimum performance. For the canopy height, follow product installation space requirements and local regulations.

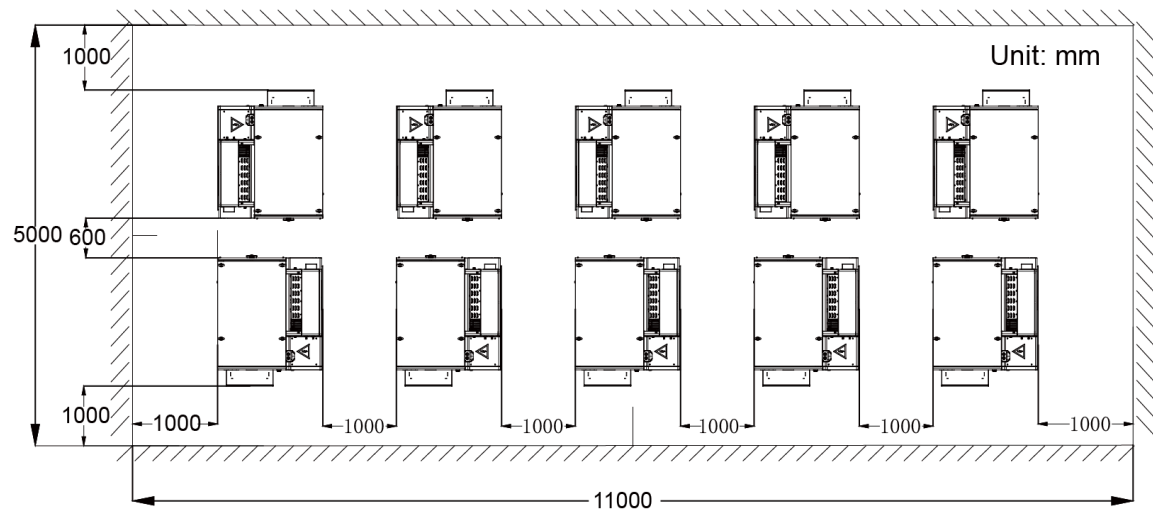
1. Install the inverter vertically. Do not install it backward-tilted, forward-tilted, or horizontally.



2. Poor air ventilation will affect the working performance of internal electronic components and shorten the service life of the system. Reserve enough clearance around the product to ensure a good air circulation at the installation area.



3. In parallel deployment, reserve the installation space as follows:



4.1.4. Lifting equipment

During the installation, use a crane to lift and move the inverter.

Follow the safety instructions below when using the crane:

- The load capacity of the crane must be larger than two tons; the slings must be strong enough to lift and move the inverter.
- Recommend using fiber slings to avoid scratching the painting on the inverter surface.

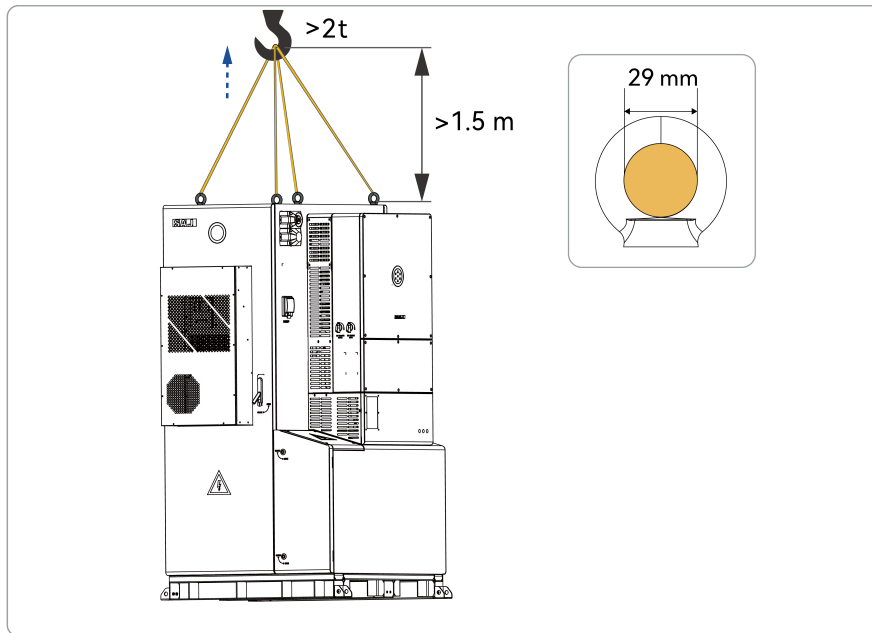


Figure 4.1. Lifting equipment

4.1.5. Installation tools

Installation tools include but are not limited to the following recommended ones. Use other auxiliary tools on site if necessary.

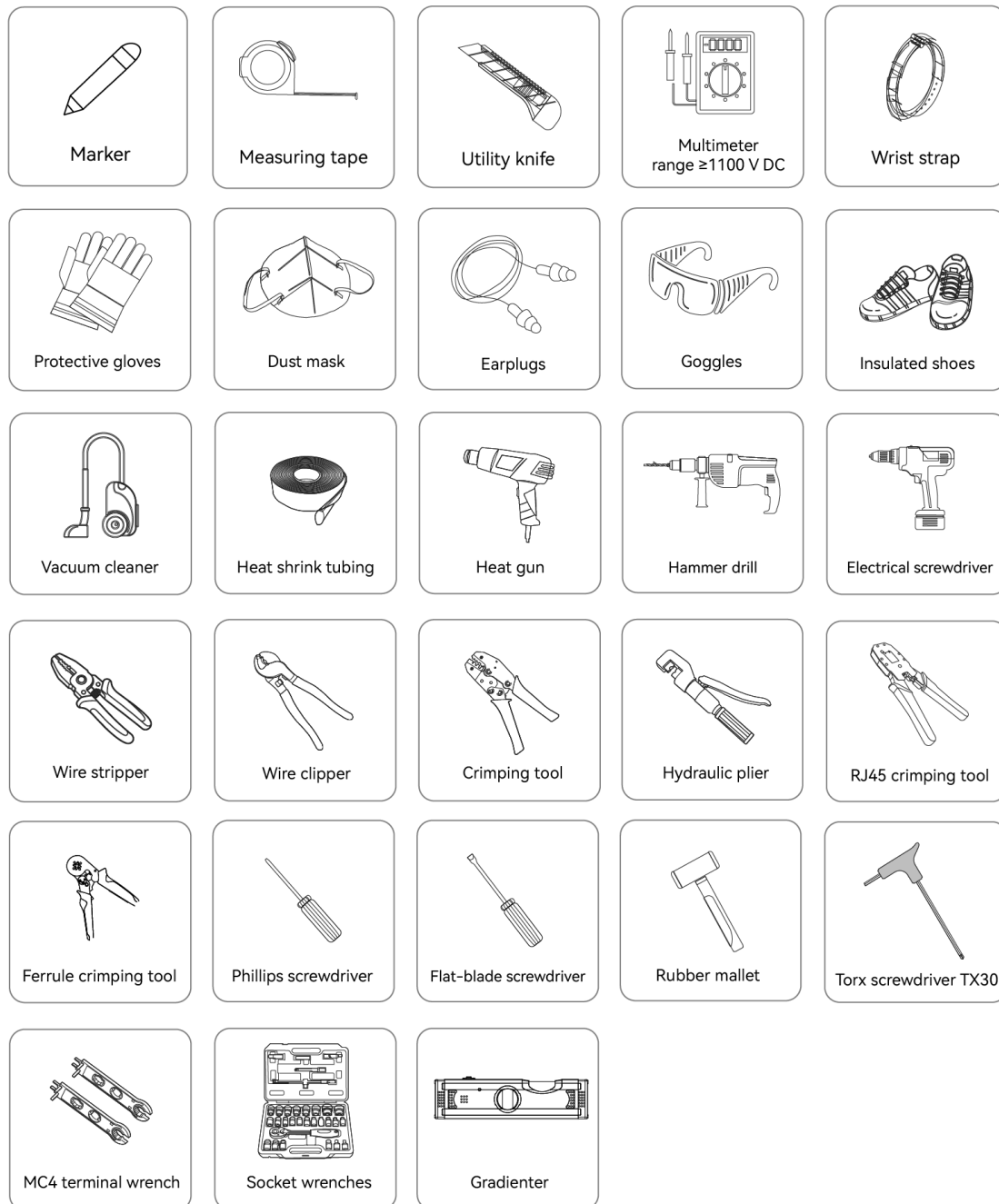
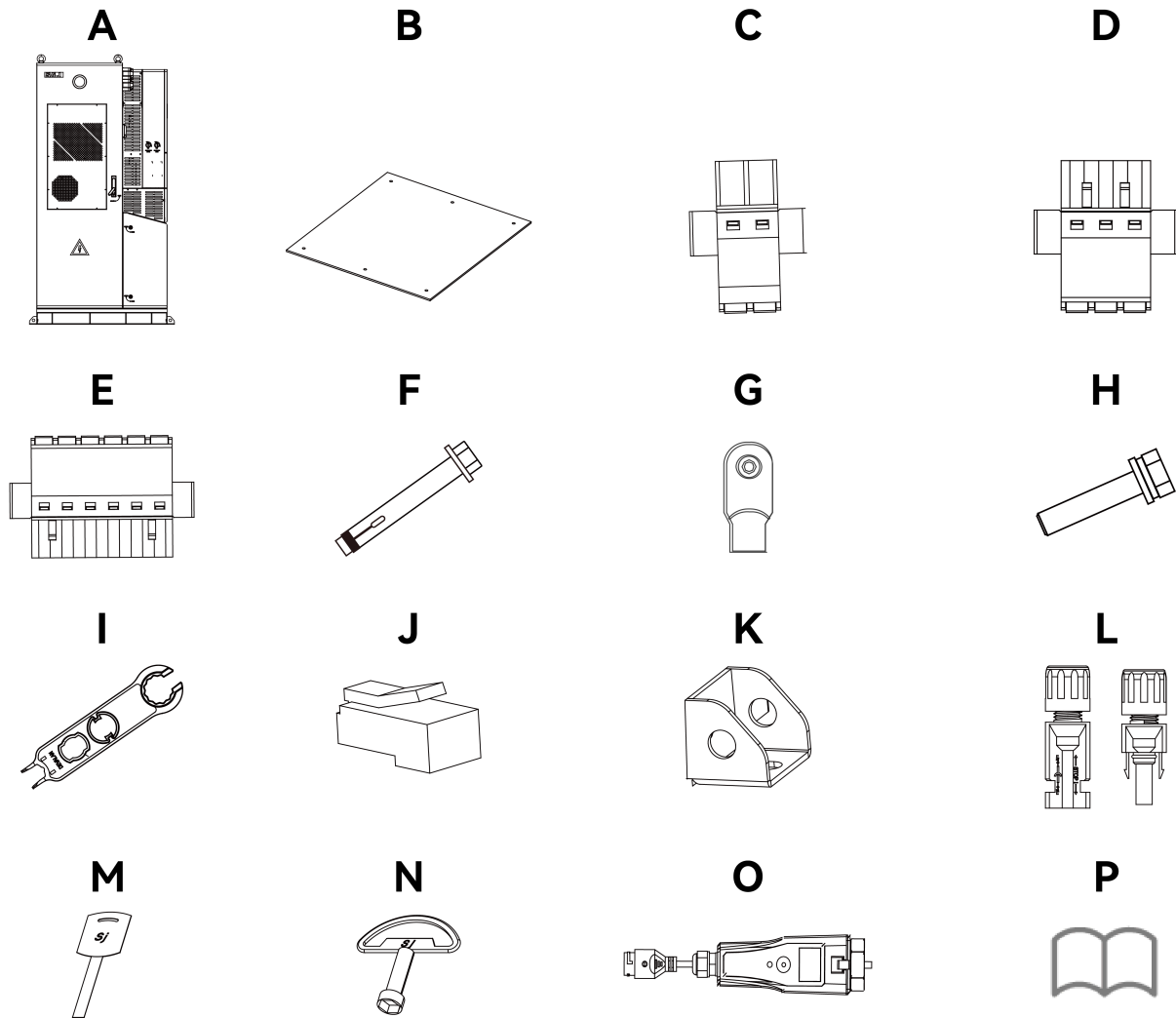


Figure 4.2. Suggested installation tools

4.1.6. Packing list



Number	Quantity	Designation
A	1	CHS2 cabinet
B	1	Positioning cardboard
C	4	2-pin plug
D	2	3-pin plug
E	4	6-pin plug
F	6	M12x80 expansion bolt
G	• RNBS 38-8: 5 • RNB70-10: 12 • SC50-10: 12	Terminals
H	8	M8x25 screw
I	1	PV connector removal tool
J	9	RJ45 plug
K	4	Mounting bracket

Number	Quantity	Designation
L	T4 models: 8 pairs T6 models: 12 pairs	PV positive and negative connectors
M	2	Key1
N	2	Key2
O	1	Communication module
P	1	Document

4.2. Mount the inverter

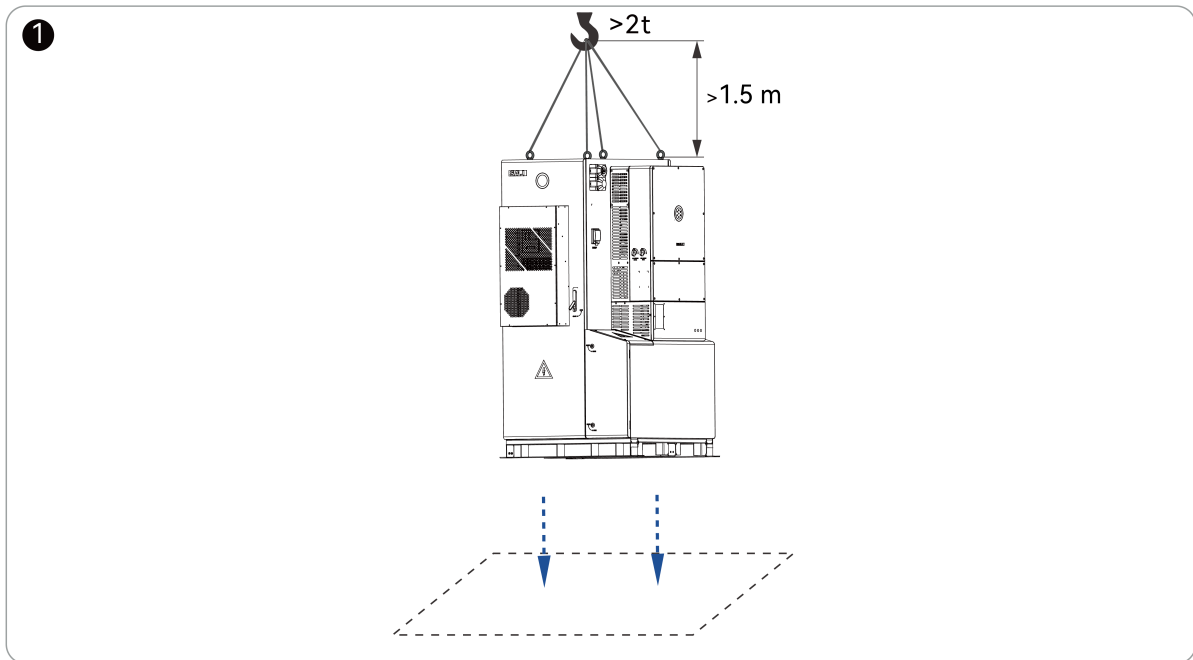
Select one of the following options to secure the cabinet:

- Secure with the mounting brackets.
- Secure with the screw bolts.

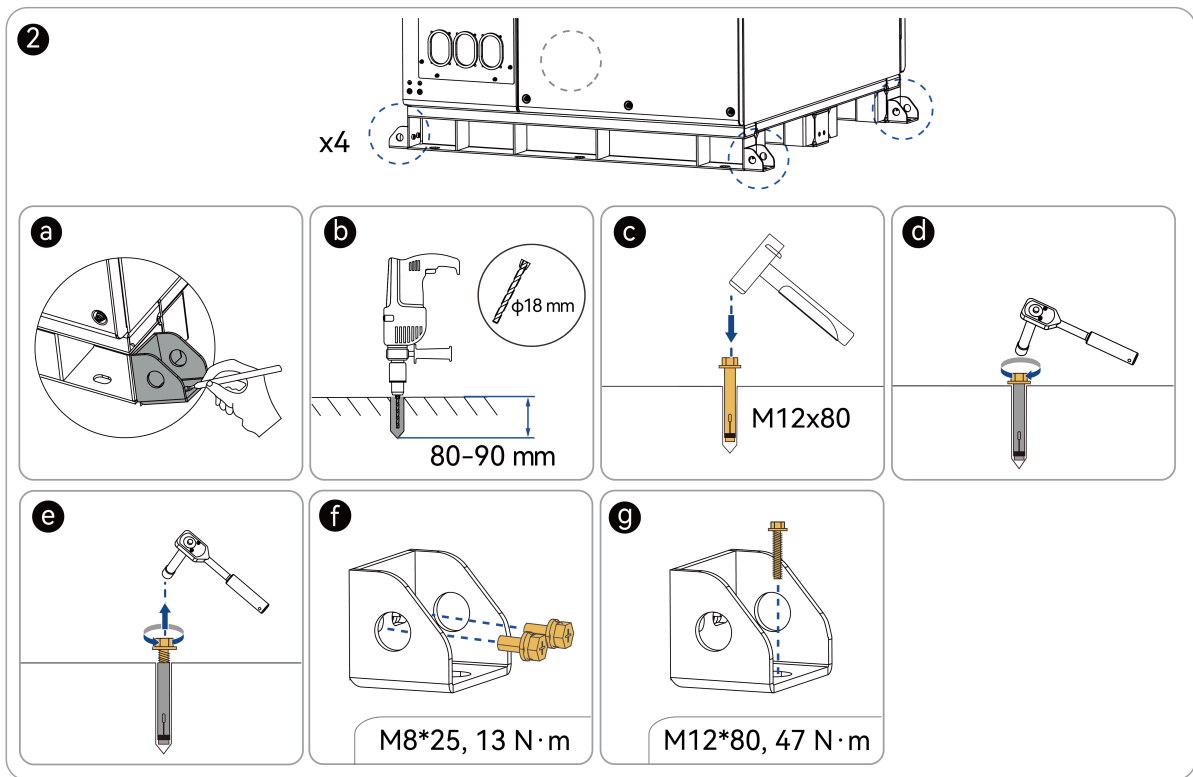
4.2.1. Secure cabinet with mounting brackets

Procedure

1. Move and place the cabinet to the installation location with a forklift or crane.



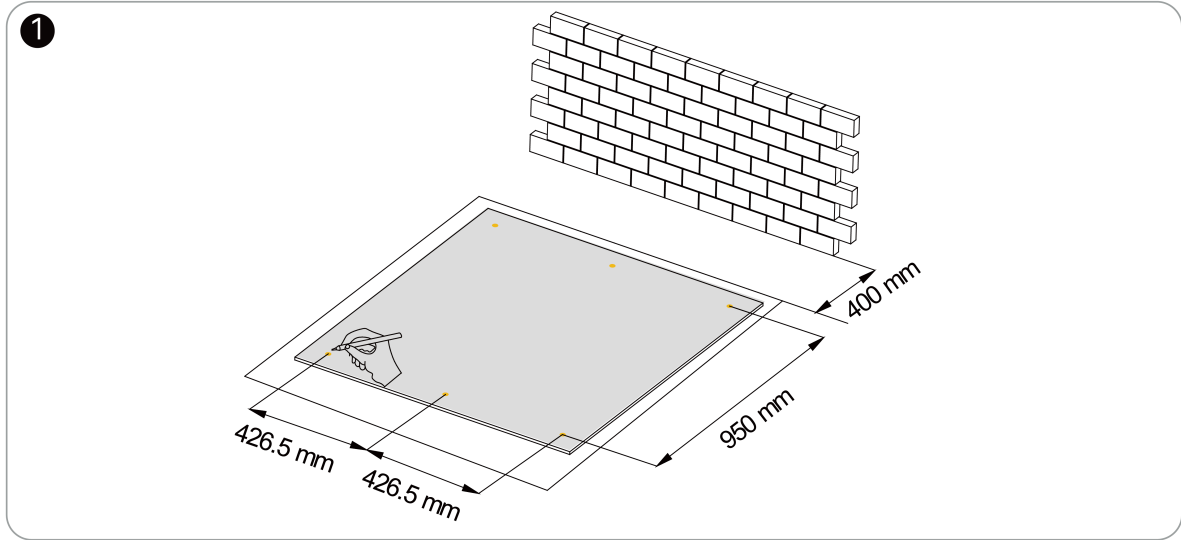
2. Mark and drill four holes with the four mounting brackets. Secure the mounting brackets with the screw bolts.



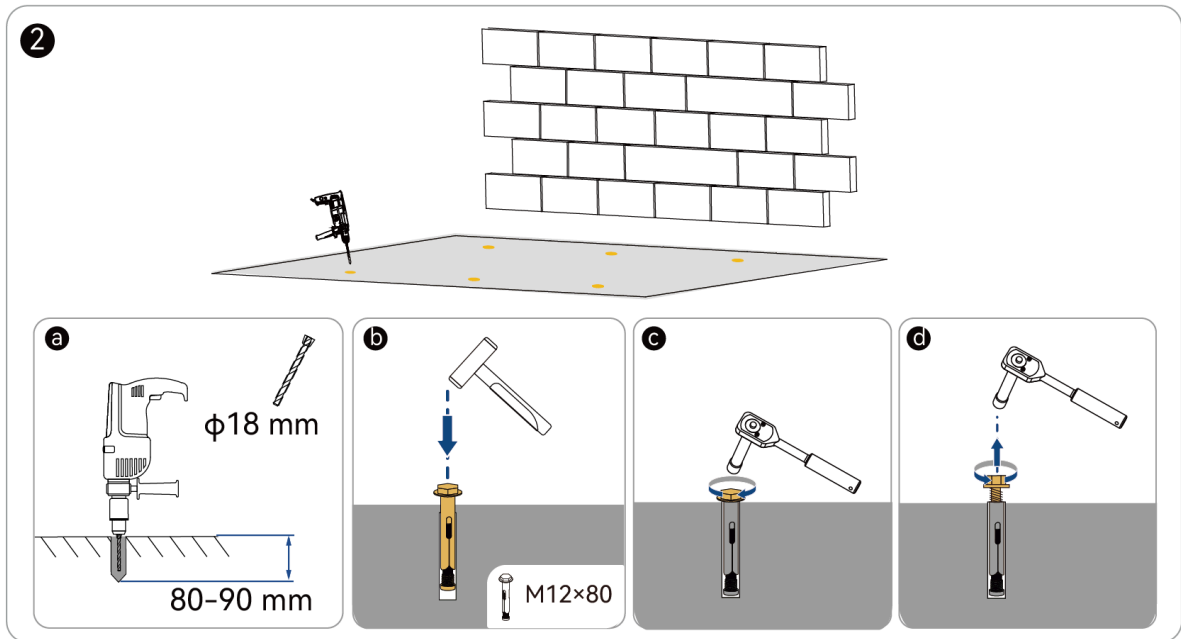
4.2.2. Secure cabinet with screw bolts

Procedure

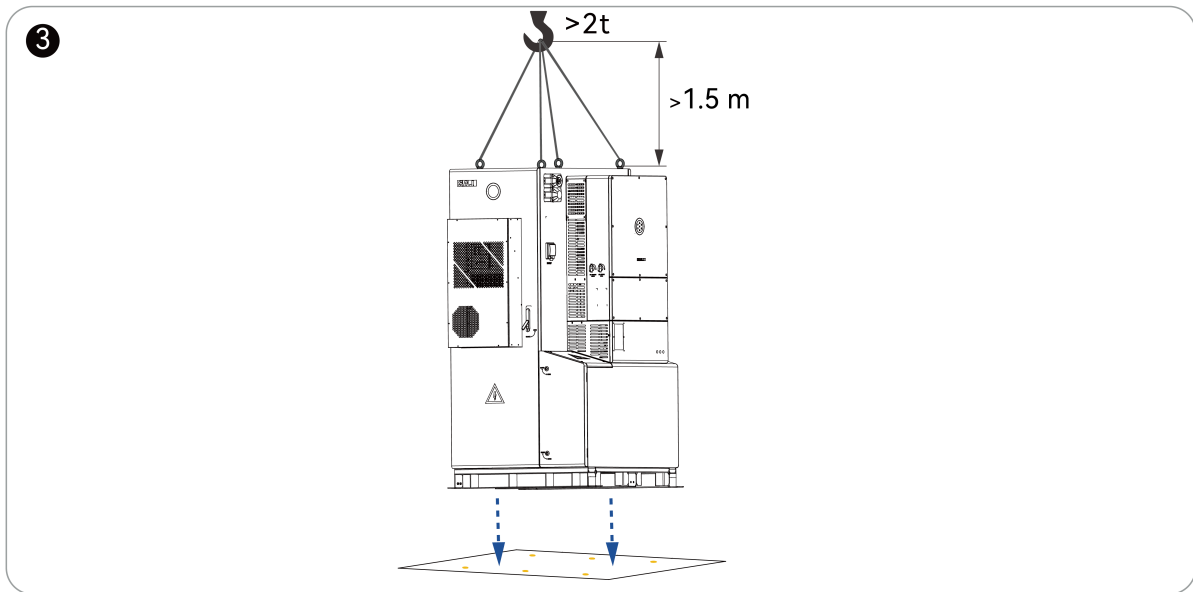
1. Place the positioning cardboard on the floor where the machine is to be located. Mark six drilling holes with the cardboard on the floor and remove the cardboard.



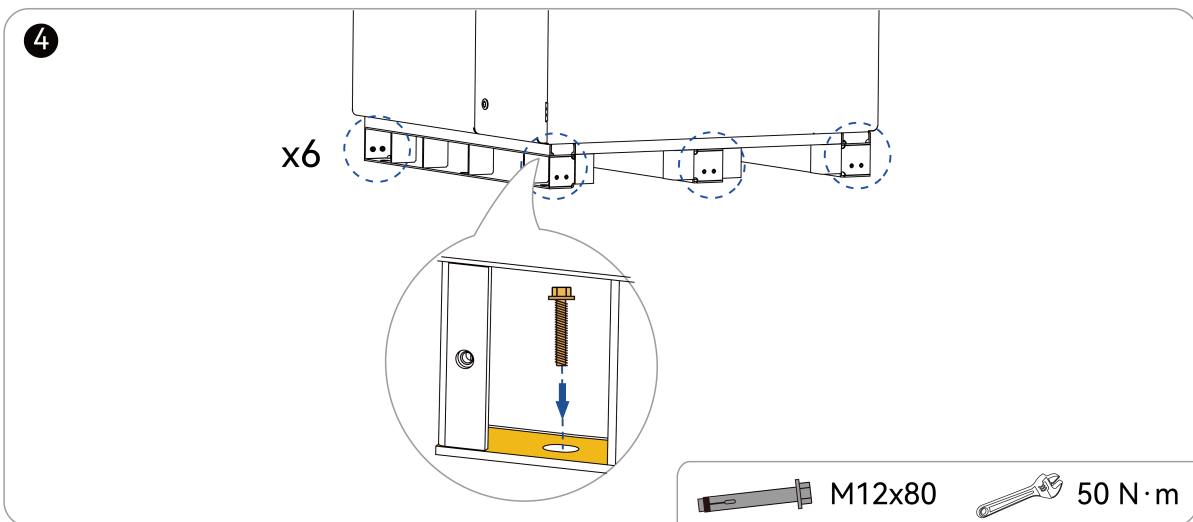
2. Use an electrical drill to drill six holes on the floor at the depth of 80–90 mm. Put an M12x80 expansion tube in each hole and take out the screw.



3. Move and place the cabinet to the installation location with a forklift or crane. Align the holes at the cabinet bottom with the drilled holes.



4. Use a wrench to tighten the M12x80 screw at the bottom to secure the cabinet to the floor.



5. Electrical connection

5.1. Electrical connection safety

Electrical connection must only be operated by professional technicians. Before the operation, the technicians must wear necessary personal protective equipment (PPE) including insulating gloves, insulating shoes, and a safety helmet.



DANGER

Danger to life due to potential fire or electricity shock.

- Do not install the cabinet near any inflammable or explosive items.
- When it is powered on, the equipment should comply with national rules and regulations.



WARNING

Any improper operation during cable connection can cause device damage or personal injury.

5.1.1. Wiring guidelines

- The selection, installation, and routing of cables must comply with local laws, regulations, and standards.
- During the placement of power cables, avoid coiling or twisting. If a power cable is found to be too short, replace it entirely; do not create splices or weld joints within the cable.
- Ensure that all cables are firmly connected, have good insulation, and are appropriately sized for their application.
- Cable trays and pass-through holes should not have sharp edges. Use protective measures at conduit entrances or pass-through holes to prevent damage to cables from sharp edges or burrs.
- Group similar types of cables together and secure them neatly, ensuring they lie flat and straight without damage to the outer jacket. Different types of cables should be laid separately to avoid entanglement or crossing.
- For buried cables, use cable supports and clamps to securely fix them in place. Ensure that backfilled soil around underground cables is compacted to prevent deformation or damage during the backfilling process.
- When external conditions like installation methods or ambient temperatures change, verify the cable selection according to local regulations to ensure parameters like current-carrying capacity.
- To prevent insulation aging or damage due to high temperatures, maintain a minimum distance of 30 mm between cables and heat-generating components or heat source peripheries.

5.1.2. Ground protection

- Follow the grounding guidelines below for the equipment which is critical to ensure electrical safety and compliance with local standards:
- The impedance of the equipment's grounding system must meet the requirements specified by local electrical standards.
- The equipment must be permanently connected to a protective ground. Before operating the equipment, always check the electrical connections to ensure that the equipment is reliably grounded.
- It is strictly prohibited to operate the equipment if the grounding conductor has not been installed.
- Do not damage or tamper with the grounding conductor in any way.

5.1.3. AC- and DC-side handling

- Before installing or removing power cables, turn off all switches on both the AC and DC sides to ensure that no electrical flows through the system during the operation.
- Prior to connecting the AC side cables, verify that the phase sequence of the three-phase cables matches the silk-screen markings on the cable connectors.
- If the equipment has multiple input and output paths, disconnect all inputs and outputs before proceeding. After ensuring all power sources are disconnected, wait for at least 5 minutes to allow any residual charge in capacitors or other components to dissipate. Only then should you perform any operations on the equipment.

5.1.4. Electrostatic Discharge (ESD) Protection



CAUTION

Contact with or improper handling of printed circuit boards or other electrostatic discharge sensitive components can lead to device damage.

- Avoid unnecessary contact with circuit boards.
- Adhere to ESD protection standards, such as wearing an anti-static wrist strap.

5.1.5. Earth fault alarm monitoring

This inverter is of transformer-less design and therefore does not provide galvanic isolation between the DC and AC sides. To comply with safety requirements, it incorporates earth fault alarm monitoring function in accordance with IEC 62109-2, *clause 13.9*. This function continuously checks the insulation resistance of the PV array to earth.

If an earth fault is detected due to damaged cables, moisture ingress or similar reasons, the inverter responds as follows:

- The LED light illuminates **red**.
- An error code **<31>** is displayed in the elekeeper App.

When error code **<31>** is reported, the technical support engineer can take the following actions:

1. Disconnect all the AC and DC power sources.
2. Check whether the grounding cable and all the AC power cables are connected securely.
3. Check whether all the AC and DC power cables are broken or soaked in water.
4. Check whether the battery packs are soaked in water.
5. When all the above items are normal, restart the system.
6. If the error is still active, contact SAJ for further support.



NOTICE

This inverter **must not be connected to functionally earthed PV arrays**, where either the positive or negative pole is permanently connected to earth. Such installations would be interpreted as a permanent earth fault, causing continuous false alarms and potentially damaging the inverter's internal circuitry.

5.2. Plan the cable connections

5.2.1. Single deployment

On-grid and backup

The following diagram shows the system connections of a single machine where both the backup and the on-grid loads are enabled.

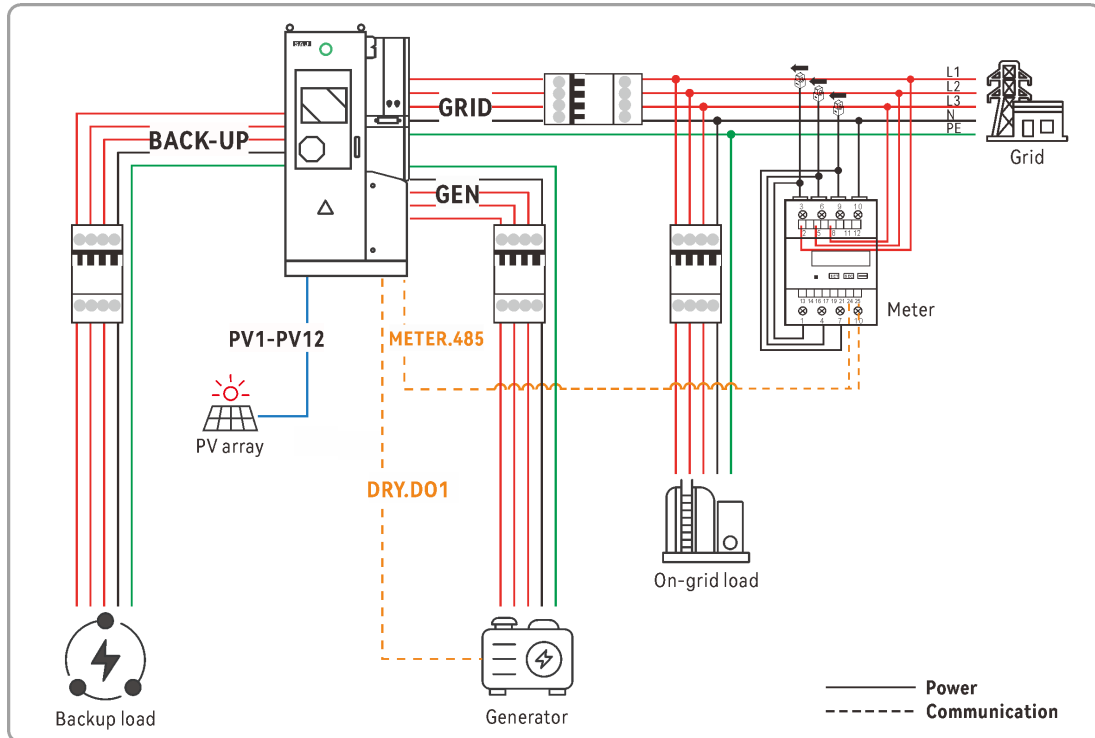


Figure 5.1. Single deployment with on-grid and backup connections

On-grid only

The following diagram shows the system connections of a single machine where only the on-grid loads are enabled.

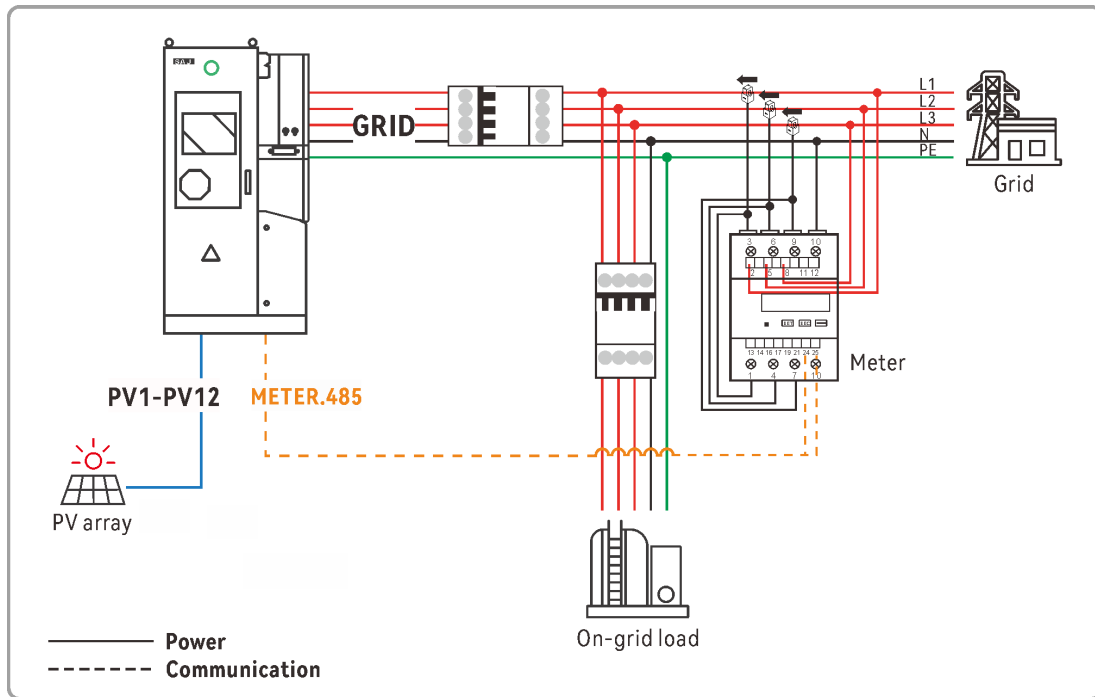


Figure 5.2. Single deployment with on-grid connection

5.2.2. Parallel deployment

The CHS2 series ESS support parallel deployment of 10 cabinets at maximum for different application scenarios.

On-grid and backup

The following diagram shows the system connections of parallel deployment where both the backup and the on-grid loads are enabled.

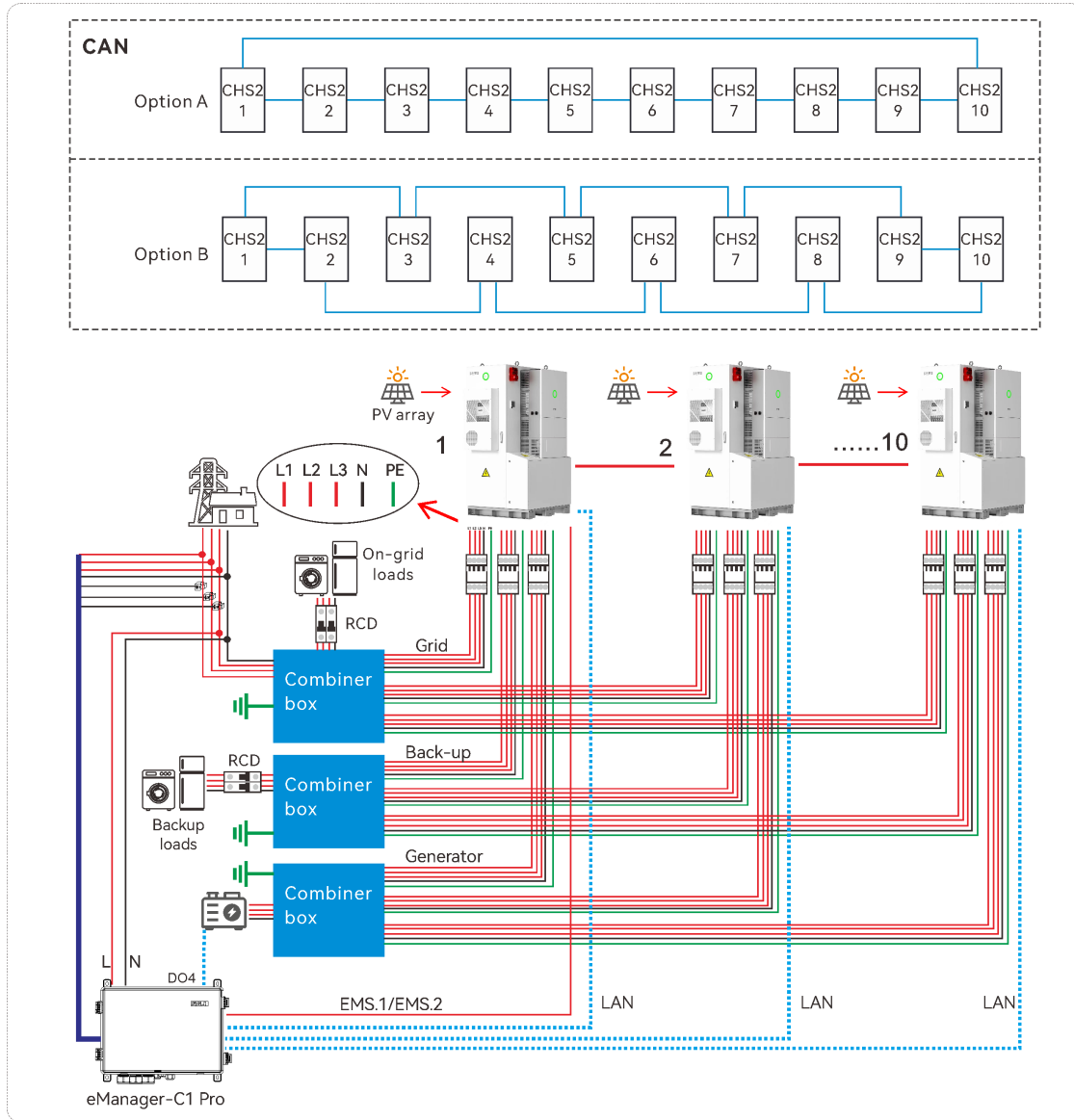


Figure 5.3. Parallel deployment with on-grid connection

Install the RCDs for backup loads and on-grid loads respectively as illustrated above.

Compatible RCD type	Recommended rated current (mA)
A or B	300

Table 5.1. Recommended RCD specifications

The following figure shows the detailed cable connections of EMS:

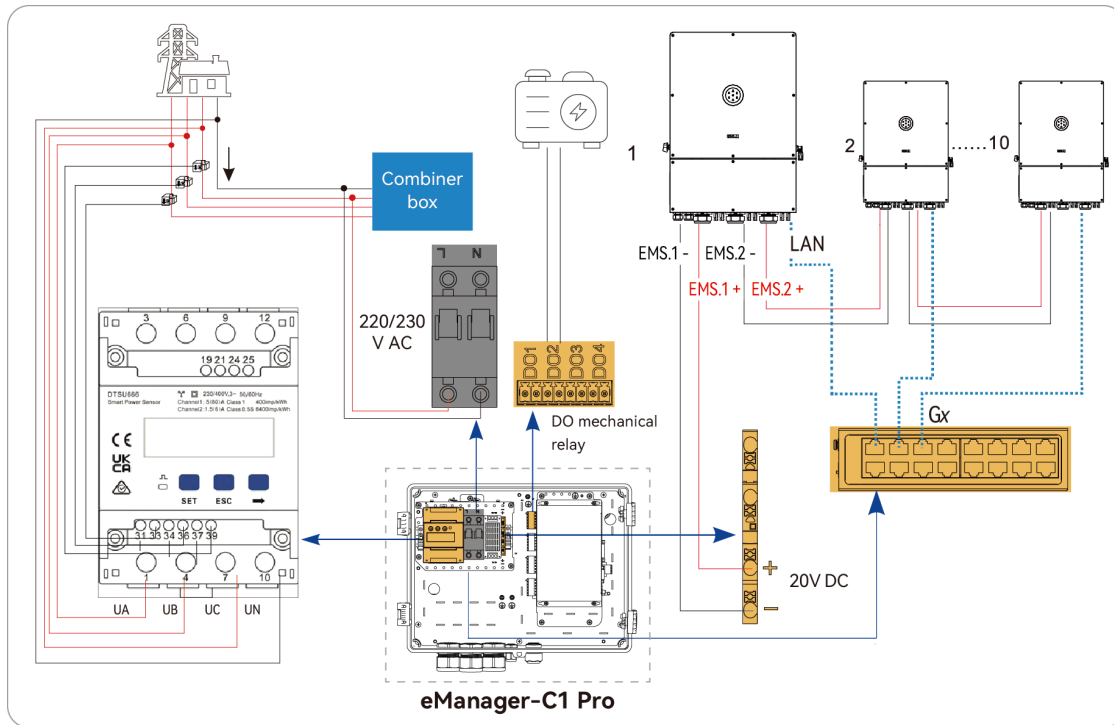


Figure 5.4. EMS cable connections in parallel deployment

On-grid only

The following diagram shows the system connections of parallel deployment where only the on-grid loads are enabled.

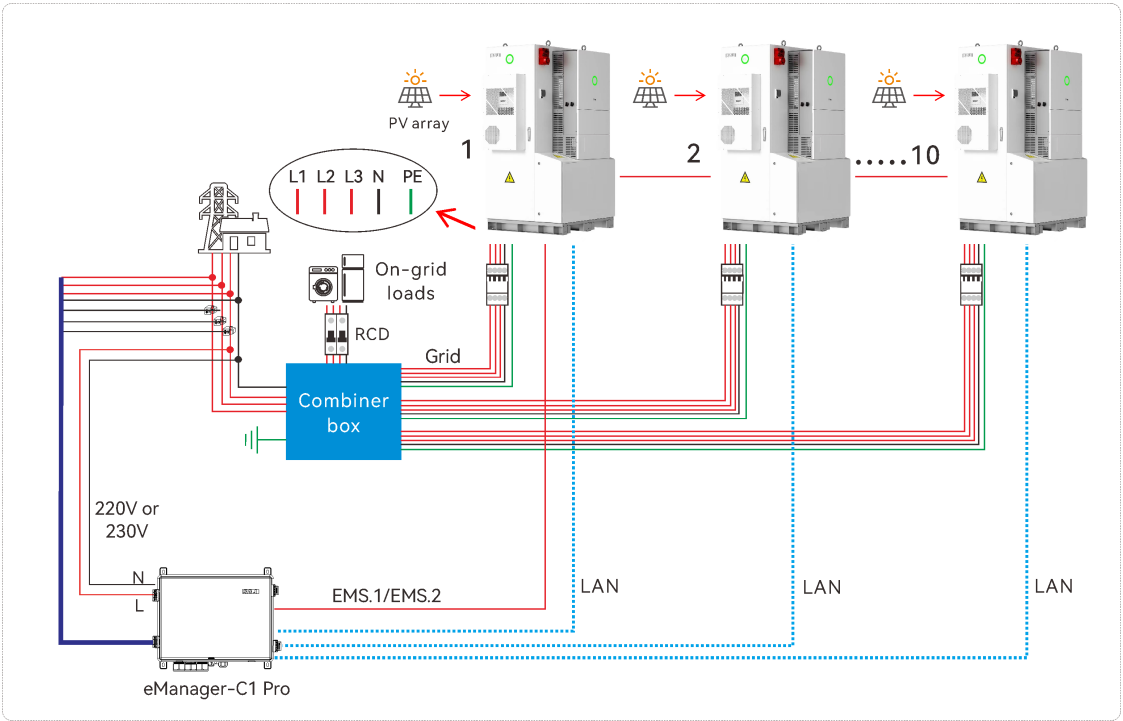


Figure 5.5. Parallel deployment with on-grid connection

Install the RCD for on-grid loads respectively as illustrated above.

Compatible RCD type	Recommended rated current (mA)
A or B	300

Table 5.2. Recommended RCD specifications

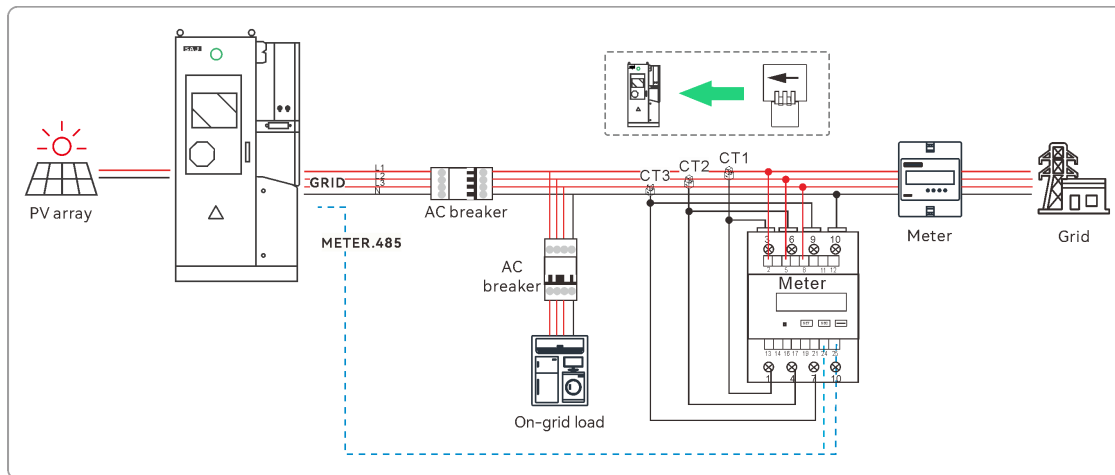
5.2.3. Meter connection solutions

CHS2 series inverters support the following meter connection solutions. Plan the meter connection according to actual customer requirements.

For customized requirements and solutions, contact SAJ product support.

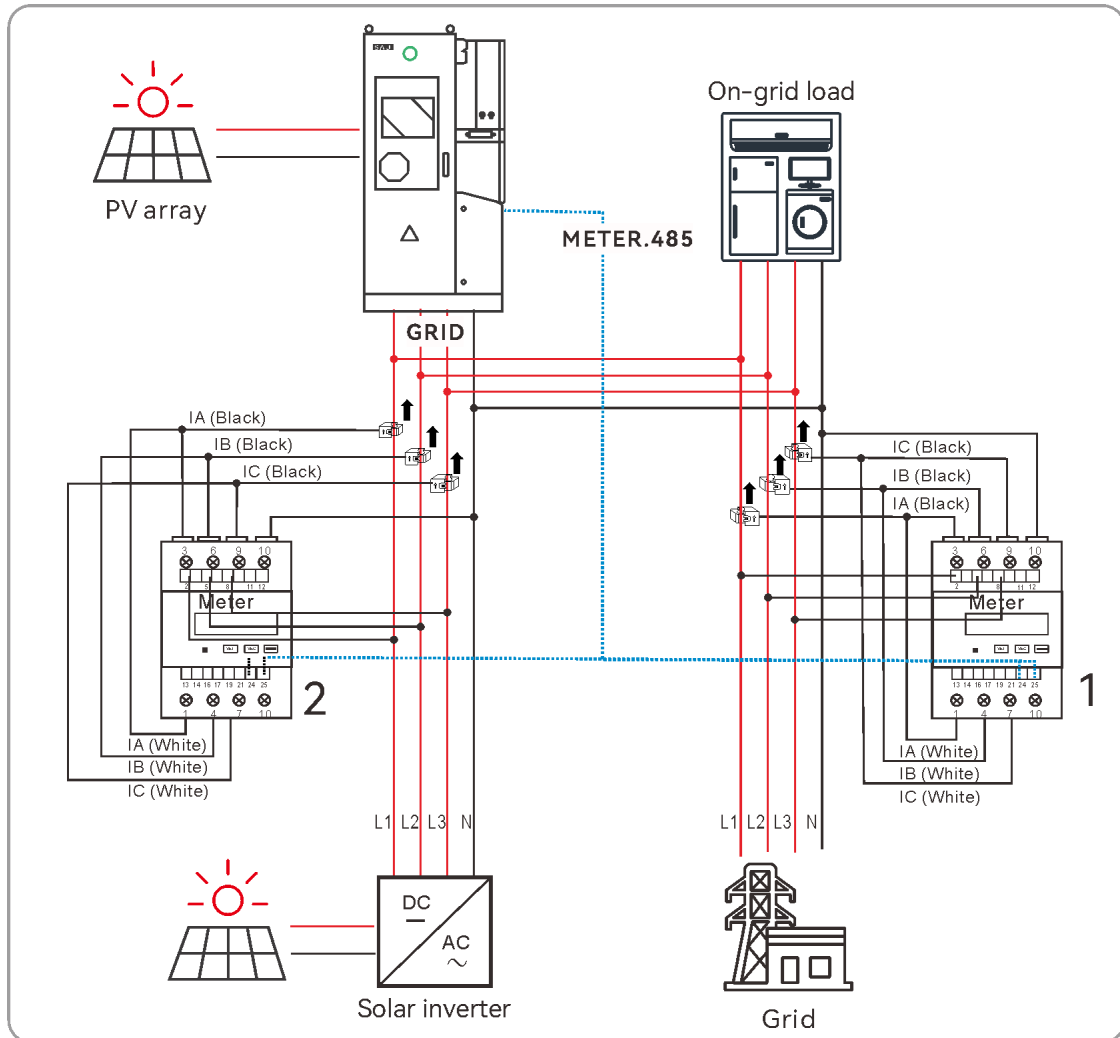
One meter for single deployment

Install the grid meter between the grid main breaker and the loads. The directional arrow on the CT must point towards the on-grid loads.



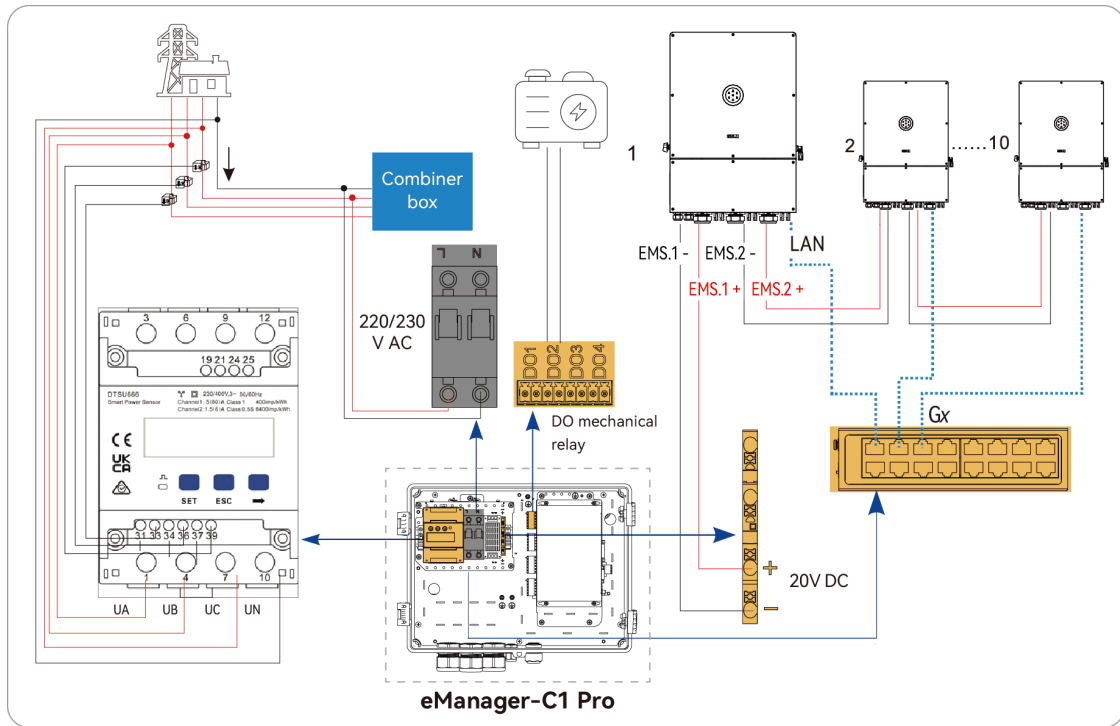
Two meters for single deployment with a solar inverter

The second PV meter can be installed for the solar inverter and reports data to CHS2 through RS485 connection.



Parallel deployment

In parallel deployment, follow the diagram below to connect to the meter integrated in the EMS communication box. During commissioning, configure the export limit control function on the elekeeper App according to local grid requirements and regulations.



5.3. Prepare electrical cables

Prepare the items listed in this section before installation.

Grounding cable

Cable type	Conductor cross-sectional area (mm ²)	Connecting terminal
Outdoor multi-core copper wire cable	35	RNB38-8 OT terminal in the package

Table 5.3. Grounding cable

PV power cables

Cable type	Conductor cross-sectional area (mm ²)	Maximum current (A)
Outdoor single-conductor PV cable (≥1000V DC)	4.0-6.0	30-35

Table 5.4. PV power cable

Communication cables

Port	Cable type / Connecting terminal	Maximum length (m)
- METER.485 - EMS	Standard CAT6 outdoor shielded network cable. Use the RJ45 connectors in the package to assemble the cables.	300
- LAN - Parallel1, Parallel2		100
- BMS.1 - BMS.3		20

Table 5.5. RJ45 communication cables

Cable type	Conductor cross-sectional area (mm ²)	Connecting terminal
Multi-core high-temperature outdoor communication cable	0.20-3.31	2/3/6-pin connectors installed on the communication terminal block of the inverter.

Table 5.6. 2/3/6-pin communication cables

AC power cables - single deployment

Cable type: Outdoor multi-core high-temperature cable ($\geq 400V$)

The following table specifies the required **GRID**, **GEN**, and **BACK-UP** AC cable gauges when the backup output is active in single deployment. Under this configuration, the Grid and the Generator are capable of powering the backup loads and simultaneously charging the battery.

Model	Cable cross-sectional area (mm ²)		Conductor material
	Range	Recommended	
CHS2-29.9K-T4-X	16-35	25	Copper
CHS2-30K-T4-X	16-35	25	
CHS2-49.9K-T6-X	25-70	50	
CHS2-50K-T6-X	25-70	50	
CHS2-30K-T6-X-LV			

Table 5.7. Single deployment with on-grid and backup connections

The following table specifies the required **GRID** AC cable gauges when the backup output is disabled in single deployment:

Model	Cable cross-sectional area (mm ²)		Conductor material
	Range	Recommended	
CHS2-29.9K-T4-X	16-35	16	Copper
CHS2-30K-T4-X	16-35	16	
CHS2-49.9K-T6-X	25-70	25	
CHS2-50K-T6-X	25-70	25	
CHS2-30K-T6-X-LV			

Table 5.8. Single deployment with on-grid connection

Note:

When the grid-connection distance is large, select AC cables with larger diameter for the actual condition.

AC power cables - parallel deployment

Cable type: Outdoor multi-core high-temperature cable ($\geq 400V$)

The following table specifies the required **GRID**, **GEN**, and **BACK-UP** AC cable gauges when the backup output is active in parallel deployment.

Model	Cable cross-sectional area (mm ²)		Conductor material
	Range	Recommended	
CHS2-49.9K-T6-X	70-120	70	Copper
CHS2-50K-T6-X	70-120	70	
CHS2-30K-T6-X-LV			

Table 5.9. Parallel deployment with on-grid and backup connections

Note: When the backup output is active, the power cable length must meet the following requirements:

- All the power cables from the **BACK-UP** terminals of the inverters in the combined cabinet to the combiner box shall be of equal length.
- All the power cables from the **GEN** terminals of the inverters in the combined cabinet to the combiner box shall be of equal length.

The following table specifies the required **GRID** AC cable gauges when the backup output is disabled in parallel deployment:

Model	Cable cross-sectional area (mm ²)		Conductor material
	Range	Recommended	
CHS2-49.9K-T6-X	25-70	25	Copper
CHS2-50K-T6-X	25-70	25	
CHS2-30K-T6-X-LV			

Table 5.10. Parallel deployment with on-grid connection

Note:

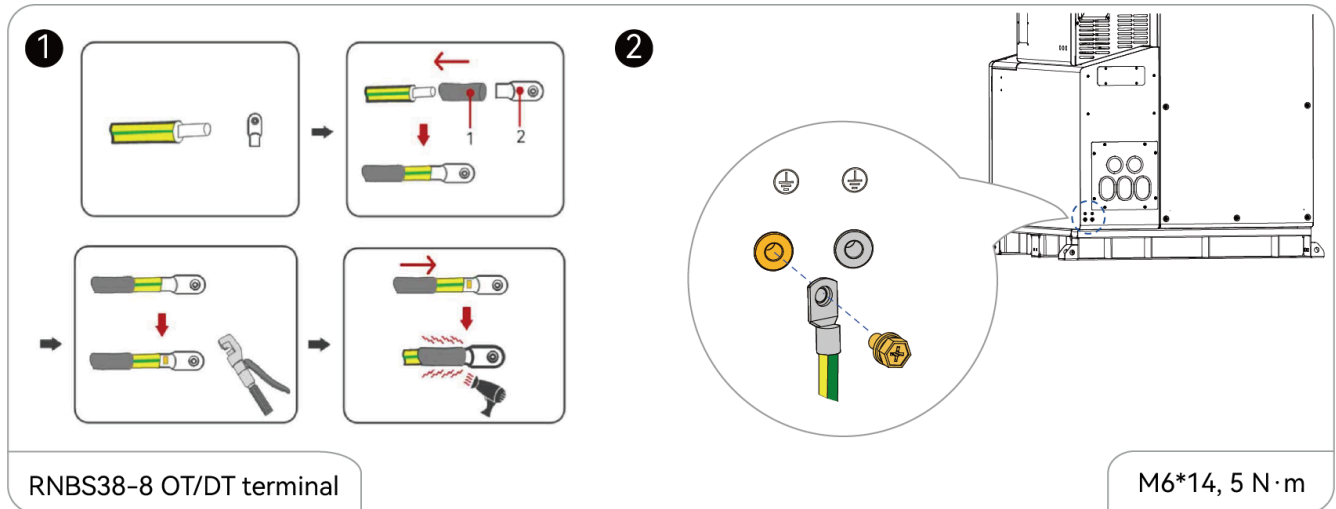
When the grid-connection distance is large, select AC cables with larger diameter for the actual condition.

5.4. Connect the grounding cable



WARNING

Connect the grounding cable before other electrical connections.



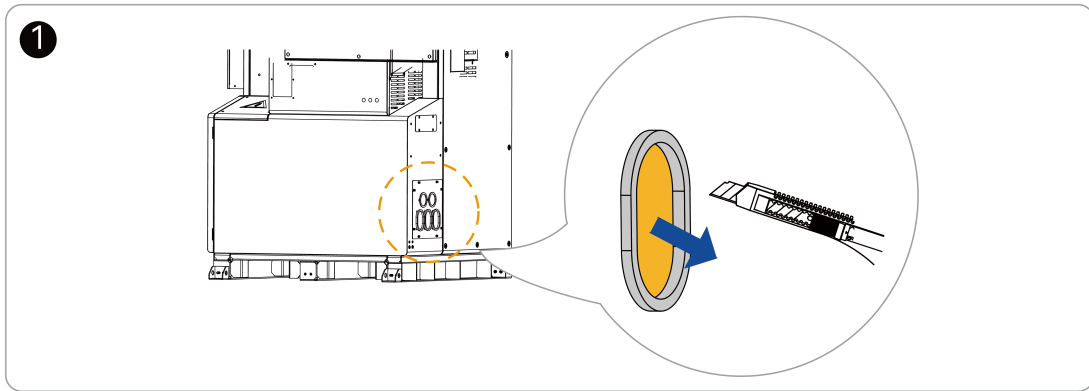
Procedure

1. Assemble the cable with the RNBS38-8 OT/DT terminal.
2. Remove the screw from one of the grounding terminal, insert the screw through the OT/DT terminal, and tighten the cable with the screw.
Two grounding connection points are provided for cable connection convenience. Select one of the ports for connection.
3. Connect the other cable end to the external earthing bar.

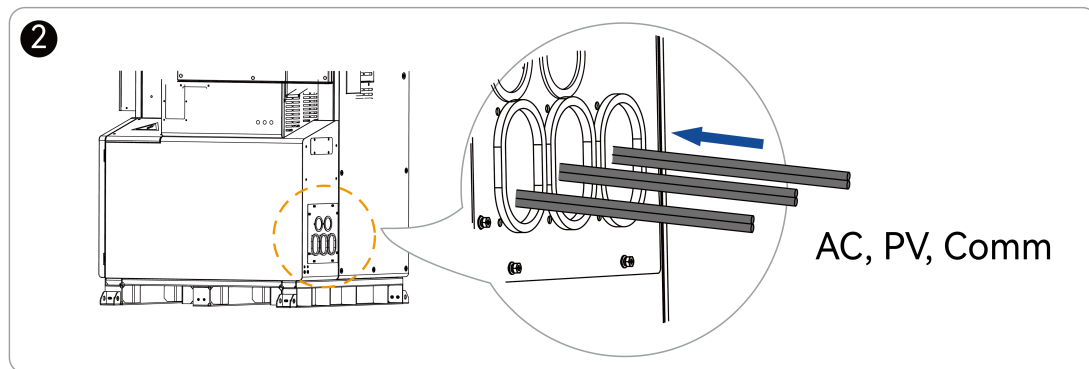
5.5. Organize cables and remove covers

Procedure

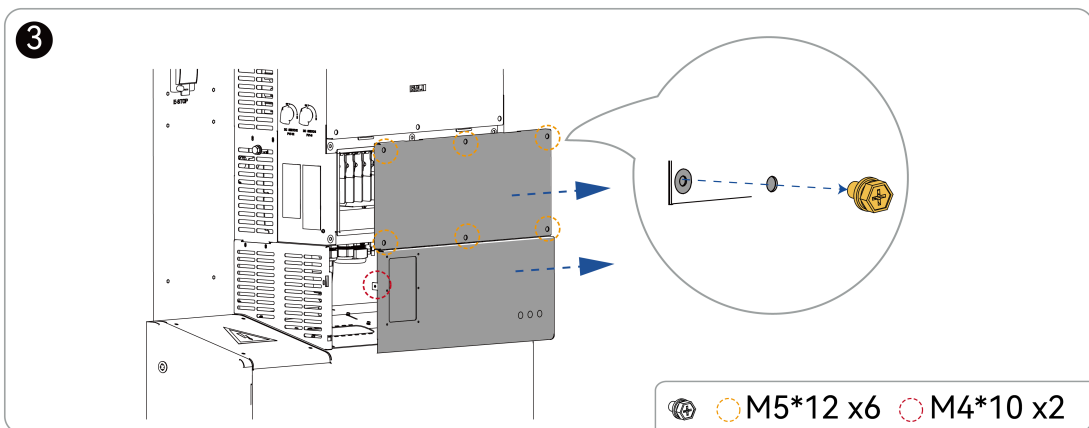
1. Use a knife to cut the end of the cable sleeves at the cable outlet holes.



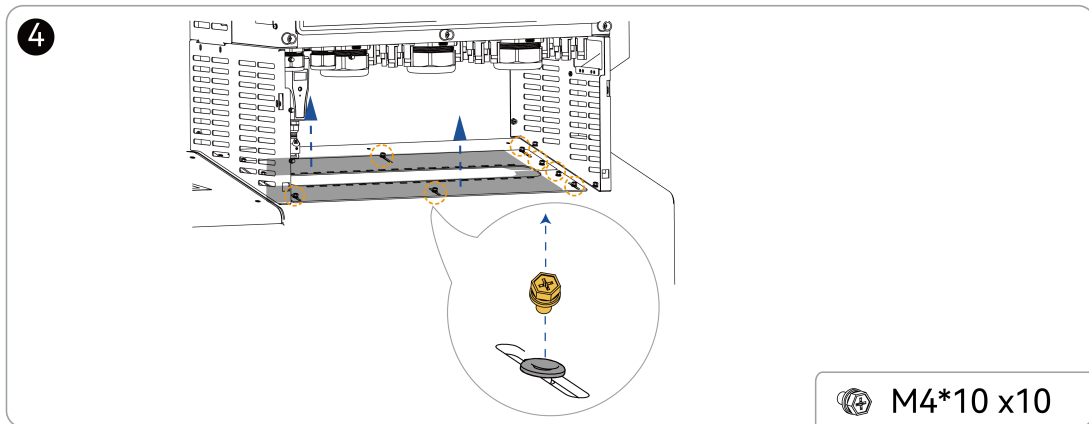
2. Pass the cables through the cable outlet holes.



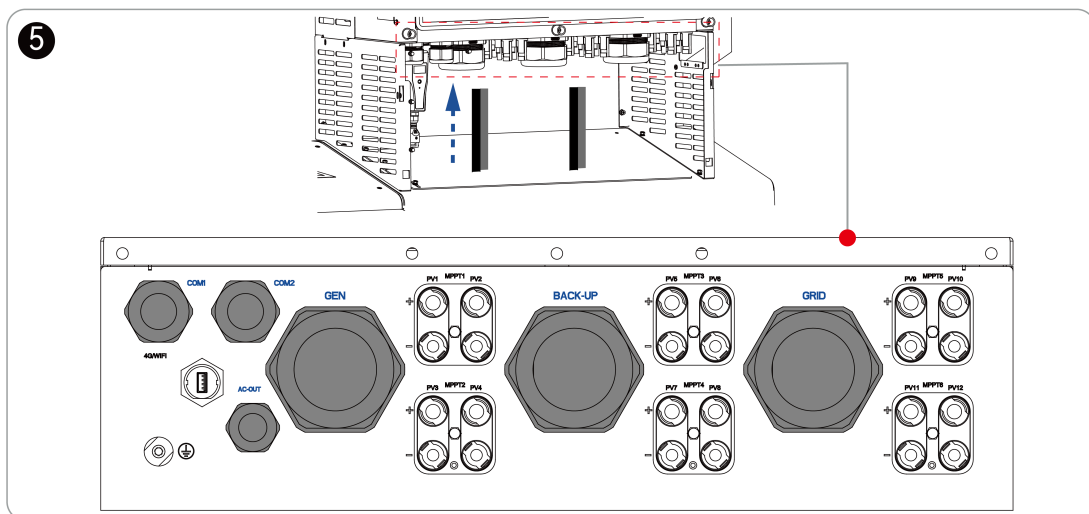
3. Remove the decorative panel of the inverter.



4. Remove the baffle under the inverter.



5. Pass the cables through the corresponding cable glands at the bottom of the inverter.



5.6. Connect the AC power cables

Connect the AC power cables according to the following diagrams.

The following diagram shows the system connections of a single machine where both the backup and the on-grid loads are enabled.

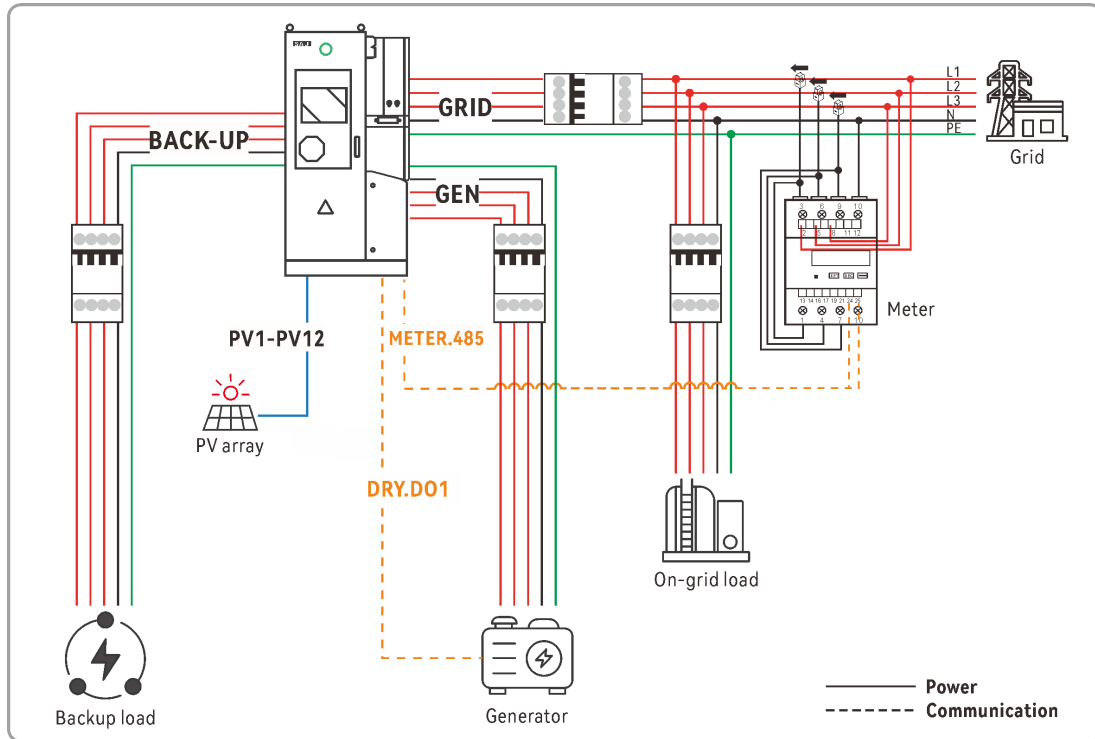


Figure 5.6. Single deployment with on-grid and backup connections

The following diagram shows the system connections of a single machine where only the on-grid loads are enabled.

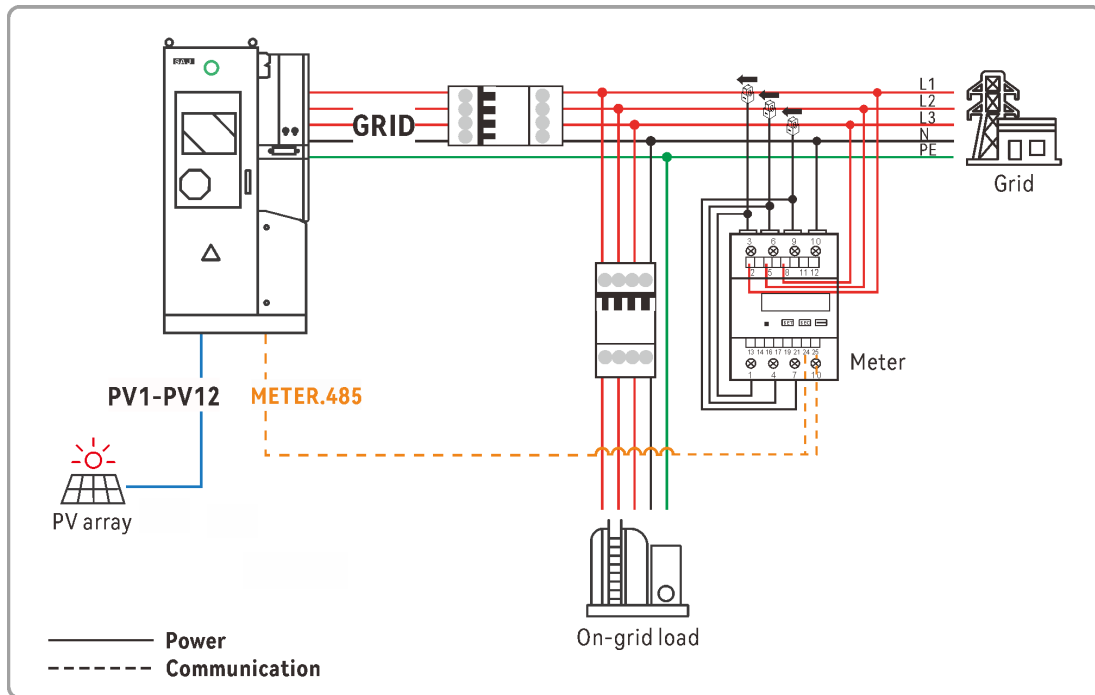
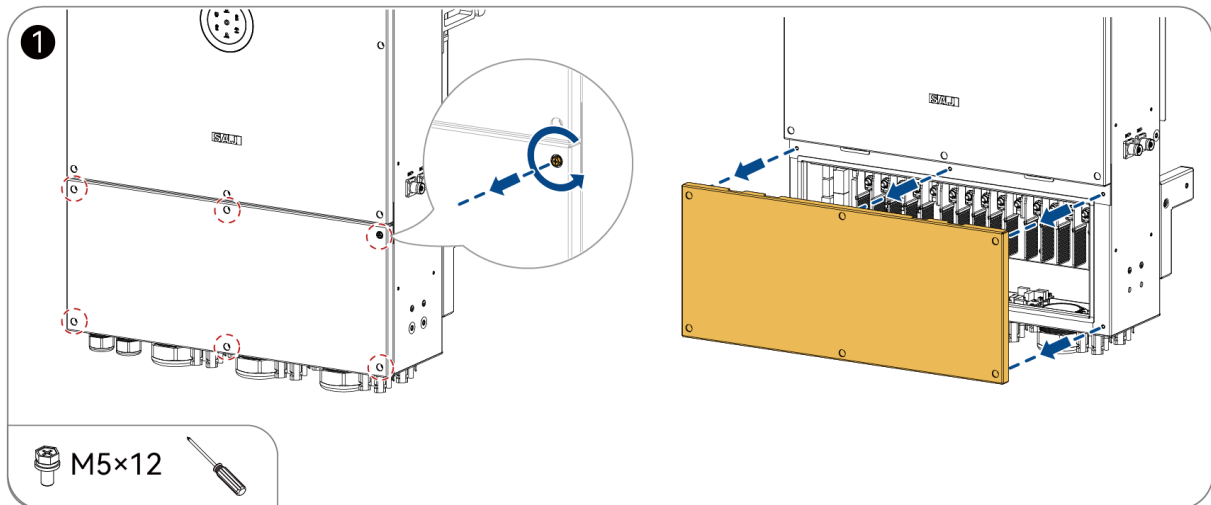


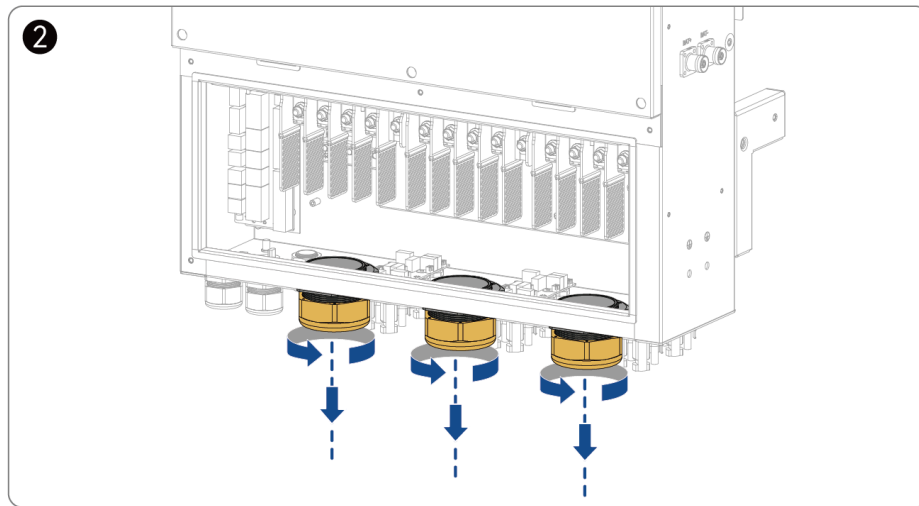
Figure 5.7. Single deployment with on-grid connection

Procedure

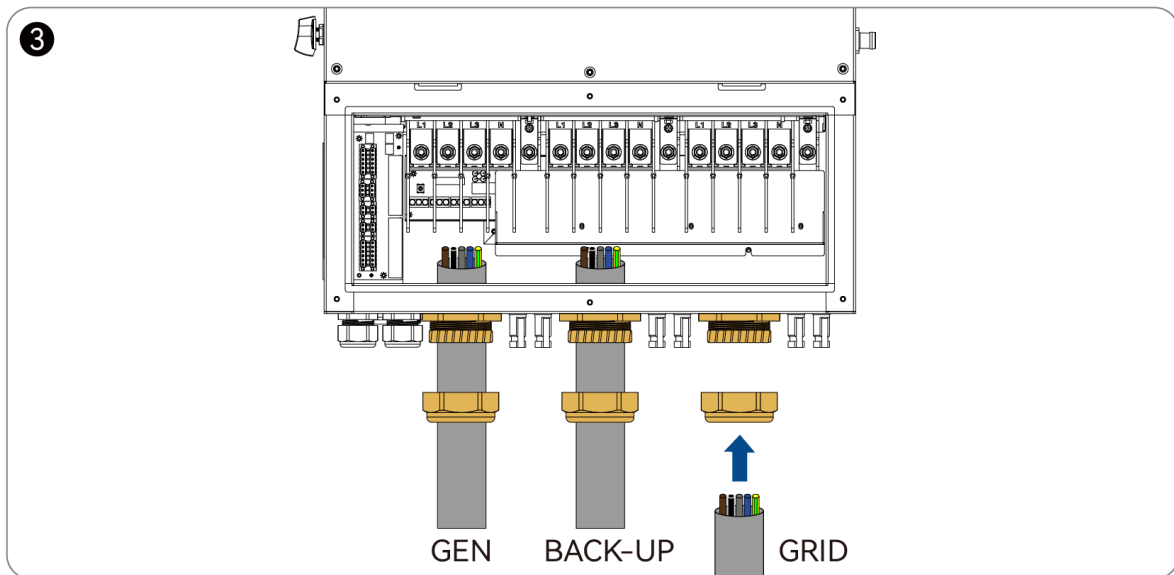
1. Remove the front cable cover of the inverter.



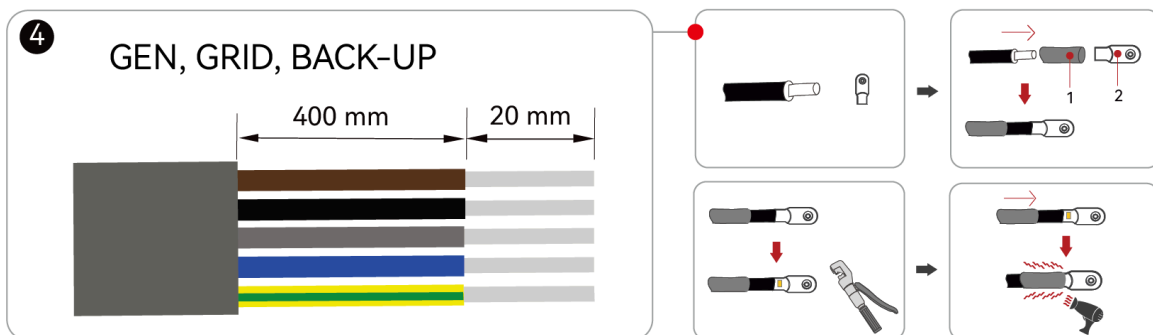
2. Loosen the water-proof nuts of **GEN**, **BACK-UP**, and **GRID** cable glands at the bottom of the inverter.



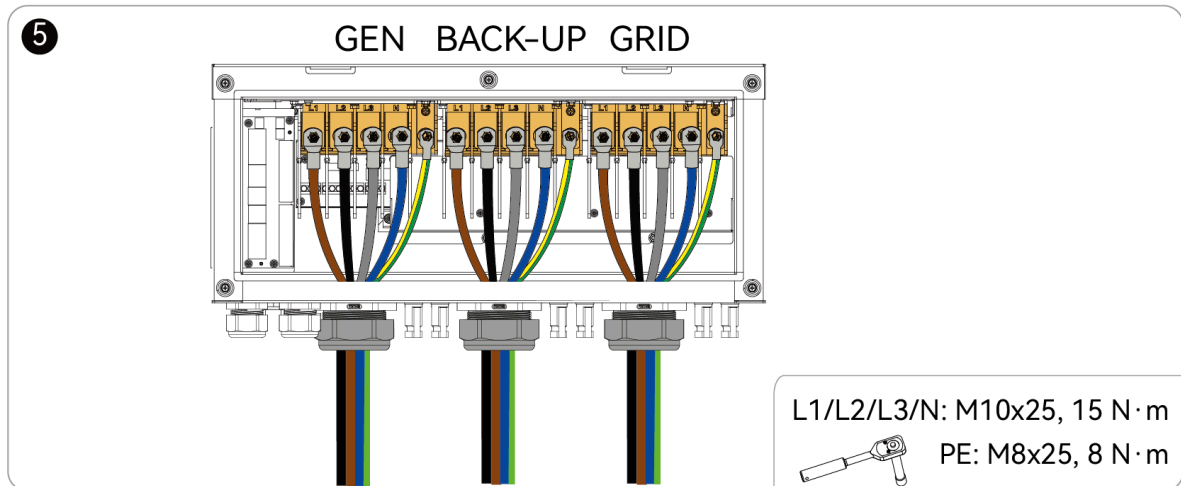
3. Pass the AC cables through the corresponding cable glands at the bottom of the inverter.



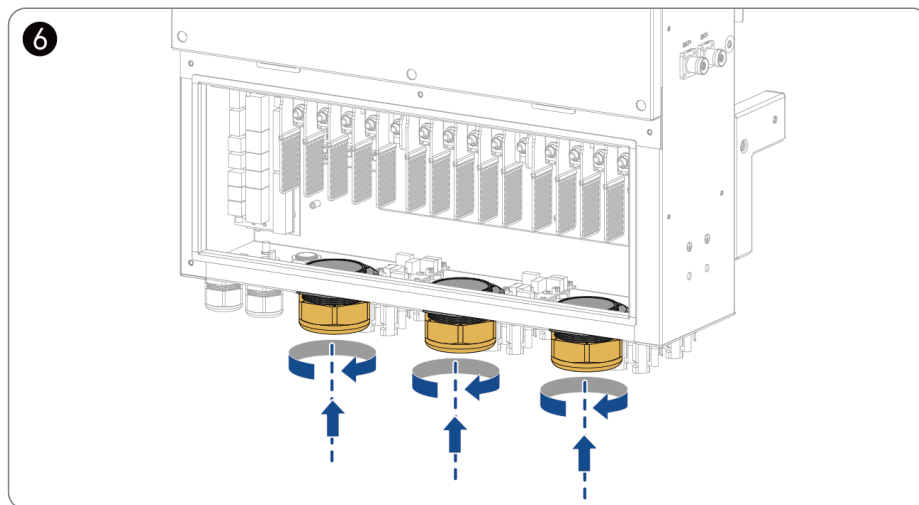
4. Peel off the insulation skin of the AC cables at proper length and crimp the cable ends with the RNB70-10 or SC50-10 OT/DT terminals tightly. Select the corresponding terminals depending on the cable specification.



5. Loosen the screws on the **L1**, **L2**, **L3**, **N** and **PE** ports. Secure the AC cables to the corresponding ports of **L1**, **L2**, **L3**, **N** and **PE** with the screws.

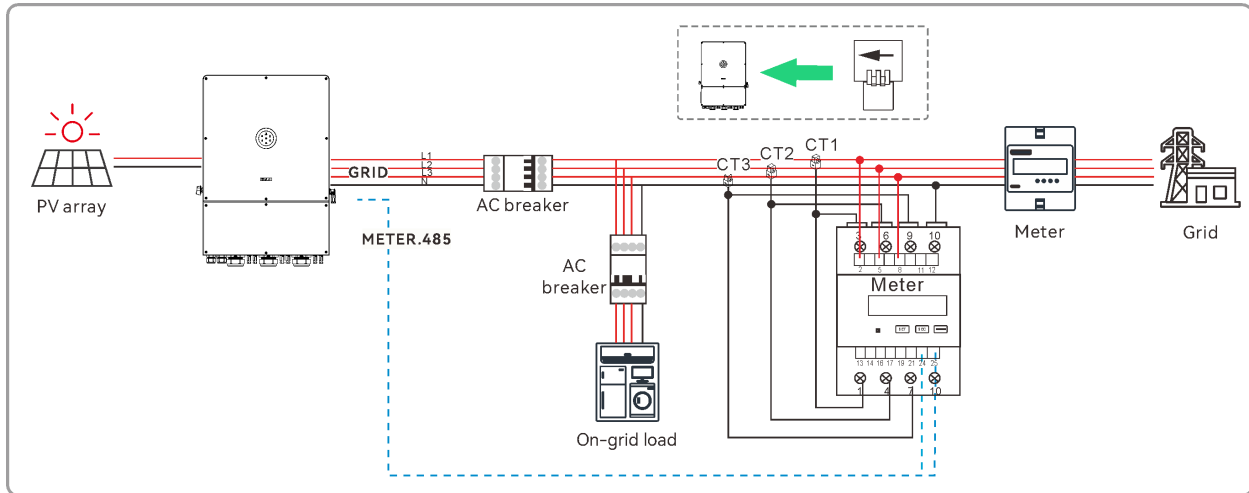


6. Fasten the water-proof nuts of **GEN**, **BACK-UP**, and **GRID** cable glands at the bottom of the inverter.



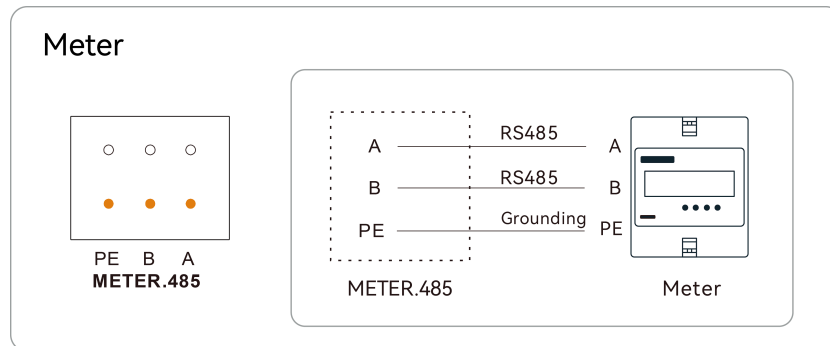
5.7. Connect the PV meters

Connect the PV meter cables according to the meter connection solution diagrams.



Procedure

1. Connect the meter power cables and CT cables. Point the CTs to the inverter.
2. Connect the RS485 communication cables between the inverter 3-pin **METER.485** port and the meter communication port.



5.8. Connect the communication cables

Follow this common procedure to connect the 2-pin, 3-pin, 6-pin, and RJ45 communication cables for the corresponding functions.

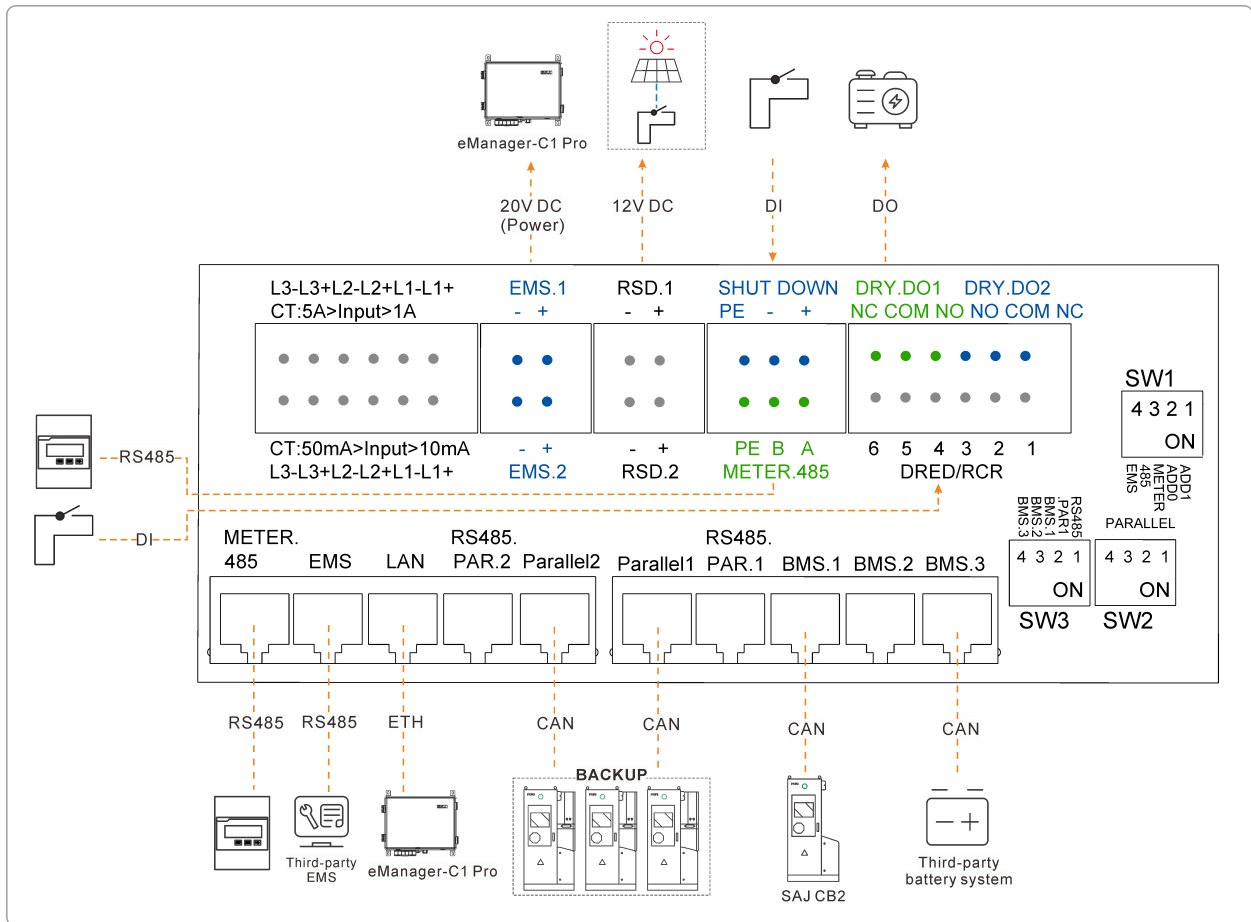
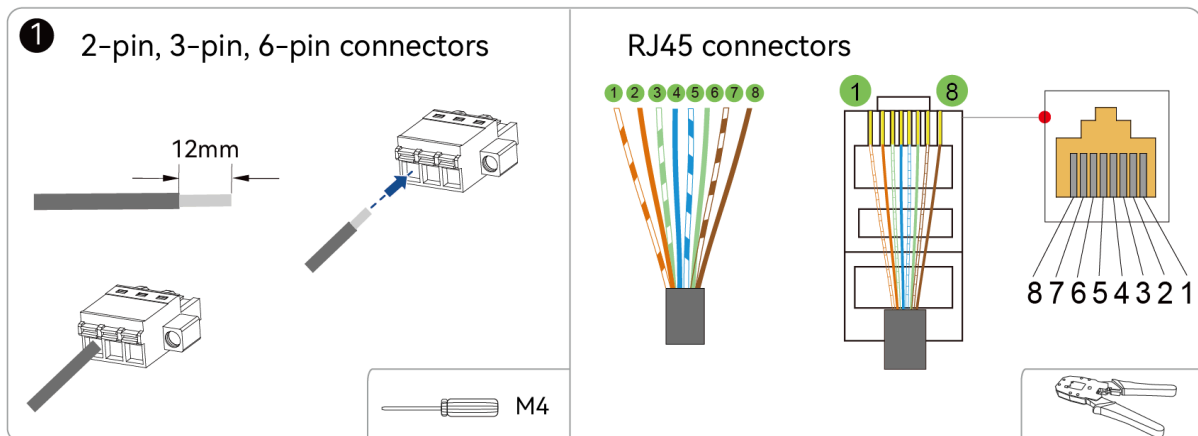


Figure 5.8. Communication connection overview

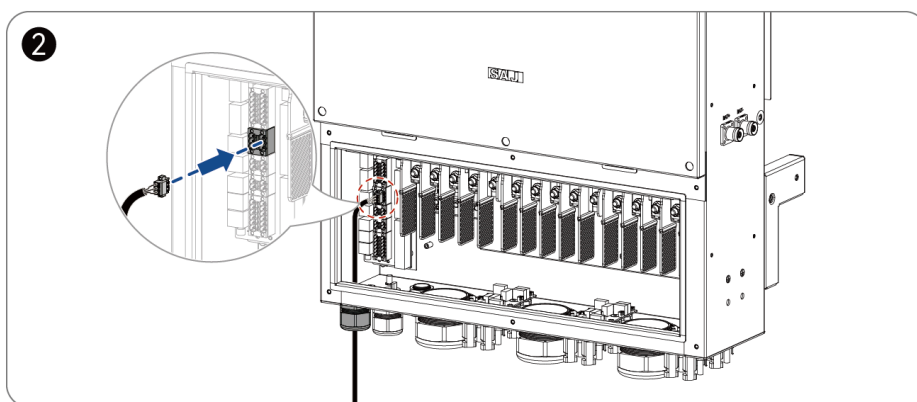
Procedure

1. Assemble the pin connectors and RJ45 connectors according to the actual requirement.



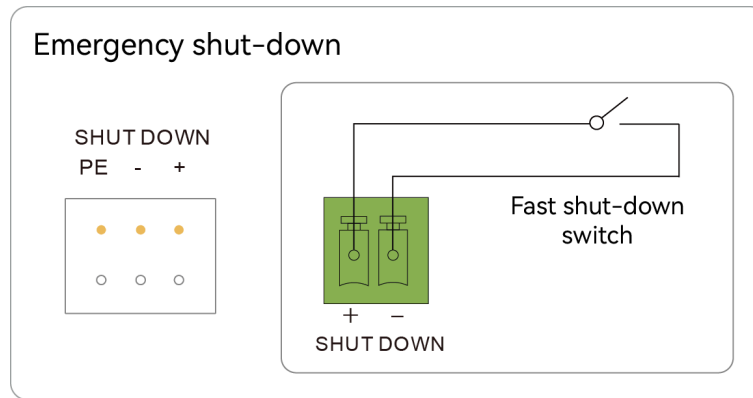
2. Connect the communication cables to the corresponding ports.

Example: Connect the 3-pin cable as follows:



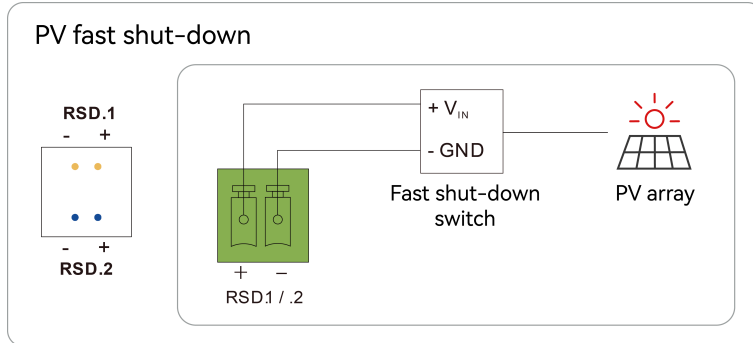
5.8.1. Connect the emergency shutdown device

The 3-pin **SHUT DOWN** port can connect with an external switch to stop the inverter immediately in emergent situations.



5.8.2. Connect the PV fast shutdown device

The **RSD.1** and **RSD.2** ports can supply power to the fast shutdown module of the photovoltaic system at the rated voltage of 12 V. The two ports can control the fast shutdown and startup of the PV system by turning on or off the power supply to the fast shutdown module.



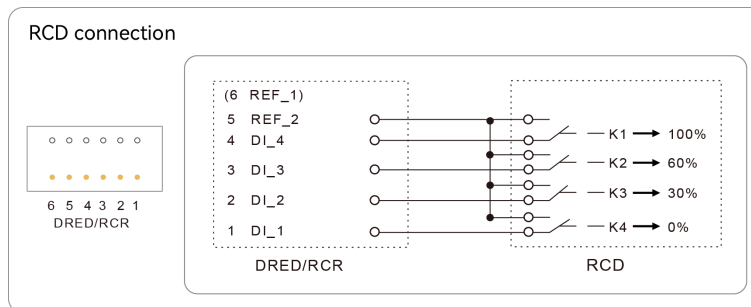
5.8.3. Connect the RCR device

According to the local regulations, a ripple control receiver (RCR) device is required to control the maximum output power that is exported to the grid.

When the RCR device connecting to the DI port is closed, the device signals the inverter to export power to the grid at the corresponding level that is configured for the **RCR Power Settings** on the elekeeper App. Each port corresponds to the following settings on the App:

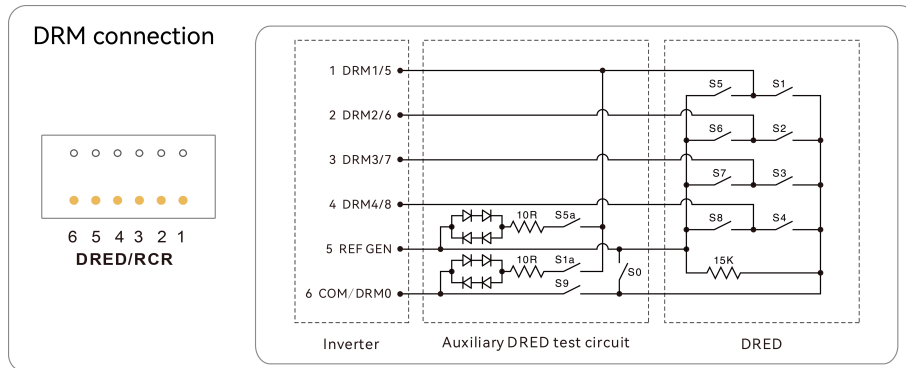
- **DI1:** LEVEL1
- **DI2:** LEVEL2
- **DI3:** LEVEL3
- **DI4:** LEVEL4

The rated power control limit of K1 to K4 devices increases. Connect the devices accordingly to the 6-pin **DRED/RCR** ports **DI1** to **DI4**.



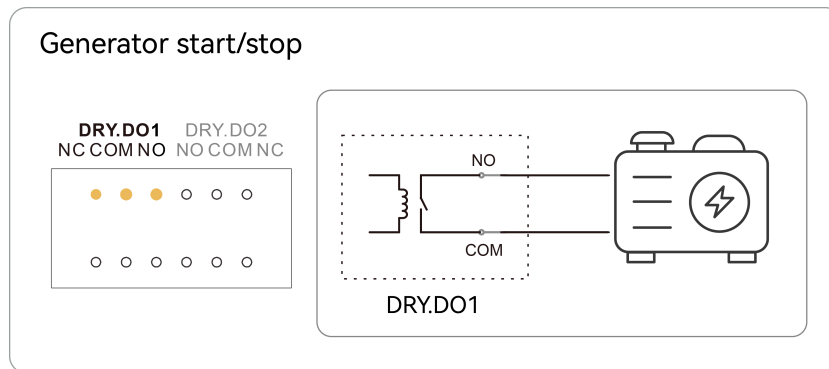
5.8.4. Connect the DRED device (Australia and New Zealand)

According to the local regulations in Australia and New Zealand, a DRED device is required for demand response modes (DRM) control. Connect the DRED device to the following 6-pin **DRED/RCR** port:



5.8.5. Connect the generator communication

Connect the generator to the 2-pin **GEN** port to control the start and stop of the generator:

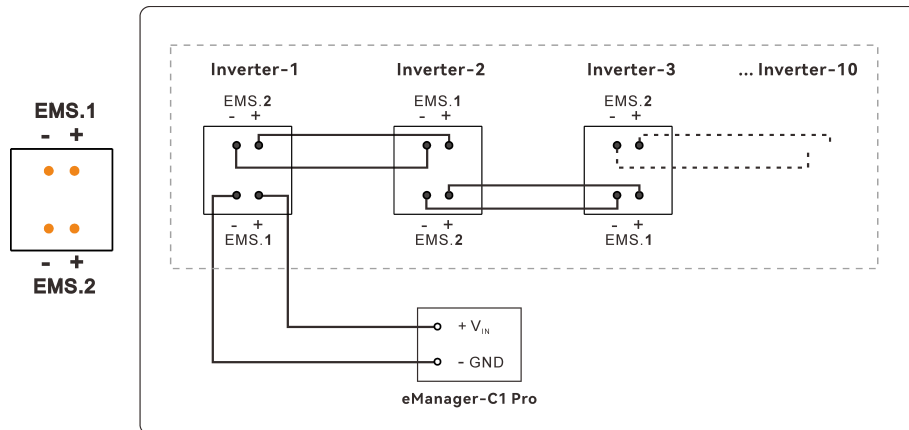


5.8.6. Connect the parallel deployment communication

For CHS2 parallel deployment, connect the communication cables as illustrated in section *Parallel deployment*.

- The **EMS.1** and **EMS.2** ports can supply power to the energy management system (EMS) at the rated output voltage of 20 V DC in parallel deployment. In parallel deployment, multiple inverters can supply power to the EMS at the same time, and at least two inverters must provide the power supply to the EMS. The length of the power supply wire to the EMS is limited to 50 meters.

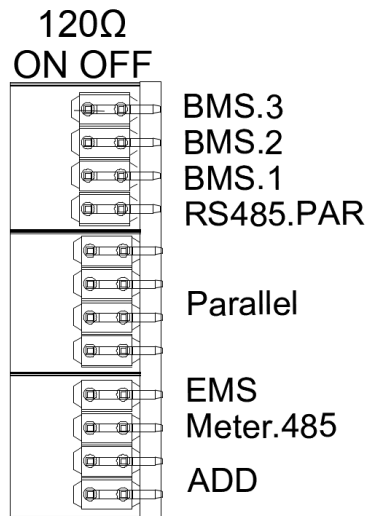
For the 20V DC power input connection, connect the 2-pin communication cables according to the following diagram:



- When the inverters are deployed in parallel, the generator needs connect to the **DO4** interface of eManager-C1 Pro for the start and stop control.

5.8.7. Turn on DIP switches

The dual inline package (DIP) switches are provided to control the activation of 120 Ω terminal resistors to ensure the communication stability of the corresponding communication functions.



After all the communication cables are connected, turn on the corresponding DIP switch according to the following instructions:

Switch	Description
BMS.3, BMS.2, BMS.1	For the CAN communication between battery management systems (BMS). Turn the switch on when the corresponding BMS connection is enabled.
RS485.PAR	For RS485 PAR1 communication. Turn the switch on as needed.
Parallel	For cabinet parallel deployment. Turn the switches to the ON position on the two cabinets that are physically farthest apart.
EMS	For RS485 communication with the EMS. Turn the switch on as needed.
METER.485	For RS485 communication with the external meters. Turn the switch on as needed.
ADD	Reserved for future use.

Table 5.11. DIP switches

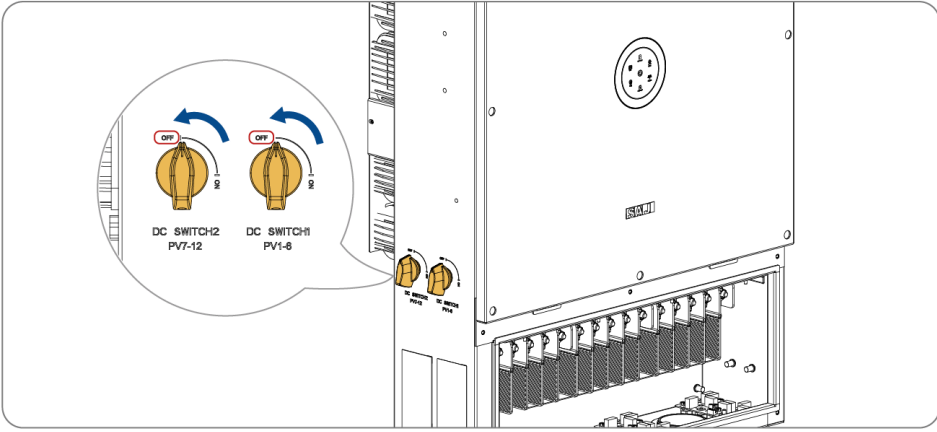
5.9. Connect the PV cables

Before you begin


WARNING

Risk of electric shock

Make sure that the two PV switches on the inverter are turned off before the electrical connections.



- Prepare a multimeter with DC voltage range larger than 1000 V. Multimeter of lower measurement range can be damaged.
- Determine the maximum possible Open-circuit Voltage (Voc) of the PV strings.


NOTICE

When calculating the maximum possible Open-circuit Voltage (Voc) of the PV array, the installation engineer needs to take extreme low-temperature conditions of the actual installation site into account. Calculate this maximum Voc using the lowest expected PV cell temperature and the Voc temperature coefficient of the PV modules.

If the Voc exceeds the inverter's maximum DC input voltage during cold weather, the inverter cannot operate properly.

PV cable connection guidelines:

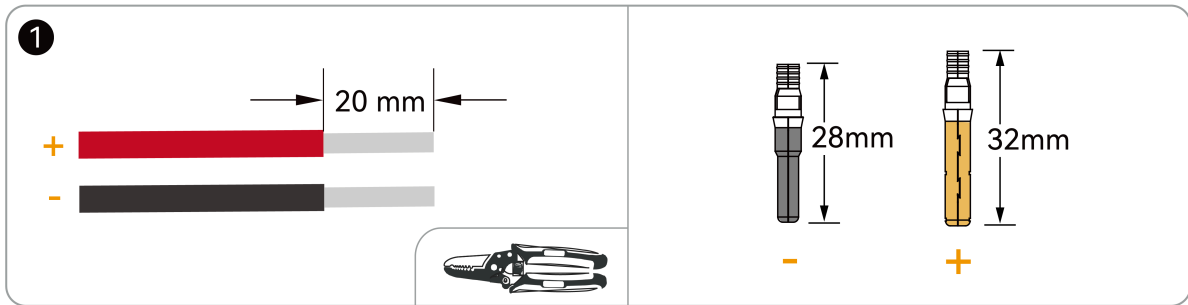
- Evenly distribute the PV input cables across the PV input terminals.
- Maximize the number of MPPT inputs.
- PV strings connected to the same MPPT circuit must use solar panels of the same model and in the same quantity.

Number of PV array	Inverter PV terminal	Number of PV array	Inverter PV terminal
1	PV 1	7	PV 1, 2, 3, 5, 7, 9, 11
2	PV 1, 3	8	PV 1, 2, 3, 4, 5, 7, 9, 11
3	PV 1, 3, 5	9	PV 1, 2, 3, 4, 5, 6, 7, 9, 11
4	PV 1, 3, 5, 7	10	PV 1, 2, 3, 4, 5, 6, 7, 8, 9, 11
5	PV 1, 3, 5, 7, 9	11	PV 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
6	PV 1, 3, 5, 7, 9, 11	12	PV 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

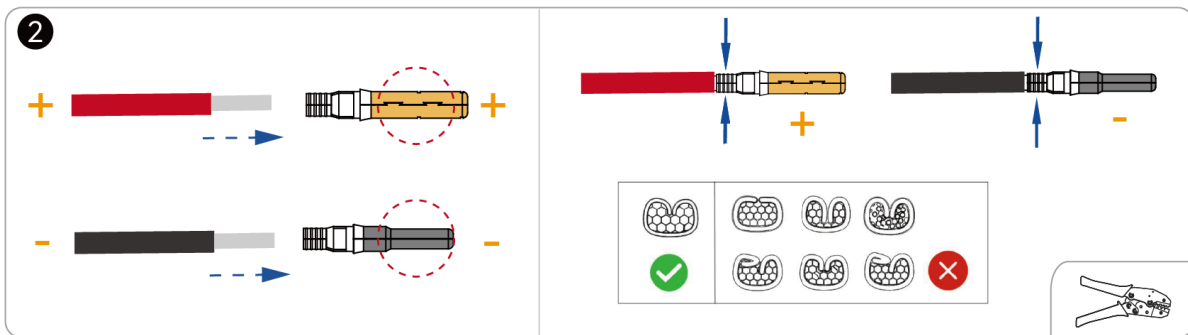
Table 5.12. MPPT terminal connection guideline

Procedure

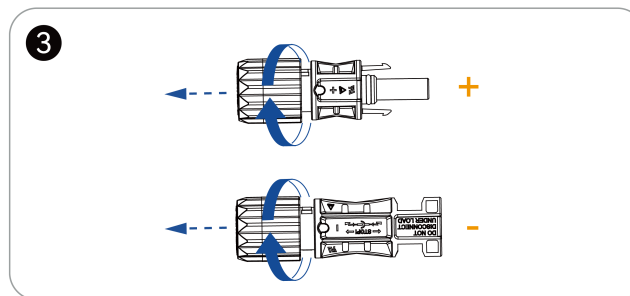
1. Use a wide-bladed screwdriver to strip off the insulation layer by 20 mm from one end of each PV power cable.



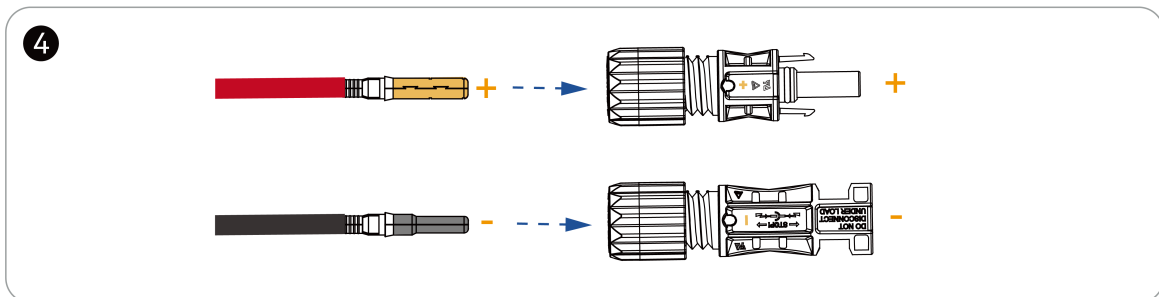
2. Insert the cable ends to the sleeves. Use crimping pliers to assembly the cable ends.



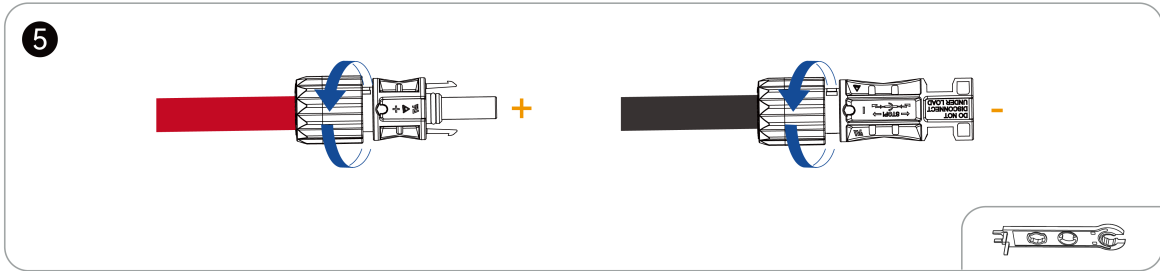
3. Loosen the lock screws on the positive and negative connectors.



4. Insert the positive and negative cables into the positive and negative connectors. Gently pull the cables backward to ensure firm connection.

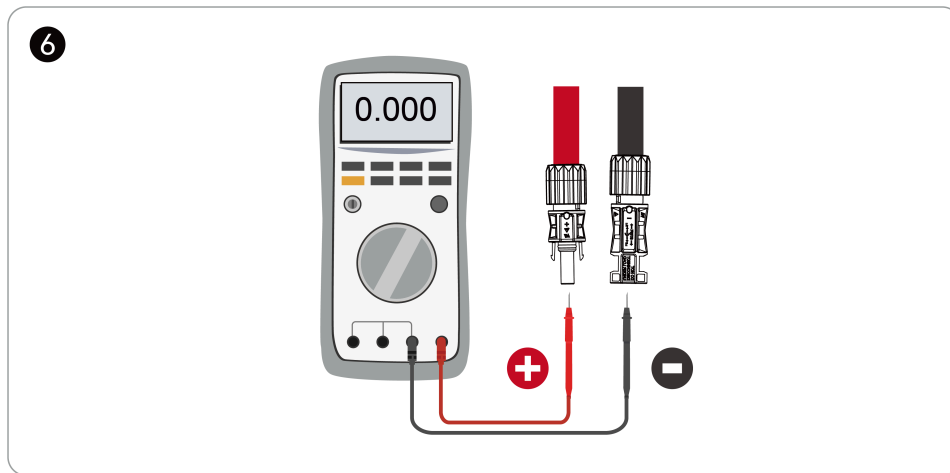


5. Tighten the lock screws on the positive and negative cable connectors with the D4 assembly tool.

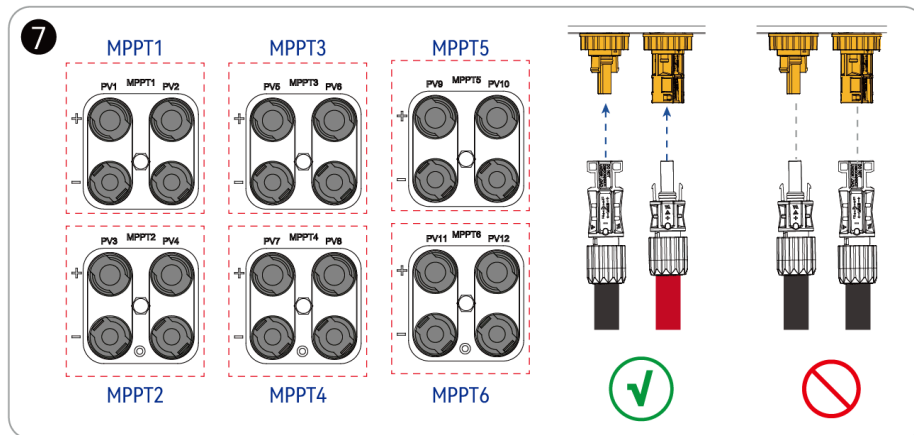


6. Measure the DC voltage of each positive and negative PV input cable with the multimeter.

Make sure that the Open-circuit Voltage (Voc) of each PV array input does not exceed the maximum DC voltage of the inverter. Meanwhile, the voltage reading shows the correct polarity.



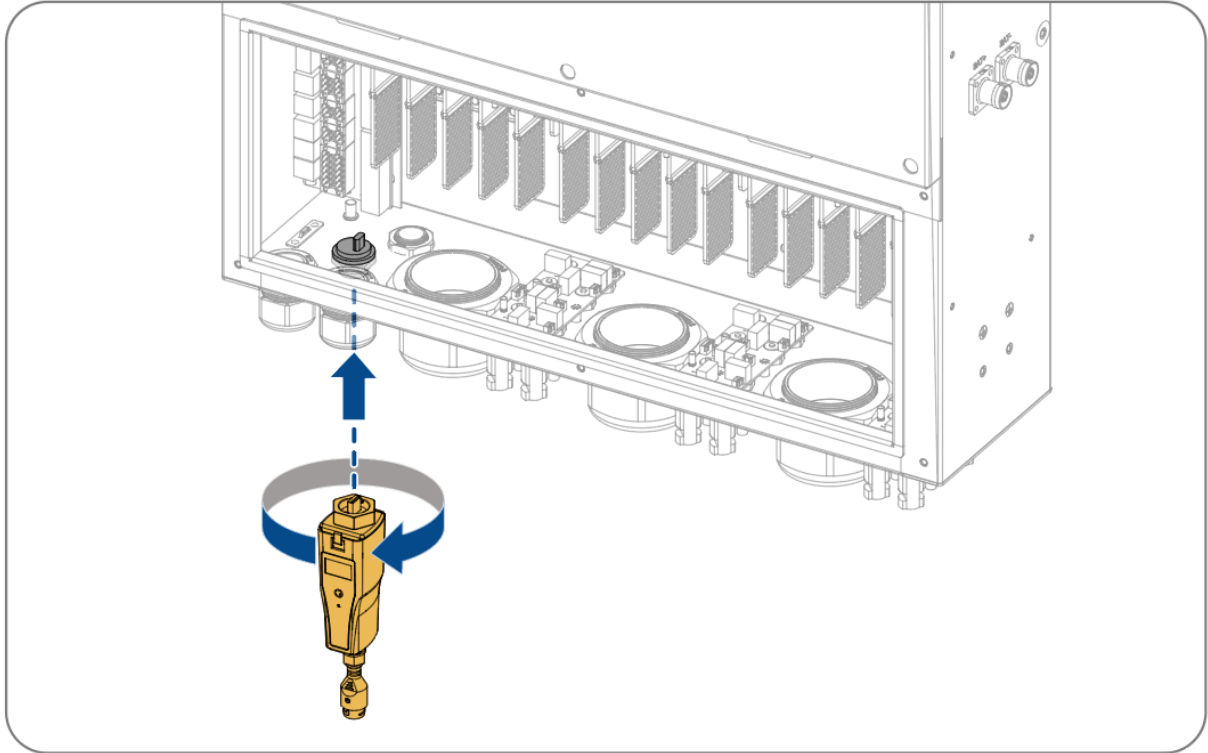
7. Insert the positive and negative cable connectors into the positive and negative PV ports on the inverter until a “click” sound is heard.



5.10. Connect the communication module

Procedure

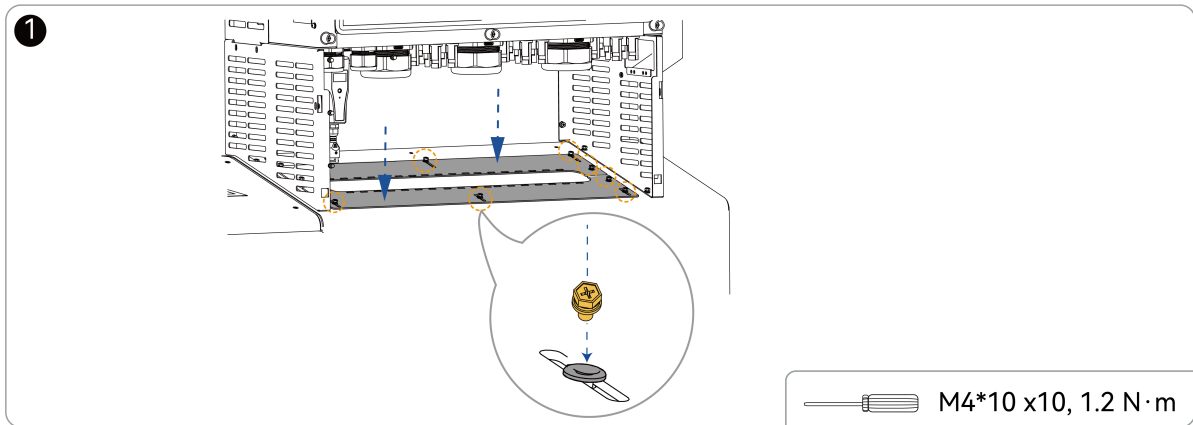
Remove the dust-proof cover from the **4G/WIFI** port, plug in the communication module, and rotate less than 90 degrees to secure the module.



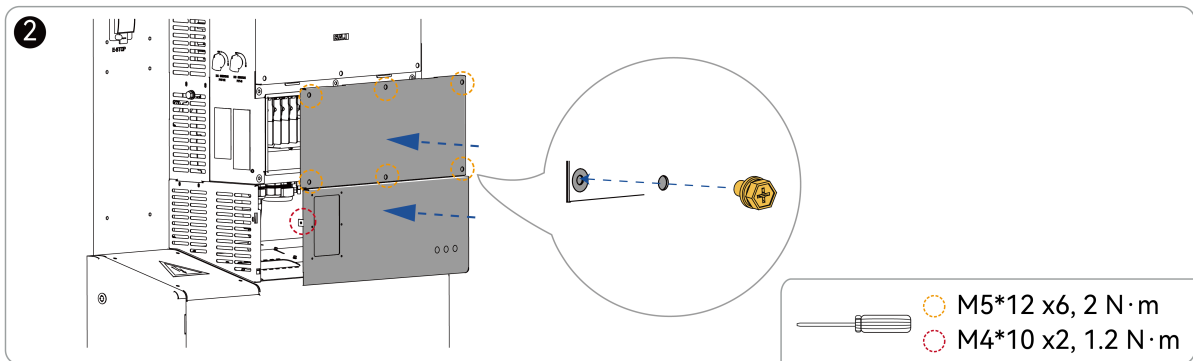
5.11. Finalize the installation

Procedure

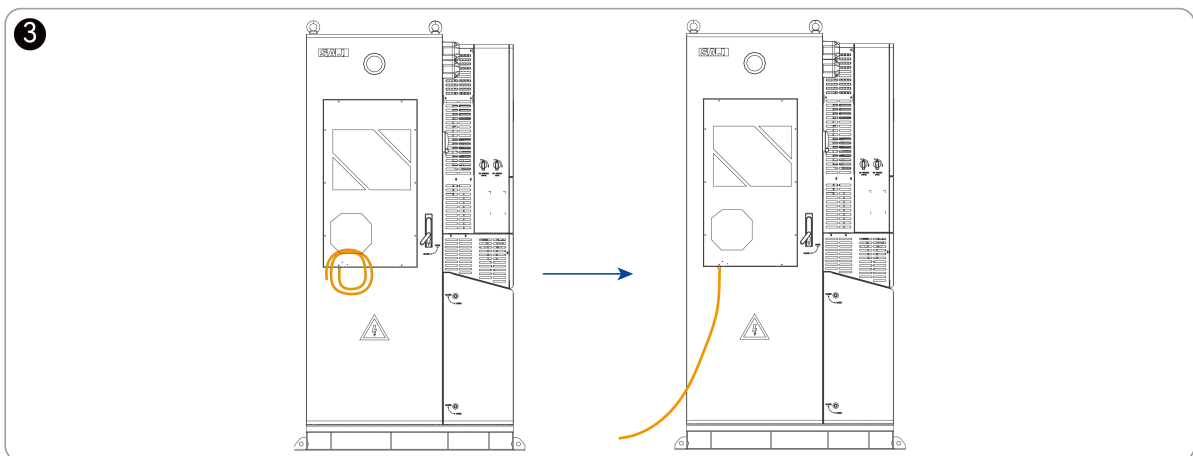
1. Install the baffle back inside the inverter.



2. Install back the decorative panel on the front of the inverter.



3. Loosen the AC drain pipe to ensure proper draining of the AC condensate. Avoid blocking the pipe which can cause water backflow into the cabinet.



6. Startup and shutdown

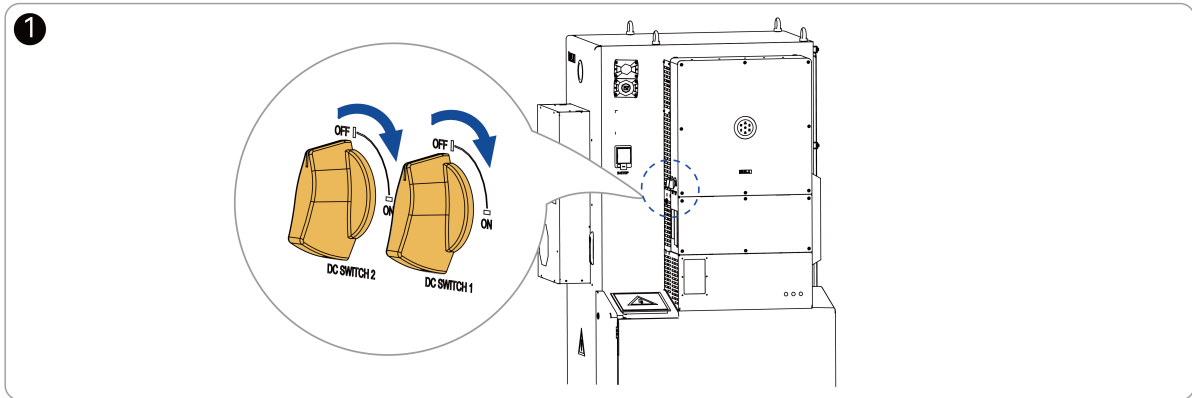
6.1. Start up the system

Before you begin

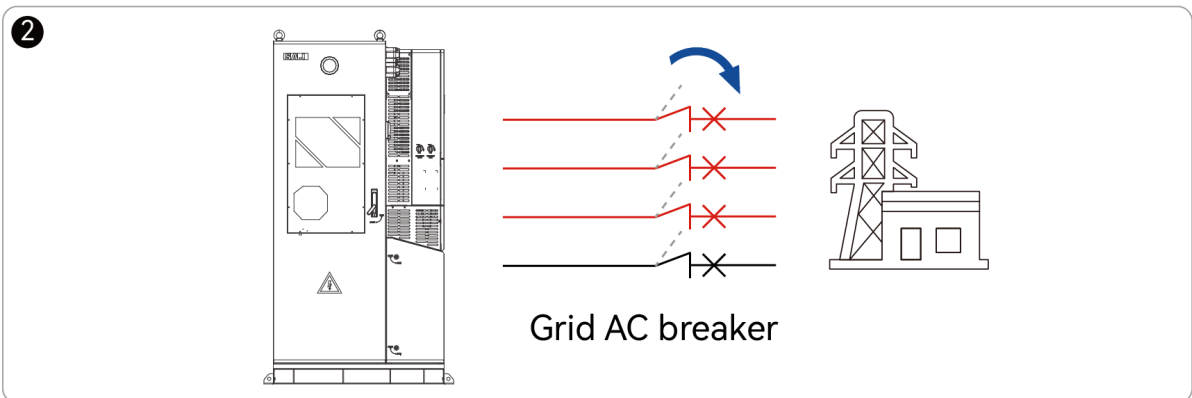
Check that all the cable connections are completed as instructed.

Procedure

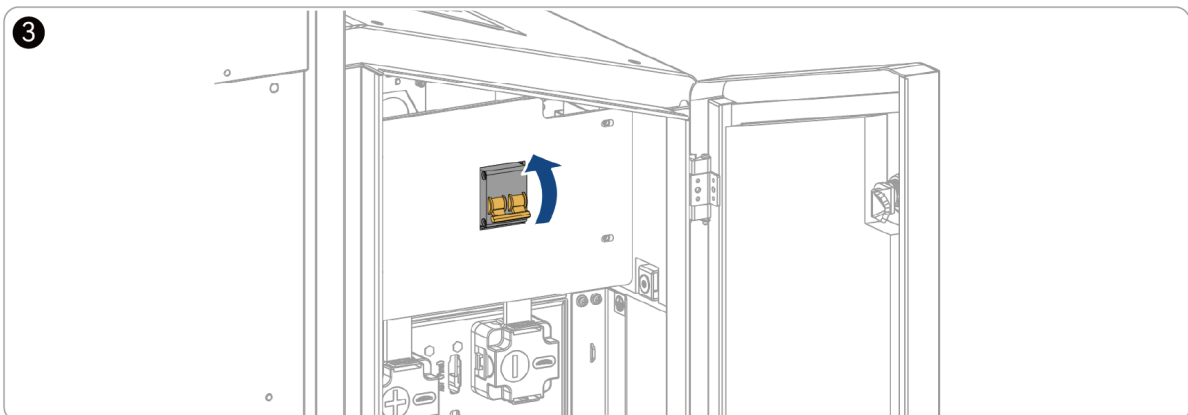
1. Turn the two DC switches to the **ON** position on the inverter to enable the PV side connection.



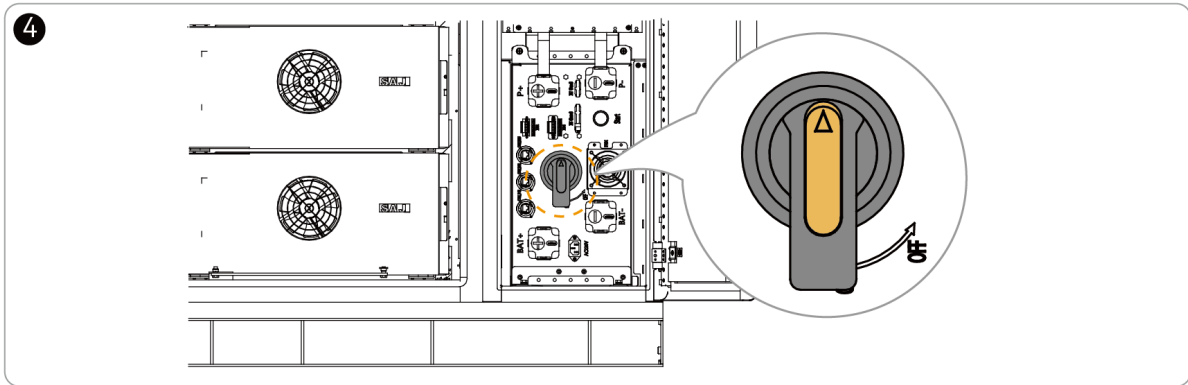
2. Connect the external AC circuit breaker to enable the connection to the grid.



3. Rotate the main switch on the battery control unit to the **ON** position.



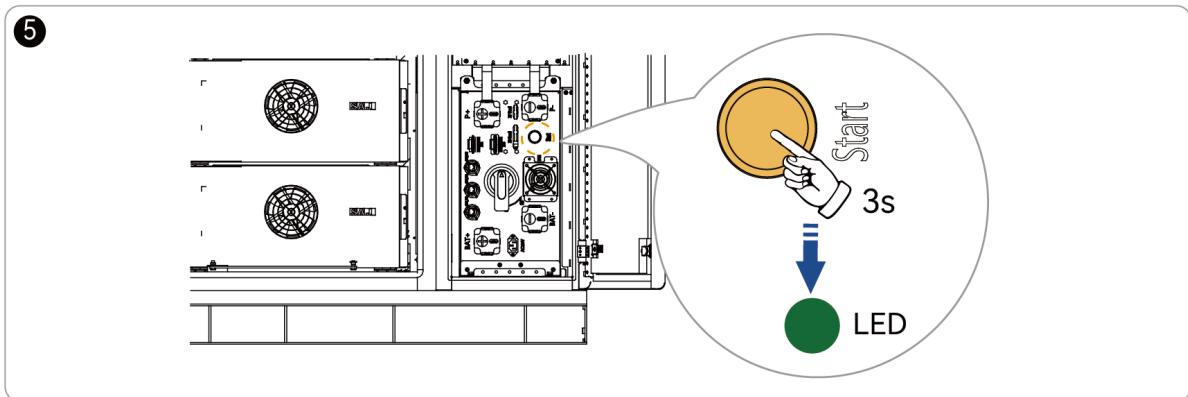
- Press and hold the **START** button on the battery control unit for 3 seconds until the LED light flashes in green. It indicates that the CHS2 system starts up.



Note:

If the main switch suddenly trips while the machine is running, reset the main switch and rotate the main switch to the **ON** position again.

- Remove the drying agent from inside the cabinet.



- Close the cabinet doors and keep the keys at a safe place.

6.2. Shut down the system



Risk of high voltage and electric shock

Before any operation, disconnect the inverter from all AC and DC power sources and wait at least 5 minutes to allow internal capacitors to discharge.

Procedure

- Disconnect the external AC circuit breaker to disconnect from the grid.
- Rotate the main switch on the battery control unit to the **OFF** position to shut down the battery system.
- Turn off the two DC switches on the inverter to disconnect from the PV.

Note: After closing the cabinet door, lock the door handle with the two locks.

7. Commissioning on elekeeper App Version 5.0

7.1. Download and log in to the elekeeper App

7.1.1. About elekeeper

The SAJ elekeeper Application Version 5.0 is an easy-to-use, AI-powered energy management platform designed for homeowners and businesses with full ecosystem autonomous AI control. It gives the Owner full control over their energy - from generation and storage to consumption and selling - through a single App that works on phones, tablets, and computers. The platform provides the following AI-powered modules:

- **AI Care:** provides six-dimensional system diagnosis and 24/7 system protection.
- **AI Saving:** provides AI-powered working strategy adaptation for various scenarios to maximize user revenue.
- **AI Keeper:** provides intelligent functions including full voice autonomous control, user intent recognition, , electricity data analysis, and autonomous task planning.

7.1.2. Download the elekeeper App

Search for "elekeeper" in the App store and download the App.

Alternatively, scan the below QR code to download the App.



7.1.3. Sign up at the elekeeper App

The end user, installer, or distributor can follow this procedure to sign up at the elekeeper App. The installer can also follow this procedure to create an account for the end user.

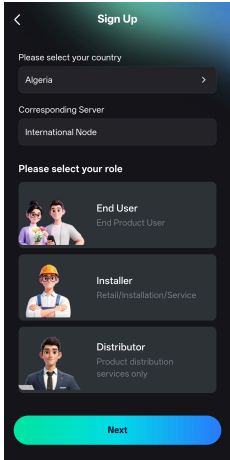
Note: Recommend activating the Location Services on the phone for optimum utilization of the functions.

Procedure

1. Open the App and tap **Sign Up** on the login page.



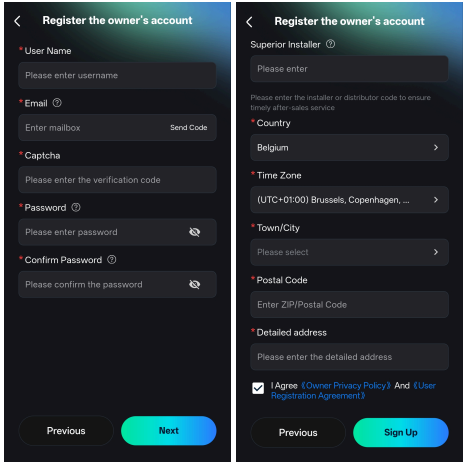
2. Select the country of the installation site and the user role.



Parameter	Description
Corresponding Server	The server is set automatically depending on the selected country.
Please select your role	• End User: The owner of the power plant. Select this option when the installer is signing up for the end user. • Installer: The installation and retail service providers. • Distributor: The distribution service provider.

Table 7.1. Signup parameters

3. For the **End User** role, fill in the user information accordingly.



4. For the **Installer** role, either create a company or join an existing company to provide the information accordingly.
To create a company:

To join a company:

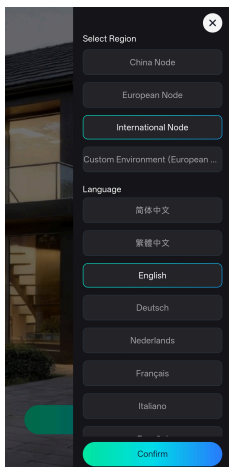
To check an existing user's company code, open page **My**:

- For the **Distributor** role, provide similar information as the **Installer** role.

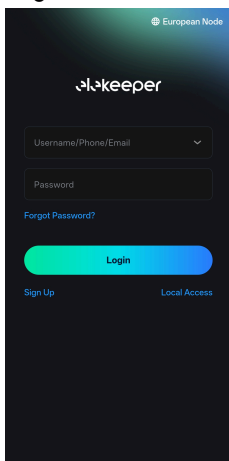
7.1.4. Log in to the elekeeper App

Procedure

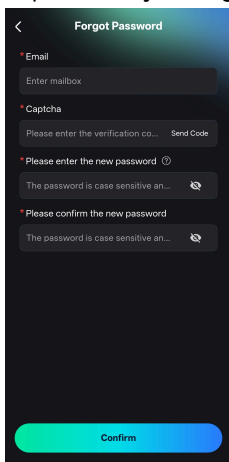
1. Open the App and tap the globe icon  on the top right corner.
2. Select the **Region** and **Language** depending on the installation site of the system.



3. Log in with the username, phone number, or email.



4. (Optional) If you forgot your password, reset your password with email verification.



7.2. Initialization and installation diagnosis

7.2.1. Perform initialization settings with EMS

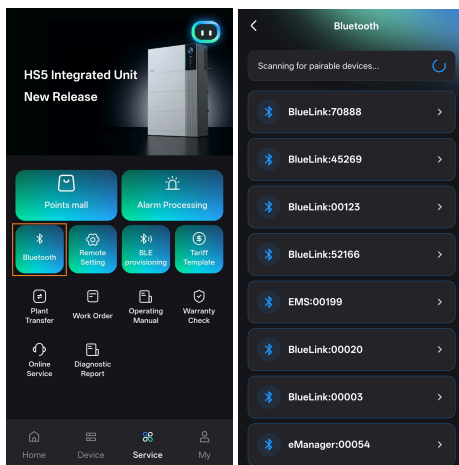
Follow this procedure to initialize the system on the elekeeper App when the EMS module is connected.

Procedure

1. Enable the Bluetooth function on the mobile phone.
2. On page **Service**, tap **Bluetooth**. Select the communication module, inverter or EMS according to the last five digits of the serial number (SN).

Example:

- **BlueLink: 45269** for a communication module or inverter.
- **EMS: 00199** for EMS units.

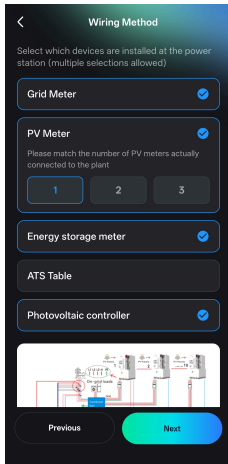


3. On page **Add Device**, check that the inverter or battery system is added as connected device.

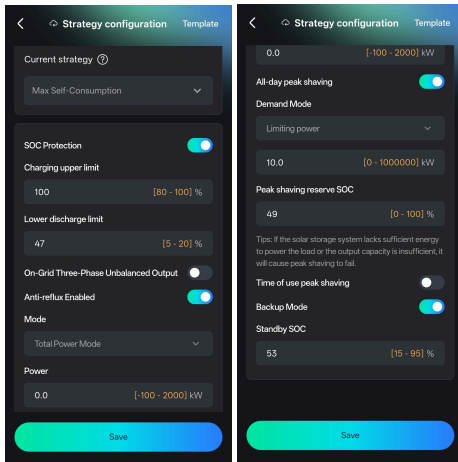


4. On page **Wiring Method**, check and configure the connected meters as needed.

Example:

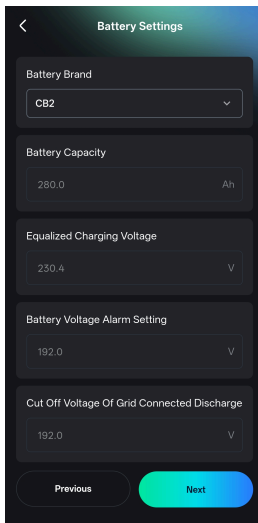


- On page **Strategy configuration**, select the system working strategy and set the corresponding parameters.
Example:



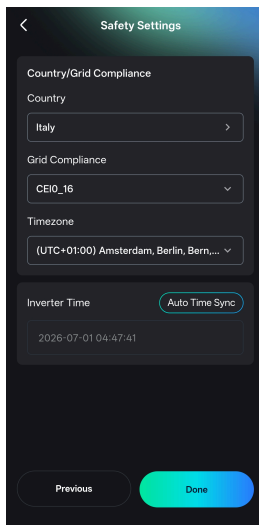
For detailed parameter descriptions, see [7.4. Configure working strategy \(on page 93\)](#).

- On page **Battery Settings**, select the connected battery system and configure battery parameters as needed.
Example:



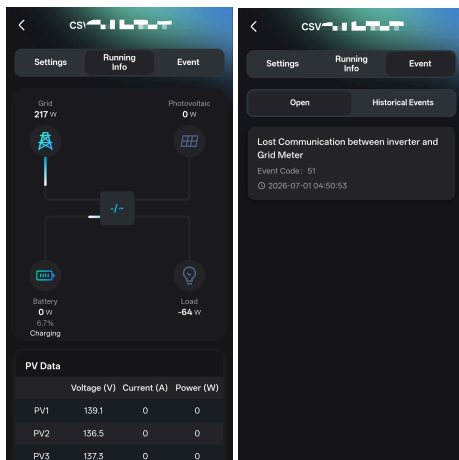
For detailed parameter descriptions, see [7.5. Set the battery parameters \(on page 97\)](#).

- On page **Safety Settings**, set the grid compliance parameters.

Example:

Parameter	Description
Country	The equipment installation location.
Grid Compliance	Select the grid compliance according to your installation location. Taking Australia as an example, select the specific type of compliance according to the owner's grid configuration. • AS4777_AustraliaA: For large interconnected power system. • AS4777_AustraliaB: For small interconnected power systems. For example, Western Power. • AS4777_AustraliaC: For isolated or remote power systems. For example, Horizon Power and TasNetworks.
Inverter Time	Tap Auto Time Sync to sync the inverter time to the time of the device running the App.

8. After the initialization is completed, check the system status on the **Running Info** and **Event** pages:



7.2.2. Perform installation diagnosis

After the inverter initialization is completed, perform one-click installation diagnosis to verify the installation status of the system, including the network connection, battery settings, wiring status, and so on.

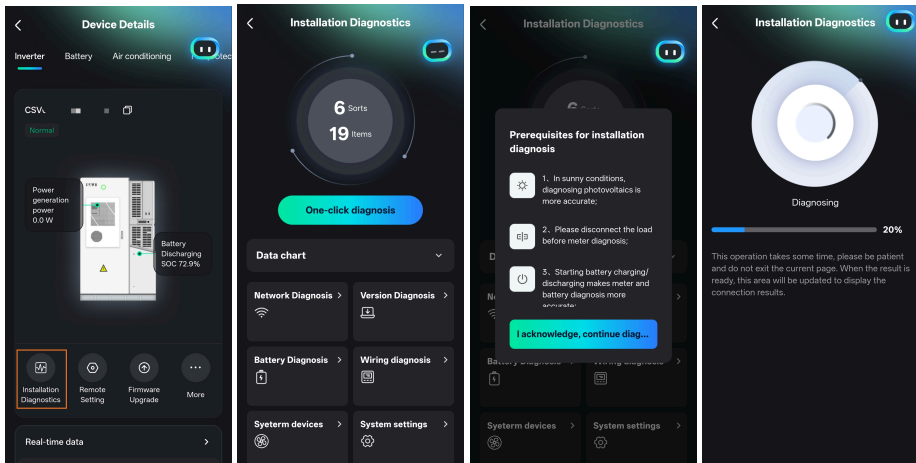
Procedure

1. On the **Home** page, tap the device name to open the **Device Details** page.

Example:



2. Tap **Installation Diagnostics** to start one-click diagnosis.



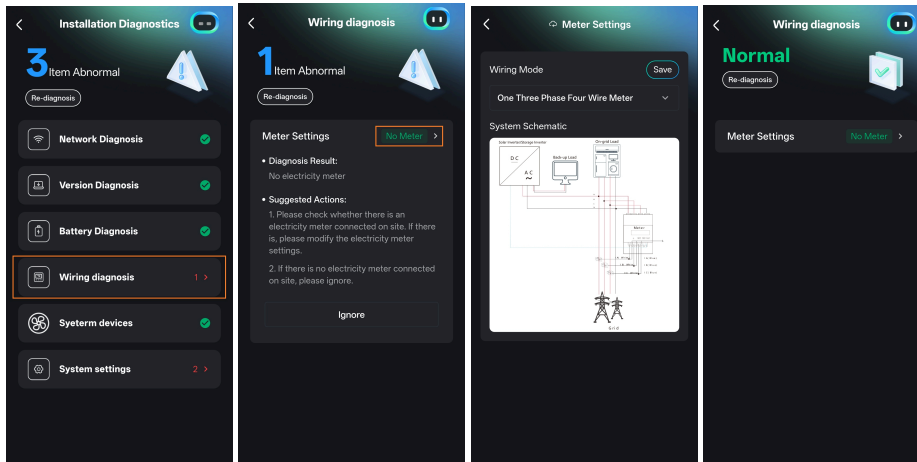
Note: If the software versions of the product are too low, follow the prompt-up to upgrade the system version first.

3. Check the faulty diagnostics results and take the suggested actions.

Example:

- a. Tap **Wiring diagnosis** to check the detailed issue and suggested actions.
- b. Tap **No Meter** to change the meter settings where applicable or ignore this issue.

- c. Tap **Re-diagnosis** to run the check again.
- d. Take necessary actions until the issue is resolved.



7.2.3. Run self-test for grid connection (For Italy)

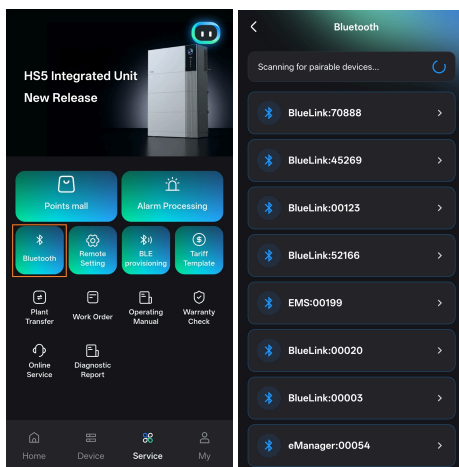
Italian Standard CEI0-21 requires a self-test function for all inverters that connect to the utility grid. During the self-testing time, the inverter will check the reaction time for over-frequency, under-frequency, over-voltage and under-voltage. The self-test ensures that the inverter can disconnect from the grid when required. If the self-test fails, the inverter cannot feed into the grid.

Procedure

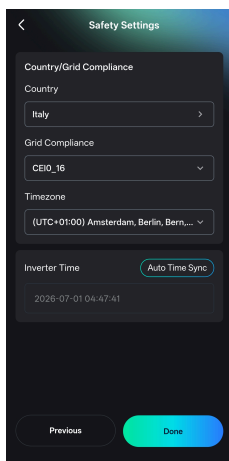
1. On page **Service**, tap **Bluetooth**. Select the communication module, inverter or EMS according to the last five digits of the serial number (SN).

Example:

- **BlueLink: 45269** for a communication module or inverter.
- **EMS: 00199** for EMS units.

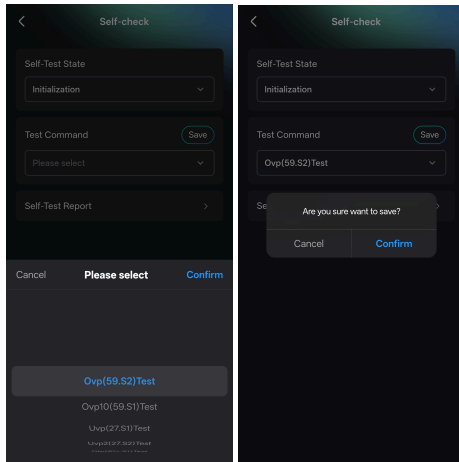


2. On the **Remote Setting** page, tap **Safety Settings** and check whether the grid compliance is set to **Italy** grid codes. Change the settings if needed.

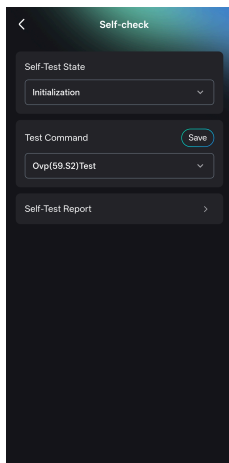


3. On the **Local Connection** page, tap **Self-check**. Choose the self-test items as required, and tap **Save**.

It takes around 5 minutes to complete each item. After the test item is completed, **Self-Test State** shows **Initialization**.



4. Tap **Self-Test Report** to check the test report. Download the test report if the self-test fails and contact **SAJ** or your inverter supplier.



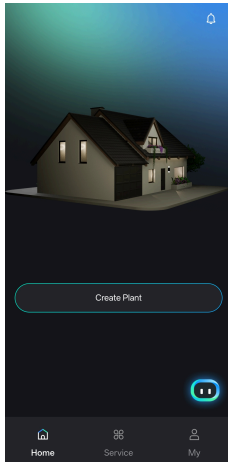
7.3. Plant management

7.3.1. Create a power plant

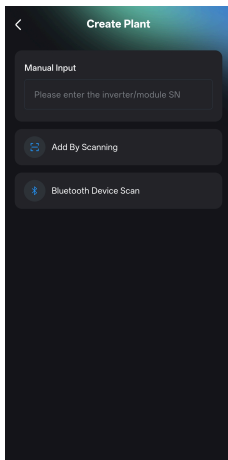
Follow this procedure to create a power plant.

Procedure

1. On the **Home** page, tap **Create Plant**.



2. Provide the product serial number (SN) to add the devices in the plant.
 - **Manual Input:** Enter the SN of the inverter or the communication module.
 - **Add By Scanning:** Scan the SN.
 - **Bluetooth Device Scan:** Connect to the inverter or communication module through Bluetooth connection.



3. Configure the plant details based on the owner's actual information.

Create Plant

1 Add Device 2 Station Information 3 Link Installer

* Plant Name
CHS2 plant

* Country
Belgium

* Time Zone
(UTC+01:00) Brussels, Copenhagen, Madrid, Paris

* City
Woluwe-Saint-Lambert

* Detailed address

* Post Code

Previous Next

Is photovoltaic installed ☒

* Plant capacity ①
50 kWp

Number of PV Panels
12

PV Panel Azimuth ①
45

PV Panel Inclination ①
45

Previous Next

4. Provide the end user and installer information for future maintenance and support purposes.

The installer company code is created when the installed signs up at the App. For example, 19067G.

Create Plant

1 Add Device 2 Station Information 3 Customer

Please enter both owner and installer info for plant maintenance and support

End User [Select Owner](#)

Username / Phone Number

Search

Installer

Username / Phone Number / Company ...

Search

Ignore

Previous Save

5. After the plant is created successfully, check the plant status as needed.

Plant Device +

0°C
Grid 0 W Photovoltaic 0 W Load 0 W

148 W
Diesel Generator 90.1% Discharge

Normal CHS2 plant

Revenue Max Self Consumption

0 Yesterday 0 Month 0 Total

AI Saving 3.0

Home Service My

Plant Device +

90.1%

Associated Devices

EMS Module(199) Grid Meter(199)
Offline Offline

Energy Storage PV Meter(199)
Offline Offline

Diesel(199)

Home Service My

Device Details

Inverter Battery Air conditioning

CSVL

Power generation power 0.0 W

Battery Discharging SOC 72.3%

Installation Diagnostics Remote Setting Firmware Upgrade More

Real-time data

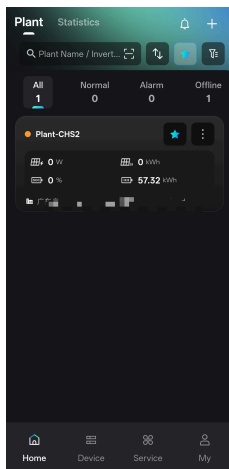
7.3.2. View the power plant details

Follow this procedure to check detailed power plant information.

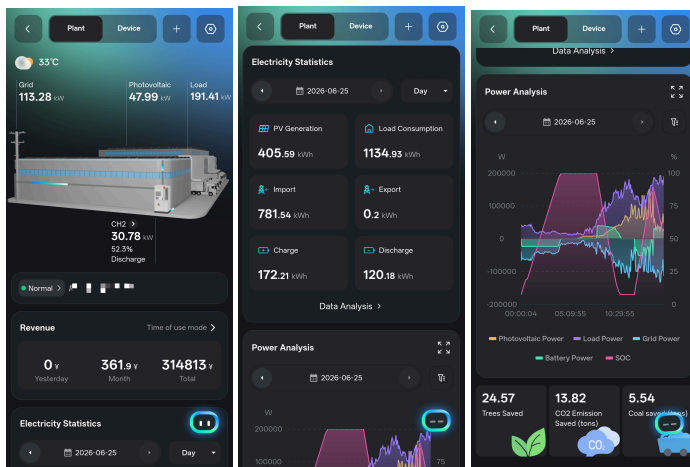
Procedure

1. On the **Home** page, select and tap the target power plant.

Example:



2. Check the following plant information.



Information	Description
Live energy information	• Grid: The power that the device is importing from or exporting to the grid. • Photovoltaic: The current power generated by the PV array. • Load: The overall power consumption by the load. • Discharge: The current SOC of the battery system.
Revenue	The daily, monthly, and total revenue of the power plant.
Electricity Statistics	The energy statistics of the power plant. Daily, weekly, monthly, yearly, and total statistics are available for detailed data analysis.
Power Analysis	The power statistics of the power plant.

Table 7.2. Power plant information

3. Tap each highlighted area for further information or operation.



Number	Description
①	Tap to check the weather forecast.
②	Tap to open the Device Details page for detailed device status and operations like remote settings.
③	Tap to open the alarm messages list.
④	Tap to check or modify the working strategy of the device.

7.4. Configure working strategy

Follow this procedure to configure the device working strategy.

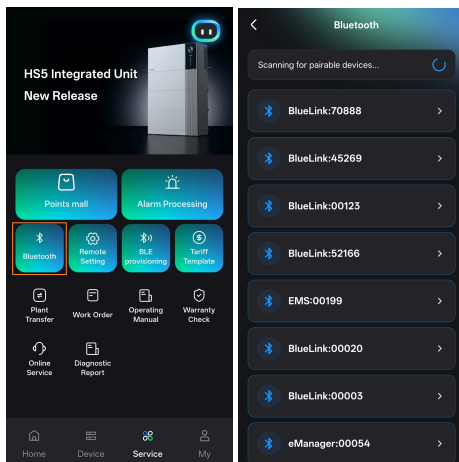
Note: The working strategy options and parameters may vary for different devices. Configure the parameters based on the actual App.

Procedure

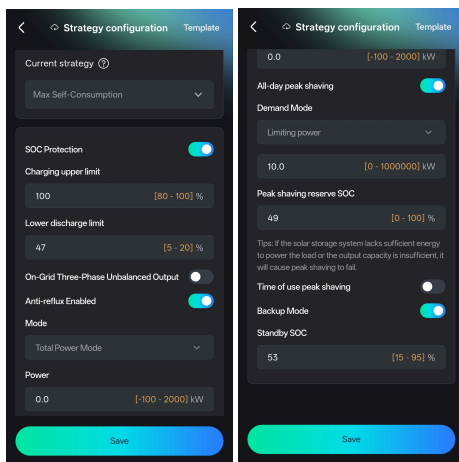
- On page **Service**, tap **Bluetooth**. Select the communication module, inverter or EMS according to the last five digits of the serial number (SN).

Example:

- BlueLink: 45269** for a communication module or inverter.
- EMS: 00199** for EMS units.



- Select **Strategy Configuration** or **Working Modes** (depending on the device) to configure the parameters as needed.
- For mode **Max Self-Consumption**, configure the following parameters:

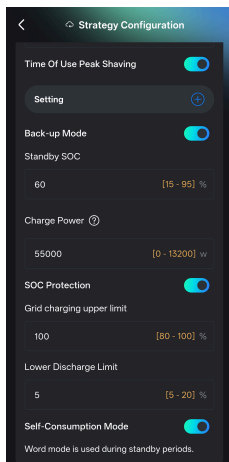


Parameter	Description
Current strategy	The active working strategy for the device.
SOC Protection	Whether to enable battery state of charge (SOC) protection to help prevent excessive charging or discharging.
Charging upper limit	The maximum battery SOC allowed during charging. Once reached, the battery stops charging.

Parameter	Description
Lower discharge limit	The minimum battery SOC allowed during discharging to protect the battery from over-discharge. Once reached, the battery stops discharging.
On-Grid Three-Phase Unbalanced Output	Whether to enable three-phase unbalanced output when the system is operating on-grid. This parameter is applicable for three-phase inverters only.
Anti-reflux Enabled	Enables or disables export limit control function to prevent power from feeding back to the grid.
Mode	Selects the export limit control mode used by the system.
Power	The power limit value used in the selected control mode.
All-day peak shaving	Enables or disables peak shaving throughout the entire day.
Demand Mode	Selects the demand control method used for peak shaving.
Demand Mode power	Sets the target power limit used when the selected demand mode requires a power threshold.
Peak shaving reserve SOC	Sets the battery SOC reserved for peak shaving operation.
Time of use peak shaving	Enables or disables peak shaving based on configured time periods.
Backup Mode	Enables or disables backup power operation so the battery can reserve energy for backup loads.
Standby SOC	Sets the battery SOC to be maintained in standby for backup or reserve purposes.

Table 7.3. Max Self-Consumption parameters

4. For **Time of Use Peaking Shaving** mode, configure the following parameters:

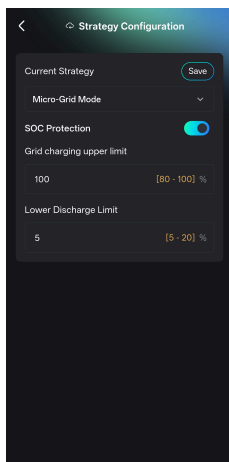


Parameter	Description
Time Of Use Peak Shaving	Enables or disables peak shaving based on configured time-of-use periods.
Setting	The time-of-use setting area where you can add and configure the charging and discharging schedules at configured charging power limit.
Back-up Mode	Whether to enable the backup power operation so the battery can reserve energy for backup loads.
Standby SOC	The battery SOC to be maintained in standby for backup or reserve purposes.
Charge Power	The charging power used when backup mode charging is active.
SOC Protection	Whether to enable battery state of charge (SOC) protection to help prevent excessive charging or discharging.

Parameter	Description
Grid charging upper limit	The maximum battery SOC allowed when charging from the grid.
Lower Discharge Limit	The minimum battery SOC allowed during discharging to protect the battery from over-discharge.
Self-Consumption Mode	Whether to enable self-consumption mode during standby periods. For CHS2 series, enable this option of Self-Consumption Mode for the non-charging or non-discharging periods so that the system can work in self-consumption mode when the system is not charging or discharging. If this option is disabled during these periods, the system will be at the bypass status and provides no power to the backup loads.

Table 7.4. TOU mode parameters

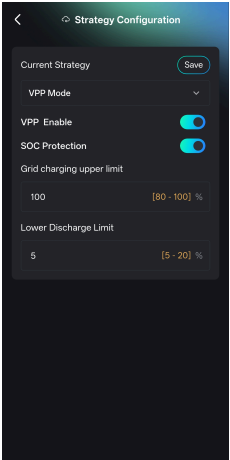
5. For **Micro-Grid Mode**, configure the following parameters:



Parameter	Description
Current Strategy	The active working strategy for the device.
SOC Protection	Enables or disables battery SOC protection to help prevent excessive charging or discharging in micro-grid mode.
Grid charging upper limit	The maximum battery SOC allowed when charging from the grid.
Lower Discharge Limit	Sets the minimum battery SOC allowed during discharging to protect the battery from over-discharge.

Table 7.5. Micro-Grid mode parameters

6. For **VPP Mode**, configure the following parameters:



Parameter	Description
VPP Enable	Enables or disables VPP mode for the device.
SOC Protection	Enables or disables battery SOC protection to help prevent excessive charging or discharging in VPP mode.
Grid charging upper limit	The maximum battery SOC allowed when charging from the grid.
Lower Discharge Limit	Sets the minimum battery SOC allowed during discharging to protect the battery from over-discharge.

Table 7.6. VPP mode parameters

7.5. Set the battery parameters

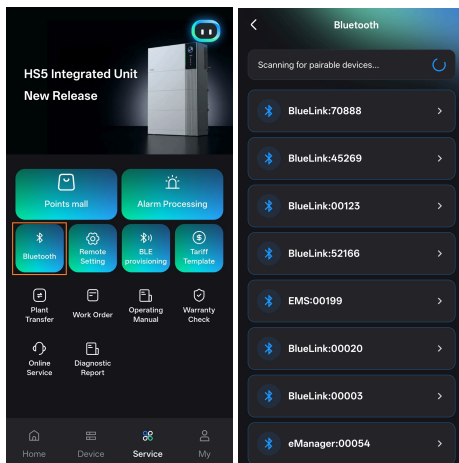
The installation technicians can configure the **Battery Settings** during the initialization of the inverter on the elekeeper App or set the parameters after installation through remote connection.

Procedure

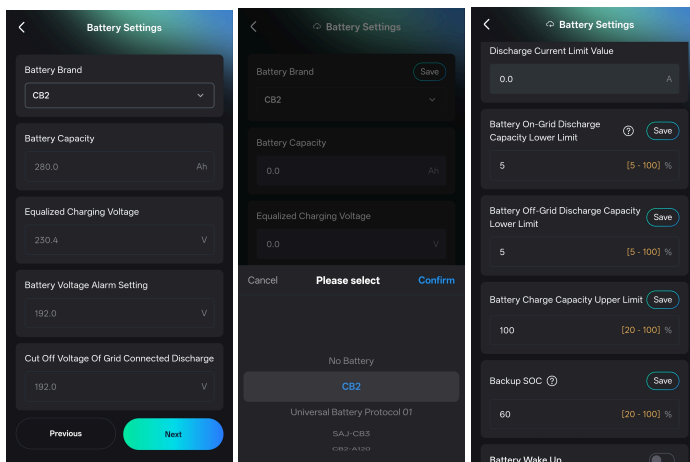
1. On page **Service**, tap **Bluetooth**. Select the communication module, inverter or EMS according to the last five digits of the serial number (SN).

Example:

- **BlueLink: 45269** for a communication module or inverter.
- **EMS: 00199** for EMS units.



2. Select **Battery Settings** and configure the parameters as needed.



Parameter	Description
Battery Brand	The brand of the battery currently adapted for match the corresponding BMS communication protocol.
Battery Capacity	The rated ampere-hour capacity (Ah) of the battery pack, used by the system to estimate total energy (kWh) and remaining runtime.
Equalized Charging Voltage	The maximum charging voltage limit for the battery. When reached, charging stops or switches to constant voltage to prevent overcharging and cell damage.
Battery Voltage Alarm Setting	The voltage threshold at which a low-voltage alarm is triggered. It reminds the user to monitor battery level.

Parameter	Description
Cut Off Voltage Of Grid Connected Discharge	The voltage at which the battery hard-stops discharging during grid-tied operation and switches to grid power, serving as the final physical protection.
Charge Current Limit Value	The maximum charging current (A) allowed by the battery. The system limits the input power beyond this current to protect cells from high current stress.
Discharge Current Limit Value	The maximum discharging current (A) allowed. The load power is limited beyond this current to avoid overcurrent damage to the battery.
Battery On-Grid Discharge Capacity Lower Limit	The SOC percentage at which discharging stops during grid-tied operation, switching to grid power to reserve energy for unexpected outages.
Battery Off-Grid Discharge Capacity Lower Limit	The lower SOC percentage (typically lower than the grid-tied value) allowed during off-grid/power outage situations to extend emergency backup duration.
Battery Charge Capacity Upper Limit	The SOC percentage at which charging stops. Reducing this value can prolong battery life.
Backup SOC	The target SOC threshold maintained by the system (higher than the grid-tied discharge limit). When SOC falls below this, the system prioritizes PV or grid charging to ensure sufficient backup power.
Battery Wake Up	A function to force a wake-up voltage or restart communication when the battery enters sleep state due to undervoltage, overtemperature, or BMS protection, allowing reconnection without physical rewiring.

Table 7.7. Battery parameters

7.6. Configure export limit control function

The export limit function controls the maximum power that the inverter exports to the grid. For this function to take effect in single-machine deployment, the installer needs to prepare a meter and connect the meter to the inverter.

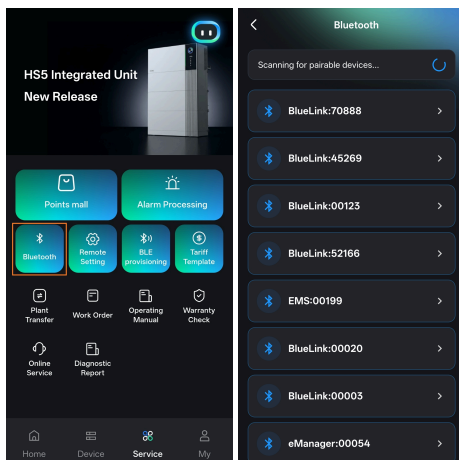
Follow this procedure to configure the export limit control parameters.

Procedure

- On page **Service**, tap **Bluetooth**. Select the communication module, inverter or EMS according to the last five digits of the serial number (SN).

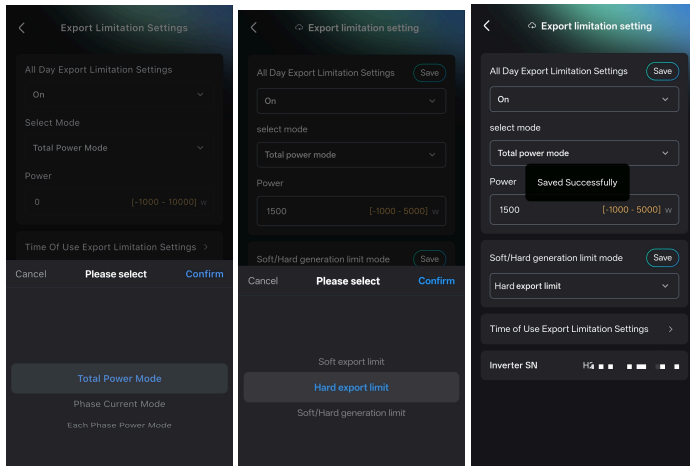
Example:

- **BlueLink: 45269** for a communication module or inverter.
- **EMS: 00199** for EMS units.



2. Select **Export Limitation Settings** to configure the parameters as needed.

Example:



Parameter	Description
All Day Export Limitation Settings	Enable or disable the export power limitation function that runs continuously throughout the entire day.
Select Mode	The modes for the export power limitation function. • Total Power Mode • Phase Current Mode • Each Phase Power Mode Phase Current Mode and Each Phase Power Mode are only applicable for three-phase inverters.
Power	The export power limit value.
Soft/Hard generation limit mode	• Soft export limit: enable software limit control only, and the export limit is the user-defined power limit value. - In case of communication loss, the inverter exports power within the AC grid output power limit. - In 60 seconds after communication recovery, the export limit is controlled by the user-defined power limit value again. • Hard export limit: enable both software and hardware limit controls. - When the export power exceeds the user-defined limit for 5 seconds, the inverter enters standby mode. The inverter restarts automatically in 60 seconds, gradually ramping up its output power. - In case of communication loss for 5 seconds, the inverter stops working. • Soft/Hard generation limit: the control mode is similar to Hard export limit. Only that the inverter enters standby mode when the export power exceeds the user-defined limit for 15-20 seconds. Note: This parameter is only applicable for specific grid code according to local regulations.
Time Of Use Export Limitation Settings	The time-specific settings that take priority over the All Day Export Limitation Settings . The settings can be executed once on specific time and date or repeatedly as a loop.

7.7. Configure power adjustment function

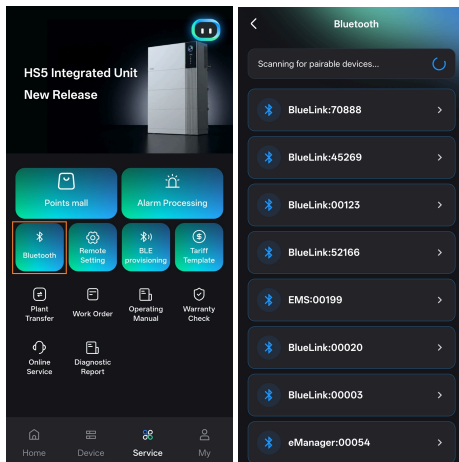
The power adjustment function allows the inverter to regulate and optimize the output power according to grid requirements and operational conditions. This function enables the inverter to adjust active and reactive power dynamically to improve grid stability, comply with local regulations, and enhance energy efficiency.

Procedure

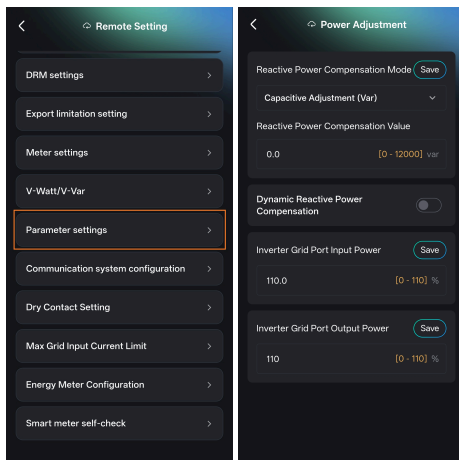
1. On page **Service**, tap **Bluetooth**. Select the communication module, inverter or EMS according to the last five digits of the serial number (SN).

Example:

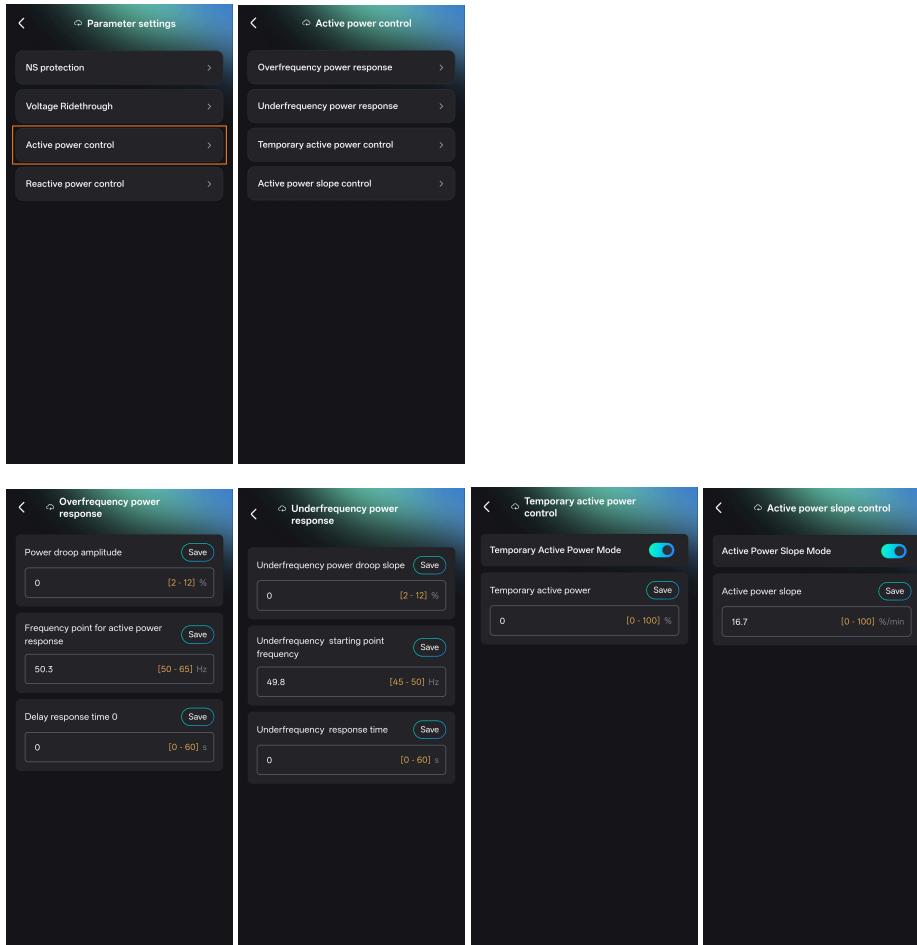
- **BlueLink: 45269** for a communication module or inverter.
- **EMS: 00199** for EMS units.



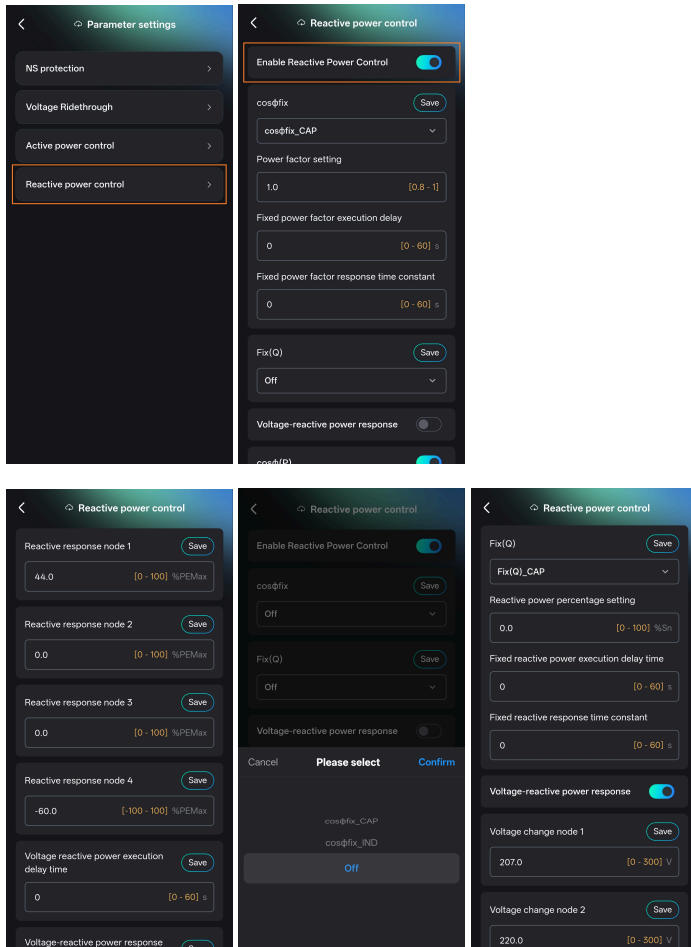
2. Select **Parameter settings**, and configure the power adjustment parameters as needed.



3. For **Active power control**, select the corresponding parameter groups and configure the corresponding parameters as needed:



- For **Reactive power control**, enable the control function first and then configure the corresponding parameters as needed:



7.8. Configure the DRM settings

When the **Country** is set to Australia on page **Safety Settings**, set the demand response mode (DRM) according to local regulations as needed.

Procedure

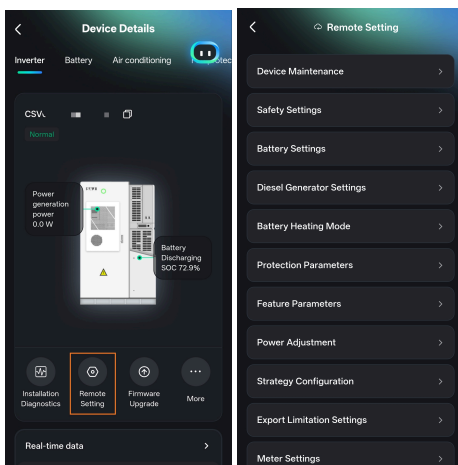
- On the **Home** page, tap the device name to open the **Device Details** page.

Example:



- On page **Device Details**, tap **Remote Setting** to open the device settings.

Example:



Note: The settings menu and parameter list may vary for different devices and user roles.

- Select **DRM Settings**, and enable the **DRM Check** function.



7.9. View the V-Watt and V-Var settings

This inverter complies with AS/NZS 4777.2: 2020 for power quality response modes. It meets DNSPs' grid connection rules and requirements for the volt-watt and volt-var settings in different regions.

Note:

With regard to the power rate limit mode, SAJ product sets the product WGr to 16.67% Pn by default in the following cases according to the requirements of 3.3.5.2 as 4777.2: 2020.

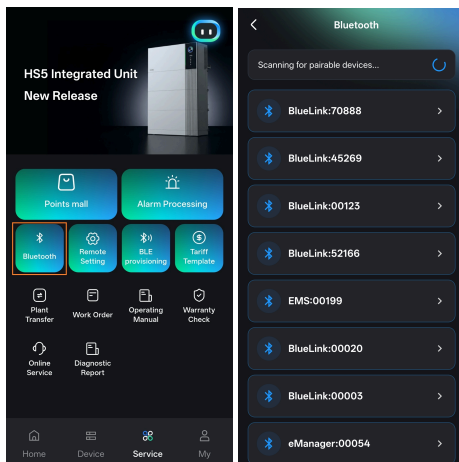
- Soft ramp up after connection.
- Reconnect or soft ramp up/down following a response to frequency disturbance.

Procedure

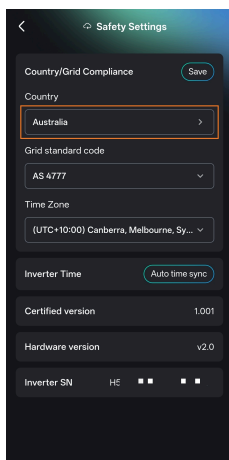
1. On page **Service**, tap **Bluetooth**. Select the communication module, inverter or EMS according to the last five digits of the serial number (SN).

Example:

- **BlueLink: 45269** for a communication module or inverter.
- **EMS: 00199** for EMS units.



2. On the **Remote Setting** page, tap **Safety Settings** and check whether the grid compliance is set to **Australia** grid codes. Change the settings if needed.



3. On the **Remote Setting** page, select **V-Watt/V-Var** to view the parameter values.

For **V-Watt** response mode:

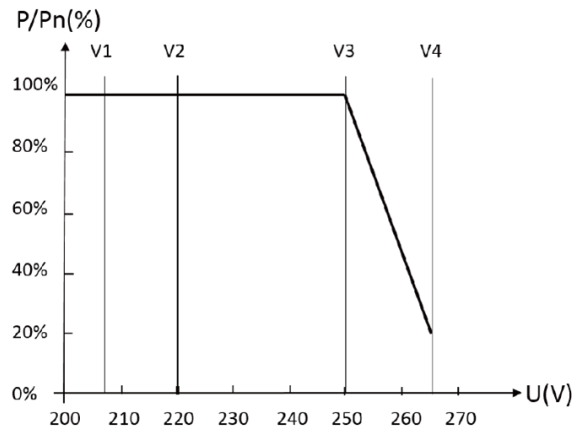


Figure 7.1. Curve for a Volt-Watt response mode (AS4777 Series)

V-Watt/V-Var	
V-Watt	Enabled
V1	207.0V
V1	220.0V
V3	253.0V
V4	260.0V
%P1	100.0%
%P2	100.0%
%P3	100.0%
%P4	20.0%
V-Var	Disabled
V1	207.0V
V1	220.0V

Parameters:

For **Volt-Var** control mode:

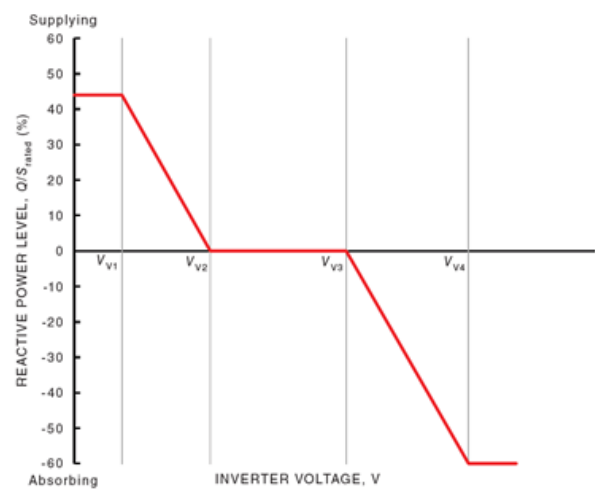


Figure 7.2. **Curve for a Volt-Var control mode (AS4777 Series)**

V-Watt/V-Var	
%P2	100.0%
%P3	100.0%
%P4	20.0%
V-Var	Enabled
V1	207.0V
V2	220.0V
V3	240.0V
V4	258.0V
%VAR1	44.0%
%VAR2	0%
%VAR3	0%
%VAR4	-60.0%

Parameters:

7.10. Configure the AFCI function

Follow this procedure to enable the AFCI function on the elekeeper App for the applicable devices.

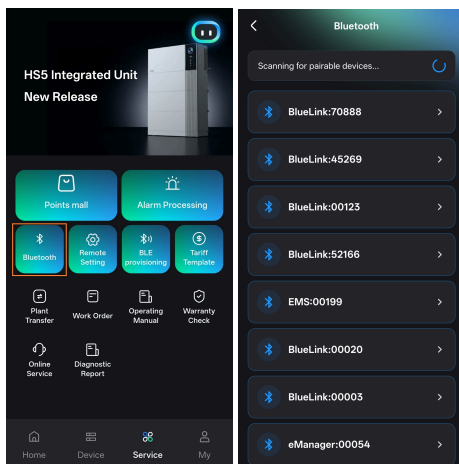
The inverter is equipped with an arc-fault circuit interrupter (AFCI). The AFCI is a safety feature designed to detect and interrupt arc faults, which are unintended electrical discharges that can cause fires. It continuously monitors the MPPT electrical circuits for characteristic signatures of arcing conditions. When an arc fault is detected, the AFCI function quickly interrupts the circuit to prevent potential fire hazards to enhance the system safety and reliability.

Procedure

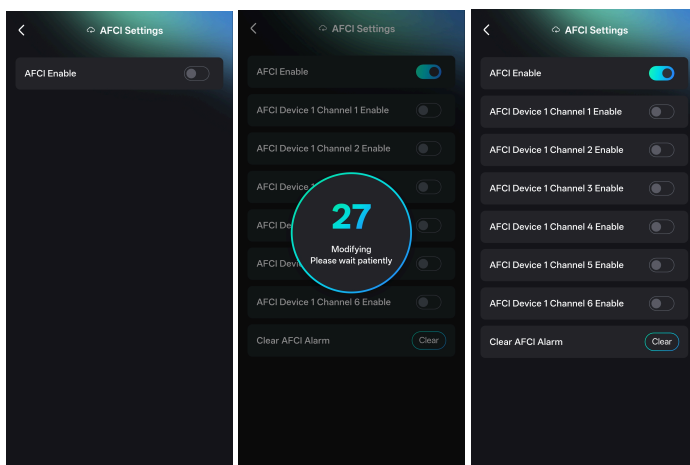
1. On page **Service**, tap **Bluetooth**. Select the communication module, inverter or EMS according to the last five digits of the serial number (SN).

Example:

- **BlueLink: 45269** for a communication module or inverter.
- **EMS: 00199** for EMS units.



2. Select **AFCI Settings**, and tap the icon to enable the AFCI function.



7.11. Configure G100 function

The G100 function is only applicable when the **Country** setting is UK (United Kingdom) on page **Safety Settings**. This function controls the export and import limit at the connection point of the distribution network.

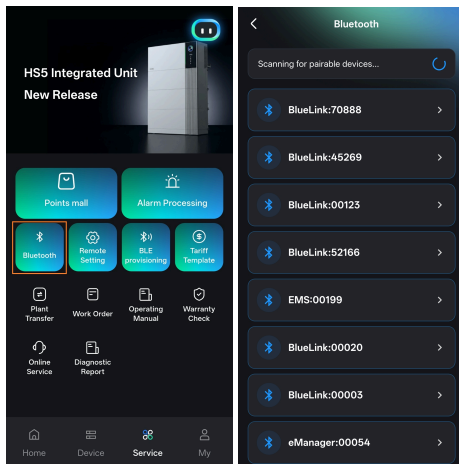
If export and import limit control fails at the connection point, the inverter (or PCS, hereinafter referred as the inverter) will shut down and can only be restarted by resetting the G100 system. If the failure happens four times within 30 days, the inverter will be locked and can only be restored to operation by clearing the fault history.

Procedure

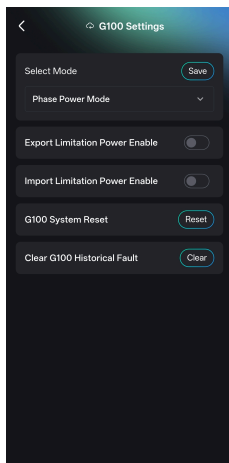
1. On page **Service**, tap **Bluetooth**. Select the communication module, inverter or EMS according to the last five digits of the serial number (SN).

Example:

- **BlueLink: 45269** for a communication module or inverter.
- **EMS: 00199** for EMS units.



2. Select **G100 Settings** to configure the parameters as needed.



Parameter	Description
Mode	Whether to control the export and import power limit per total power or per phase power.
Export Limitation Power Enable	The total power or phase power to be exported to the grid depending on the mode.
Import Limitation Power Enable	The total power or phase power to be imported from the grid depending on the mode.

Parameter	Description
G100 System Reset	To restart the inverter after an export or import limit control failure happens.
Clear G100 Historical Fault	To manually clear the history of limit control failures for restarting the inverter.

Table 7.8. G100 settings

8. Operation and maintenance

8.1. General safety instructions



WARNING

Danger of high voltage

- After the system is shut down, wait for at least five minutes to let the energy storage capacitors discharge completely before you open the cabinet door for any maintenance operations.
- Only qualified electrical technicians are allowed to perform the maintenance operations.
- Only perform the maintenance operations in clear and dry weather with no strong wind or sand. Do not open the cabinet door in weather conditions such as rain, snow, thunderstorms, sandstorms, or heavy fog.
- Do not allow any items (such as fingers, parts, screws, or tools) to contact the fan until it has been powered off and has completely stopped rotating to prevent mechanical injuries.



CAUTION

- Do not leave any screws, washers, and other metal parts inside the cabinet. It can cause short circuits, arc discharges, or other electrical faults, which can lead to serious incidents such as fires or explosions.
- Sand or impact of moisture could damage the electrical components and affect the operating performance of the system.

To ensure the safety and efficiency of maintenance work on the BESS, it is essential to strictly follow these safety operating procedures:

- There must be at least two people or more on-site during maintenance work to assist and respond in emergencies.
- During maintenance, use insulating materials to cover nearby live components to prevent accidental electric shock.
- Do not power on the equipment before completing fault diagnosis to avoid new faults or safety hazards.
- During live inspections, pay attention to warning signs on the equipment and avoid standing near the cabinet door to prevent injuries from unexpected situations.
- For switches that need to be disconnected for maintenance, place a "Do Not Close" warning sign at the switch location to prevent accidental operation.
- After replacing power components or changing wiring in the system, manually start the wiring detection and topology recognition process to ensure normal system operation and avoid abnormalities.
- After completing all maintenance and replacement operations, promptly lock the cabinet door and properly store the keys to ensure the safety of the equipment.

8.1.1. Battery safety instructions



DANGER

A short circuit in a battery pack can generate an instantaneous large current and release a significant amount of energy, which poses serious risks including personal injury and property damage.

When performing maintenance operations on the battery packs:

- Use high-quality electrical (insulating) tape to wrap any exposed cable terminals on the battery pack to prevent accidental contact between conductive parts and reduces the risk of short circuits.
- Avoid allowing any conductive objects such as screws, tools, or metal debris near the battery pack. These items can inadvertently cause a short circuit if they contact exposed terminals or internal components.

8.2. Regular maintenance

Conduct regular maintenance of the product to ensure its long-term stable operation.

The maintenance cycles provided in this section are for reference; actual maintenance cycles should be adjusted based on the specific environmental conditions at the project site. Especially in harsh environments such as desert areas, maintenance cycles should be shortened, and cleaning and anti-corrosion measures should be more frequent.

If the system is installed in a desert area, it is recommended to carefully inspect and thoroughly clean both the inside and the outside of the cabinet after each sandstorm.

NOTICE

- The maintenance cycles in this section are provided as references; actual maintenance cycles should be adjusted based on factors like power station size, site location, and its environmental conditions.
- Increase the maintenance frequency in areas with heavy sandstorm or dust.

8.3. Suggested maintenance operations

Product parts	Operation	Standard	Interval	Power OFF
Cabinet	Visual inspection: • Rust • Door locks • Air vents	No obvious coating peeling or scratches. No obvious paint fading or rusting. Door lock is not damaged. No dust accumulation in the vent. No insects, rats, snakes and other animals.	Quarterly	No
Air Conditioner	Visual inspection: • Outer appearance • Rust • Fan • Filter	No obvious damage. No obvious paint fading or rusting. No screw loose and falling off. The fan rotates normally without abnormal noises. The surface of the filter is clean and not blocked.	Quarterly	No
EMS	Viewing the indicator status.	The indicator is steady green.	Quarterly	No
Distributor Box	Visual inspection: • Check the appearance • Rust • Anything unusual in the cabinet	No obvious coating peeling, scratches. No obvious paint fading or rusting. The cabinet is clean and free of unexpected objects.	Quarterly	No
Labels	Visual inspection.	Clearly visible and free from defacement.	Quarterly	No
Air Conditioner External Fan	Clean the external fan filter.	The filter surface is clean and free of clogging.	Every 6 months	No
Battery Package	Charge the battery.	If the system is not in use for a long period of time, charge the battery to no less than 50% SOC.	Every 6 months	Yes
Battery Package	Visual inspection: • Check the appearance • Rust • Screws • Fan • Front panel vents	No obvious damage. No obvious paint fading or rusting. The screws are not loose or falling off. The fan rotates normally without abnormal noises. The surface of the front panel vents is clean and not clogged.	Yearly	Yes
Grounding and Equipotential Junction Point	• Ground wire • Internal equipotential	The grounding resistance must not be greater than 4Ω. Equipotential connections inside the cabinet are correct.	Yearly	Yes
Security Function	Emergency button	Check that the emergency stop button is working.	Yearly	Yes

9. Troubleshooting

For the errors reported as below, take the suggested troubleshooting actions in the listed order first. If the error is still present after taking the suggested actions or no specific action is suggested, contact the service support for further assistance.



NOTICE

The troubleshooting operations must be performed by authorized technicians.

Error code	Error message	Cause	Troubleshooting actions
1	Master Relay Error	1. The live wire is grounded on the grid side. 2. The grid voltage is too low. 3. The inverter relay circuit is faulty.	1. Measure whether the voltage between the ground wire and the neutral wire is greater than 10V. 2. Measure whether the grid voltage is too low.
2	Master EEPROM Error	Internal EEPROM failure of the inverter.	1. After turning off the AC/DC switch for 5 minutes, restart the inverter. 2. Check whether the firmware is upgraded to the correct version.
3	Master Temperature High Error	The inverter temperature is too high.	1. Check whether the heat dissipation channel of the inverter is blocked. 2. Check whether the inverter is installed in a location exposed to direct sunlight. 3. Check whether the installation environment is well-ventilated.
4	Master Temperature Low Error	The inverter temperature is too low.	Check whether the ambient temperature of the inverter installation location too low.
5	Lost Communication M<->S	Internal communication of the inverter is lost.	After turning off the AC and DC switch for 5 minutes, restart the inverter.
6	GFCI Device Error	The inverter GFCI device fails.	After turning off the AC and DC switch for 5 minutes, restart the inverter.
7	DCI Device Error	The inverter DCI device fails.	After turning off the AC and DC switch for 5 minutes, restart the inverter.
8	Current Sensor Error	The inverter current sensor malfunctions.	1. After turning off the AC and DC switch for 5 minutes, restart the inverter. 2. Whether the positive and negative poles of the string MC4 connectors are reversed.

Error code	Error message	Cause	Troubleshooting actions
9	Master Phase1 Voltage High	The grid voltage is higher than the inverter safety regulations.	1. Check whether the grid voltage is too high. 2. Check whether the inverter AC output cable connection is secure and whether the grid-connected cable is too thin. 3. Check whether the inverter grid compliance is selected correctly on the App.
10	Master Phase1 Voltage Low	The grid voltage is lower than the allowed range of the inverter safety regulations.	1. Check whether the grid voltage is too low. 2. Check whether the inverter AC output cable connection is secure. 3. Check whether the inverter grid compliance is selected correctly on the App.
11	Master Phase2 Voltage High	The grid voltage is higher than the inverter safety regulations allow.	1. Check whether the grid voltage is too high. 2. Check whether the inverter AC output cable connection is secure and whether the grid-connected cable is too thin. 3. Check whether the inverter grid compliance is selected correctly on the App.
12	Master Phase2 Voltage Low	The grid voltage is lower than the allowed range of the inverter safety regulations.	1. Check whether the grid voltage is too low. 2. Check whether the inverter AC output cable connection is secure. 3. Check whether the inverter grid compliance is selected correctly on the App.
13	Master Phase3 Voltage High	The grid voltage is higher than the inverter safety regulations.	1. Check whether the grid voltage is too high. 2. Check whether the inverter AC output cable connection is secure and whether the grid-connected cable is too thin. 3. Check whether the inverter grid compliance is selected correctly on the App.
14	Master Phase3 Voltage Low	The grid voltage is lower than the allowable range of the inverter safety regulations.	1. Check whether the grid voltage is too low. 2. Check whether the inverter AC output cable connection is secure. 3. Check whether the inverter grid compliance is selected correctly on the App.
15	Grid Voltage 10Min High	The grid voltage is higher than the inverter safety regulations.	1. Check whether the grid voltage is too high. 2. Check whether the inverter AC output cable connection is secure and whether the grid-connected cable is too thin. 3. Check whether the inverter grid compliance is selected correctly on the App.

Error code	Error message	Cause	Troubleshooting actions
16	OffGrid Output Voltage Low	The system temperature is too high, causing the battery to reduce load output.	1. Check whether the ambient temperature is too high. 2. Check whether the inverter heat dissipation channel is blocked. 3. Check whether the inverter is installed in a location exposed to direct sunlight.
17	OffGrid Output Short Circuit	External wiring short circuit on back-up side.	Check the external cable connections on the back-up side.
18	Master Grid Frequency High	The grid frequency is higher than the upper limit specified by the local power grid.	1. Check whether the grid compliance of the inverter is selected correctly on the App. 2. After 5 minutes of disconnecting the AC and DC switch, restart the inverter.
19	Master Grid Frequency Low	The grid frequency is lower than the lower limit specified by the local power grid.	1. Check whether the grid compliance of the inverter is selected correctly on the App. 2. After 5 minutes of disconnecting the AC and DC switch, restart the inverter.
20	BATInputMode Error	The actual battery connection is not parallel connection.	1. Check whether all battery connections are secure. 2. Check whether the battery input mode is configured to parallel mode.
21	Phase1 DCV High	The DC component of the AC L1 output exceeds the limit range.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
22	Phase2 DCV High	The DC component of the AC L2 output exceeds the limit range.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
23	Phase3 DCV High	The DC component of the AC L3 output exceeds the limit range.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
24	Master No Grid Error	The inverter cannot detect the grid voltage.	1. Confirm whether there is a power outage in the power grid. 2. Check whether the grid-connected box switch is tripped. 3. Check whether the inverter AC cable is firmly connected.
25	DC ReverseConnect Error	There is a reverse connection at the PV or battery port.	Check whether the negative and positive cables at the PV side and the battery side are connected correctly.
26	Parallel machine CAN Com Error	Parallel CAN communication failed.	Check the cable connections for parallel CAN communication.

Error code	Error message	Cause	Troubleshooting actions
27	GFCI Error	A ground leakage current fault was detected in the power station system.	1. Turn off the AC and DC switches and wait for 5 minutes. 2. Check whether the ground wire of the AC output end is firm, and whether the AC wiring is correct. 3. Check whether the AC and DC cables are damaged or soaked in water, and whether the battery board is soaked in water.
28	Phase1 DCI High	The DC component of the AC L1 output exceeds the limit range.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
29	Phase2 DCI High	The DC component of the AC L2 output exceeds the limit range.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
30	Phase3 DCI High	The DC component of the AC L3 output exceeds the limit range.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
31	ISO Error	The insulation resistance between the string and the ground is less than the set value.	1. Turn off the AC and DC switches and wait for 5 minutes. 2. Check whether the ground wire of the AC output end is firm, and whether the AC wiring is correct. 3. Check whether the AC and DC cables are damaged or soaked in water, and whether the battery board is soaked in water.
32	Bus Voltage Imbalance	The voltage distribution among the three phases is unequal.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
33	Master Bus Voltage High	The DC input voltage exceeds the allowed input limit of the inverter.	1. Check the number of battery panels in each string and calculate whether the open circuit voltage of the string exceeds the maximum input voltage of the inverter. 2. If the above items are normal, turn off the AC/DC switch for 5 minutes, and then restart the inverter.
34	Master Bus Voltage Low	The bus voltage of the inverter is too low.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
35	Master Grid Phase Error	Grid phase error.	Measure whether the voltage between three-phase power of the grid is normal.
36	Master PV Voltage High	The DC input voltage of the inverter is too high.	1. Check the number of battery panels in each string and calculate whether the open circuit voltage of the string exceeds the maximum input voltage of the inverter. 2. If the above items are normal, turn off the AC/DC switch for 5 minutes, and then restart the inverter.

Error code	Error message	Cause	Troubleshooting actions
37	Master Islanding Error	Loss of power grid causes islanding.	1. Confirm whether there is a power outage in the power grid. 2. Check whether the grid-connected box switch is tripped, and whether the inverter AC cables are firmly connected. 3. Close the AC switch and reconnect to the grid.
38	Master HW Bus Voltage High	The DC input voltage exceeds the allowed input limit of the inverter.	1. Check the number of battery panels in each string and calculate whether the open circuit voltage of the string exceeds the maximum input voltage of the inverter. 2. If the above items are normal, turn off the AC/DC switch for 5 minutes, and then restart the inverter.
39	Master HW PV Current High	1. The positive and negative poles of the string are connected reversely. 2. The inverter is internally damaged.	1. Check whether the positive and negative poles of the string are reversely connected. 2. If the above items are normal, turn off the AC/DC switch for 5 minutes, and then restart the inverter.
40	Master Self-Test Failed	Inverter power-on self-test abnormality.	Contact technical support for further assistance.
41	Master HW Inv Current High	The grid-side output current exceeds the inverter limit.	1. Turn off the AC and DC switch and check whether the AC cable is firmly connected. 2. If the above items are normal, turn off the AC/DC switch for 5 minutes, and then restart the inverter.
42	Master AC SPD Error	AC lightning protection circuit abnormality.	Contact technical support for further assistance.
43	Master DC SPD Error	DC lightning protection circuit abnormality.	Contact technical support for further assistance.
44	Master Grid NE Voltage Error	Live line grounding occurs on the grid side.	Measure whether the voltage between the ground wire and the neutral wire is greater than 10V. If it is greater than 10V, the live wire is grounded.
45	Master Fan1 Error	Fan 1 blades are stuck or damaged.	1. Check whether the external fan (if any) is running normally. 2. Turn off the AC and DC switch, waiting for 5 minutes, and then restart the inverter.
46	Master Fan2 Error	Fan 2 blades are stuck or damaged.	1. Check whether the external fan (if any) is running normally. 2. Turn off the AC and DC switch, waiting for 5 minutes, and then restart the inverter.
47	Master Fan3 Error	Fan 3 blades are stuck or damaged.	1. Check whether the external fan (if any) is running normally. 2. Turn off the AC and DC switch, waiting for 5 minutes, and then restart the inverter.

Error code	Error message	Cause	Troubleshooting actions
48	Master Fan4 Error	Fan 4 blades are stuck or damaged.	1. Check whether the external fan (if any) is running normally. 2. Turn off the AC and DC switch, waiting for 5 minutes, and then restart the inverter.
49	Lost Communication between Master and Meter	Abnormal communication between inverter and meter.	1. Confirm whether the meter is working normally. 2. Check whether the communication cable connection between the inverter and the meter is secure. 3. Check whether the communication parameters between the inverter and the meter are set correctly, including address, baud rate, and so on.
50	Lost Communication between M<->S	Internal communication of the inverter is lost.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
51	Lost Communication between inverter and Grid Meter	The communication between the inverter and the grid meter is abnormal.	1. Confirm whether the meter is working normally. 2. Check whether the communication cable connection between the inverter and the meter is secure. 3. Check whether the communication parameters between the inverter and the meter are set correctly, including address, baud rate, and so on.
52	HMI EEPROM Error	Internal EEPROM failure of the inverter.	1. After turning off the AC/DC switch for 5 minutes, restart the inverter. 2. Check whether the firmware is upgraded to the correct version.
53	HMI RTC Error	RTC error.	Contact technical support for further assistance.
54	BMS Device Error	Battery abnormality.	Contact technical support for further assistance.
55	BMS Lost.Conn	BMS does not start normally.	Check whether the BMS START button is on.
56	CT Device Err	CT Device Err	Contact technical support for further assistance.
57	AFCI Lost Com.Err	AFCI board communication interrupted.	Contact technical support for further assistance.
67	Emergency stop	Emergency stop button pressed.	Reset the emergency stop button.
69	Fire lockout fault	The fire alarms are triggered, including smoke, flooding, or aerosol alarms.	1. Check whether the cabinet is free of any smoke, water immersion, or abnormal situation. 2. If the cabinet is working properly, clear the alarm manually on the App.
81	Lost Communication D<->C	Internal communication of the inverter is lost.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
83	Master Arc Device Error	Arc Device Error.	Contact technical support for further assistance.

Error code	Error message	Cause	Troubleshooting actions
84	Master PV Mode Error	PV mode selection error.	Check whether the inverter string mode is set correctly.
85	Authority expires	Authority expires.	Contact technical support for further assistance.
86	DRM0 Error	DRM0 Error	Contact technical support for further assistance.
87	Master Arc Error	DC arcing caused by DC short circuit or poor terminal contact.	1. Check whether each terminal is in good contact and whether the PV positive and negative insulation to the ground is normal. 2. If the above items are normal, turn off the AC and DC switch, waiting for 5 minutes, and then restart the inverter.
88	Master SW PV Current High	1. The positive and negative poles of the string are connected reversely. 2. The inverter is internally damaged.	1. Check whether the positive and negative poles of the string are reversely connected. 2. If the above items are normal, turn off the AC and DC switch, waiting for 5 minutes, and then restart the inverter.
89	Battery Voltage High	The battery voltage is higher than the maximum voltage value of the inverter.	Contact technical support for further assistance.
90	Battery Current High	The battery power is too low or the load is too large, causing the battery unable to output.	1. Reduce the back-up load. 2. Charge the battery or stop using the battery.
91	Battery Charge Voltage High	The voltage is too high during battery charging.	1. Do not turn off the battery during charging. 2. Restart the battery and the inverter.
92	Battery OverLoad	The battery power is too low or the load is too large, causing the battery to be unable to output.	1. Reduce the back-up load. 2. Charge the battery or stop using the battery.
93	Battery SoftConnet TimeOut	Battery precharge bus failed.	Contact technical support for further assistance.
94	Output OverLoad	The load connected to the back-up end is greater than the maximum output power of the inverter.	Reduce the back-up load.
95	Battery Open Circuit	Inverter cannot detect battery voltage.	1. Check whether the battery circuit breaker is open. 2. Check whether the connection of the battery power cables is secure.
96	Battery Discharge Voltage Low	Low voltage is detected during battery discharge.	Do not turn off the battery during battery discharge.

Error code	Error message	Cause	Troubleshooting actions
97	BMS Internal Communication Error	1. The communication between the battery high-voltage box and the battery pack is abnormal. 2. The last battery pack was not connected to the resistor plug, which causes the high voltage box fail to recognize the number of battery packs.	1. Check whether the communication cable is correctly connected. 2. Check whether the last battery pack has a resistor plug. 3. Check whether the communication network is working.
98	Bat Sequence Error	Battery pack communication abnormality.	1. Check whether the communication cable is correctly connected. 2. Check whether the last battery pack has a resistor plug. 3. Check whether the communication network is working.
99	Discharge Over Current Protection	The discharge current exceeds the set threshold.	Wait for the fault to be cleared automatically or restart the inverter.
100	Charge Over Current Protection	The charge current exceeds the set threshold.	Wait for the fault to be cleared automatically or restart the inverter.
101	Module Under Voltage Protection	The total pressure is lower than the set threshold.	Force charging the battery.
102	Module Over Voltage Protection	The total pressure is higher than the set threshold.	Wait for the fault to be cleared automatically or restart the inverter.
103	Single Cell Under Voltage Protection	The cell voltage is lower than the set maximum value.	Force charging the battery.
104	Single Cell Over Voltage Protection	The cell voltage is higher than the set maximum value.	Wait for the fault to be cleared automatically or restart the inverter.
105	BMS Hardware Error	1. Single voltage detection module failure. 2. Temperature detection module failure. 3. Current detection module failure.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
106	Charging temperature low protection	Charging the battery below 0°C.	Wait for the battery to heat up until the fault is cleared.
107	Charging temperature high protection	Battery temperature is too high.	Wait for the battery to cool down until the fault is cleared.

Error code	Error message	Cause	Troubleshooting actions
108	Discharging temperature low protection	The battery temperature is too low, disconnect the relay to stop discharging.	Wait for the battery to heat up until the fault is cleared.
109	Discharging temperature high protection	Battery temperature is too high.	Wait for the battery to cool down until the fault is cleared.
110	BMS Relay Error	1. The negative or positive relay is stuck. 2. The negative or positive relay cannot be closed.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
111	Pre-charge Error	1. The precharge relay is damaged. 2. Precharge blocking circuit. 3. BMS damaged.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
112	BMS Insulation Error	The battery pack may have a leakage problem.	Contact technical support for further assistance.
113	BMS supplier Incompatibility	The battery pack and the BMS used in the high-voltage box do not match.	Contact technical support for further assistance.
114	Battery cell supplier incompatibility	Battery pack cell manufacturers are inconsistent.	Contact technical support for further assistance.
115	Battery cell incompatibility	Battery pack cell levels are inconsistent.	Contact technical support for further assistance.
116	Battery pack models incompatibility	The battery pack model does not match.	Contact technical support for further assistance.
117	Circuit Breaker Is Open	1. The battery circuit breaker is not closed. 2. The battery circuit breaker auxiliary contact is abnormal.	Close the battery air switch.
118	Temperature Difference Is Too Wide	Temperature detection module error.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
119	Voltage Difference Is Too Wide (Class II)	The sampling line is loose.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
120	Voltage Difference Is Too Wide (Class I)	The sampling line is loose.	After turning off the AC/DC switch for 5 minutes, restart the inverter.
121	BMS Over Temperature Protect	1. The ambient temperature is too high. 2. Battery overloaded.	1. Check whether the ambient temperature of the battery is too high. 2. If the temperature is normal, let the battery rest for 30 minutes and restart it.

Error code	Error message	Cause	Troubleshooting actions
122	Short Circuit Protect	The positive and negative terminals of the battery are short-circuited.	Check whether the battery cable connections are correct.
123	Total voltage match failed	Contact technical personnel to troubleshoot the problem.	Contact technical support for further assistance.
124	The system is locked	Contact technical personnel to troubleshoot the problem.	Contact technical support for further assistance.
125	FUSE error protection	Contact technical personnel to troubleshoot the problem.	Contact technical support for further assistance.
126	Battery Port Voltage Abnormal Protection	The voltage on the battery charging port is too high.	Check whether the positive and negative battery power cables are connected to the correct ports.
129	CO sensor triggered	The CO concentration in the cabinet is higher than the threshold.	Check the situation inside the cabinet.
130	Stroke switch triggered	Cabinet door is open.	Close the cabinet door.
131	Temperature sensor triggered	The temperature inside the cabinet is higher than the threshold.	Check the temperature inside the cabinet.
132	Smoke sensor triggered	The smoke concentration in the cabinet is too high.	Check the smoke situation in the cabinet.
133	Water sensor triggered	The water immersion sensor in the cabinet detects moisture above the threshold.	Check the water immersion in the cabinet.
134	Aerosol triggered	Aerosol in the cabinet is triggered.	Check the situation inside the cabinet.
135	Emergency stop	Emergency stop button is activated.	Reset the emergency stop button.
136	T/H sensor communication lost	1. Abnormal power supply of temperature and humidity sensor. 2. The temperature and humidity sensor communication wiring is abnormal.	Check whether the temperature and humidity sensor wires are connected securely.
137	Air conditioning communication lost	1. Abnormal power supply of air conditioner. 2. The air conditioner communication line is abnormal.	Check whether the air conditioner wires are connected securely.
138	Temperature inside cabinet too high	Internal malfunction of air conditioning system.	Contact technical support for further assistance.

Error code	Error message	Cause	Troubleshooting actions
139	Temperature inside cabinet too low	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
140	Humidity too high	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
141	Humidity too low	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
142	Coil anti-freeze	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
143	Defrost probe error	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
144	Fuse error	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
145	Condensing temperature probe error	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
146	Temperature probe inside cabinet error	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
147	Outlet air temperature probe error	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
148	Humidity probe error	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
149	Internal fan error	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
150	Compressor error	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
151	High voltage alarm	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
152	Low voltage alarm	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
153	High voltage alarm lock alarm	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
154	Phase sequence alarm	Internal malfunction of air conditioning system.	Contact technical support for further assistance.
155	CO sensor communication lost	1. Abnormal power supply of CO sensor. 2. The CO sensor communication line is abnormal.	Check whether the CO sensor wires are connected securely.
156	Temperature of T/H sensor is too high	The temperature of the temperature sensor and the humidity sensor is too high.	1. Check whether the sensors are working properly. 2. Check the running status of the cabinet.

Error code	Error message	Cause	Troubleshooting actions
162	Gen Start Or Stop fail	Multiple attempts to start or shut down the generator without success.	1. Check whether the generator is working properly. 2. Check the cable connections to the generator. 3. After turning off the AC/DC switch for 5 minutes, restart the inverter.
163	Lost Communication Gen Meter	Abnormal communication between inverter and meter.	1. Confirm whether the meter is working normally. 2. Check whether the communication cable connection between the inverter and the meter is secure. 3. Check whether the communication parameters between the inverter and the meter are set correctly, including address, baud rate, and so on.
164	Battery protocol mismatch	The system failed to retrieve the SOC value due to battery protocol mismatch. As a result, the generator cannot work in the auto-start mode.	1. Check that the battery brand is set correctly on the App. Modify the battery brand if necessary. 2. Clear the alarm manually or configure the connection to the generator on the App again.
165	Generator port overloaded	The generator output power exceeds the load capacity of the inverter.	1. Check whether the generator is working properly. 2. Check whether the loads are working properly. 3. Disconnect from the generator on the App and set the generator connection parameters again.
166	Generator wiring fault	The phase sequence of the generator cable connection is incorrect.	Check whether all the phases of the generator cable connections are correct.
167	Generator overvoltage fault	The voltage of the generator is too high.	Check whether the generator is working properly.
168	Generator undervoltage fault	The voltage of the generator is too low.	Check whether the generator is working properly.
169	Generator overfrequency fault	The frequency of the generator is too high.	1. Check whether the generator is working properly. 2. Check whether the loads are excessive, causing the diesel generator frequency to drop.
170	Generator underfrequency fault	The frequency of the generator is too low.	Check whether the generator is working properly.

10. Product specification

10.1. System

Model	CHS2-29.9K-T4-X	CHS2-30K-T4-X	CHS2-49.9K-T6-X	CHS2-50K-T6-X
DC Input				
Max. PV Array Power [Wp]@STC	59800	60000	99998	100000
Max. DC Voltage [V]	1000			
MPPT Voltage Range [V]	180–850			
Rated DC Voltage [V]	600			
Start Voltage [V]	200			
Max. DC Input Current [A]	4*45		6*45	
Max. DC Input Current per String [A]	22.5			
Max. DC Short Circuit Current [A]	4*55		6*55	
Number of Strings per MPPT	2			
Battery Parameters				
Battery Type	LiFePO4			
Rated Energy [kWh]	57.3–100.3			
Rated Capacity [Ah]	280			
Battery Voltage Range [V]	179.2–403.2			
Max. Charging/Discharging Current [A]	150			
AC Output [On-grid]				
Rated AC Power [VA]	29900	30000	49999	50000
Max. Apparent Power [VA]	29900	33000	49999	55000
Rated Output Current [A]@230V AC	43.3	43.5	71.9	72.5
Max. AC Continuous Current [A]	43.3	47.9	71.9	79.8
Current Inrush [A]	192			
Max. AC Fault Current [A]	182.6			
Rated AC Voltage [V]	3L+N+PE, 380/400			
Rated Output Frequency/Range [Hz]	50 Hz: 45–55; 60 Hz: 55–65			
Power Factor [cos ϕ]	0i - 1 - 0c			
Total Harmonic Distortion [THDi]	<3%			
AC Input [On-grid]				
Rated AC Voltage [V]	3L+N+PE, 400			
Rated Frequency [Hz]	50, 60			
Max. Input Current [A] ①	80	80	200	200
Max. Input Current [A] ②	43.3	47.9	72.1	79.8
AC Input [Generator]				
Max. Input Power [VA]	138000	138000	138000	138000
Max. Input Current [A]@230V	200	200	200	200
Rated Input Voltage [V]	3L+N+PE, 400			
Rated Input Frequency/Range [Hz]	50 Hz: 45–55; 60 Hz: 55–65			
AC Output [Back-up]				
Max. Apparent Power [VA]	29900	33000	49999	55000

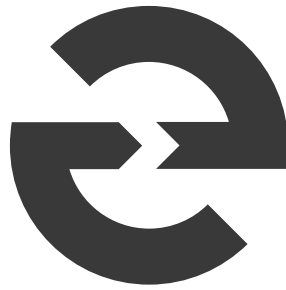
Model	CHS2-29.9K-T4-X	CHS2-30K-T4-X	CHS2-49.9K-T6-X	CHS2-50K-T6-X
Peak Output Apparent Power [VA]	29900	45000, 5s	49999	75000, 5s
Rated AC Voltage [V]	3L+N+PE, 400			
Rated Output Frequency/Range [Hz]	50 Hz: 45–55; 60 Hz: 55–65			
Output THDv (@ Linear Load)	<3%			
Efficiency				
Max. Efficiency	≥98.0%			
Euro Efficiency	97.3%			
Max. Battery to AC Efficiency	96.0%			
Protection				
PV String Current Monitoring	Integrated			
PV Insulation Resistance Detection	Integrated			
Residual Current Monitoring	Integrated			
PV Reverse Polarity Protection	Integrated			
Anti-islanding Protection	Integrated			
AC Overcurrent Protection	Integrated			
AC Short Circuit Protection	Integrated			
AC Overvoltage Protection	Integrated			
DC Switch	Integrated			
DC Surge Protection	II			
AC Surge Protection	II			
AFCI	Integrated			
RSD	Optional			
General Parameters				
Communication	Wi-Fi/Ethernet/CAN/RS485			
Topology	Transformerless			
Operating Temperature Range	-30°C to +50°C (45°C to 50°C with derating)			
Cooling Method	Air Conditioner			
Ambient Humidity	5–95% (Non-condensing)			
Altitude [m]	2000			
Ingress Protection	Battery: IP55; Inverter: IP66			
Dimensions [H*W*D] [mm]	1980*988*1065			
Weight [kg]	1050 (57.3kWh), 1150 (71.6kWh), 1250 (85.9kWh), 1350 (100.3kWh)			
Warranty [Year]	5/10			
Standard	VDE4105, IEC61727/62116, VDE0126, AS4777.2, CEI 0 21, EN50549-1, G98, G99, C10-11, UNE217002, NBR16149/NBR16150, IEC62109-1/-2, NBT32004-2018, EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4			

Model	CHS2-30K-T6-X-LV
DC Input	
Max. PV Array Power [Wp]@STC	100000
Max. DC Voltage [V]	1000
MPPT Voltage Range [V]	180–850
Rated DC Voltage [V]	600
Start Voltage [V]	200
Max. DC Input Current [A]	6*45
Max. DC Input Current per String [A]	22.5
Max. DC Short Circuit Current [A]	6*45
Number of Strings per MPPT	2
Battery Parameters	
Battery Type	LiFePO4
Rated Energy [kWh]	57.3–100.3
Rated Capacity [Ah]	280
Battery Voltage Range [V]	179.2–403.2
Max. Charging/Discharging Current [A]	150
AC Output [On-grid]	
Rated AC Power [VA]	30000
Max. Apparent Power [VA]	30000
Rated Output Current [A]@230V AC	78.7
Max. AC Continuous Current [A]	78.7
Current Inrush [A]	192
Max. AC Fault Current [A]	182.6
Rated AC Voltage [V]	3L+N+PE, 380/400
Rated Output Frequency/Range [Hz]	50 Hz: 45–55; 60 Hz: 55–65
Power Factor [cos ϕ]	0i – 1 – 0c
Total Harmonic Distortion [THDi]	<3%
AC Input [On-grid]	
Rated AC Voltage [V]	3L+N+PE, 220/230
Rated Frequency [Hz]	50, 60
Max. Input Current [A] ^①	200
Max. Input Current [A] ^②	78.7
AC Input [Generator]	
Max. Input Power [VA]	60000
Max. Input Current [A]@230V	157.5
Rated Input Voltage [V]	3L+N+PE, 220/230
Rated Input Frequency/Range [Hz]	50 Hz: 45–55; 60 Hz: 55–65
AC Output [Back-up]	
Max. Apparent Power [VA]	30000
Peak Output Apparent Power [VA]	30000
Rated AC Voltage [V]	3L+N+PE, 220/230
Rated Output Frequency/Range [Hz]	50 Hz: 45–55; 60 Hz: 55–65
Output THDv (@ Linear Load)	<3%

Model	CHS2-30K-T6-X-LV
Efficiency	
Max. Efficiency	≥98.0%
Euro Efficiency	97.3%
Max. Battery to AC Efficiency	96.0%
Protection	
PV String Current Monitoring	Integrated
PV Insulation Resistance Detection	Integrated
Residual Current Monitoring	Integrated
PV Reverse Polarity Protection	Integrated
Anti-islanding Protection	Integrated
AC Overcurrent Protection	Integrated
AC Short Circuit Protection	Integrated
AC Overvoltage Protection	Integrated
DC Switch	Integrated
DC Surge Protection	II
AC Surge Protection	II
AFCI	Integrated
RSD	Optional
General Parameters	
Communication	Wi-Fi/Ethernet/CAN/RS485
Topology	Transformerless
Operating Temperature Range	-30°C to +50°C (45°C to 50°C with derating)
Cooling Method	Air Conditioner
Ambient Humidity	5–95% (Non-condensing)
Altitude [m]	2000
Ingress Protection	Battery: IP55; Inverter: IP66
Dimensions [H*W*D] [mm]	1980*988*1065
Weight [kg]	1050 (57.3kWh), 1150 (71.6kWh), 1250 (85.9kWh), 1350 (100.3kWh)
Warranty [Year]	5/10
Standard	VDE4105, IEC61727/62116, VDE0126, AS4777.2, CEI 0 21, EN50549-1, G98, G99, C10-11, UNE217002, NBR16149/NBR16150, IEC62109-1/-2, NBT32004-2018, EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4

10.2. Battery

Model	CB2-57.3-HV5	CB2-71.6-HV5	CB2-85.9-HV5	CB2-100.3-HV5
Rated Energy [kWh]	57.3	71.6	85.9	100.3
Usable Energy [kWh]	51.5	64.4	77.3	90.2
Rated Capacity [Ah]	280	280	280	280
No. of Modules	4	5	6	7
Nominal Voltage [V]	204.8	256	307.2	358.4
Voltage Range [V]	179.2–230.4	224–288	268.8–345.6	313.6–403.2
Charge/Discharge Current [A]	140	140	140	140
Rated Power [kW]	28.6	35.6	42.9	50.1
Weight [kg]	960	1060	1160	1260
Dimension [mm]	1980*988*1065			
Communication	CAN			
Operating Temperature Range [°C]	-30°C to 50°C			
Cooling Method	Air Conditioner			
Relative Humidity	5–95% (non-condensing)			
Altitude [m]	2000			
Ingress Protection	IP55			
Mounting	Ground-Mounted			
Control Module	CBC2-HV5			
Dimension (H*W*D) [mm]	225*483*610			
Weight [kg]	28			
Battery Module	CBU2-14.33-HV5			
Rated Energy [kWh]	14.33			
Weight [kg]	115			
Dimension [mm]	231*523*805			
Applicable Standard	IEC62619-2017, UN38.3, IEC61000-6-2/4, IEC62477			



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