ATS Box Quick Guide

This quick guide provides the instructions for installing, operating, and maintaining SAJ product ATS1-T63-A.

NOTICE

- Before installation, operation, and maintenance, read the product documentation carefully.
- ONLY qualified and trained electricians who have read and fully understood all safety regulations contained in this manual can install, maintain, and repair the equipment. The operation personnel should understand the system, its working principles, and relevant national and regional standards.
- During operations, wear protective equipment and use dedicated tools.

Safety Symbol Explanation

Symbol	Description
	**Danger:** Electrical shock hazard This device is directly connected to public grid and thus all work to the battery shall only be carried out by qualified personnel.
	**WARNING:** No open flames Do not place or install near flammable or explosive materials.
	**Danger:** Hot surface The components inside the battery will release a lot of heat during operation. Do not touch metal plate housing during operating.
	**Attention:** Install the product out of reach of children.
	**Attention:** Check the user manual before service. If an error has occurred, refer to the troubleshooting chapter to remedy the error.
	**Attention:** This device shall NOT be disposed of in residential waste.
	**CAUTION:** Risk of electric shock from energy stored in capacitor. Do not remove cover until 5 minutes after disconnecting all sources of supply.
	**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**

Safety Instructions

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

DANGER

- Possible fatal personnel injuries due to electrical shock and high voltage.
- Do not touch the surface of the equipment while the housing is wet, otherwise, it might cause electrical shock.
- Do not touch the operating components that are covered by the insulation cover; it might result in burning or death.
- Do not stay close to the equipment while there are severe weather conditions including storm, lighting, etc.
- Keep the power off prior to any installation or maintenance 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 is not responsible for the loss and these warranty claims.
- Do not touch non-insulated parts or cables.
- Disconnect the AC circuit breaker, or keep it disconnect if it is tripped, and secure it against reconnection.
- Be sure that the product is well grounded to protect properties and persons.

Product Introduction

The SAJ ATS box integrates with multiple power sources and automatic load switch in the photovoltaic (PV) energy storage system (ESS) to ensure continuous power supply to loads with higher priority.

For ATS1-T63-A equipped with the eManager module, the ATS can integrate with the grid, SAJ hybrid inverters, and on-grid inverters of SAJ or other manufacturers. When the grid is available, the ATS supplies electricity to both the on-grid and off-grid loads from the integrated power sources; if the grid fails, the ATS continues to supply electricity to the off-grid loads from the backup output of hybrid inverters while disconnecting the on-grid loads.

ATS1-T63-A also provides the grid phase-loss protection function that allows the ATS to switch the power supply from the grid to the inverter backup output automatically if one of the grid phases is detected as disconnected. After the grid phase is detected as recovered, ATS switches the power supply back to the grid automatically.

The following figure shows the system diagram of ATS1-T63-A equipped with the eManager module:

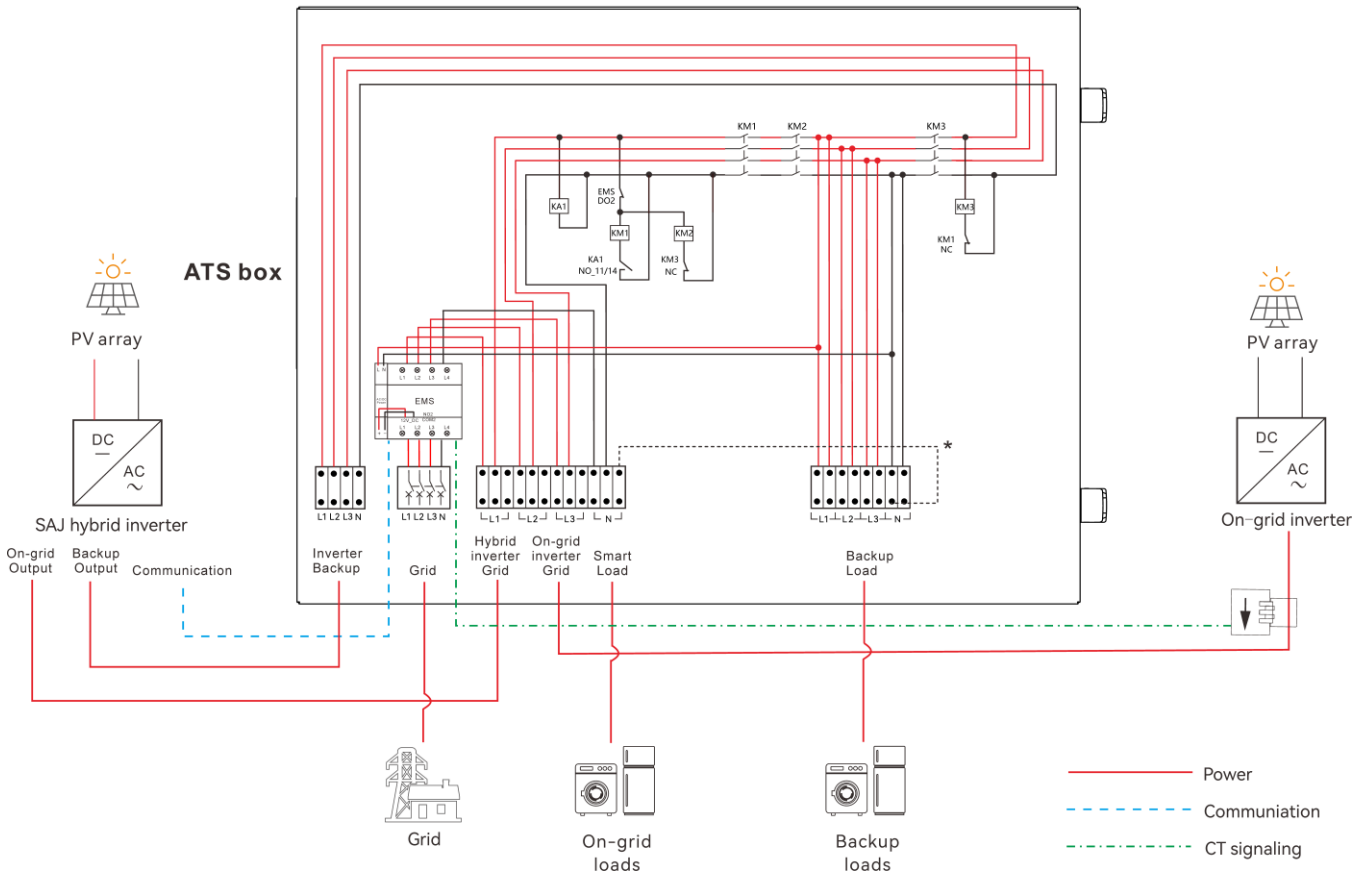


Figure 1.1. System connections – ATS with eManager

*** Note**: If the local power grid requires that the N cables of the grid and the Backup Load keep connected, the user needs to prepare the cable and connect the two N terminals as the dotted line in the diagram shows.

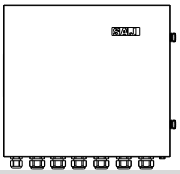
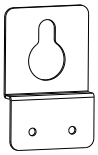
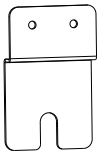
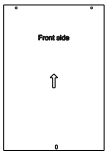
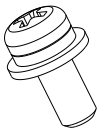
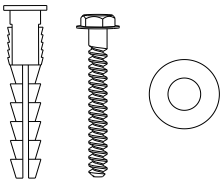
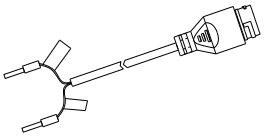
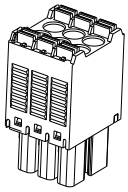
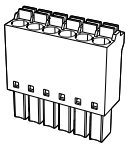
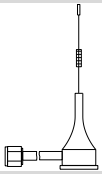
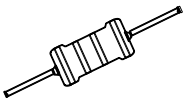
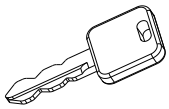
Installation Procedures

☐ 1. Check the outer packing

1. Check the outer packing package for any damage, such as holes and cracks.
2. Check the equipment model.

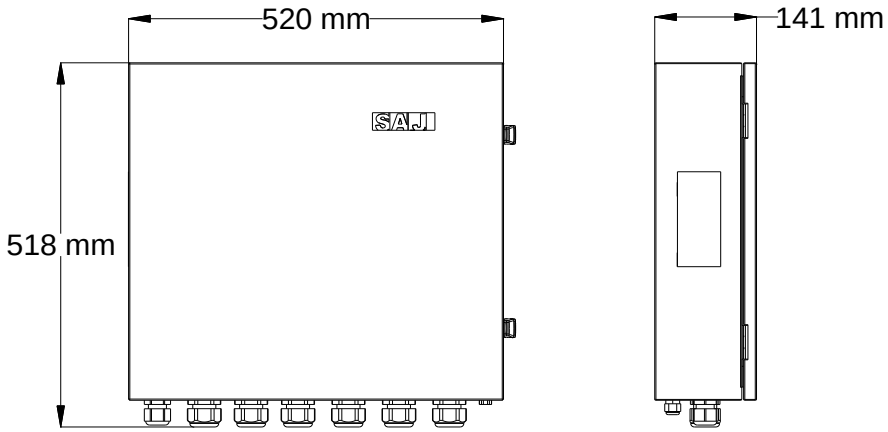
If any serious damage is found or the model is not what you requested, do not unpack the product, and contact your dealer as soon as possible.

☐ 2. Check the product package

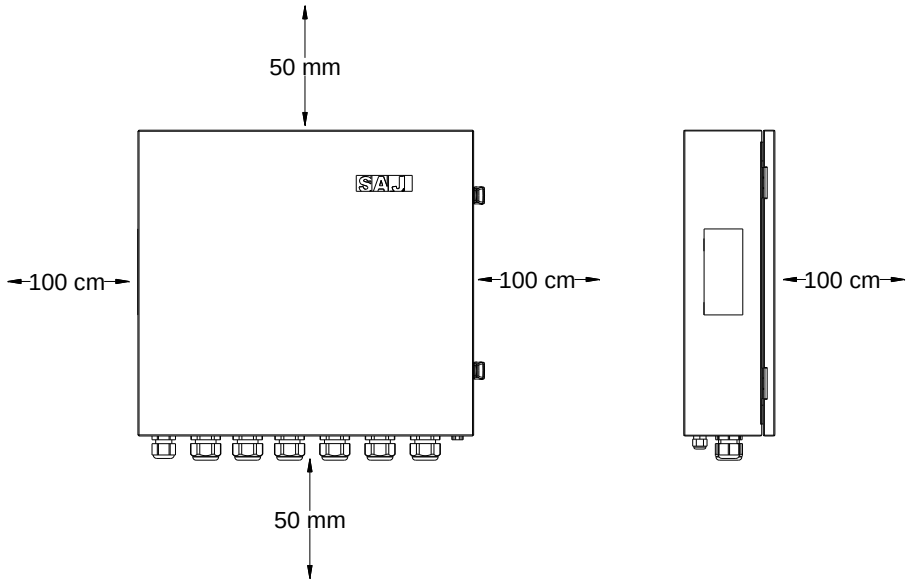
				
ATS1-T63-A	Upper mounting bracket x2	Bottom mounting bracket	Locating cardboard	M4*10 screw x6
				
Expansion tube x3 Expansion bolt x3 Gasket x3	Rail-mounted AC grounding cable terminal x3	Communication cable x2	6-pin pluggable CT terminal	6-pin pluggable RCR terminal
				
Antenna	15 kΩ resistor	Key x2	Documents	

☐ 3. Plan the installation site

The device employs natural convection cooling, and it can be installed either indoor or outdoor.

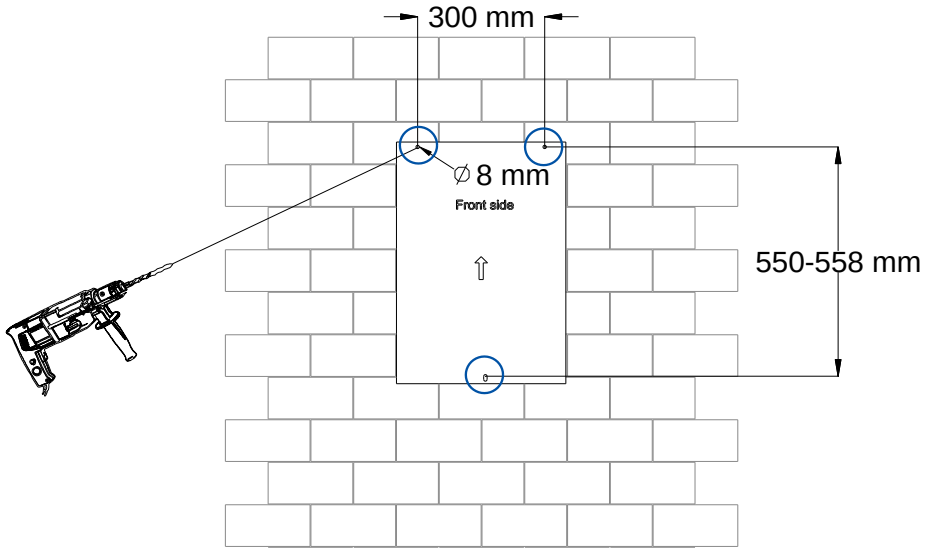


Reserve enough space around the ATS box to ensure ventilation and convenience of operation.

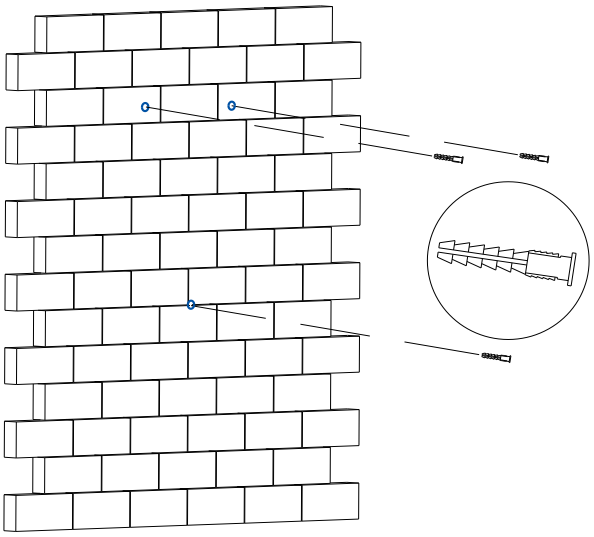


☐ 4. Mount the ATS box

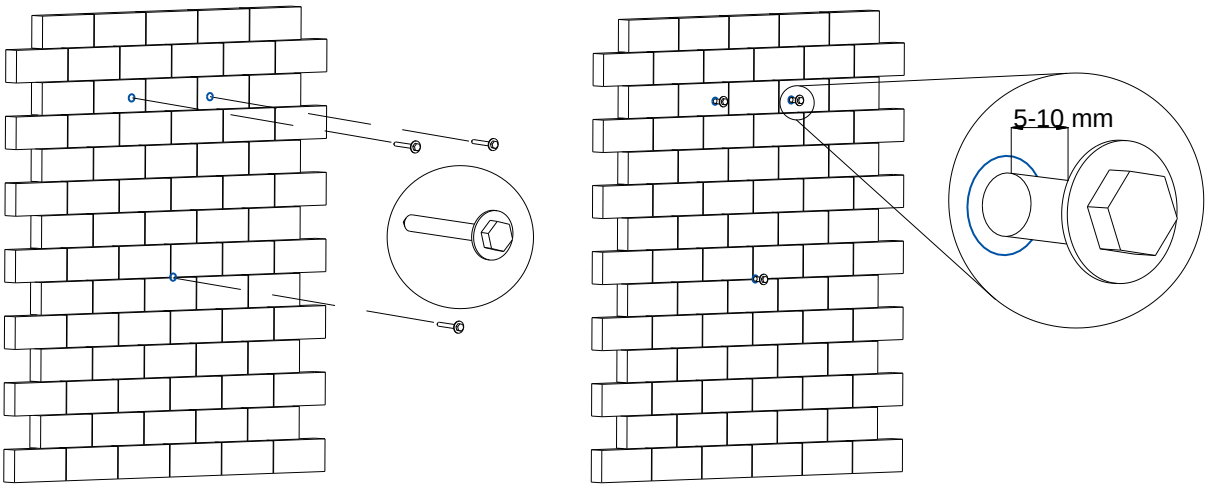
Step 1. Put the locating cardboard on the wall where the ATS box will be installed with the front side facing outwards. Mark and drill three drilling holes according to the markings on the cardboard.



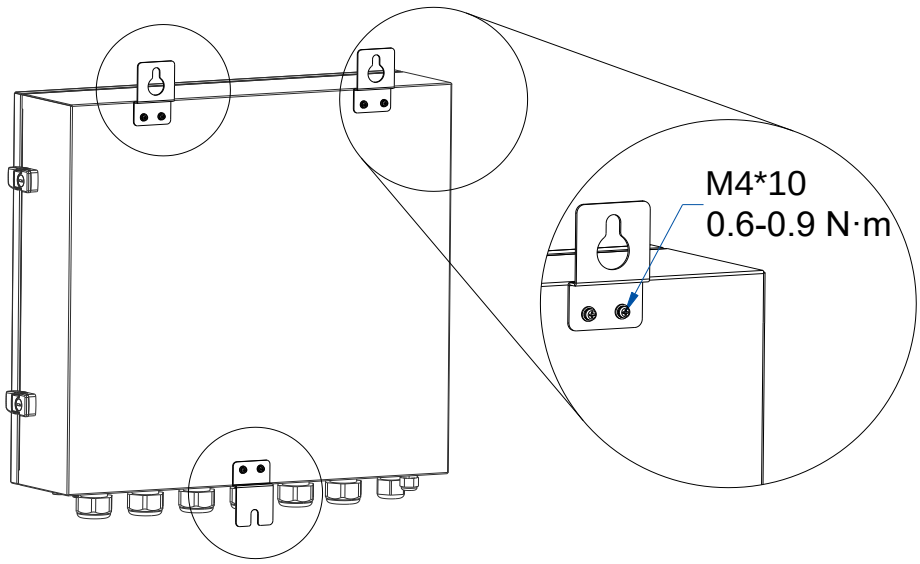
Step 2. Insert the expansion tubes into the holes.



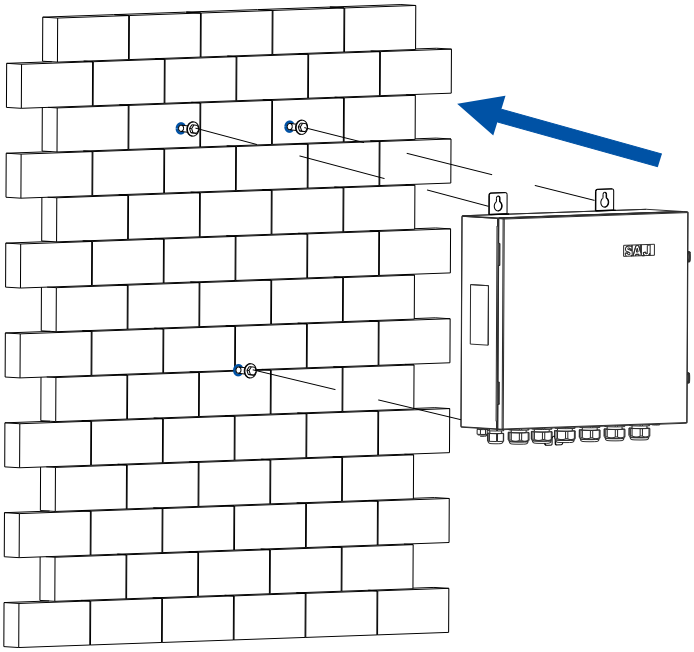
Step 3. Insert the expansion bolts into the expansion tubes, leaving around 5-10 mm outside the wall surface.



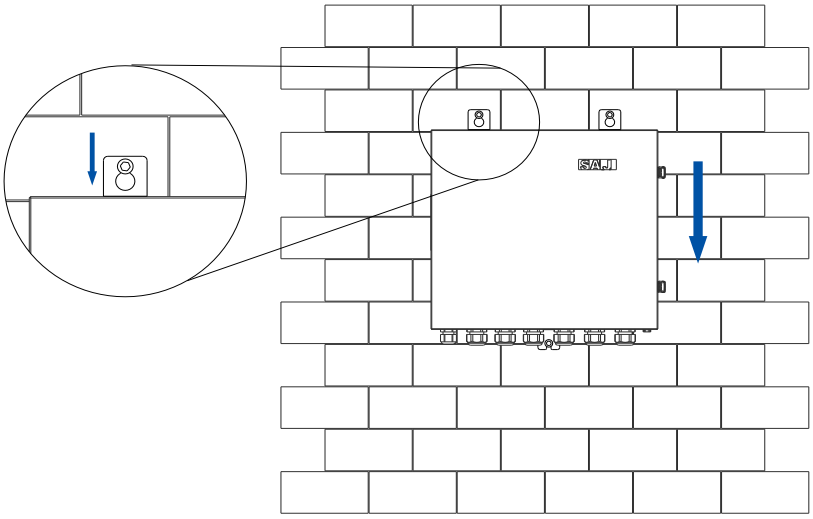
Step 4. Secure the upper and bottom mounting brackets on the back of the ATS box. Secure each bracket with two screws.



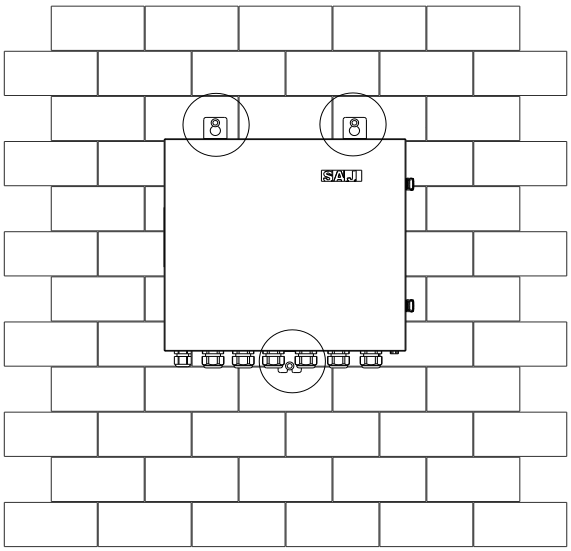
Step 5. Mount the ATS box onto the three expansion bolts on the wall.



Step 6. Slide the ATS box down along the hole of the mounting bracket to secure the box.



Step 7. Tighten the three expansion bolts to secure the mounting brackets to the wall.



☐ 5. Cable connections

5.1 Electrical interfaces description

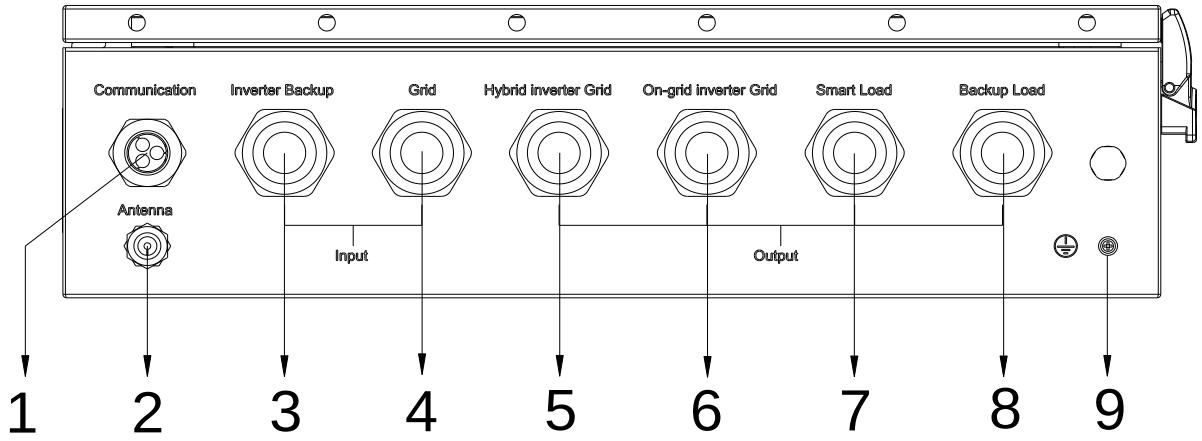


Figure 5.1. Electrical interfaces

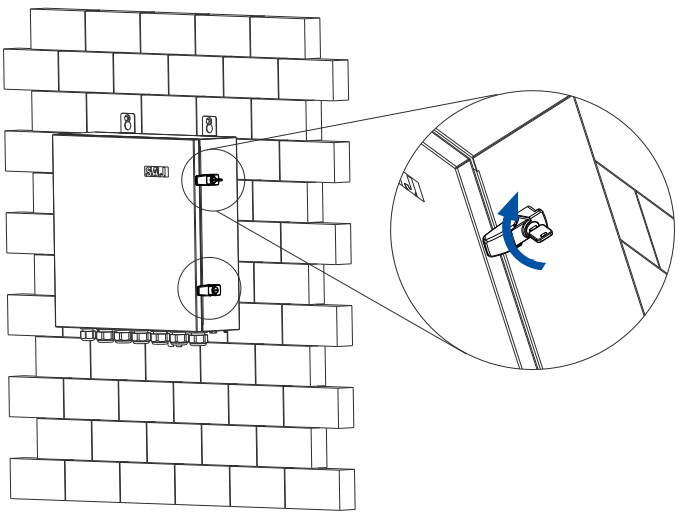
Callout	Silkscreen	Description
1	Communication	For the communication cable between ATS and the inverters.
2	Antenna	For the antenna connection for the eManager module.
3	Inverter Backup	For the AC cable connections from the backup output of hybrid inverters to supply electricity to the off-grid loads.
4	Grid	For the AC cable connections from the grid to supply electricity to both the on-grid and off-grid loads.
5	Hybrid inverter Grid	For the AC cable connections from the on-grid output of hybrid inverters.
6	On-grid inverter Grid	For the AC cable connections from the on-grid output of on-grid inverters. The electricity is supplied to both the on-grid and off-grid loads.
7	Smart Load	For the AC cable connections to supply electricity to the on-grid loads. When the power grid is out, ATS stops supplying power to these loads.
8	Backup Load	For the AC cable connections to supply electricity to the off-grid loads. When the power grid is out, ATS switches the power supply to the Inverter Backup output to ensure continuous electricity to these loads.
9	Grounding	For the grounding cable connection.

Table 5.1. Description of the electrical interfaces

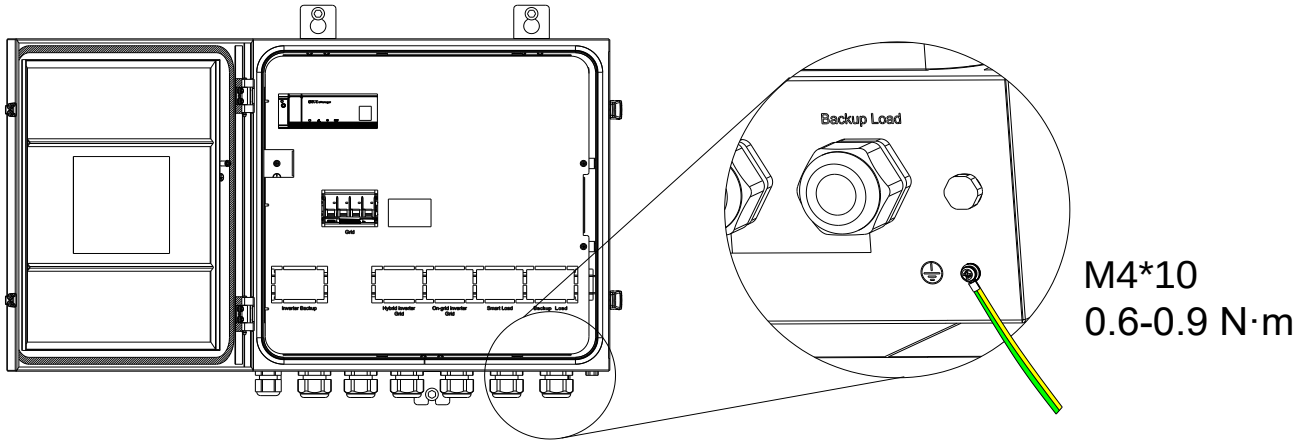
5.2 Connect the grounding cable

Step 1. Prepare a grounding cable of 6-10 AWG and an RNBS5-4 terminal for cable connection.

Step 2. Use the key to open the ATS box.



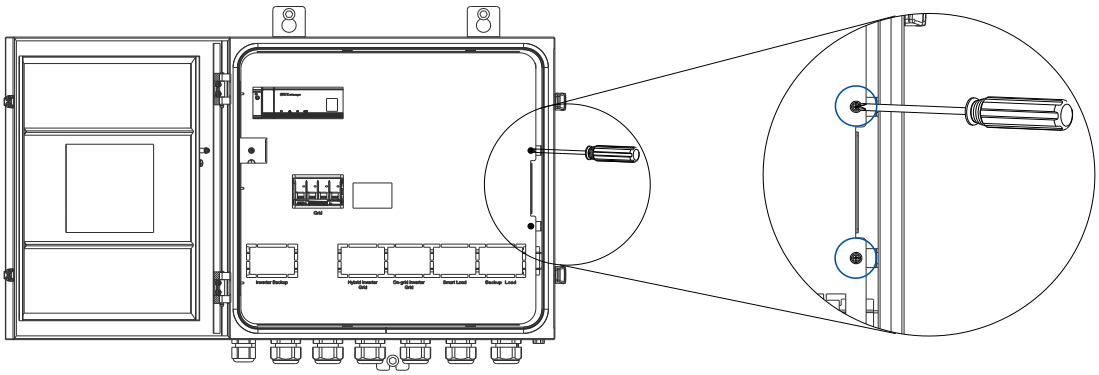
Step 3. Crimp the grounding cable with the RNBS5-4 terminal. Connect the grounding cable on the bottom of the ATS box.



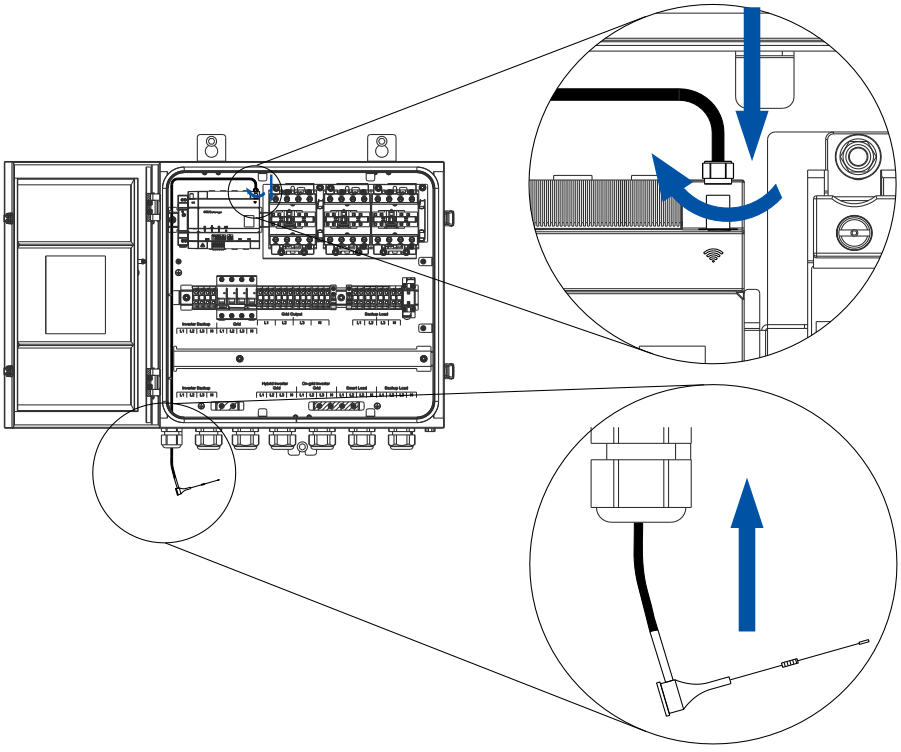
5.3 Connect the eManager module cables

The 12V power supply of the eManager module is connected by default. Take the steps below to connect the antenna and communication cables.

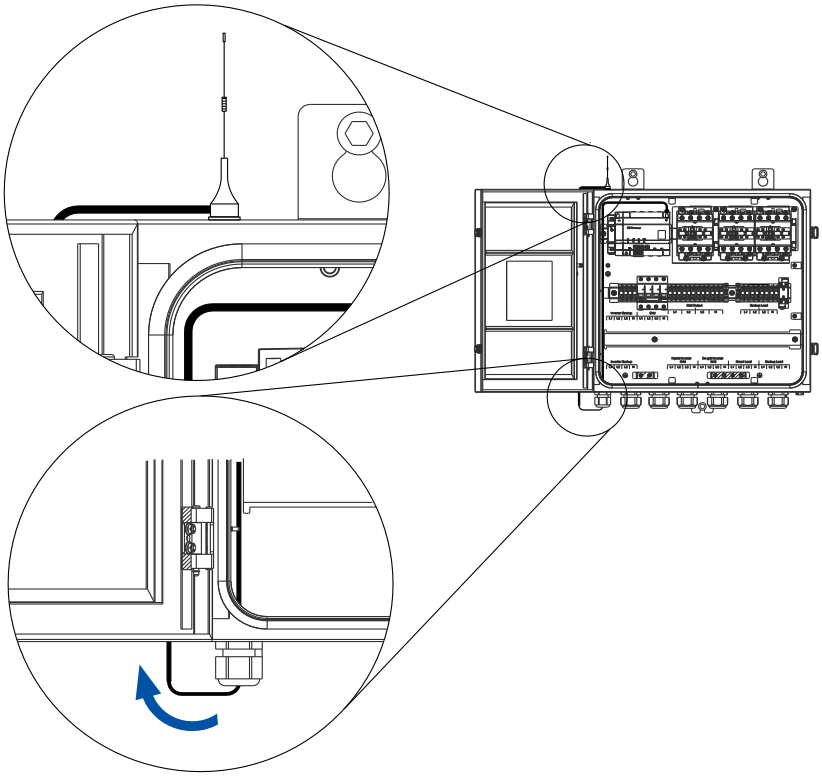
Step 1. Loosen the two screws to remove the insulation cover in the box.



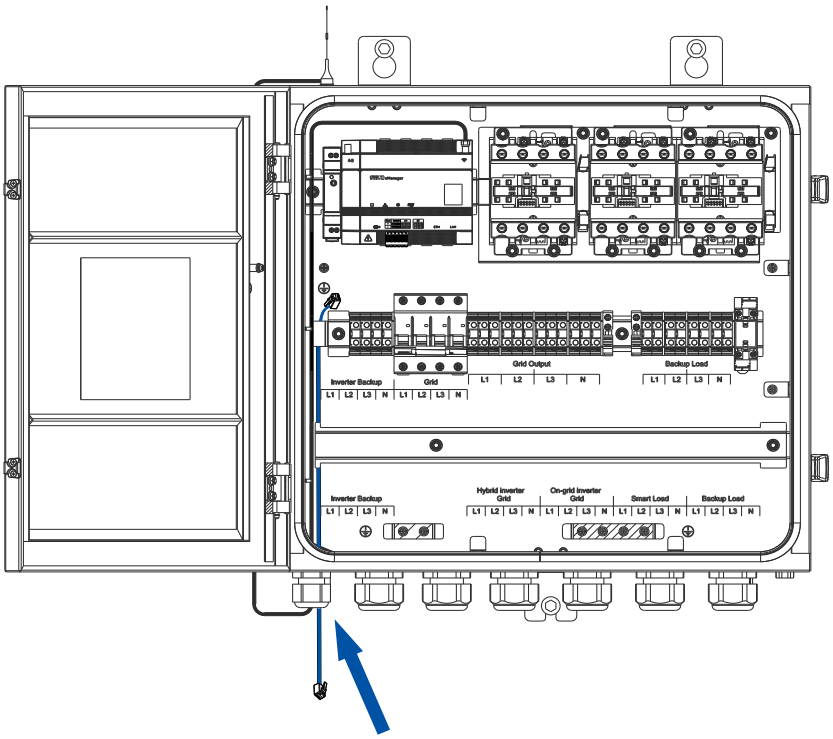
Step 2. Insert the screw end of the antenna cable through the **Antenna** cable gland at the bottom of the ATS box, pass the cable through the left side inside the box, and secure the cable end on the top right of the eManager module.



Step 3. Pass the antenna through the outside cover of the ATS box, and stick the antenna on top of the box.



Step 4. Prepare a Category 5 or 6 communication cable between the hybrid inverter and ATS with a RJ45 plug on both ends. On the ATS side, pass one end of the cable through the **Communication** cable gland alongside the antenna cable.

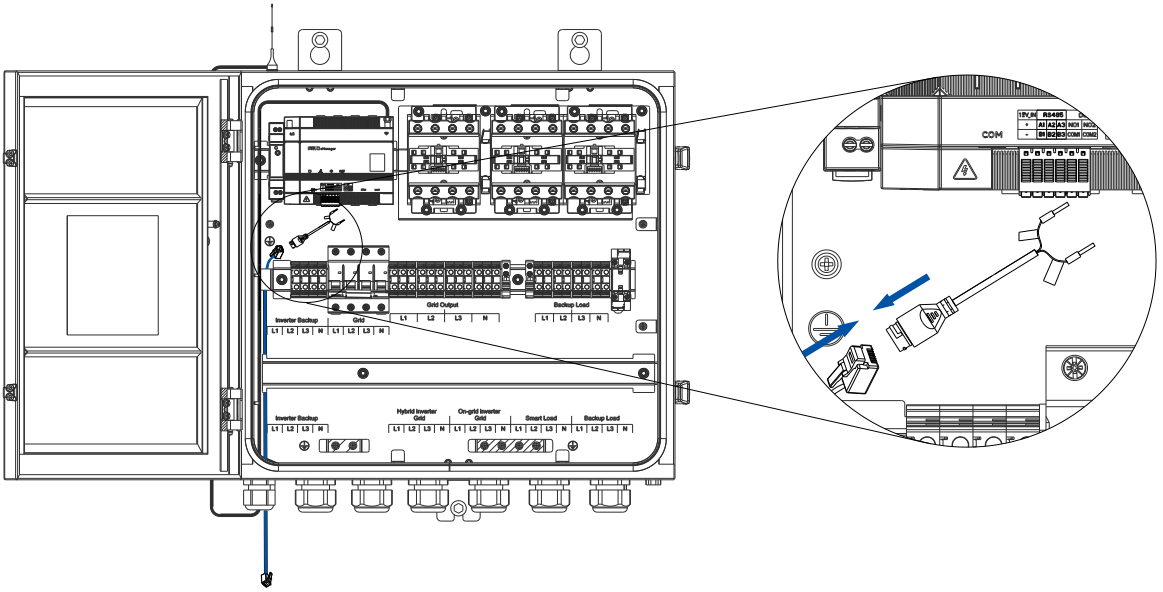


Step 5. Connect the communication cable to the RS485 or LAN port of the eManager depending on the inverter model. For detailed information, refer to the eManager user manual.

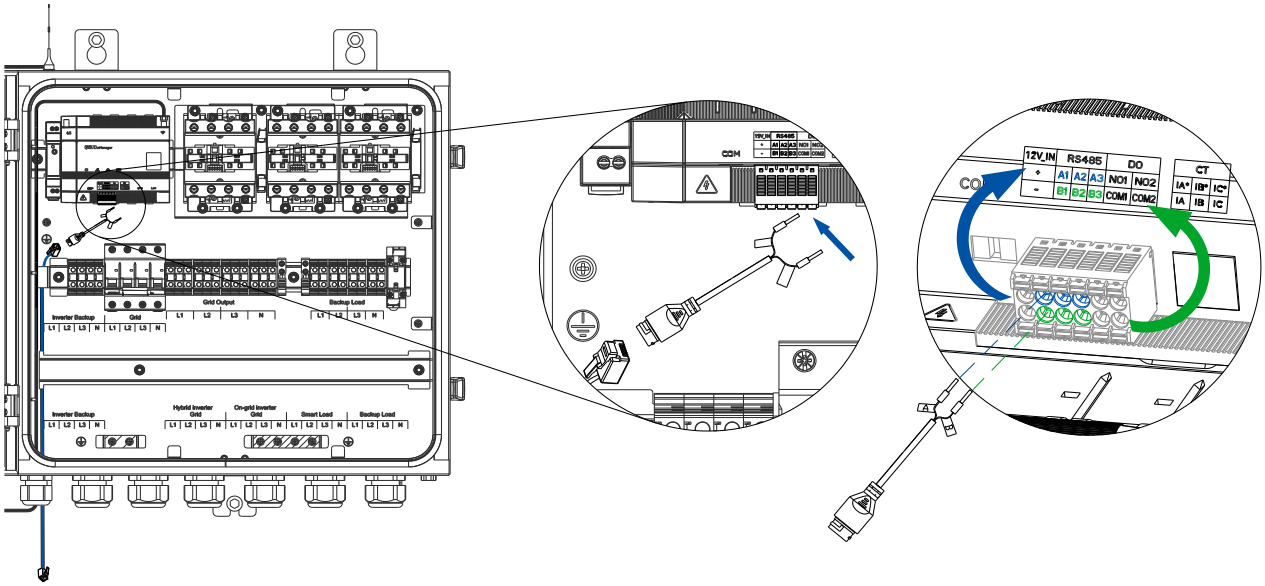
- To connect for RS485 communication:

  a. Connect one end of the RJ45 plug to the negative port of the eManager communication cable.

  Pin 7 and 8 of the RJ45 plug are used for RS485 communication.



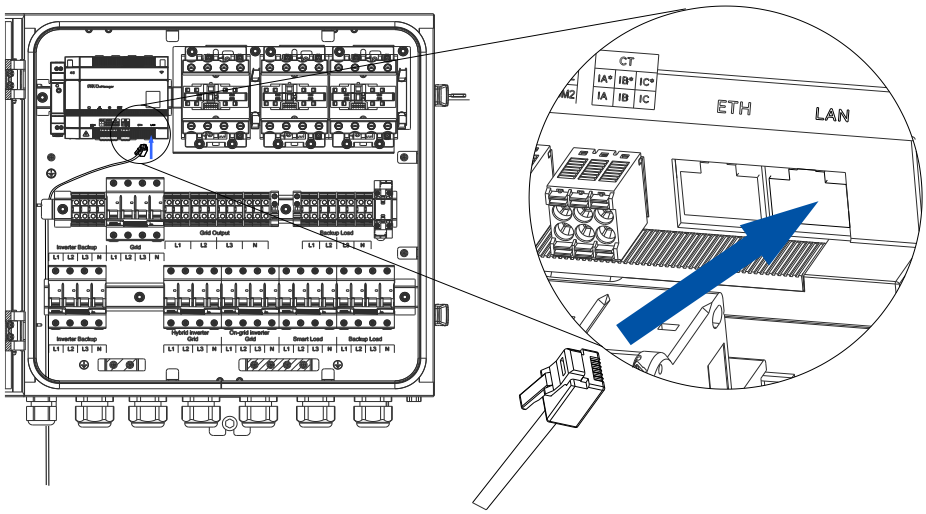
b. Insert the other two-pin connector of the eManager communication cable to the RS485 **A1/B1**, **A2/B2**, or **A3/B3** ports on the eManager module, depending on which ports are available.



c. Connect the other end of the communication cable to the corresponding port on the inverter depending on the inverter model.

- To connect for LAN communication:

  a. Insert one end of the RJ45 plug into the **LAN** port on the eManager module; connect the corresponding port on the inverter depending on the inverter model.



5.4 Install the circuit breakers

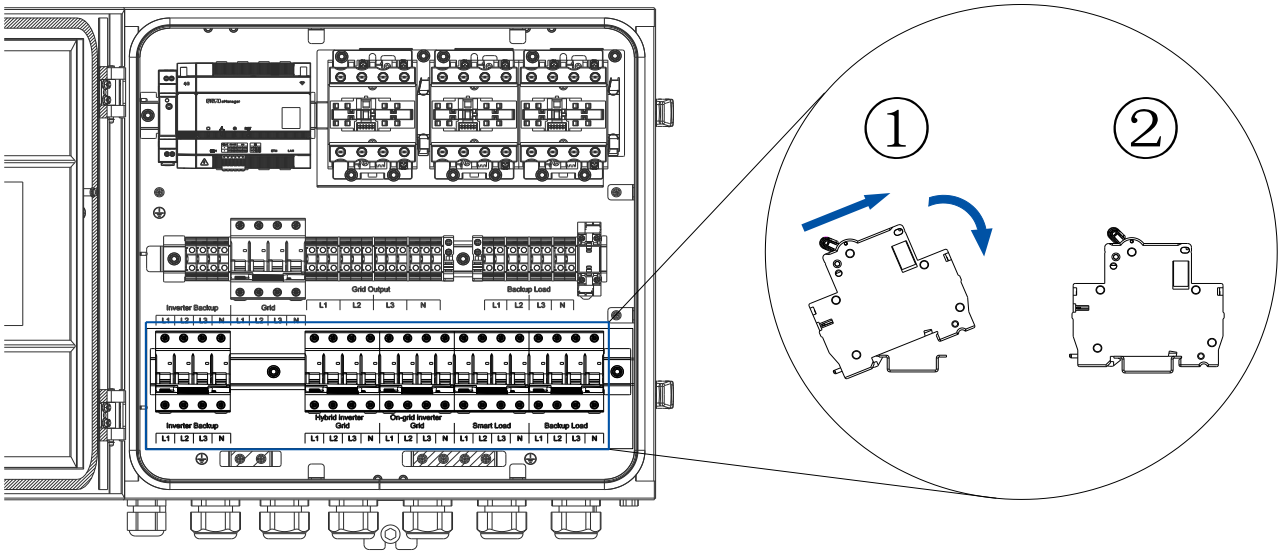
When any of the **Inverter Backup**, **Hybrid inverter Grid**, **On-grid inverter Grid**, **Smart Load**, or **Backup Load** is connected to the ATS, it is necessary to install a circuit breaker for the corresponding connection for safety purpose.

The circuit breakers can be installed inside the ATS box or in the external distribution box of the users depending on the actual requirement. Follow the instructions below to prepare and connect the circuit breakers.

Step 1. Prepare the following items for the installation of circuit breakers.

- Five circuit breakers for the following connections respectively. Select applicable circuit breakers based on the rated current of the target connections.
  - Inverter Backup
  - Hybrid inverter Grid
  - On-grid inverter Grid
  - Smart Load
  - Backup Load
- L1, L2, L3, and N cables between the circuit breaker terminal block and the circuit breakers
  - 6-10 AWG
  - Copper core
- Tubular or crimp terminals: No longer than 5 mm in width and length. Larger terminals cannot fit into the circuit breaker terminal block. See recommended terminal type for the corresponding cables:
  - 6 AWG: E16-12
  - 8 AWG: E10-12
  - 10 AWG: E6010

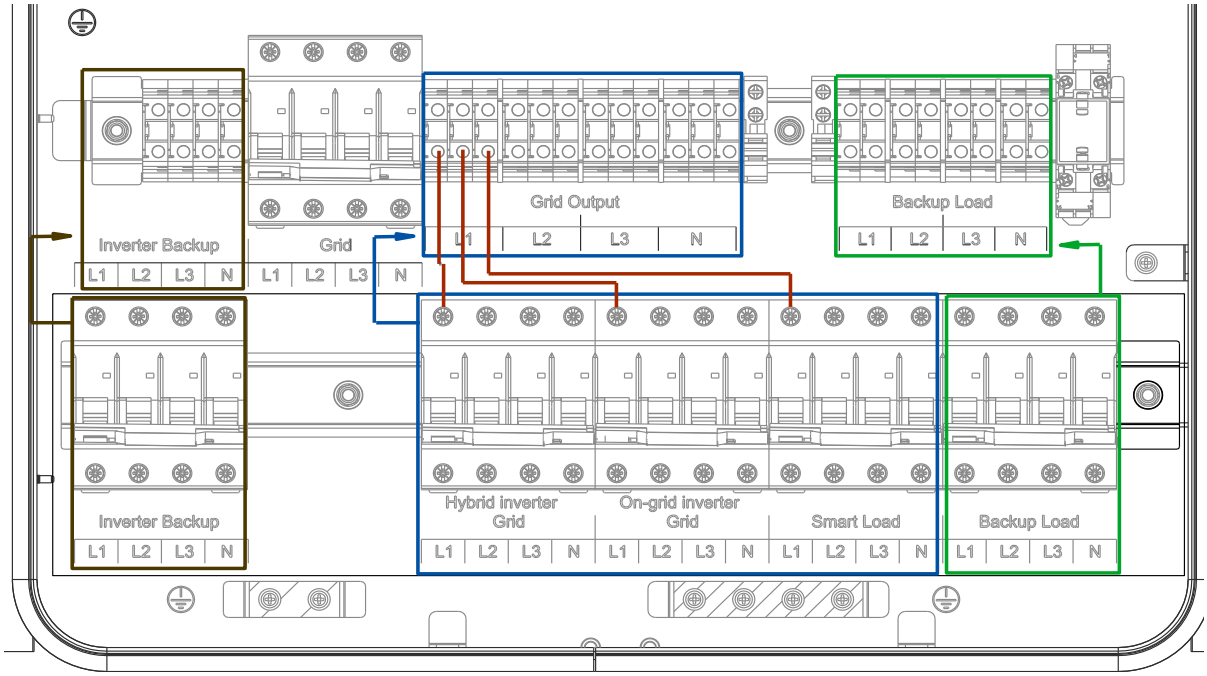
Step 2. Install the circuit breakers for the ON/OFF control of Inverter Backup, Hybrid inverter Grid, On-grid inverter Grid, Smart Load, and Backup Load connections.



Step 3. Crimp the cable ends with the recommended terminals.

Step 4. Connect one end of the L1, L2, L3, and N cables to the circuit breaker terminal block; connect the other end of the cables to the corresponding circuit breakers:

- Connect **Inverter Backup** to **Inverter Backup**.
- Connect **Hybrid inverter Grid**, **On-grid inverter Grid**, and **Smart Load** to **Grid Output**. See L1 connection as an example.
- Connect **Backup Load** to **Backup Load**.

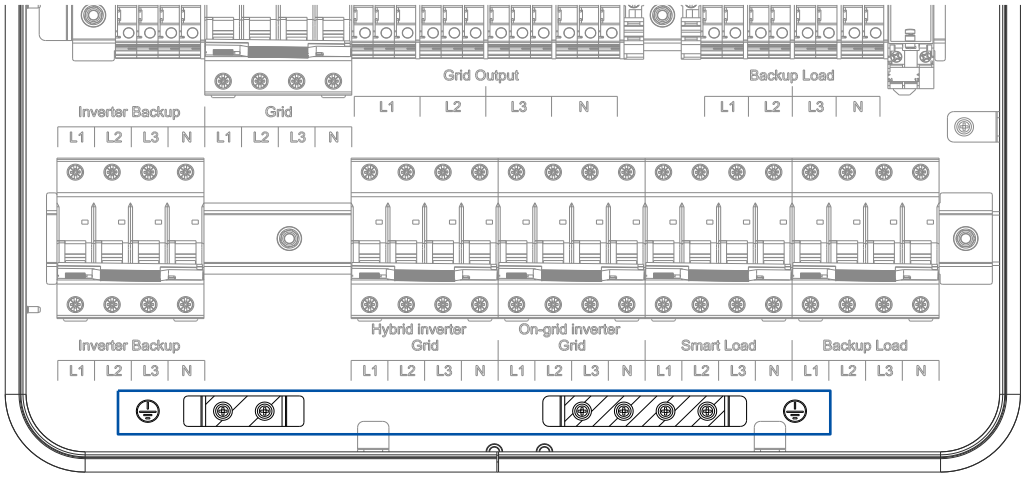


5.5 Connect the AC cables

Before you start

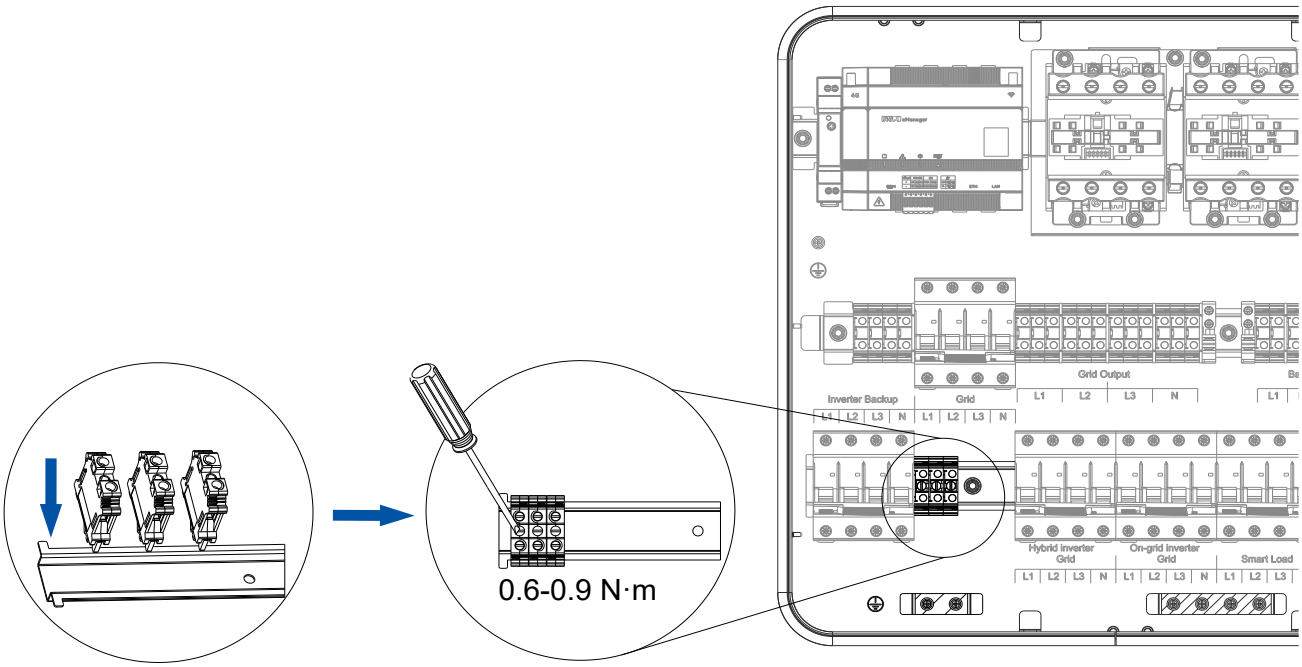
1. Select one of the following options to connect the PE cables:

- Option A: Connect the PE cables to the PE terminals at the bottom of the ATS box.



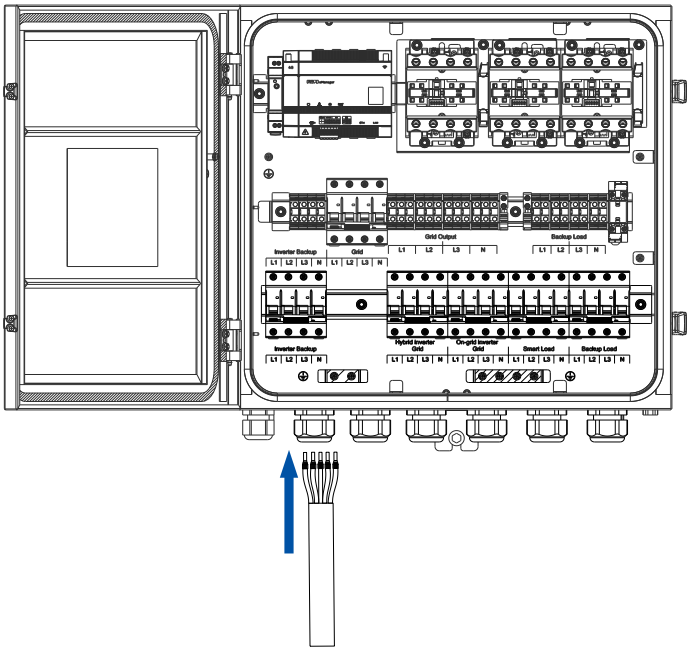
- Option B: Connect the PE cables to the rail-mounted ground cable terminal which is delivered in the package.

  With this option, secure the cable terminals to the rail first.



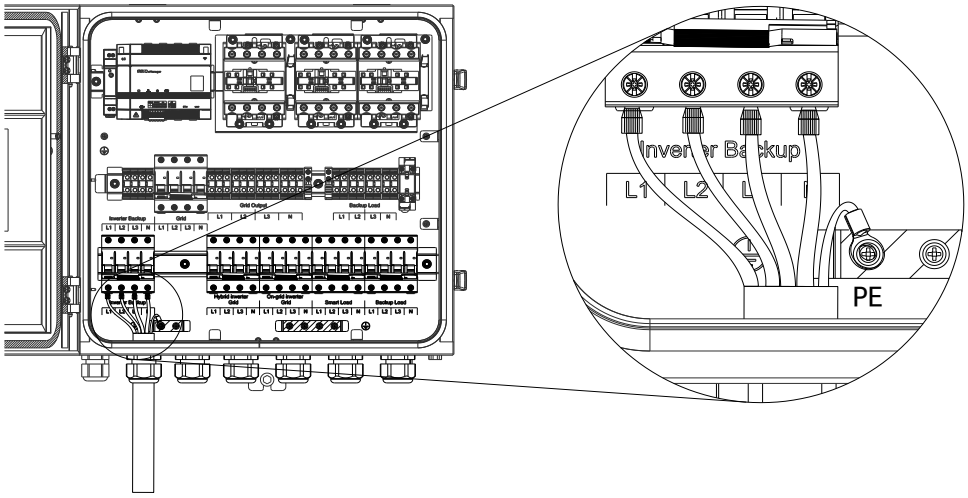
2. Prepare the AC cables and terminals according to the following specification:
   - AC cables: Outer diameter (OD) of 9-25 mm; five-core copper; each core of 6-10 AWG.
   - Tubular or crimp terminals for L1, L2, L3, and N cables.
   - For PE cables:
     - Connection option A: RNBS5-4 terminal
     - Connection option B: Tubular or crimp terminal

Step 1. Crimp the AC cable terminals with the suggested terminals. Pass the AC cables through the corresponding cable glands of **Grid**, **Inverter Backup**, **Hybrid inverter Grid**, **On-grid inverter Grid**, **Smart Load**, and **Backup Load**.

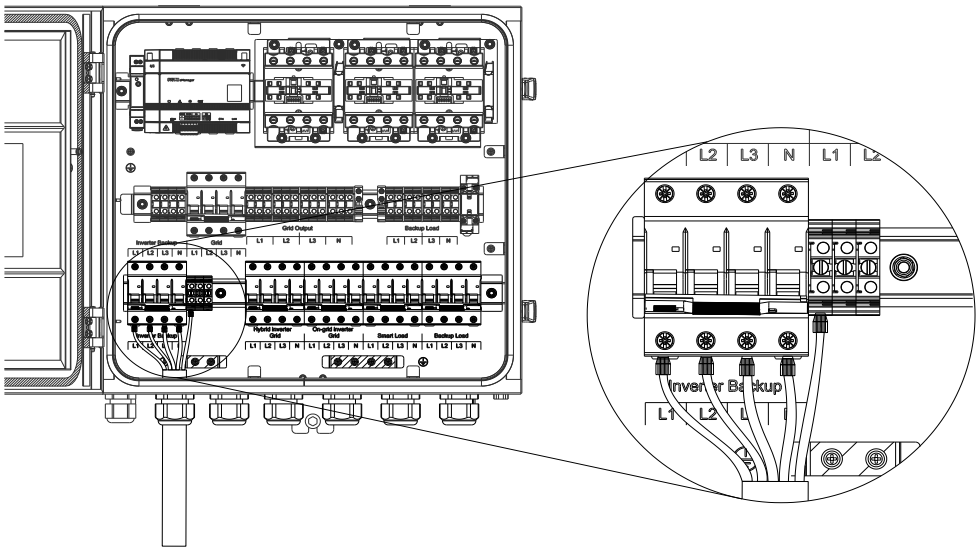


Step 2. Connect the L1, L2, L3, N, and PE cables to the corresponding ports of the circuit breakers. For example:

- Connection with PE connection option A



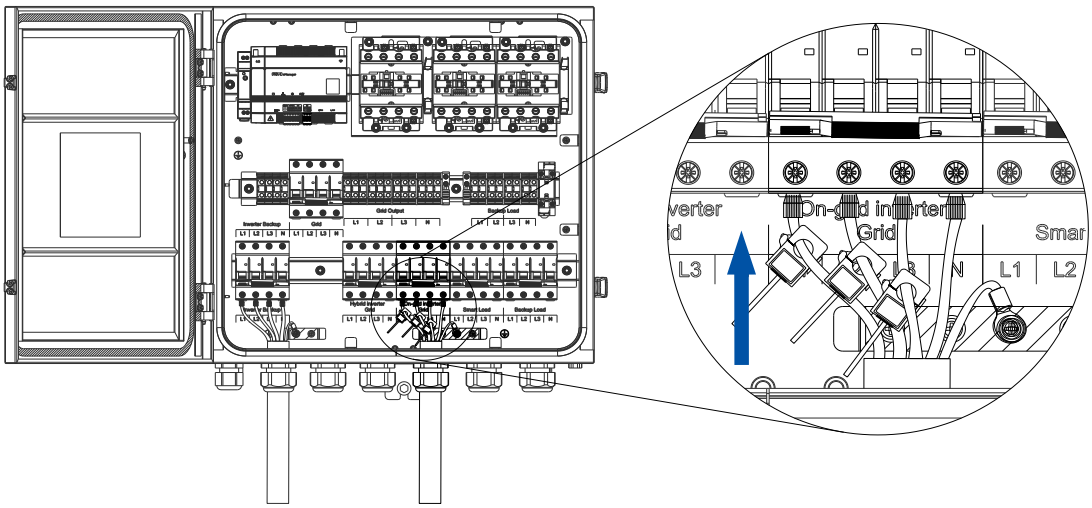
- Connection with PE connection option B



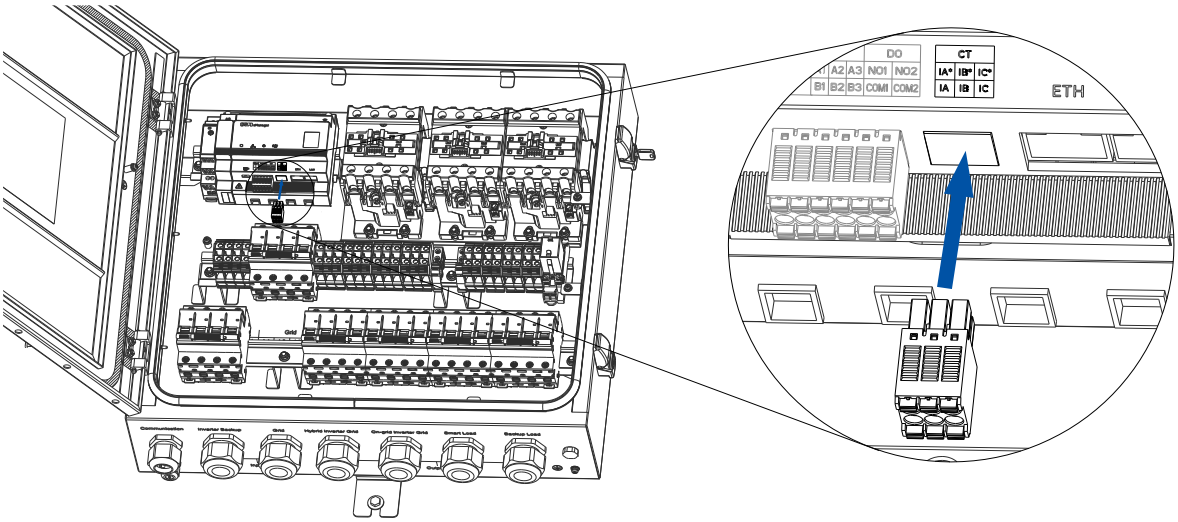
Step 3. (Optional) When the on-grid inverters are connected with the ATS box, take this step to install the current transformers (CT) if required.

a. Prepare three 100A/50mA CTs.

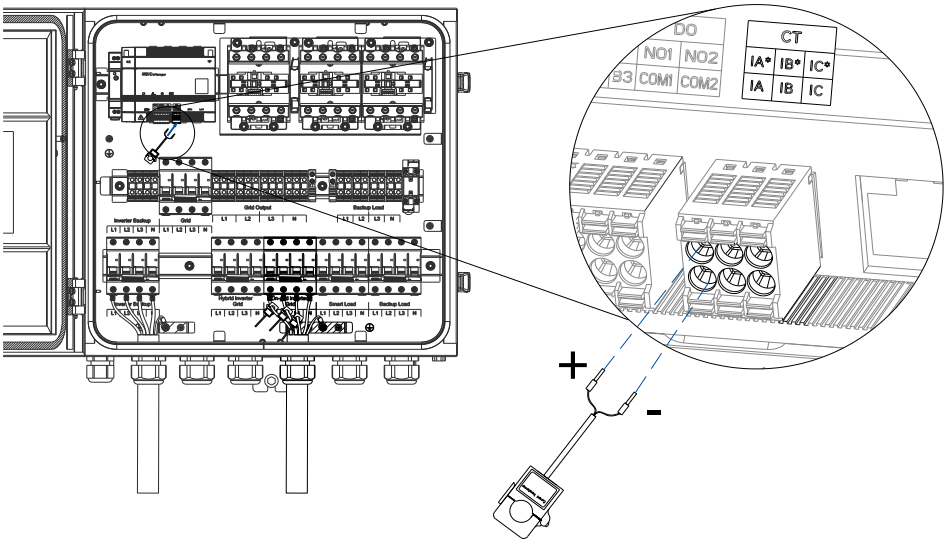
b. Install the three CTs on the L1, L2, and L3 cables of **On-grid inverter Grid**. Point the CT arrows to the circuit breakers.



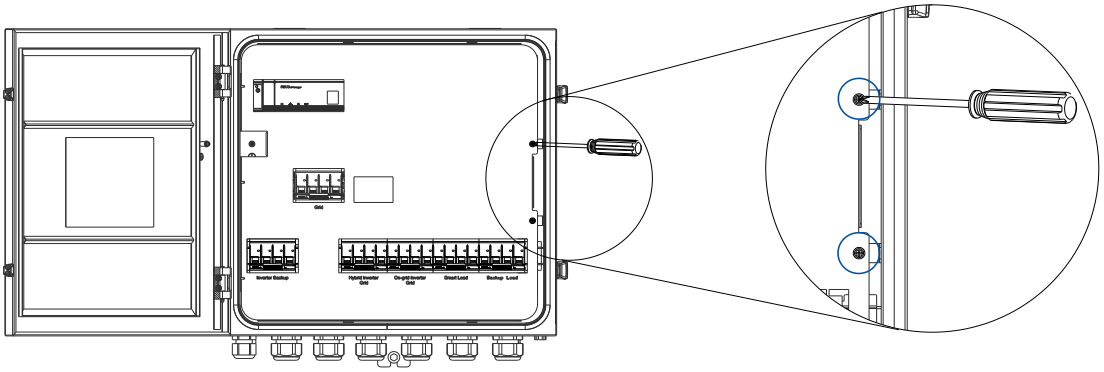
c. Insert the 6-pin pluggable terminal into the **CT** port on the eManager module.



d. Insert the positive pins of the three CTs to the **IA*** (for L1), **IB*** (for L2), and **IC*** (for L3) ports on the eManager module; insert the negative pins of the three CTs to the **IA**, **IB**, and **IC** ports.



Step 4. Cut off the insulation plate on top of the installed circuit breakers from the insulation cover. Install the insulation cover back to the box.



Step 5. Close and lock the box. Keep the keys at a proper location.

☐ 6. Commissioning on the App

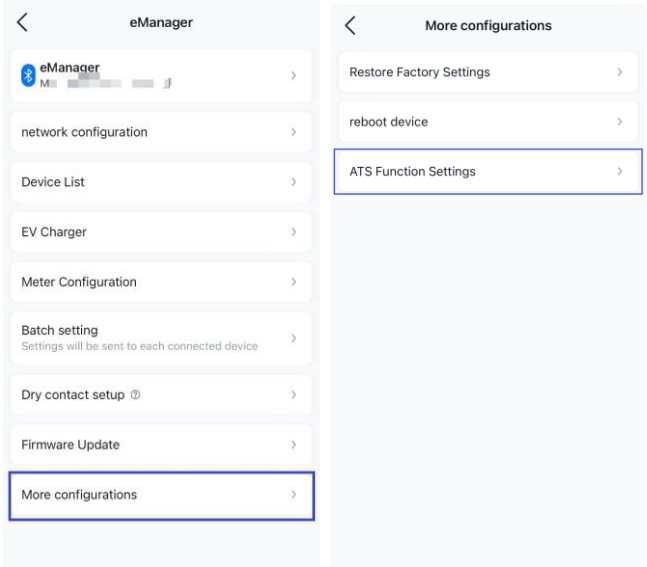
When the eManager module is installed, the users can control and monitor the running status of ATS on the elekeeper App. On your mobile phone, search for “elekeeper” in the App store and download the App. Alternatively, you can scan the below QR code to download the App.

For detailed instructions on setting the eManager functions on the App, scan the following QR code to access the latest eManager user manual. The eManager functions are available for different SAJ inverter series with the firmware upgrade of the products.

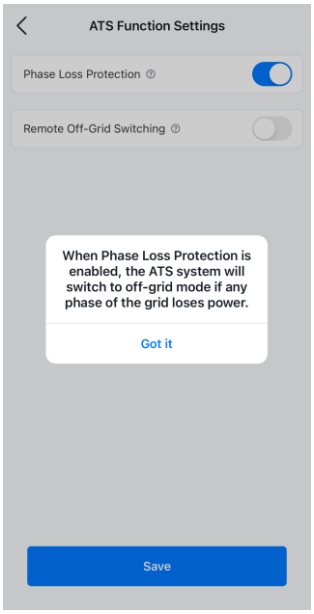
Take the following steps to enable the phase-loss protection function and the remote off-grid switching functions of ATS:

Step 1. Log in to the elekeeper App and connect to the eManager through Bluetooth connection.

Step 2. On the **eManager** page, select **More configuration** > **ATS Function Settings**:

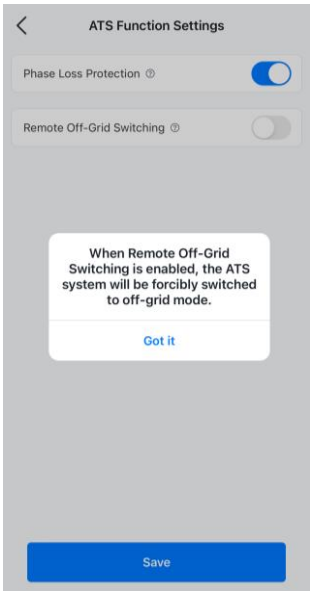


Step 3. Enable or disable the **Phase Loss Protection** function as required. This function is enabled by default.



Step 4. When it is necessary to disconnect the ATS from the grid forcibly in situations like maintenance, enable the **Remote Off-Grid Switching** function. This function is disabled by default.

After the setting is saved, the ATS switches the power supply from the grid to the inverter backup output. The ATS can connect back to the grid only after the **Remote Off-Grid Switching** function is disabled again on the App.



Appendix A: Product Specification

Parameter \ Model	ATS1-T63-A
AC Input (Grid)	
Grid Connection	Three-phase
Rated AC Voltage/Range [V]	220/380, 230/400, 240/415; 198–253/342–440
Rated Frequency [Hz]	50, 60
Rated Current [A]	50
Maximum Current [A]	63 ①
AC Input (Inverter Backup)	
Rated AC Voltage/Range [V]	220/380, 230/400, 240/415; 180–280/312–485
Rated Frequency [Hz]	50, 60
Rated Current [A]	50
Maximum Current [A]	63 ①
Inverter Connection	Three-phase
Compatible Hybrid Inverter Series	H2, HS2, HS3
AC Output [Backup Load]	
Grid Connection	Three-phase
Rated AC Voltage/Range [V]	220/380, 230/400, 240/415; 180–280/312–485
Rated Frequency [Hz]	50, 60
Rated Current [A]	50
Maximum Current [A]	63 ②
Switching Time [ms]	50
General Parameters	
Operating Temperature Range	-25℃ to +45℃
Altitude [m]	≤3000
Relative Humidity (RH)	0-95% Non-condensing
Protective Class	I
Overvoltage Category	III
Ingress Protection Rating	IP54
Dimensions [H*W*D] [mm]	518 * 520 *141
Weight [kg]	15.8
Warranty [Year]	2
Applicable Standard	IEC/EN 61439

①② When the ambient temperature is within the range of -25℃ to +30℃, the maximum current can reach 63 A. When the ambient temperature is between +30℃ and +45℃, the maximum current decreases gradually from 63 A to 50 A.

Appendix B: Recycling and Disposal

This device should not be disposed 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 by an approved collection and recycling facility in your area.

Appendix C: Warranty and Contact Information

Warranty

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

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.

Head Quarter: Guangzhou Sanjing Electric Co., LTD.

Address: SAJ Innovation Park, No.9, Lizhishan Road, Guangzhou Science City, Guangdong, P.R.China.

Tel: +86 20 6660 8588

E-mail: service@saj-electric.com

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

Trademark

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GUANGZHOU SANJING ELECTRIC CO., LTD.

V2.0