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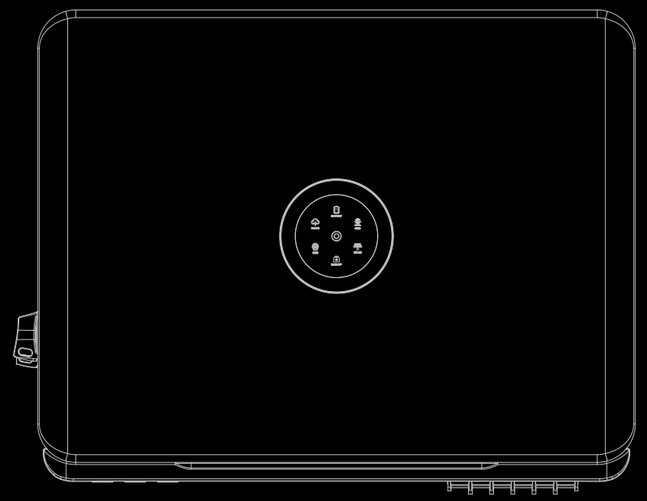


H2 Series

HYBRID INVERTER

USER MANUAL

H2-(5K-10K)-S3-(A)

Preface

Thank you for choosing SAJ products. We are pleased to provide you first-class products and exceptional service.

This manual includes information for installation, operation, maintenance, trouble shooting and safety. Please follow the instructions of this manual so that we can ensure delivery of our professional guidance and wholehearted service.

Customer-orientation is our forever commitment. We hope this document proves to be of great assistance in your journey for a cleaner and greener world.

Please check for the latest version at www.saj-electric.com.

Guangzhou Sanjing Electric Co., Ltd.

TABLE OF **CONTENTS**

1.

PREPARATION

1.1 About this document

This User Manual describes instructions and detailed procedures for installing, operating, maintaining, and troubleshooting of the following inverters:

- H2-5K-S3
- H2-6K-S3
- H2-7K-S3
- H2-8K-S3
- H2-10K-S3-A
- H2-10K-S3

Please read this manual carefully before installations and operations. Always keep this manual available in case of emergency and maintenance purposes.

1.2 Target audience

This manual is intended for qualified personnel who need to install, operate, maintain, and troubleshoot inverters and related system components. Qualified personnel should have the necessary training, knowledge, and experience in:

- Installing electrical equipment.
- Applying all applicable installation tools.
- Analyzing and reducing hazards involved in electrical work.
- Installing and configuring batteries.
- Selecting and using Personal Protective Equipment (PPE).

2.

SAFETY PRECAUTIONS

2.1 Safety levels

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

WARNING
WARNING indicates a hazardous situation which, if not avoided, can result in death or serious injury or moderate injury.

CAUTION
CAUTION indicates a hazardous situation which, if not avoided, can result in minor or moderate injury.

NOTICE
NOTICE indicates a situation that can result in potential damage, if not avoided.

2.2 Safety symbols

Symbol	Description
	**DANGER: Electric Shock Hazard** This device is connected directly to the public grid. Failure to follow the warnings in this manual could result in severe electric shock.
	**DANGER: Hot Surface** The components inside the inverter battery will release a lot of heat during operation. Do not touch metal plate housing during operating.
	**WARNING: No Open Flames** Maintain a safe distance from all flammable and explosive materials.

	**NOTICE: Keep Away from Children** Install the product out of reach of children.
	**NOTICE: Consult Manual Before Servicing** Check the user manual before servicing. If an error has occurred, refer to the troubleshooting chapter to remedy the error.
	**NOTICE: Dispose of Device Properly** This device shall NOT be disposed of in residential waste.
	**NOTICE: Dispose of Battery Properly** 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.
	**Recyclable**

2.3 Safety instructions

For safety, read all safety instructions before beginning any work, and ensure all procedures comply with local and national regulations.

DANGER

- Risk of fatal personnel injuries due to electrical shock and high voltage.
- Do not touch the operating component of the inverter; it might result in burning or death.
- To prevent the risk of electric shock during installation and maintenance, make sure that all AC and DC terminals are disconnected prior to work.
- Do not touch the surface of the inverter while the housing is wet, otherwise, it might cause electrical shock.
- Do not stay close to the inverter while there are severe weather conditions including storms, lightning, etc.
- Before opening the housing, the inverter must be disconnected from the grid and PV array; wait for at least five minutes to let the energy storage capacitors completely discharge after disconnecting from power source.
- Please keep the power off prior to any operations.

WARNING

- Any unauthorized actions including modification of product functionality of any form may cause lethal hazard to the operator, third parties, the units or their property. SAJ shall not be held responsible for the loss and these warranty claims.
- Do not touch non-insulated parts or cables.
- For personal and property safety, do not short-circuit the positive (+) and negative (-) electrode terminals.
- Disconnect the PV array from the inverter by using an external disconnecting device. If no external disconnection device is available, wait until no more DC power is applied to the inverter.
- Disconnect the AC circuit breaker, or keep it disconnect if it is tripped, and secure it against reconnection.

CAUTION

- Risk of damage due to improper modifications.

NOTICE

- Make sure the AC input voltage and current are compatible with the rated voltage and current of the inverter; otherwise, components might be damaged, or the device cannot work properly.
- Moving or reinstalling the inverter to another location might void the warranty without prior written permission from SAJ.

3.

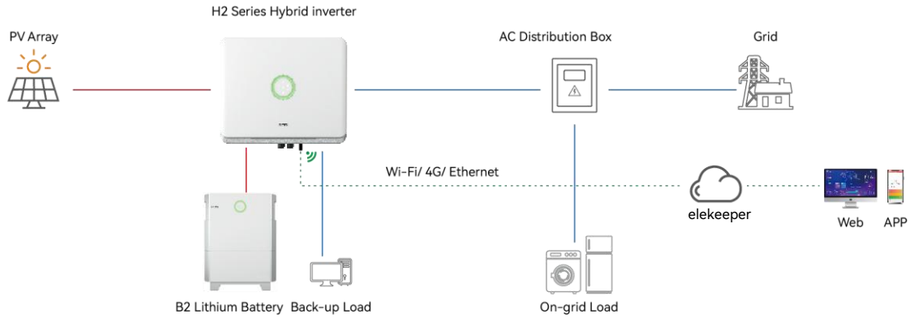
PRODUCT INFORMATION

3.1 General introduction

H2 series is a hybrid photovoltaic inverter, and it is applicable to both on-grid and off-grid solar systems. The inverter serves as a core component in energy storage systems.

The H2 inverter provides the following features:

- The inverter integrates maximum power point tracking (MPPT), battery charging/discharging circuit and full-bridge inverting circuit.
- The inverter converts solar power to grid-compliant AC power for home loads and sells extra power to the grid. The solar power can also be stored into the battery for later use during grid failures or peak electricity price periods.
- When power outage occurs, the inverter seamlessly switches critical loads to battery power without supply interruption.



3.2 Product model

3.2.1 Product models

The H2 series single-phase inverter is available for the following models:

- H2-5K-S3
- H2-6K-S3
- H2-7K-S3
- H2-8K-S3
- H2-10K-S3-A
- H2-10K-S3

3.2.2 Model description

H2 – xK – S3 - A

H2: Inverter series.

xK: Rated power of the inverter. For example, 10K indicates the rated power of the inverter is 10 kW.

S3: Single-phase inverter with 3 MPPT.

A: This model is only applicable to Australia.

3.3 Dimension

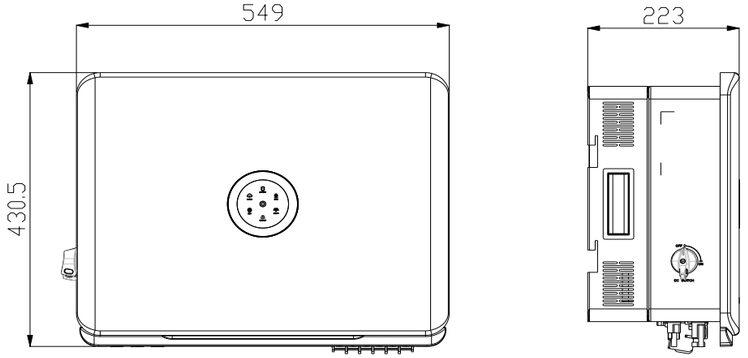


Figure 3.1 Dimensions of inverter

3.4 Terminals description

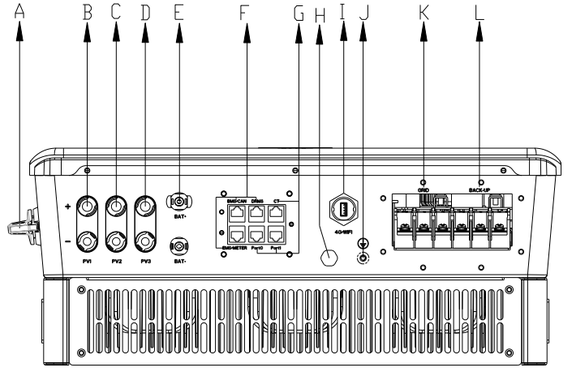


Figure 3.2 Electrical interface of H2 Inverter

Callout	Silkscreen	Description
A	DC Switch	DC switch which controls the PV connection.
B	DC Input	DC input terminals PV1+ and PV1-.
C	DC Input	DC input terminals PV2+ and PV2-.
D	DC Input	DC input terminals PV3+ and PV3-.
E	Battery Input	Cable gland for battery positive and negative cables.
F	BMS/CAN	RJ45 ports for communication connection to the battery control unit.
	EMS/METER	RJ45 port for communication connection to EMS or meter.
	DRMS	RJ45 port for connecting to external control box
G	CT	RJ45 port for communication connection to current transformer.
	Port0 & Port 1	RJ45 ports for parallel connection between inverters.
H	Release Valve	Release Valve which protects equipment structures and components by regulating internal pressure.
I	4G/ Wi-Fi	Port for connecting communication module.
J	Ground Connection	Terminals for connecting to the ground.
K	Grid	Terminals for connecting to the grid.
L	Backup	Terminals for connecting back-up loads.

Table 3.1 Terminals description

3.5 Datasheet

Model	H2-5K-S3	H2-6K-S3	H2-7K-S3	H2-8K-S3	H2-10K-S3-A	H2-10K-S3
DC Input						
Max. PV Array Power [Wp]@STC	7500	9000	10500	12000	15000	15000
Max. DC Voltage [V]	600					
MPPT Voltage Range [V]	90~550					
Rated DC Voltage [V]	360					
Start Voltage/Min Input Voltage [V]	100					
Max. DC Input Current [A]	16/16/16					
Max. DC Short Circuit Current [A]	19.2/19.2/19.2					
No. of MPPT	3					
Battery Parameters						
Battery Type	LiFePO4					
Battery Voltage Range [V]	85~450					
Max. Charging/Discharging Current [A]	50/50					
AC Output [On-grid]						
Rated AC Power [W]	4999	6000	7000	8000	9999	10000
Rated Apparent Power [VA]	4999	6000	7000	8000	9999	10000
Max. Apparent Power [VA]	4999	6600	7700	8800	9999	10000
Rated AC Output Current [A]	21.7	26.1	30.5	34.8	43.5	43.5
Max. AC Output Current to Utility Grid [A]	21.7	28.7	33.5	38.3	43.5	43.5
Current Inrush[A]	150					
Max. AC Fault Current[A]	120					
Max. AC Over Current Protection[A]	63	75	88	100	100	100
Rated AC Voltage/Range [V]	L+N+PE, 220, 230, 240/180~280					
Rated Output Frequency/Range [Hz]	50,60/45~55,55~65					
Power Factor [cos ϕ]	0.8 leading ~ 0.8 lagging					
Total Harmonic Distortion [THDi]	<3%					
AC Input [On-grid]						
Rated AC Voltage/Range [V]	L+N+PE, 220, 230, 240/180~280					
Rated Input Frequency [Hz]	50,60					
Max. Input Current [A]@230Vac	43.5	52.2	60.9	69.6	69.6	69.6
AC Output [Back-up]						
Max. Output Power [VA]	4999	6000	7000	8000	9999	10000

Model	H2-5K-S3	H2-6K-S3	H2-7K-S3	H2-8K-S3	H2-10K-S3-A	H2-10K-S3
Max. Output Current [A]	21.7	26.1	30.5	34.8	43.5	43.5
Peak Output Apparent Power [VA]	6000,60s	7200,60s	8400,60s	9600,60s	12000,60s	12000,60s
Rated AC Voltage/Range [V]	L+N+PE, 220, 230, 240/180~280					
Rated Output Frequency/Range [Hz]	50,60/45 ~ 55,55 ~ 65					
Output THDv (@ Linear Load)	<3%					
Efficiency						
Max. Efficiency	97.6%					
Euro Efficiency	97.0%					
Protection						
Battery Input Reverse Polarity Protection	Integrated					
Over Load Protection	Integrated					
AC Short Circuit Current Protection	Integrated					
DC Surge Protection	Integrated					
AC Surge Protection	Integrated					
Anti-islanding Protection	AFD					
AFCI Protection	Optional					
RSD Protection	Optional					
Interface						
PV Connection	MC4/H4(Optional)					
AC Connection	Plug-in connector					
Battery Connection	Quick connector					
Display	LED+APP					
Communication	Wi-Fi/Ethernet/4G(Optional)					
General Parameters						
Topology	Non-isolated					
Operating Temperature Range	-40℃ to +60℃ (45℃ and above with derating)					
Cooling Method	Natural Convection					
Ambient Humidity	0-100% Non-condensing					
Altitude	4000m (>3000m Power Derating)					
Noise [dBA]	<35					
Ingress Protection	IP65					
Dimensions [H*W*D] [mm]	430.5* 549 *223					
Weight [kg]	26					
Warranty [Year]	Refer to the warranty policy					
Standard	CEI 0-21, VDE4105-AR-N, VDE0126-1-1, EN50438, G98, G99, EN50549, AS4777.2, IEC62109-1&-2, IEC62040-1 , EN61000-6-1/2/3/4					

4.

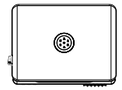
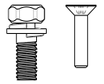
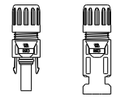
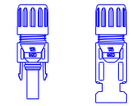
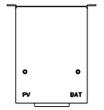
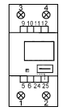
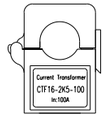
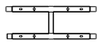
INSTALLATION

4.1 Unpacking

4.1.1 Check the outer package

Although SAJ's products have thoroughly tested and checked before delivery, there is possibility that the products may suffer damages during transportation. Please check the package for missing or damaged components. If such evidence is present, do not open the package and contact your dealer as soon as possible.

4.1.2 Check the package content

					
H2 Inverter *1	M5*12 screw *1 M4*10 screw *12	M6*50 screw suite *4	PV terminals 2*3	Battery terminal 2*1	AC terminal lug*6
					
Communication terminal cover *1	PV and BAT cover *1	AC cover *1	eSolar AIO3 module *1	Smart meter *1	Current transformer *1
					
Mounting bracket *1	120Ω resistor *1	Meter communication cable *1 (1000 mm)	Documents		

Note: The documents include the user manual and packaging list.

4.2 Choose installation site

4.2.1 Installation environment requirements

Read the following sections to carefully select a suitable installation site.

- This device is cooled by natural convention and suggested an indoor installation or an installation under a sheltered place to prevent the product from exposure to direct sunlight, rain and snow erosion
- Do not expose the device to direct solar irradiation as this could cause power derating due to overheating.
- The installation environment must be free of inflammable or explosive materials.
- The device must be installed in a place away from heat sources.
- Do not install the device at a place where the temperature changes extremely.
- Keep the device away from children.
- Do not install the device in the bedroom, toilet, or bathroom.
- When installing the device at the garage, keep it away from the driveway.
- Keep the device from water sources such as taps, sewer pipes and sprinklers to prevent water seepage.
- It is recommended that the device be installed in an area where its status can be easily checked and maintained in case of failure or emergency.

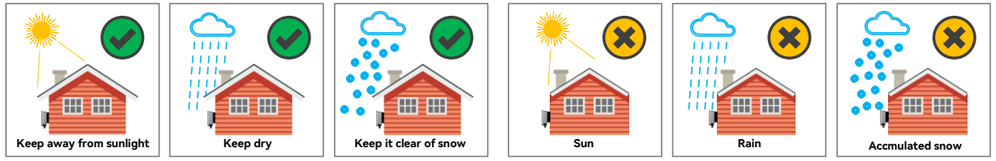


Figure 4.1 Installation location

Note: safety regulations may differ across countries and regions. Always comply with all applicable local safety requirements.

4.2.2 Installation position requirements

- The device employs natural convection cooling, and it can be installed indoors or outdoors.
- Indoor requirement:
  The battery connected to the device cannot be installed in the habitable rooms.
- Outdoor requirement:
  Elevate the unit appropriately from the ground to avoid immersion in water. The exact height should be determined based on the conditions of the installation site.
- Install the device vertically. The maximum allowable backward-tilted angle is 15 degrees.
- Do not install it forward-tilted, horizontally or upside down.

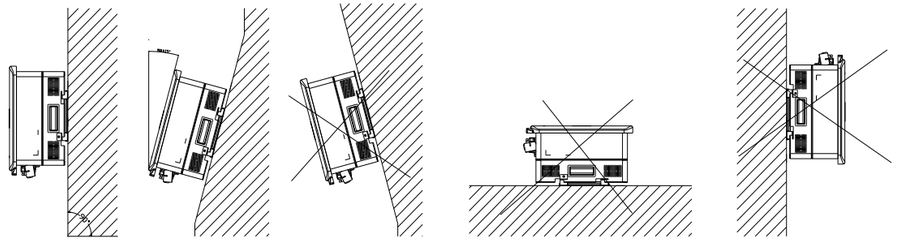


Figure 4.2 Installation position

- Select a solid and flat wall capable of supporting the total weight of the inverter and all associated accessories to ensure secure mounting.
- Maintain sufficient clearance around the inverter to allow for adequate airflow. This is especially important when installing multiple inverters in the same location.

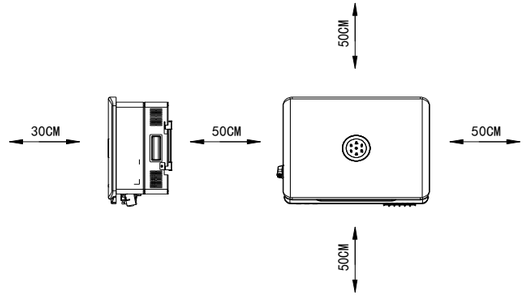
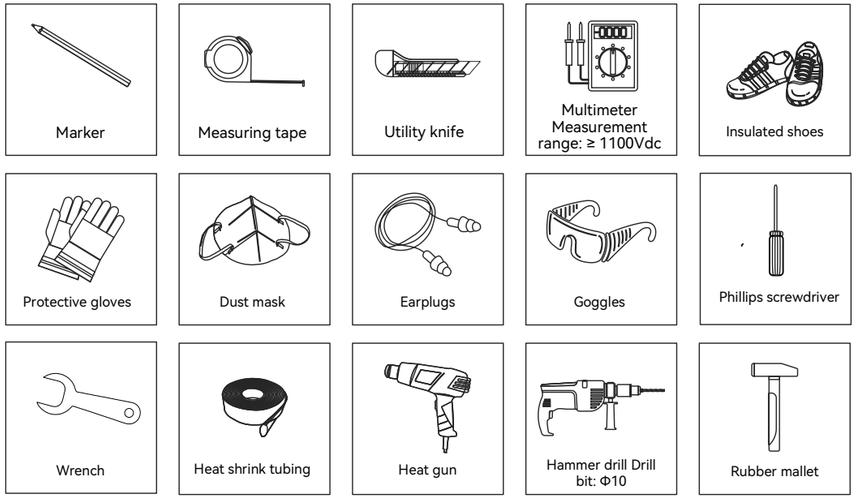


Figure 4.3 Installation clearance

4.3 Installation procedure

4.3.1 Prepare installation tools

The installation tools below are for your reference. Tools include but are not limited to the following recommended ones. You may use other auxiliary tools based on site requirements.



4.3.2 Installation procedures

1. Mark the positions of drilling holes on the mounting bracket, as shown in the figure.

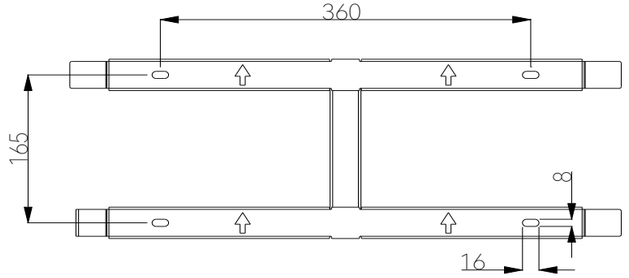


Figure 4.4 Mark positions

2. Drill holes and insert the expansion tubes

Drill 4 holes in the wall (in conformity with the position marked in Figure 4.4) and then place expansion tubes in the holes using a rubber mallet.

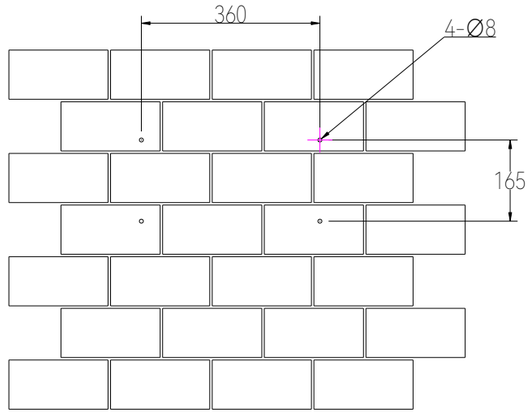


Figure 4.5 Drill holes for installation

3. Secure the mounting bracket

The panels should be secured onto the mounting position by screws as shown below.

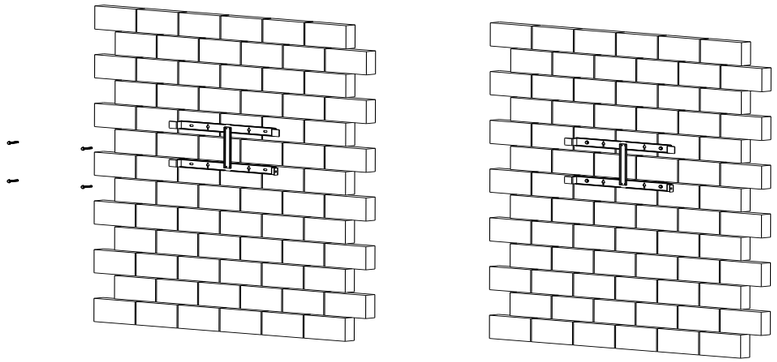


Figure 4.6 Secure the panel

4. Mount the Inverter

Carefully mount the inverter into the mounting bracket as shown in Figure 4.7.

Make sure that the rear part of the equipment is closely mounted into the bracket.

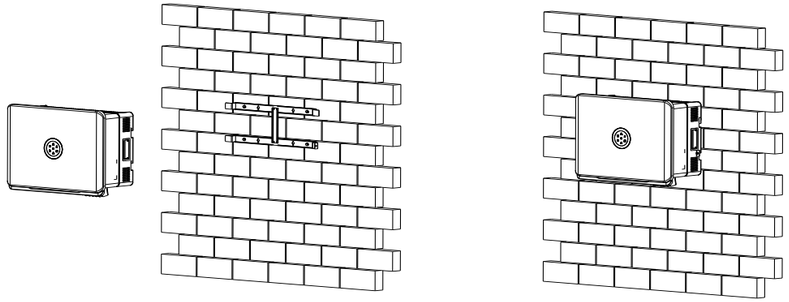
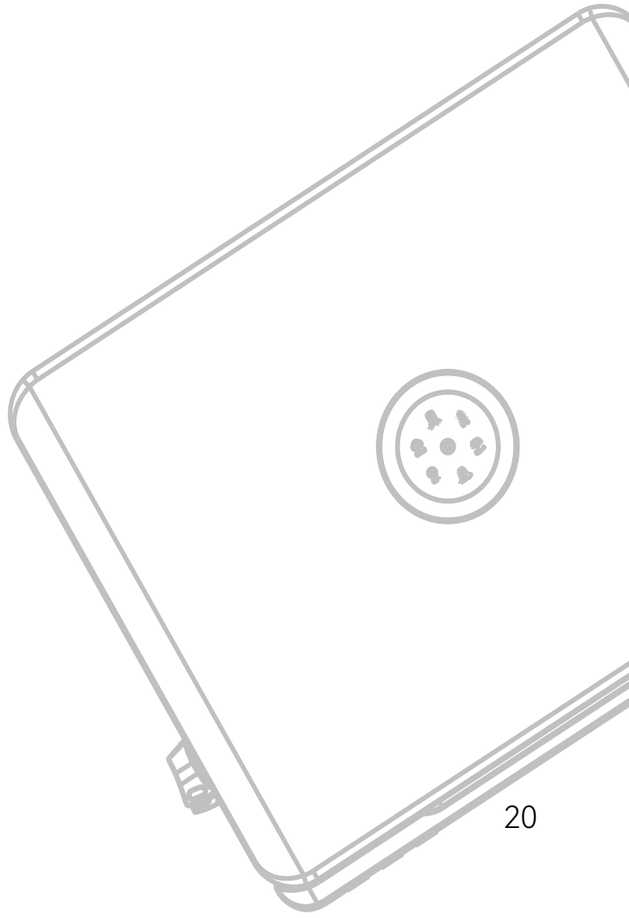


Figure 4.7 Mount the inverter



5.

ELECTRICAL CONNECTION

5.1 Safety instructions

Electrical connections must only be operated on by professional technicians. Technicians must be aware that the inverter is a bi-power supply equipment. Before connection, technicians must wear necessary protective equipment, including insulating gloves, insulating shoes, and a safety helmet.

DANGER

- Ensure that the equipment is powered off before performing any wiring operations.
- The direct connection between the inverter and high voltage power systems must be operated by qualified technicians in accordance with local and national power grid standards and regulations.

NOTICE

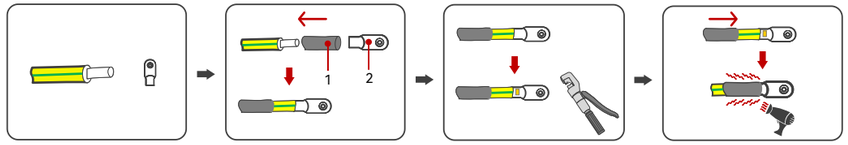
- Follow the connection procedure in this manual. Any improper operation during cable connection may cause device damage or personal injury.
- Electrical connection should be in conformity with proper stipulations, such as cross-sectional areas of conductors, fuses, and ground protection.

5.2 Connect the grounding cable

NOTICE

- Connect this additional grounding cable before other electrical connection.
- The additional cable and OT/DT terminal should be prepared by users.

Step 1. Assemble the cable and OT/DT terminal.



1. Heat shrink tubing 2. OT/DT terminal

Figure 5.1 Preparing additional grounding cable

Step 2. Remove the screw of grounding terminal and secure the additional grounding cable by inserting a screw into the screw hole in the OT/DT terminal.

Note: A 6 mm^2 conductor cross-sectional area of cable is recommended for additional grounding cable.

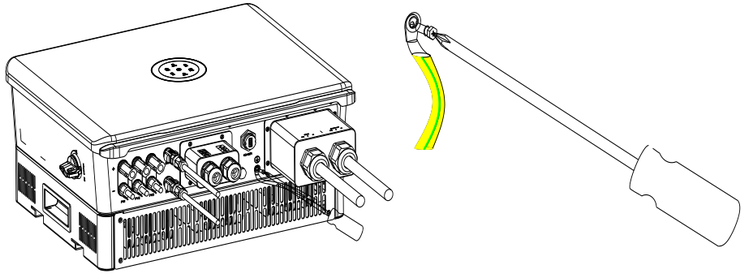


Figure 5.2 Connecting the additional grounding cable

5.3 AC-side electrical connection

5.3.1 Grid and back-up connection

NOTICE

- Prepare suitable cables according to the recommended specification in the following table. You may choose other sizes based on real needs.
- If the inverter is installed far away from the grid connection point, select a larger cable size to ensure that the voltage drops from the grid connection point to the inverter is within 2% of the grid voltage.

Cable cross-sectional area（mm^2）	
Range	**Recommend**
13 to 21	16

Table 5.1 Recommended specifications of AC cables

Procedure

Step 1. Open the waterproof cover, insert the AC cable through the AC waterproof cover hole.

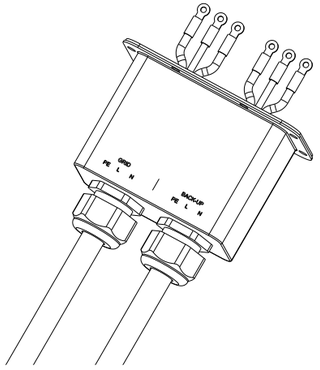


Figure 5.3 Thread the cables

Step 2. Secure the cables to the L, N and PE terminals of the inverter.

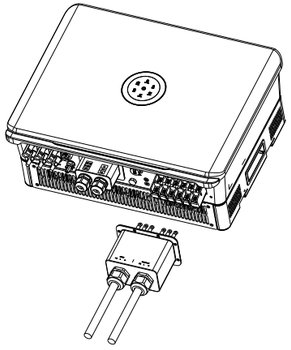


Figure 5.4 Connect the Cables

Step 3. Secure the AC waterproof cover.

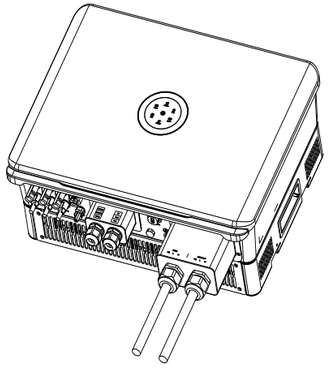
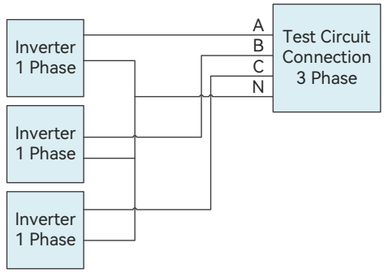


Figure 5.4 Screw the Connector

Note: (Only for Australia) During off-grid operation, the PE line at the backup end will remain connected to the PE line at the grid end inside the inverter.

5.3.2 Multiple inverter connection



The inverter should not be installed in multiple phase combinations. If any such multiple inverter combination is not tested，it should not be used or external devices should be used in accordance with the requirements of AS/NZS 4777.1

5.3.3 Earth fault alarm

This inverter complies with IEC 62109-2 clause 13.9 for earth fault alarm monitoring. If an Earth Fault Alarm occurs, the ring light will be lit up in red and error code <31> will be displayed on LED panel 1 until the error being solved and inverter functioning properly.

Note: The inverter cannot be used with functionally earthed PV Arrays.

5.3.4 External AC circuit breaker and residual current device

NOTICE

- Install an AC circuit breaker to ensure the safe disconnection of the inverter from the grid.
- The integrated leakage current detector of inverter can detect the real time external current leakage. When a leakage current detected exceeds the limitation, the inverter will disconnect from grid via the breaker.
- The inverter does not require an external residual current device, as it has integrated with a RCMU. If local regulations require the application of external residual current device, either type A or type B RCD is compatible with the inverter. The action current of external residual current device should be 300mA.

Inverter type	Recommended breaker specification
H2-(5-10K)-S3, H2-10K-S3-A	100 A
Note: Do not connect multiple inverters to one AC circuit breaker.	

Table 5.2 Recommended circuit breaker specification

5.4 Connect the battery to inverter

⚠ WARNING
• Power off the battery system before connecting the power cable to avoid high voltage danger. • The electrical connection of high voltage battery systems must be operated by qualified technicians in accordance with local and national power grid standards and regulations. • If lithium battery is connected, it is not required to install a breaker between battery and inverter.

Procedure

Step 1. Prepare battery cables according to the following table.

Cable Cross-sectional area（mm^2）	
Range	**Recommend**
8 to 10	8

Table 5.3 Recommended specification

Step 2. Open the waterproof cover, then insert the battery cable through the waterproof hole.

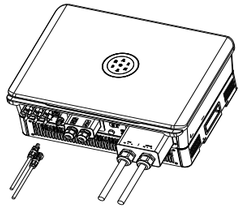


Figure 5.5 Open the waterproof cover

Step 3. Assemble the battery cables.

a. Strip off the insulation skin of DC cable, the core is exposed to 15 mm.
b. Open the spring clamp using a 3 mm wide bladed screwdriver.
c. Fully insert the stripped wire into the terminal hole.
d. Ensure the wire end is visible in the spring.
e. Close the spring clamp. Make sure that spring clamp is snapped in.
f. Push the wiring module into the sleeve.
g. Tighten the cable gland.

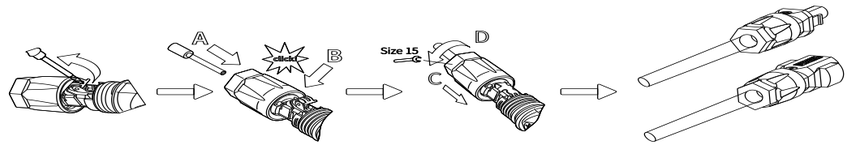


Figure 5.6 Assemble the battery cables

Step 4. Secure the battery cable on the battery terminal by positive and negative in order.

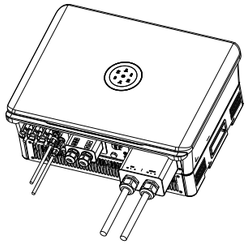


Figure 5.7 Secure battery power cables

Step 5. Refer to **Section 5.6** ***Communication Connection*** to install the BMS communication cable to connect the inverter with battery.

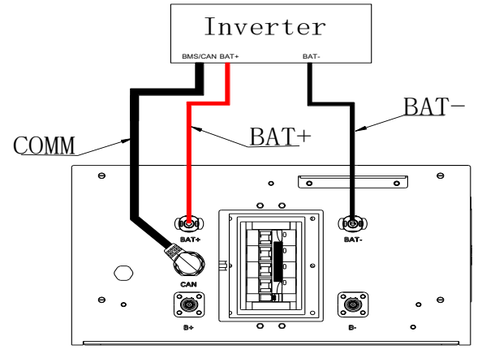


Figure 5.8 Connect battery to the inverter

5.5 PV-side connection

⚠WARNING

- Make sure the PV array is well insulated to ground before connecting it to the inverter.
- Do not touch non-insulated parts or cables. The PV panel string will produce high lethal voltage when exposed to sunlight. Touching live DC cables results in death or lethal injures.
- Do not disconnect DC connectors under load.
- Wear suitable personal protective equipment for all work.

Prepare suitable cables according to the recommended specification in the following table. You may choose other sizes based on real needs.

Conductor cross-sectional area of cables (mm^2)		Conductor material
Scope	Recommended value	Outdoor multi-core copper wire cable, complying with 600Vdc
4.0 to 6.0	4.0	

Table 5.4 Recommended specification

5.5.1 Assemble the PV connector

! NOTICE

- Please place the connector separately after unpacking to avoid confusion for connection of cables.
- Please connect the positive connector to the positive side of the solar panels and connect the negative connector to the negative side of the solar side. Make sure to connect them in the correct position.

DC connector is made up of positive and negative connectors.

Figure 5.9 Positive connector and negative connector

Procedure

1. Loosen the lock screws on positive and negative connector.
2. Strip the insulation of the positive and negative cables with 8-10mm length.

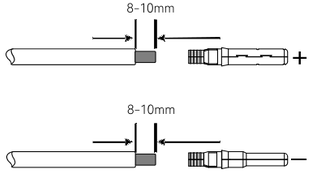


Figure 5.10 Striping off the insulation of cables

3. Assembly the positive and negative cables with corresponding crimping pliers.

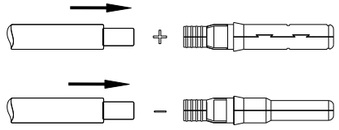


Figure 5.11 Inserting cables to lock screws

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

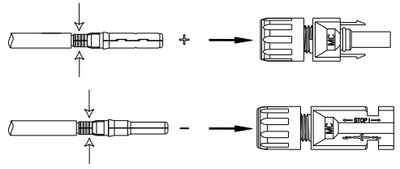


Figure 5.12 Inserting crimped cables into connectors

5. Fasten the lock screws on positive and negative connectors.

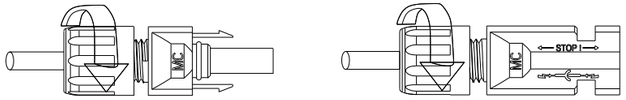


Figure 5.13 Securing the connectors

6. Make sure the DC switch is at OFF position

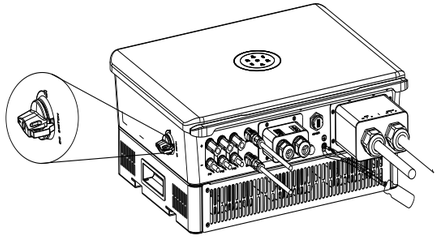


Figure 5.14 Turn off the DC switch

7. Connect the positive and negative connectors into positive and negative DC input terminals of the inverter, a “click” sound should be heard when the contact cable assembly is seated correctly.

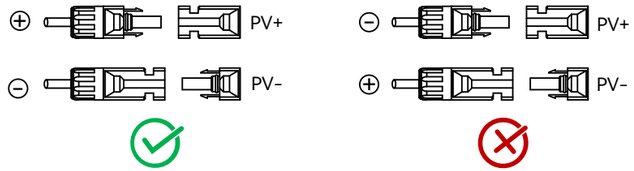


Figure 5.15 Plug in PV connectors

5.5.2 Install the waterproof cover for PV and battery cables

Insert the cable through cover holes and tighten the screws to secure the cover.

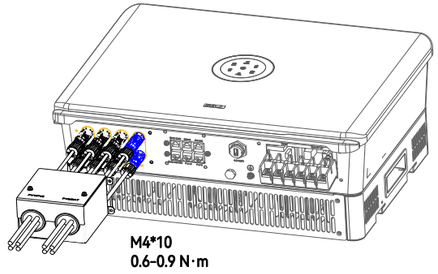


Figure 5.16 Install the PV and BAT cover

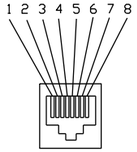
5.6 Communication connection

5.6.1 Connect the RJ45 ports

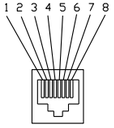
Procedure

Step 1. Prepare communication cables according to the RJ45 port description.

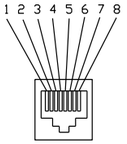
BMS/CAN	
1	NC
2	NC
3	NC
4	CANH
5	CANL
6	NC
7	NC
8	NC



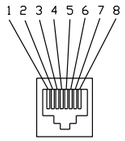
DRMS	
1	DRM1/5
2	DRM2/6
3	DRM3/7
4	DRM4/8
5	RefGen
6	Com/DRM0
7	V+
8	V-



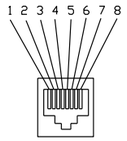
CT	
1	R/CT.1+
2	R/CT.1-
3	NC
4	NC
5	NC
6	NC
7	NC
8	NC



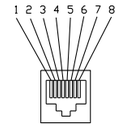
EMS/METER	
1	RS485-A+
2	RS485-B-
3	NC
4	NC
5	NC
6	NC
7	RS485-A+
8	RS485-B-



PORT0	
1	NC
2	NC
3	NC
4	NC
5	NC
6	NC
7	NC
8	NC



PORT1	
1	NC
2	NC
3	NC
4	NC
5	NC
6	NC
7	NC
8	NC



Step 2. Insert the communication cable through the waterproof cable gland and connect to the corresponding port.

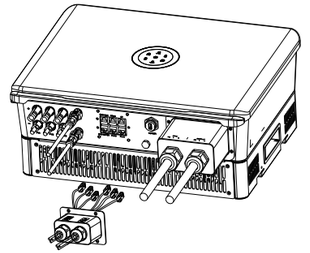


Figure 5.17 Communication cable connection

5.6.2 Install the communication module

Procedure

Plug in the communication module to 4G/WIFI port and secure the module by rotating the nut.

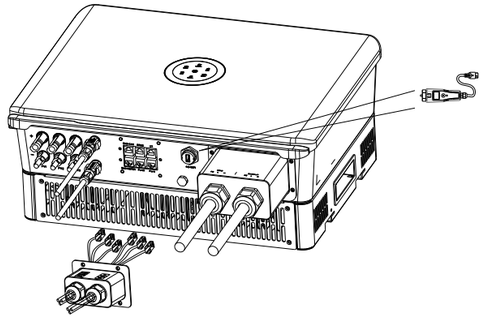


Figure 5.18 Install communication module into 4G/WiFI port

Note: 4G/Wi-Fi port could be externally connected with eSolar 4G module, eSolar Wi-Fi module or eSolar AIO3 module. For details, refer to communication module Quick Installation Guide at https://www.saj-electric.com/.

5.7 System connection

The system connection in Australia and New Zealand is shown as below; the neutral cable of grid and backup side must be connected together for safety.

Note: Do not connect the PE terminal of backup side.

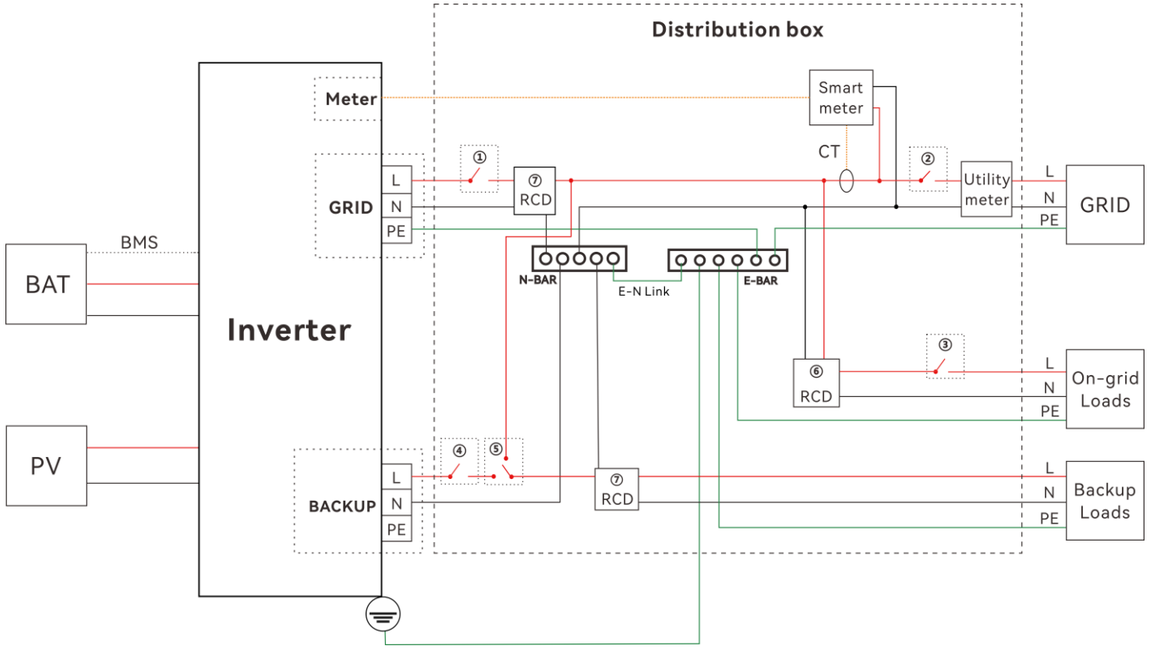


Figure 5.19 System connection for Australia and New Zealand

The system connection for grid system without special requirements is shown as below.

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

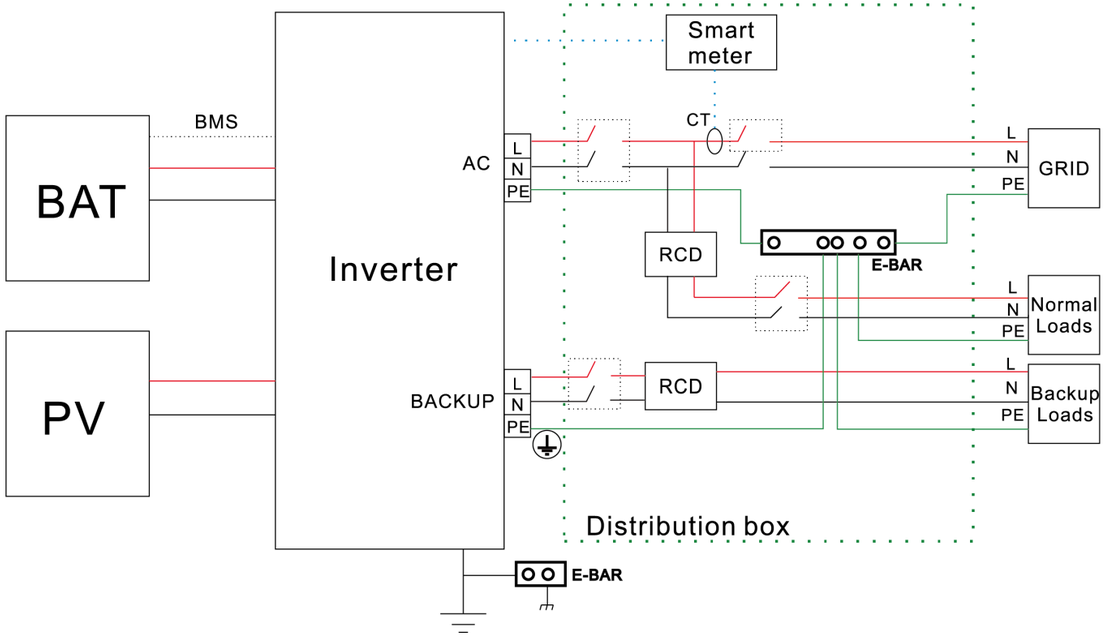
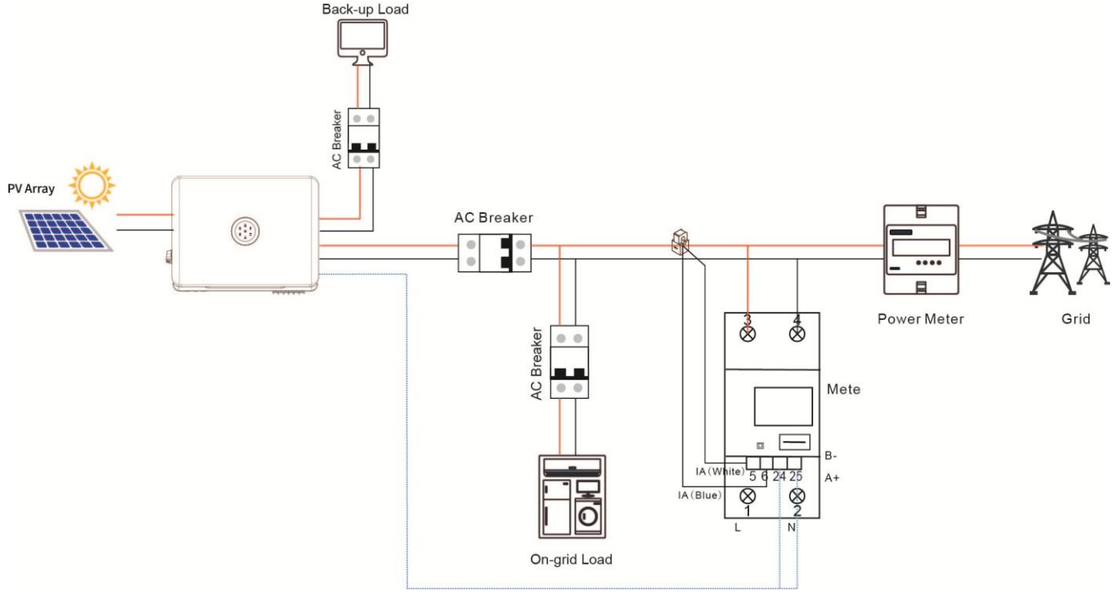


Figure 5.19 System connection without special requirements



Note: If the RS485 cable length between inverter and meter is longer than 20m, please install the 120Ω resistor in port 24&25 of the meter.

5.8 AFCI (optional)

The inverter is equipped with arc-fault circuit interrupter (AFCI). With AFCI protection, when there is an arc signal on the DC side due to aging of the cable or loose contact, inverter can quickly detect and cut off power to prevent fire, making the PV system run more safely.

6.

COMMISSIONING

6.1 Commissioning procedures

Step 1. Connect the AC circuit breaker.

Step 2. Connect the DC circuit breaker between inverter and battery (if applicable).

Step 3. Turn on the battery (if applicable).

Step 4. Turn on the DC switch on the inverter.

Step 5. Install the communication module into the inverter.

Step 6. Setup the initial setting for inverter on the elekeeper App.

Step 7. Observe the LED indicators on the inverter to ensure the inverter is running properly.

6.2 Start up and shut down

6.2.1 Start up

Step 1. Turn on the circuit breaker.

Step 2. Press and hold the main switch for 2 to 3s, until the display is on.

6.2.2 Shut down

- Automatically shut down

  When the solar light intensity is not strong enough during sunrise and sunset or the output voltage of photovoltaic system is less than the minimum input power of inverter, inverter will shut down automatically.

- Shut down manually

  Step 1. Disconnect AC side circuit breaker.

  Step 2. If multiple inverters are connected, disconnect the minor circuit breaker prior to disconnection of main circuit breaker.

  Step 3. Disconnect the DC switch after inverter has reported grid connection lost alarm.

6.3 LED interface description

System commissioning

After the wiring is completed, please refer to the inverter manual for system commission and operation.

Note: Turn on the circuit breaker and main switch when using battery.

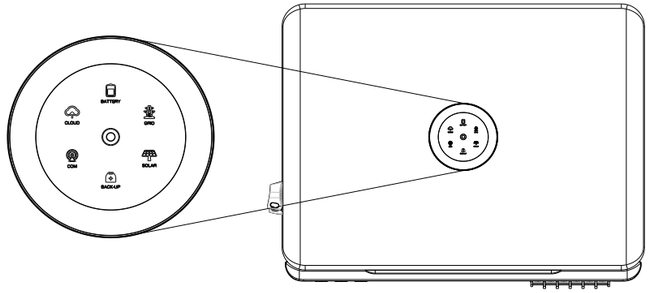


Figure 6.3 LED interface

LED indicator	Status	Description
	LED off	Inverter power off
	Breathing	Inverter is at initial state or standby state
	Solid	Inverter running properly
	Breathing	Inverter is upgrading
	Solid	Inverter is faulty
System	Solid	Importing electricity from grid
	On 1s, off 1s	Exporting electricity to grid
	On 1s, off 3s	Not importing and exporting at all
	Off	Off-grid

LED indicator	Status	Description
Battery	Solid	Battery is discharging
	On 1s, off 1s	Battery is charging
	On 1s, off 3s	SOC low
	Off	Battery is disconnected or inactive
Grid	Solid	Connected to grid
	On 1s, off 1s	Counting down to grid connection
	On 1s, off 3s	Grid is faulty
	Off	No grid
PV	Solid	PV array is running properly
	On 1s, off 1s	PV array is faulty
	Off	PV array is not operating
Backup	Solid	AC side load is running properly
	On 1s, off 1s	AC side load overload
	Off	AC side is turned off
Communication	Solid	Both BMS and meter communication are good
	On 1s, off 1s	Meter communication is good, BMS communication is lost
	On 1s, off 3s	Meter communication is lost, BMS communication is good
	Off	Both meter and BMS communication are lost
Cloud	Solid	Connected
	On 1s, off 1s	Connecting
	Off	Disconnected
Note: One breathing cycle is 6 seconds.		

Table 6.1 LED Interface description

6.4 Commission on the elekeeper App

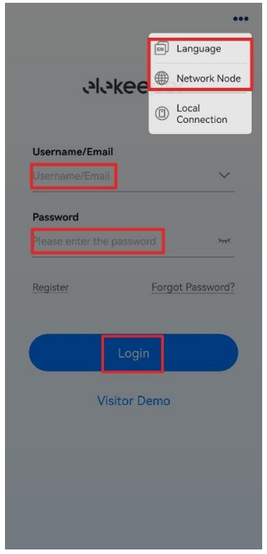
6.4.1 Log in to the App

Procedure

- If you have an account, log in to the App directly:

a. Tap the three-dot icon ••• on the top right corner. Choose the **Language** and **Network Node** based on your needs.

b. Log in to the App by using the **Username / Email** and **Password**.



- To apply for a new account, perform as follows:

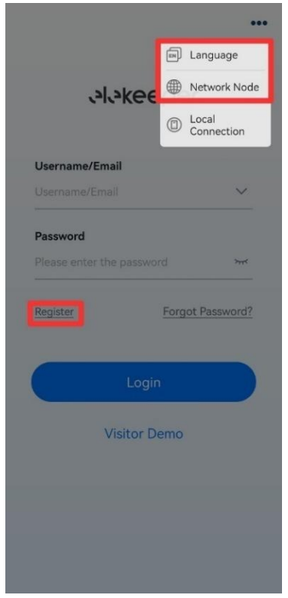
a. Tap the three-dot icon ••• on the top right corner. Choose the language and network node based on your needs.

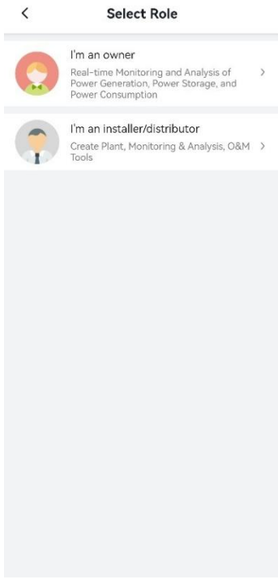
b. Tap **Register**. Choose whether you are an owner, installer or distributor.

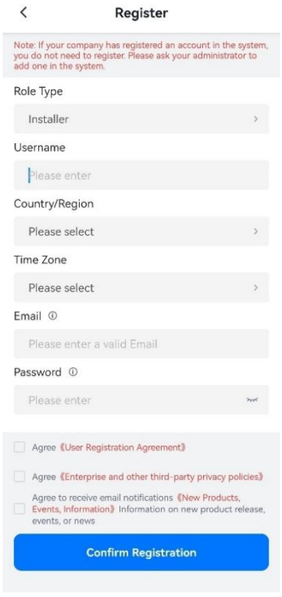
c. Follow the instructions on the screen to complete the registration.

d. Log in to the App by using the new account and the password.

e. Example (for installer):







6.4.2 Perform the Initialization Settings

Prerequisite

The Bluetooth function on your mobile phone is enabled.

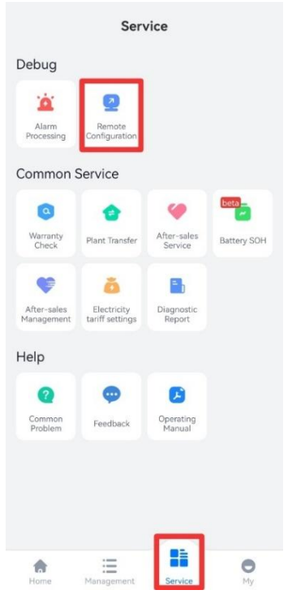
Procedure

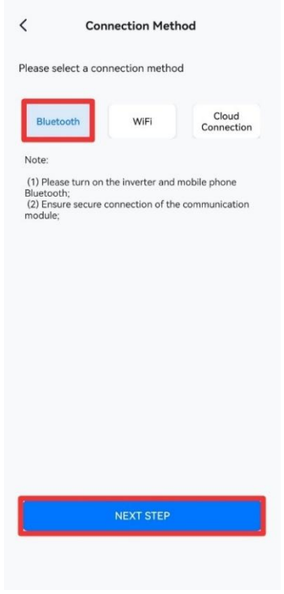
1. Select your device

a. On the **Service** interface, select **Remote Configuration**.

b. Tap **Bluetooth** and then **NEXT STEP**.

c. Tap your inverter according to the inverter serial number (SN).

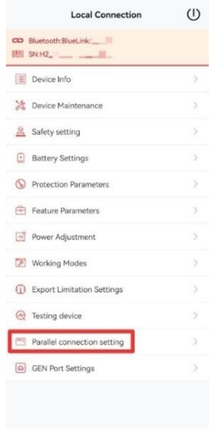


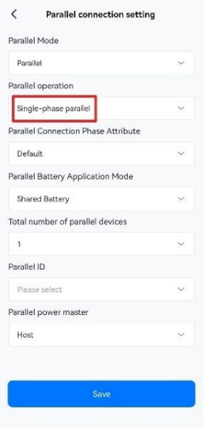


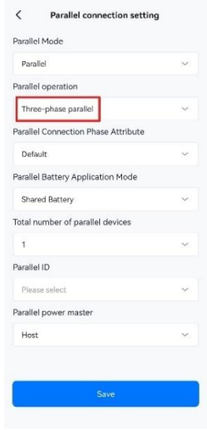
2. Complete the initialization settings by following the instructions on the screen.

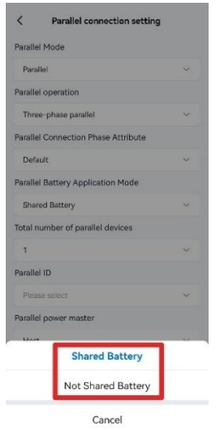
a. Parallel connection settings

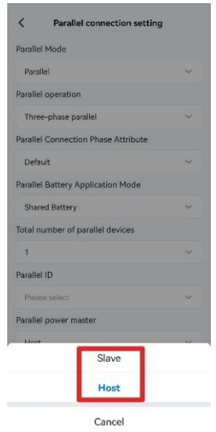
Choose the corresponding **Parallel operation, Parallel Connection Phase Attribute, Parallel Battery Application Mode, Total number of parallel devices,** and **Parallel power master.**



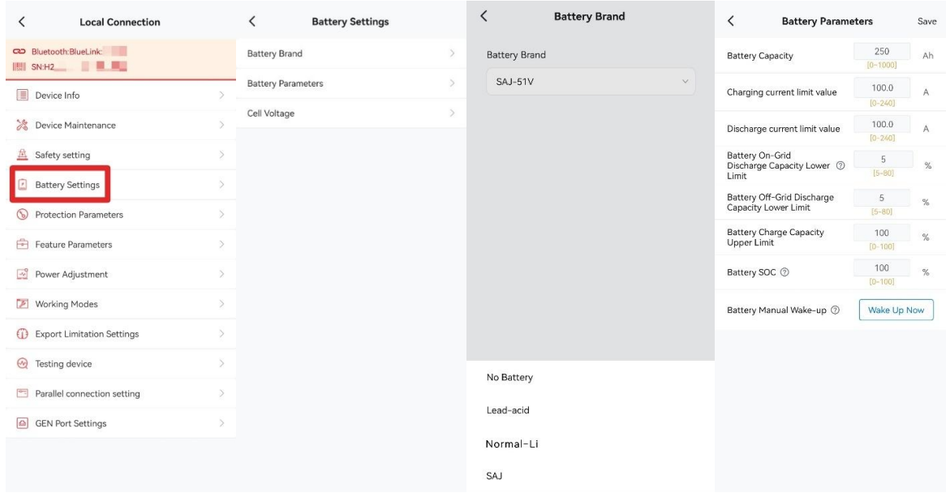






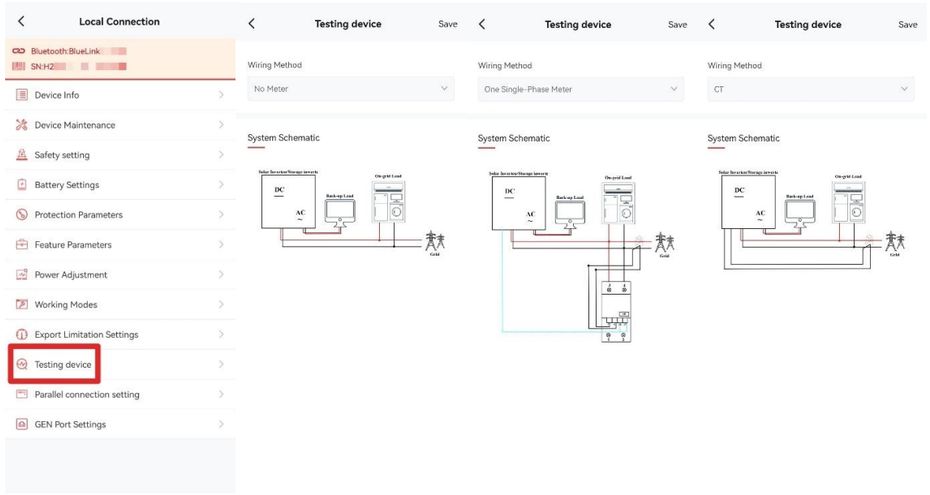


b. Battery brand and settings



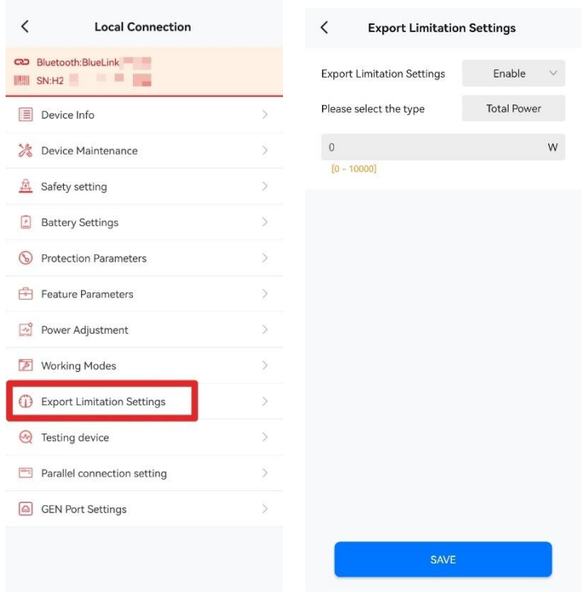
c. Wiring method and system schematic

Select the wiring method based on real scenarios. The corresponding system schematic will be shown below.



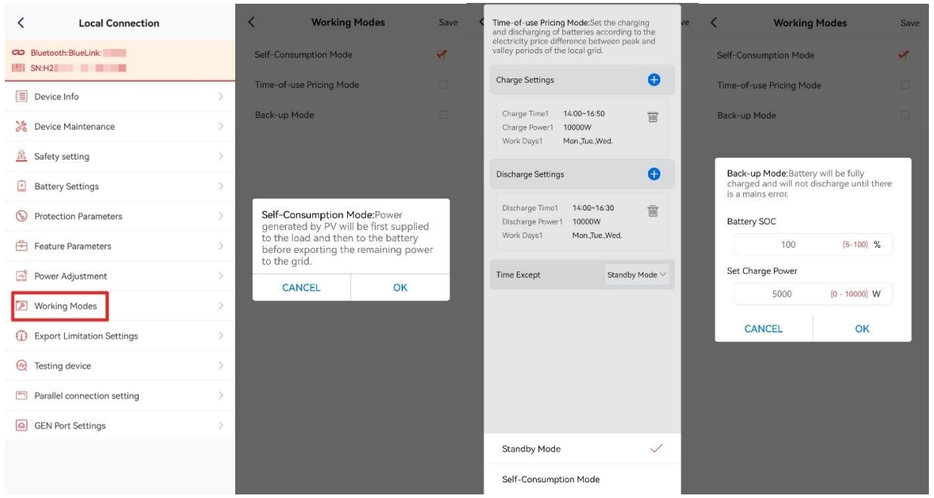
d. Export limitation settings

Set the export power to limit the power output of photovoltaic systems exporting to the public grid.



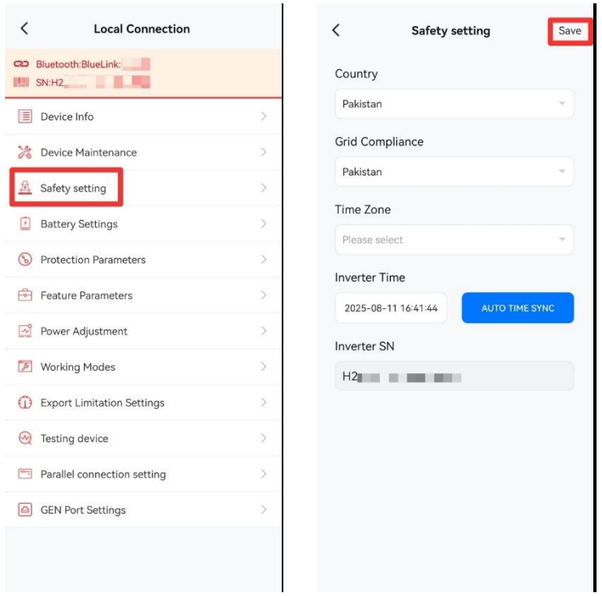
e. Working modes

Choose one of the working modes: **Self-Consumption Mode, Time-of-use Mode,** or **Back-up Mode.**



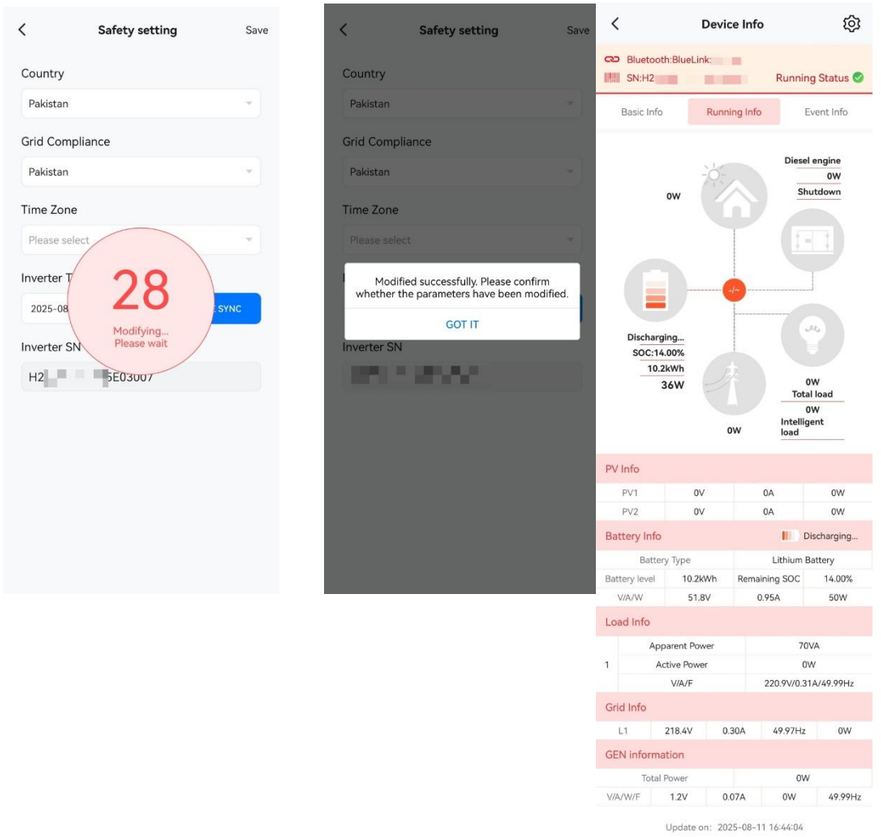
f. Country and grid compliance

Tap **Safety Setting**. Select the **Country** and **Grid Compliance**.



g. Initialization completion

Tap **Save** and wait 30 seconds for the parameters to be modified.



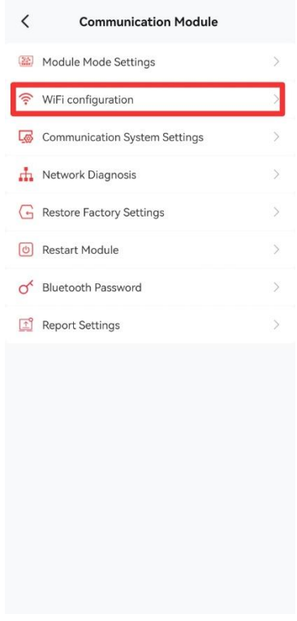
6.4.3 Configure the communication module

About this task

If you want to remotely monitor the energy storage system and view the device statistics (for example, when you are away from home), connect the communication module installed on the inverter to the network.

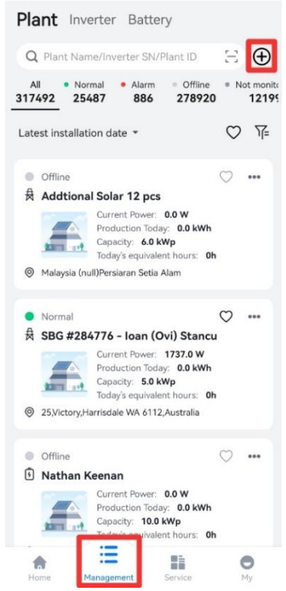
Procedure

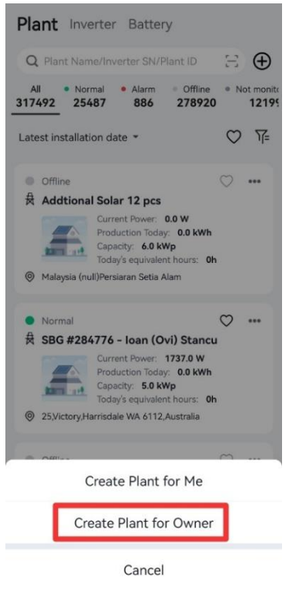
1. On the **Device List** page, select your communication module according to its SN.
2. Tap the setting icon on the top right corner.
3. Select **WiFi Configuration** and set the communication module to connect to your home network.



6.4.4 Create a plant

1. On the **Management** page, tap the ⊕ icon on the top right corner. Select **Create Plant for Owner**.

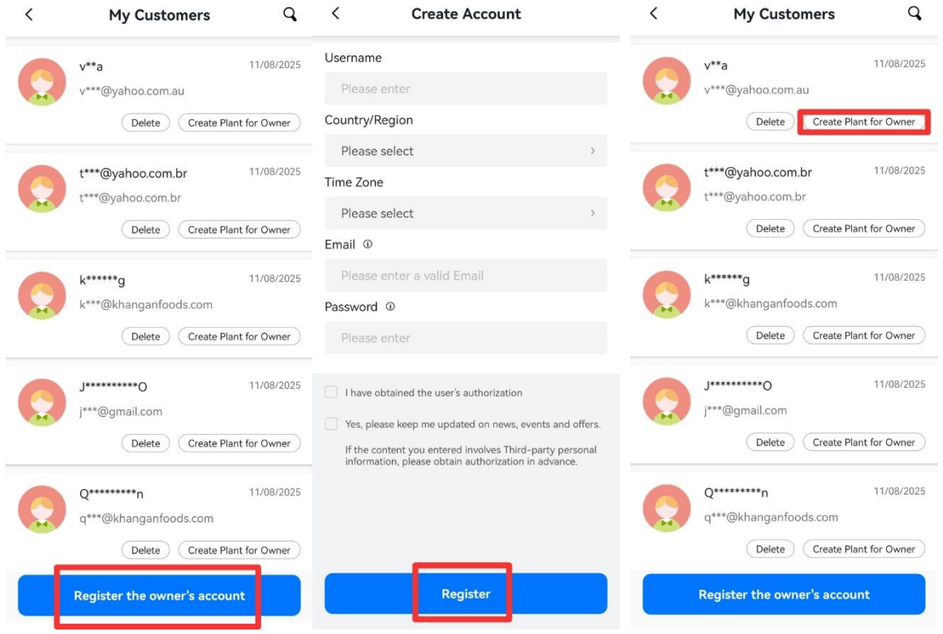




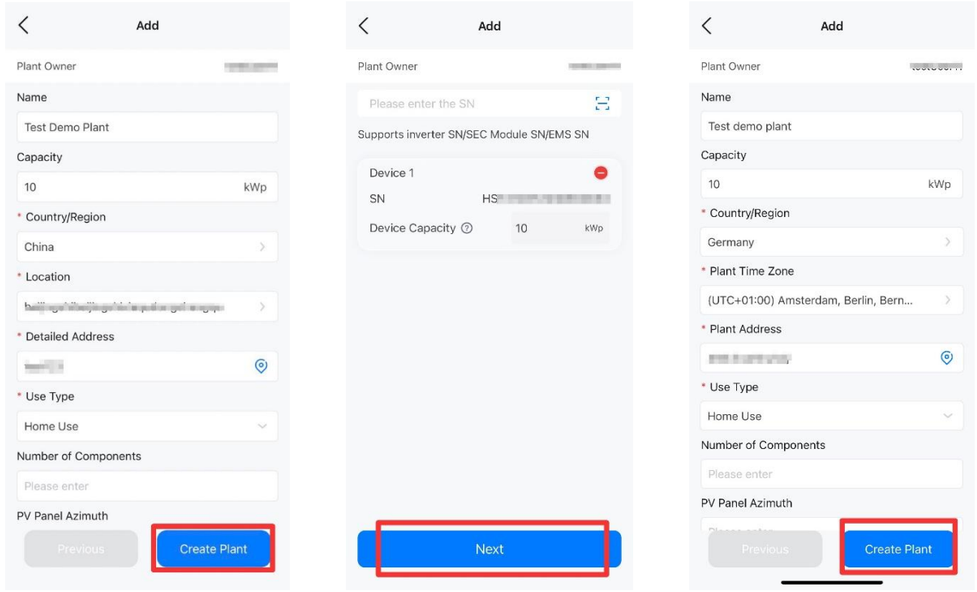
2. Apply for an account for the end user.

   a. Follow the instructions below to apply for an account for the end user.

   b. Create a plant for the end user.



3. Configure the plant details.



6.4.5 View the fixed power factor mode and fixed reactive power mode

Once **Country and Grid Compliance** are selected during initialization, the parameters relating to the reactive power control settings are set automatically. In typical household scenarios, these default values generally require no adjustment.

If adjustment is necessary, before any modifications, contact SAJ for consultation and ensure that you have the necessary electrical knowledge and are fully aware of the impact of such modifications.

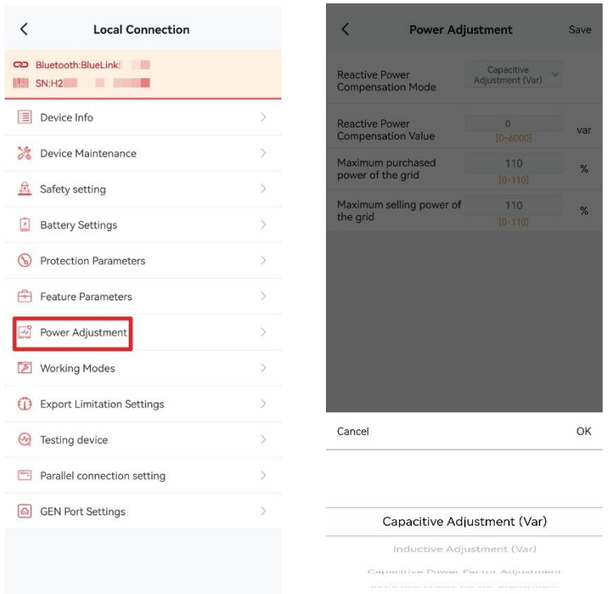
To view the settings, perform as follows:

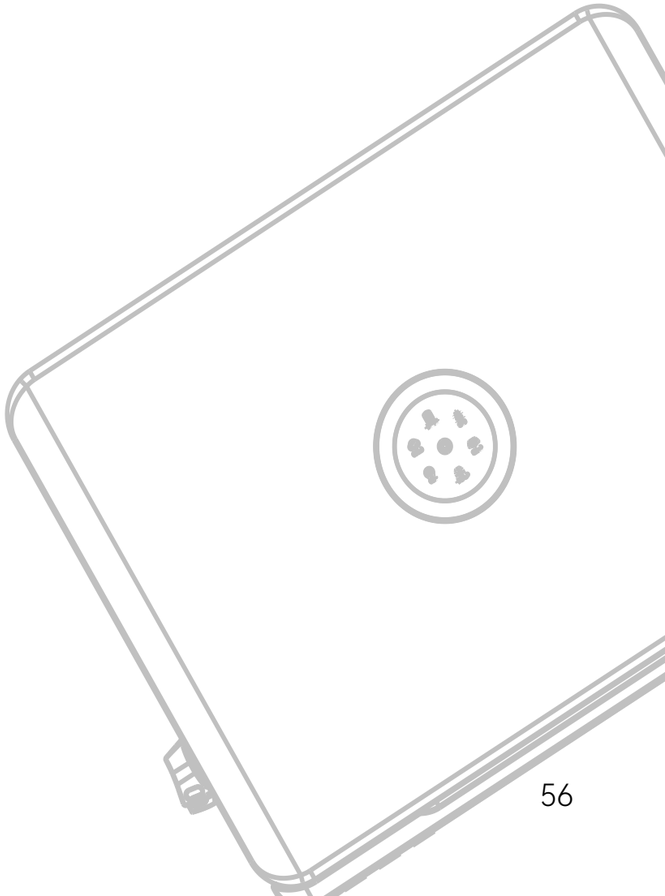
- Fixed power factor mode

  Select **Capacitive Power Factor Adjustment** or **Inductive Power Factor Adjustment**. The power factor range is from 0.8 leading to 0.8 lagging.

- Fixed reactive power mode

  Select **Capacitive Adjustment (Var)** or **Inductive Adjustment (Var)**. The power ranges from -60% Pn to 60% Pn.





7.

TRANSPORTATION AND STORAGE

7.1 Transportation

⚠ WARNING

- 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 stack more than four cartons of inverters in a single pile.
- Ensure that transport vehicles are not overloaded and that weight is distributed evenly.
- Maintain stable driving conditions throughout transportation — avoid sudden acceleration, deceleration, or severe shaking.
- The weight of the inverter adheres to local regulations regarding manual handling requirements. Assign sufficient personnel for moving operations to avoid injury.
- 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.
- Use professional lifting and handling equipment operated by trained personnel with relevant skills and experience.

! NOTICE

- The transportation service provider must be certified for handling and transporting inverters.
- All transportation equipment must be adequately prepared and inspected by authorized professional organizations to verify compliance and suitability.
- Inverters must be placed in their original packaging or specially designed transport packaging.
- Packaging materials should possess sufficient strength and cushioning properties to prevent damage from impact or compression during transportation.
- Securely fasten inverters within the packaging to prevent movement during transportation. For larger or heavier units, use additional restraints or fixing devices as necessary.
- Observe all safety symbols displayed on the packaging prior to and during transportation.

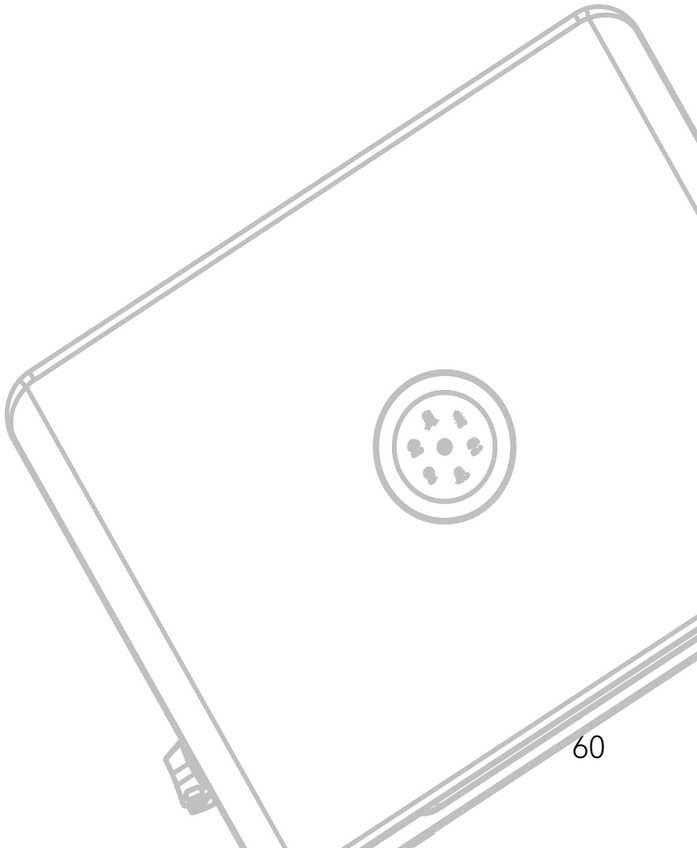
7.2 Storage

⚠ WARNING

- Do not unpack the inverter 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 more than four cartons of inverters in a single pile. Improper stacking may result in personal injury or device damage.
- Do not place heavy objects on top of the inverters. Crushing may deform the housing or damage internal components.
- Do not tilt or invert the packaging. Maintain the upright orientation as indicated on the carton to prevent internal displacement or component stress.

⚠ NOTICE

- Store inverters in a clean, dry, and well-ventilated area to avoid moisture buildup and overheating.
- Retain the original packaging with desiccants when storing inverters. Repackage properly if necessary.
- Regularly inspect stored inverters every three months. Check for environmental damage, pest intrusion, or packaging degradation.
- Promptly replace any packaging materials that have been damaged by insects or rodents.
- If an inverter has been stored for two years or longer, it must undergo inspection and functional testing by qualified personnel before being commissioned.



8.

SYSTEM MAINTENANCE

8.1 Routine maintenance

To ensure that the system can operate properly for a long term, routine maintenance is recommended.

To purchase the routine maintenance service, contact the installer, distributor, or SAJ after-sales.

Check item	Check method	Maintenance interval
System cleanliness	Check periodically whether the heat sinks are blocked or dirty.	Once every 6 to 12 months
Cleanness of air intake and exhaust vents	Check periodically whether there is dust or foreign objects at the air intake and exhaust vents. Detailed operations are as follows: Power off the system and remove dust and foreign objects. If necessary, remove the baffle plates from the air intake and exhaust vents for cleaning	Once every 6 to 12 months (or once every 3 to 6 months based on the actual dust conditions in the environment)
Fan	Check whether the fan generates abnormal noise during operation. Detailed operations are as follows: Remove foreign objects from the fan. If the abnormal noise persists, replace the fan.	Once every 6 to 12 months
System running status	1. Check whether the inverter is damaged or deformed. 2. Check whether the inverter generates abnormal sound during operation. 3. Check whether all inverter parameters are correctly set during operation.	Once every 6 months
Electrical connection	1. Check whether cables are disconnected or loose. 2. Check whether cables are damaged, especially whether the cable sheath that contacts a metal surface is damaged.	6 months after the first commission and once every 6 to 12 months after that
Grounding reliability	Check whether the PE cable is securely connected.	6 months after the first commission and once every 6 to 12 months after that
Sealing	Check whether all terminals and ports are properly sealed.	Once a year

9.

TROUBLESHOOTING

9.1 Troubleshooting

For any errors reported below, contact the after-sales for service support. The operations and maintenance must be performed by authorized technicians. The following table lists the error codes and corresponding messages:

Code	Fault Information
1	Master Relay Error
2	Master EEPROM Error
3	Master Temperature High Error
4	Master Temperature Low Error
5	Lost Communication M<->S
6	GFCI Device Error
7	DCI Device Error
8	Current Sensor Error
9	Master Phase1 Voltage High
10	Master Phase1 Voltage Low
11	Master Phase2 Voltage High
12	Master Phase2 Voltage Low
13	Master Phase3 Voltage High
14	Master Phase3 Voltage Low
15	Grid Voltage 10Min High
16	OffGrid Output Voltage Low
17	OffGrid Output Short Circuit
18	Master Grid Frequency High
19	Master Grid Frequency Low
21	Phase1 DCV High
22	Phase2 DCV High
23	Phase3 DCV High
24	Master No Grid Error
27	GFCI Error
28	Phase1 DCI Error
29	Phase2 DCI Error
30	Phase3 DCI Error
31	ISO Error
32	Bus Voltage Balance Error
33	Master Bus Voltage High

34	Master Bus Voltage Low
35	Master Grid Phase Lost
36	Master PV Voltage High
37	Master Islanding Error
38	Master HW Bus Voltage High
39	Master HW PV Current High
40	Master Self-Test Failed
41	Master HW Inv Current High
42	Master AC SPD Error
43	Master DC SPD Error
44	Master Grid NE Voltage Error
45	Master Fan1 Error
46	Master Fan2 Error
47	Master Fan3 Error
48	Master Fan4 Error
49	Lost Communication between Master and Meter
50	Lost Communication between M<->S
51	Lost Communication between inverter and Grid Meter
52	HMI EEPROM Error
53	HMI RTC Error
54	BMS Device Error
55	BMS Lost.Conn
56	CT Device Err
57	AFCI Lost Err
58	Lost Com. H<->S Err
59	Lost Communication between inverter and PV Meter
61	Slave Phase1 Voltage High
62	Slave Phase1 Voltage Low
63	Slave Phase2 Voltage High
64	Slave Phase2 Voltage Low
65	Slave Phase3 Voltage High
66	Slave Phase3 Voltage Low
67	Slave Frequency High
68	Slave Frequency Low
73	Slave No Grid Error
74	Slave PV Input Mode Error
75	Slave HW PV Curr High

76	Slave PV Voltage High
77	Slave HW Bus Volt High
81	Lost Communication D<->C
83	Master Arc Device Error
84	Master PV Mode Error
85	Authority expires
86	DRM0 Error
87	Master Arc Error
88	Master SW PV Current High
89	Battery Voltage High
90	Battery Current High
91	Battery Charge Voltage High
92	Battery OverLoad
93	Battery SoftConnet TimeOut
94	Output OverLoad
95	Battery Open Circuit Error
96	Battery Discharge Voltage Low

10.

APPENDIX

10.1. Recycling and disposal

This device should not be disposed of as a residential waste. An inverter that has reached the end of its operation life is not required to be returned to your dealer; instead, it must be disposed of by an approved collection and recycling facility in your area.

10.2. Warranty

Check the product warranty conditions and terms on the SAJ website:
https://au.saj-electric.com/en-au/services-support-warranty

10.3. Contacting support

Online technical support

Go to https://www.saj-electric.com/services-support-technical to check FAQs or send your message or product enquiry.

Call for assistance

For SAJ support telephone numbers, see https://www.saj-electric.com/locations for your region support details.

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E-mail: info@saj-electric.com.au

Website: https://au.saj-electric.com/

10.4. Trademark

SAJ is the trademark of Sanjing.