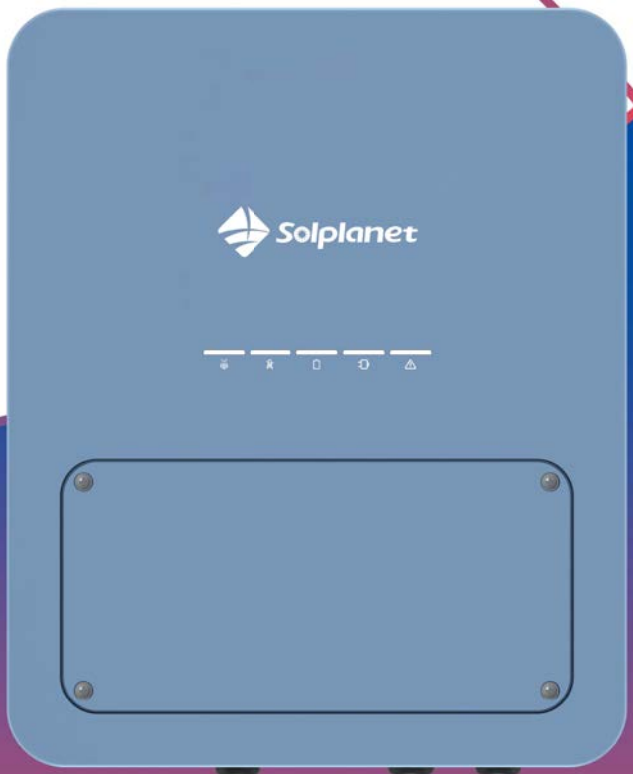


Single phase hybrid inverter

User Manual

ASW002K-SH-EU / ASW2.50K-SH-EU

ASW003K-SH-EU&AU / ASW3.68K-SH-EU&AU

ASW004K-SH-EU&AU / ASW005K-SH-EU&AU

ASW006K-SH-EU&AU

Android

iOS

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1 General information

1.1 About this document

This document describes the mounting, installation, commissioning, configuration, operation, troubleshooting and decommissioning of the product as well as the operation of the product user interface.

You will find the latest version of this document and further information on the product in PDF format at www.solplanet.net.

It is recommended that this document is stored in an appropriate location and be available at all times.

1.2 Product validity

This document is valid for the following models:

- ASW002K-SH-EU
- ASW2.50K-SH-EU
- ASW003K-SH-EU&AU
- ASW3.68K-SH-EU&AU
- ASW004K-SH-EU&AU
- ASW005K-SH-EU&AU
- ASW006K-SH-EU&AU

1.3 Target group

This document is intended for qualified persons who must perform the tasks exactly as described in this user manual.

All installation work must be performed by appropriately trained and qualified persons.

Qualified persons must possess the following skills:

- Knowledge of how an inverter works and is operated.
- Knowledge of how batteries work and are operated.
- Training in how to deal with the dangers and risks associated with installing, repairing and using electrical devices, batteries and installations.
- Training in the installation and commissioning of electrical devices.
- Knowledge of all applicable laws, standards and directives.

Knowledge of and compliance with this document and all safety information.

1.4 Symbols

DANGER

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

WARNING

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

CAUTION

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

NOTICE

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

Information that is important for a specific topic or goal, however not related to safety.

2 Safety

2.1 Intended use

- The product is a transformerless hybrid inverter with 2 MPP trackers and a battery connection that feeds the direct current of the PV array into the connected battery or converts it to grid-compliant single-phase current and then feeds it into the utility grid. The product also can convert the DC current supplied by the battery into grid-compliant single-phase current. The product also can convert the AC current supplied by the grid into battery current.
- The product has a backup function that can continue to supply selected circuits with power from the battery or PV system in the event of a grid fault.
- The product also can convert the direct current supplied by the battery into grid-compliant single-phase current.The product is intended for indoor and outdoor applications.
- The product must only be connected with PV modules of protection class II (in accordance with IEC 61730, application class A). Do not connect any sources of energy other than PV modules and batteries to the product.
- PV modules with a high capacitance to ground must only be used if their coupling capacitance is less than 1.2µF.
- The product is not equipped with an integrated transformer and therefore has no galvanic isolation. The product must not be operated with PV modules which require functional grounding of either the positive or negative PV conductors. This can cause the product to be irreparably damaged. The product may be operated with PV modules with frames that require protective earthing.
- The inverters shall not be used in multiple phase combinations.
- All components must remain within their permitted operating ranges and their installation requirements at all times.
- Use the product only in accordance with the information provided in the user manual and with the locally applicable standards and directives. Any other application maycause personal injury or damage to property.
- The product must only be operated in connection with an intrinsically safe lithium-ion battery approved by AISWEI. The entire battery voltage range must be completely within the permissible input voltage range of the product.
- The product must only be used in countries for which it is approved by AISWEI and the grid operator.
- Knowledge of all applicable laws, standards and directives.
- Knowledge of and compliance with this document and all safety information.
- The type label must be permanently attached to the product and must be in a legible condition.
- This document does not replace any regional, state, provincial, federal or national laws, regulations or standards that apply to the installation, electrical safety and use of the product.

2.2 Important safety instructions

The product has been designed and tested strictly according to the international safety requirements. As with all electrical or electronical devices, there are residual risks despite careful construction. To prevent personal injury and property damage and to ensure long-term operation of the product, read this section carefully and observe all safety information at all times.

⚠ *DANGER*

Danger to life due to high voltages of the PV array or the battery!

The DC cables connected to the battery or the PV array may be live. Touching the DC conductors or the live components can cause to lethal electric shocks. If you disconnect the DC connectors from the product under load, an electric arc may occur leading to electric shock and burns.

- Do not touch non-insulated cable ends.
- Do not touch the DC conductors.
- Do not touch any live components of the product.
- Do not open the product.
- Observe all safety information of the battery manufacturer.
- All work on the product must only be carried out by qualified personnel who have read and fully understood all safety information contained in this document and the user manual.
- Disconnect the product from all voltage and energy sources and ensure it cannot be reconnected before working on the product.
- Wear suitable personal protective equipment for all work on the product.

DANGER

Danger to life due to electric shock when touching live components in backup mode!

Even if the AC breaker and the PV switch of the inverter are disconnected, the parts of the system may still be live when the battery is switched on due to backup mode.

- Do not open the product.
- Disconnect the product from all voltage and energy sources and ensure it can not be reconnected before working on the product.

DANGER

Danger to life due to fire or explosion when batteries are fully discharged!

Danger to life due to fire or explosion when batteries are fully discharged.

- Make sure that the battery is not fully discharged before commissioning the system.
- Contact the battery manufacturer for further proceedings if the battery is fully discharged.

DANGER

Danger to life due to burns caused by electric arcs through short-circuit currents!

Short-circuit currents in the battery can cause heat accumulation and electric arcs if the battery is short circuited or wrongly installed. Heat accumulation and electric arcs may result in lethal injuries due to burns.

- Disconnect the battery from all voltages sources prior to performing any work on the battery.
- Only use properly insulated tools to prevent accidental electric shock or short circuits during installation.
- Observe all safety information of the battery manufacturer.

DANGER

Danger to life due to electric shock when touching live system components in case of a ground fault!

If a ground fault occurs, parts of the system may still be live. Touching live parts and cables may result in death or lethal injuries due to electric shock.

- Disconnect the product from voltage and energy sources and ensure it cannot be reconnected before working on the device.
- Only touch the cables of the PV modules on their insulation.
- Do not touch any parts of the substructure or frame of the PV array.
- Do not connect PV strings with ground faults to the product.

⚠ WARNING

Danger to life due to electric shock from destruction of the measuring device due to overvoltage!

Overvoltage can damage a measuring device and result in voltage being present in the enclosure of the measuring device. Touching the live enclosure of the measuring device results in death or lethal injuries due to electric shock.

- Only use measuring devices with the measurement span higher than the DC input voltage range

⚠ CAUTION

Risk of burns due to high temperature!

Some parts of the enclosure can become hot during operation.

- During operation, do not touch any parts other than the enclosure lid of the product.

⚠ CAUTION

Risk of injury due to weight of product!

Injuries may result if the product is lifted incorrectly or dropped while being transported or mounted.

- Transport and lift the product carefully. Take the weight of the product into account.
- Wear suitable personal protective equipment for all work on the product.

NOTICE

Damage to the inverter due to electrostatic discharge.

Internal components of the inverter can be irreparably damaged by electrostatic discharge.

- Ground yourself before touching any component.

The country grid code set must be set correctly.

If you select a country grid code set which is not valid for your country and purpose, it can cause a disturbance in the PV system and lead to problems with the grid operator. When selecting the country grid code set, you must always observe the locally applicable standards and directives as well as the properties of the PV system (e.g., PV system size, grid-connection point).

- If you are not sure which standards and directives are valid for your country or purpose, contact the grid operator.

2.3 Symbols on the label



Beware of a danger zone

This symbol indicates that the inverter must be additionally grounded if additional grounding or equipotential bonding is required at the installation site.



Beware of high voltage and operating current

The inverter operates at high voltage and current. Work on the inverter must only be carried out by skilled and authorized electricians.



Beware of hot surfaces

The inverter may become hot during operation. Avoid contact during operation.



WEEE designation

Do not dispose of the product together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.



CE marking

The product complies with the requirements of the applicable EU directives.



Certification mark

The product has been tested by TUV and got the quality certification mark.



RCM Mark

The product complies with the requirements of the applicable Australian standards.



Capacitor discharge

Danger to life due to high voltages in the inverter. Do not touch live parts for 5 minutes after disconnection from the power sources.



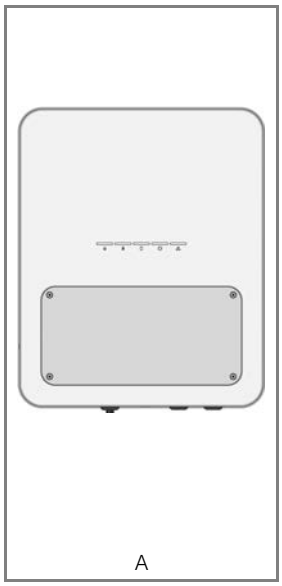
Observe the documentation

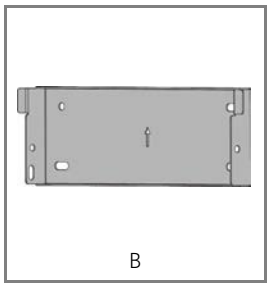
Observe all documentation supplied with the product.

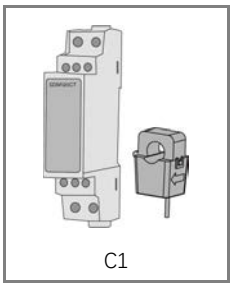
3 Unpacking and storage

3.1 Scope of delivery

Check the scope of delivery for completeness and any visible external damage. Contact your distributor if the scope of delivery is incomplete or damage.

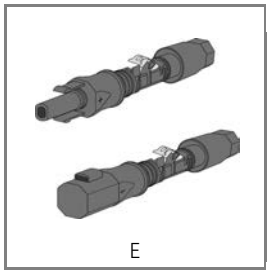

A

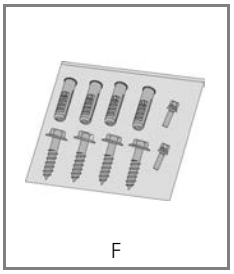

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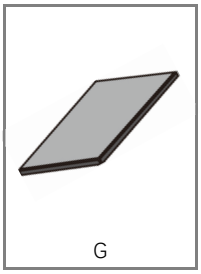

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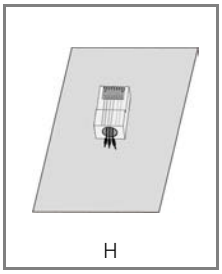

C2


D


E


F


G


H

Object	Description	Quantity
A	Inverter	1
B	Wall Bracket	1
C1	Smart meter（Used in Europe only）	1
C2	Smart meter（Used in Australia only）	1
D	Communication device（Ai-Dongle）	1
E	DC connector	2
F	Fastener package	1
G	Document	1
H	Communication and Resistance terminal (only for parallel)	1

3.2 Product storage

Suitable storage is required if the inverter is not installed immediately:

- Store the inverter in the original packing case.
- The storage temperature must be between -40°C to +70°C, and the storage relative humidity must be between 0 and 100%, non-condensing.
- The packing with the inverter shall not be tilted or inverted.
- The product must be fully inspected and tested by professionals(Refer to section 1.3) before it can be put into operation, if it has been stored for half a year or more.

4 Inverter overview

4.1 Product description

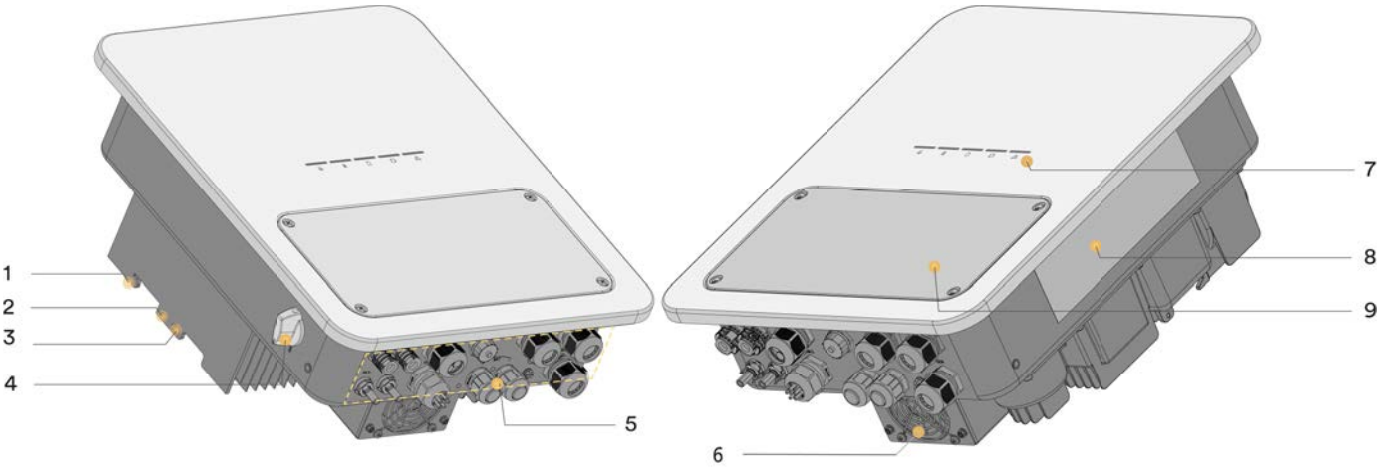
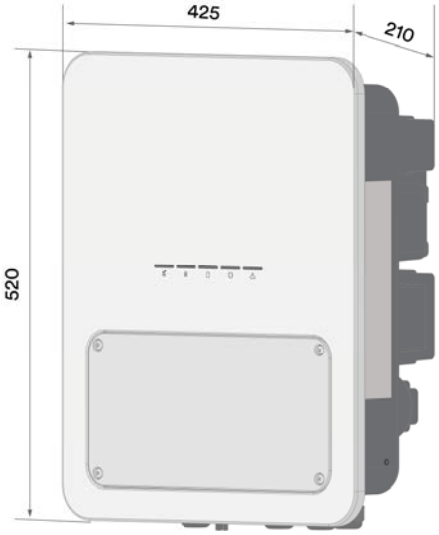


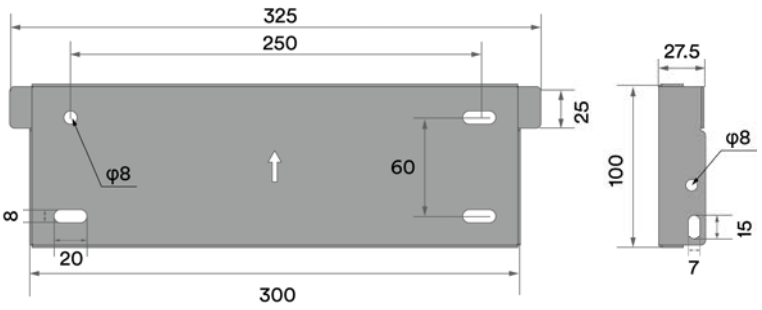
Figure shown here is for reference only. The actual product received may differ!

Object	Name	Description
1	Mounting flange	Used to hang the inverter onto the mounting bracket.
2	Inverter fixing point	Used for fixing the inverter onto the mounting bracket.
3	Anti-theft holes	For installation of anti-theft locks.
4	DC Switch	Used to isolate the inverter from a DC input source. e.g. PV array
5	Electrical connection interface	Includes AC terminals, DC connectors, battery connectors, EPS Load terminal, generator terminal, communication ports and an additional grounding terminal. For details, refer to "6.1 Connection Interface description".
6	Fan assembly	Maintain and replace the fan.
7	LED indicator panel	Indicates the current working state of the inverter.
8	Labels	Warning symbols, nameplate, and QR code.
9	Lower enclosure lid	Connection area inside the inverter.

4.2 Dimensions



Unit：mm



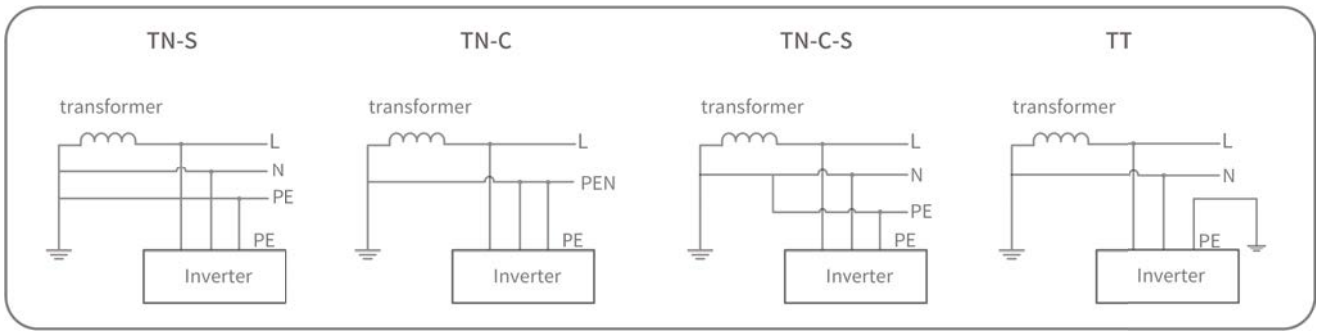
4.3 LED indicator

Function	LED	Description
SOLAR	Glowing	The product operates normally, and the PV array is available.
	Blinking	The product is self-checking automatically, or the firmware is being updated.
	Off	Power from the PV array is not available.
BAT	Glowing	The product operates normally, and the battery energy is available.
	Blinking	The product is self-checking automatically, or the firmware is being updated.
	Off	Power from the battery is not available.
ERROR	Yellow Glowing	There is a warning fault, the communication between Ai-Dongle and inverter has failed, or the other warning fault. The warning message and the corresponding event number will be displayed on the APP or Cloud.
	Red Glowing	There is an error fault. The Error message and the corresponding event number will be displayed on the APP or Cloud.
	Off	The product is operating normally.
EPS	White Glowing	The EPS port of the product is available and operates normally.
	Red Glowing	The EPS port operates abnormally.
	Off	The EPS port of the product stops operation.
GRID	White Glowing	The product is connected and operates normally in non-off-grid mode, or the grid voltage is greater than the safety voltage(36V) in off-grid mode.
	Red Glowing	The GRID port operates abnormally without a battery.
	Off	The GRID port is disconnected, or the grid operates abnormally with a battery, or the grid voltage is less than the safety voltage(36V) in off-grid mode, or the product stops operation.

For safety reasons, the EPS LED will blink white when there is no load or when the load power is low, indicating potential live voltage on the EPS port, which could pose a danger to life.

4.4 Supported grid types

The grid structures supported by the product is TN-S, TN-C, TN-C-S, TT, as shown in the figure below:



For the TT grid structure, the effective value of the voltage between the neutral wire and the ground wire must be less than 20V.

4.5 Interfaces and functions

The product is equipped with the following interfaces and functions:

Ai-Dongle

The product is equipped with an Ai-Dongle as standard, which provides a user interface, which can locally or remotely connect to the Solplanet App, for configuring and monitoring the product. The Ai-Dongle can connect to the internet via WLAN or an ethernet cable. Solplanet communication products or a third-party monitoring device can be used if the Ai-Dongle is not connected.

RS485 Interface

The inverter may or may not be equipped with two RS485 interfaces. The inverter can communicate with Solplanet communication products or third party devices via the RS485 interface. For more information regarding third party devices, please contact the local Solplanet service department.

Ethernet Interface

With support of Modbus TCP/IP , the ethernet interface enables integration with third-party systems for advanced monitoring and control.

BMS Interface

The BMS Interface (CN705) connects the inverter to the Battery Management System (BMS) to enable efficient battery monitoring and management. This interface supports communication protocols such as CAN, allowing real-time exchange of battery parameters, including State of Charge (SOC), voltage, and current. By ensuring seamless communication between the inverter and the BMS, the interface optimizes battery performance, enhances safety, and enables precise control of charging and discharging processes. The connection is established via CANH/L pins on CN705, refer to the Interface Pinout Table.

Export power control

The product is equipped with an export power limit function, so as to meet the requirements of various national standards or grid standards for limiting the output power at the grid connection point. The export power control solution measures the

active power at the grid connection point and uses this information to control the inverter's active power output, preventing it from exceeding the agreed export power limit.

To measure the export active power, the product supports either current transformers (CTs) or a smart meter (not both simultaneously). Users can choose their preferred method based on installation requirements.

The smart meter used with this product must be approved by Solplanet. For more information about compatible smart meters, please contact Solplanet service.

Multifunction Relay

The product is equipped with two multifunction relays as standard. One of the relays can serve as a dry contact signal for controlling a diesel generator. When the diesel generator function in the Solplanet App is enabled and the diesel generator connection conditions are met, the open contact will switch to on (voltage-free output). The second multifunction relay can be configured to operate in a specific system mode. For more information, please contact Solplanet service.

Temperature Senser Interface

The product is equipped with one temperature sensor interface. If the temperature of the battery needs to be monitored, the external sensor can be connected.

Current Transformer Interface

The product is equipped with a dedicated current transformer (CT) interface for directly connecting current transformers to the inverter. This interface allows the inverter to monitor export power by directly measuring current at the grid connection point.

For additional export power control, the RS485 communication interface can connect to a smart meter. Users can select either CTs or a smart meter, but not both simultaneously.

EPS Function

The inverter features a EPS function, forming a single-phase EPS grid using energy from the battery and PV system. During grid failures, the inverter disconnects from the grid and supplies critical loads through the EPS connector. When grid power returns, the inverter automatically reconnects to the grid.

Generator Function

The inverter can connect to a diesel generator which serves ad an auxiliary power source to power the Emergency Power Supply (EPS) loads and charge the battery. In case of a power outage, the inverter will automatically start the diesel generator. The generator can also be manually controlled via the app, where users can set the conditions for its activation. Users can configure the generator port (GEN port) based on their needs. It can be set to supply power to EPS loads and the battery, or it can be configured as an intelligent load port.

Earth fault alarm

This product complies with IEC 62109-2 clause 13.9 for earth fault alarm monitoring. If an earth fault alarm occurs, the red colour LED indicator will light up. At the same time, the error code 38 will be sent to the Solplanet Cloud.

4.6 Energy Management

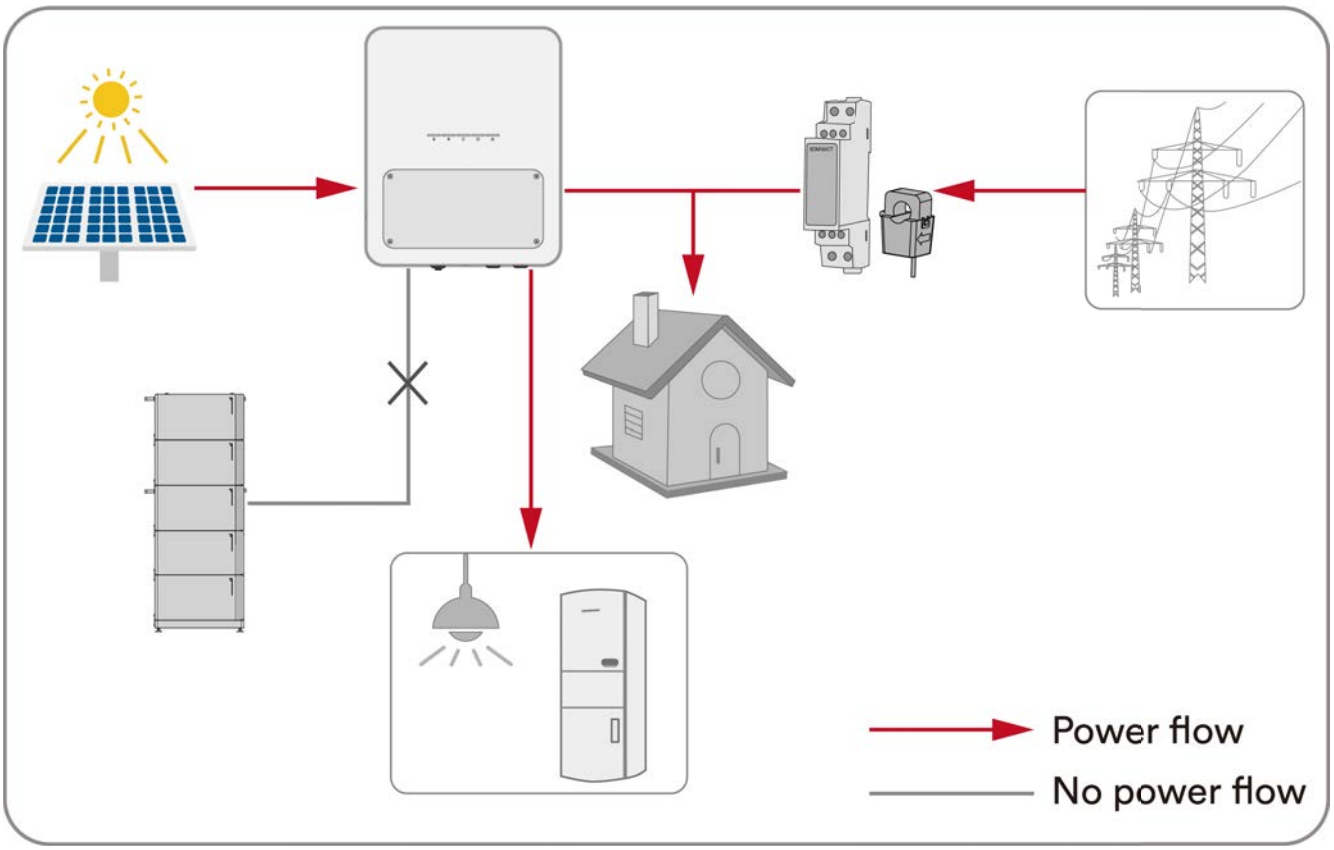
The energy management mode depends on PV energy and user's preference. There are five energy management mode can be chosen.

4.6.1 Self-Consumption mode

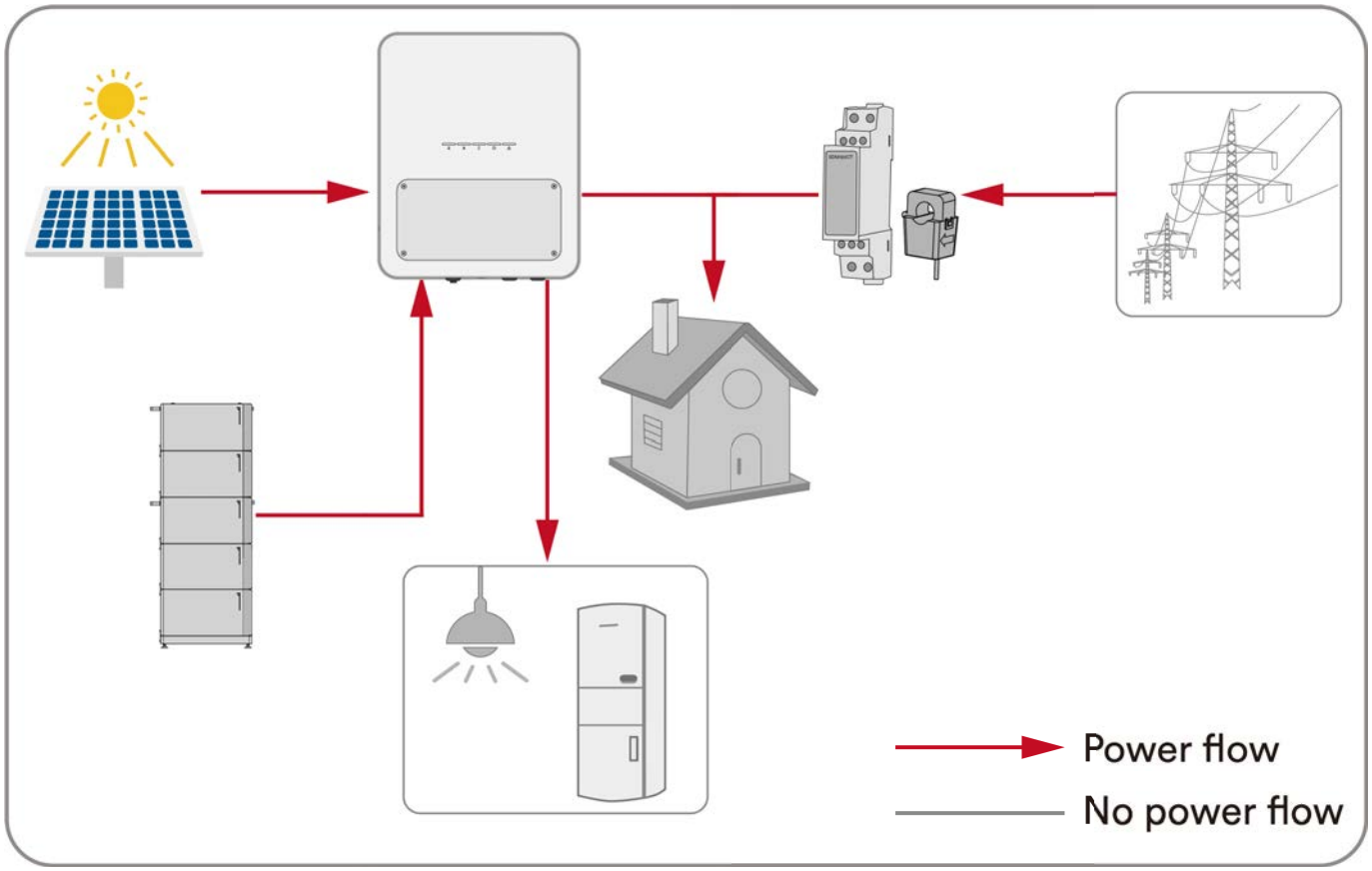
Self-consumption prioritises the supply of the load with PV and battery energy resulting in an increase of the self- consumption and self-sufficiency rates.

Energy management during the daytime:

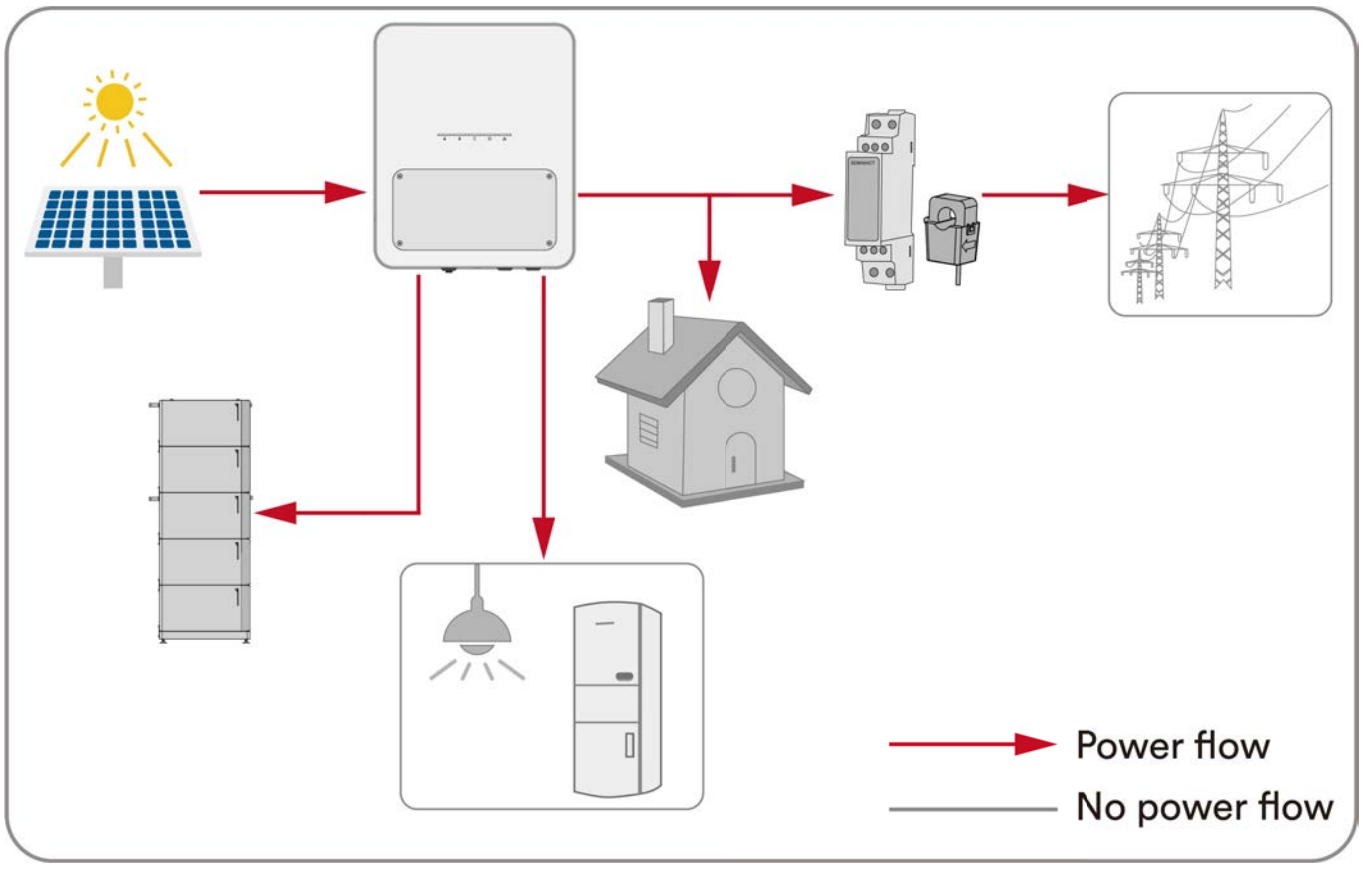
Case 1: PV power generation is lower than the power consumption and there is no battery energy available. The balance of load power, if any, is supplied from the utility grid.



Case 2: PV power generation is lower than the power consumption and there is available battery energy. The balance of load power, is supplied from the battery and if needed from the utility grid.

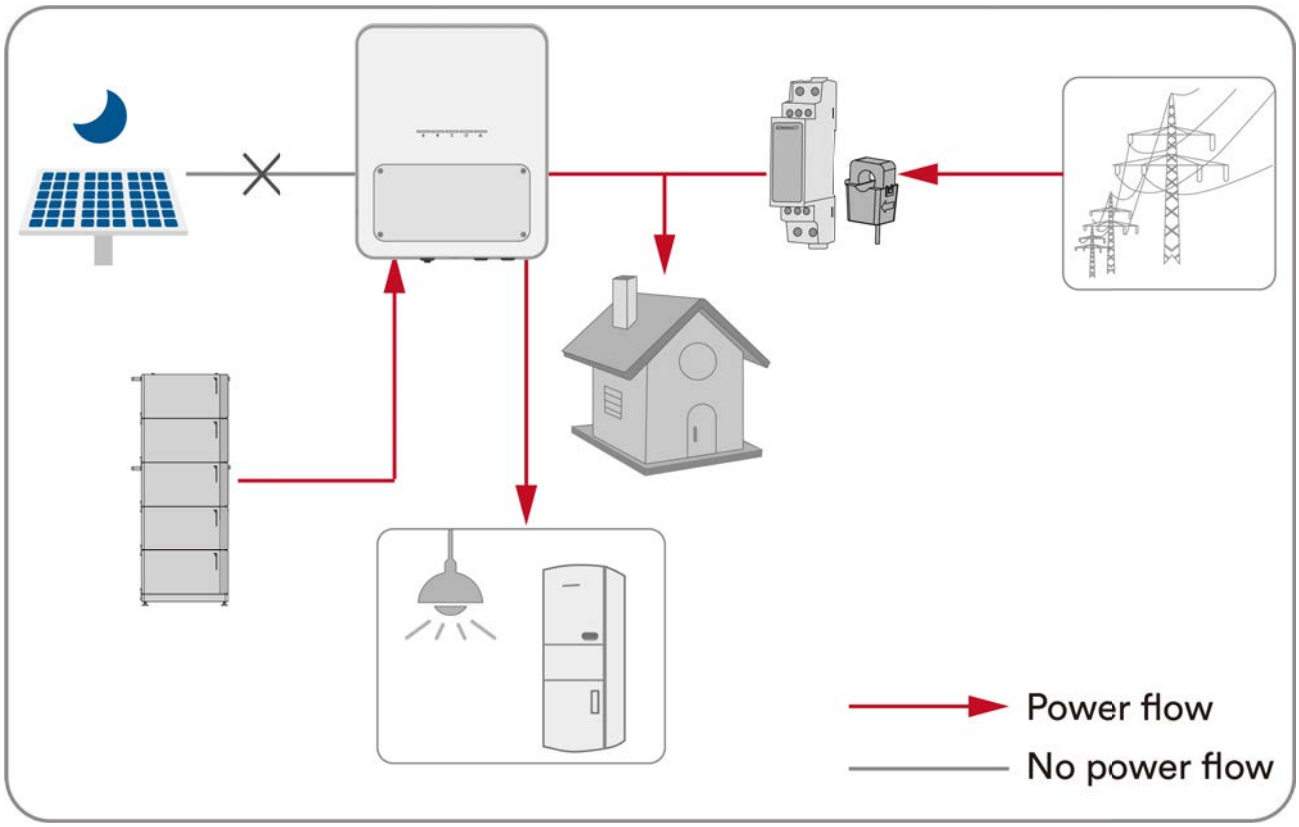


Case 3: PV power generation is larger than the power consumption. Battery charging via PV energy is prioritised. PV energy is exported to the utility grid if it is greater than the load and when the battery is completely charged.

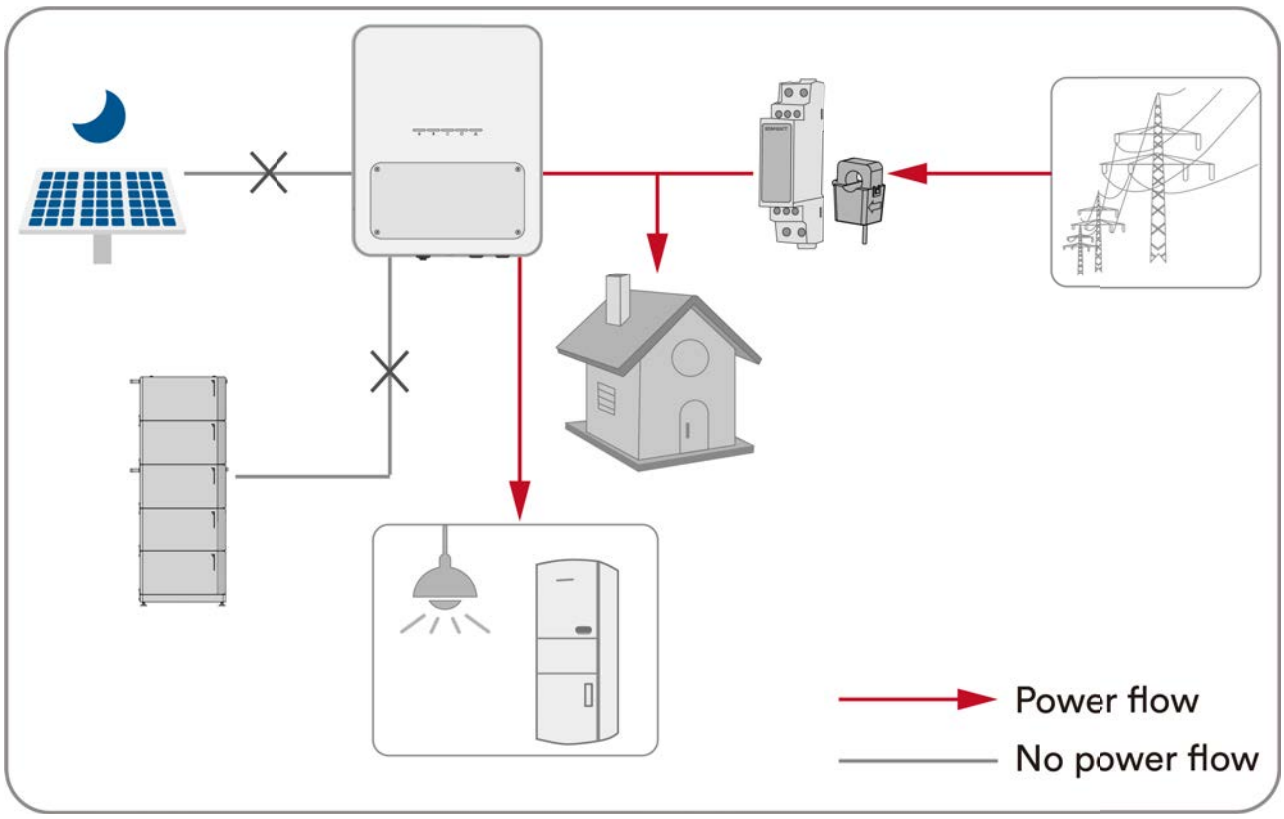


The energy management during night:

Case 1: Battery energy is available. The power consumption will be supplied by the battery and the balance, if required, will be supplied by the utility grid.



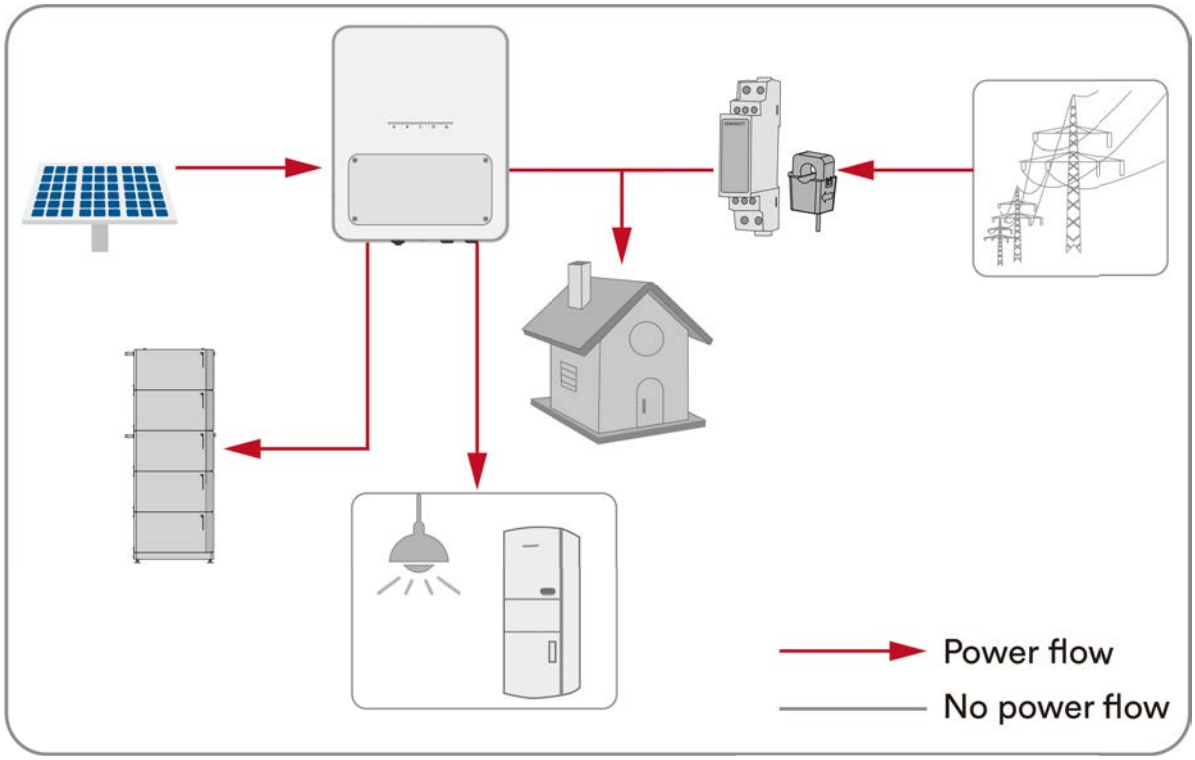
Case 2: Battery energy not available. The load power consumption will be supplied by the utility grid.



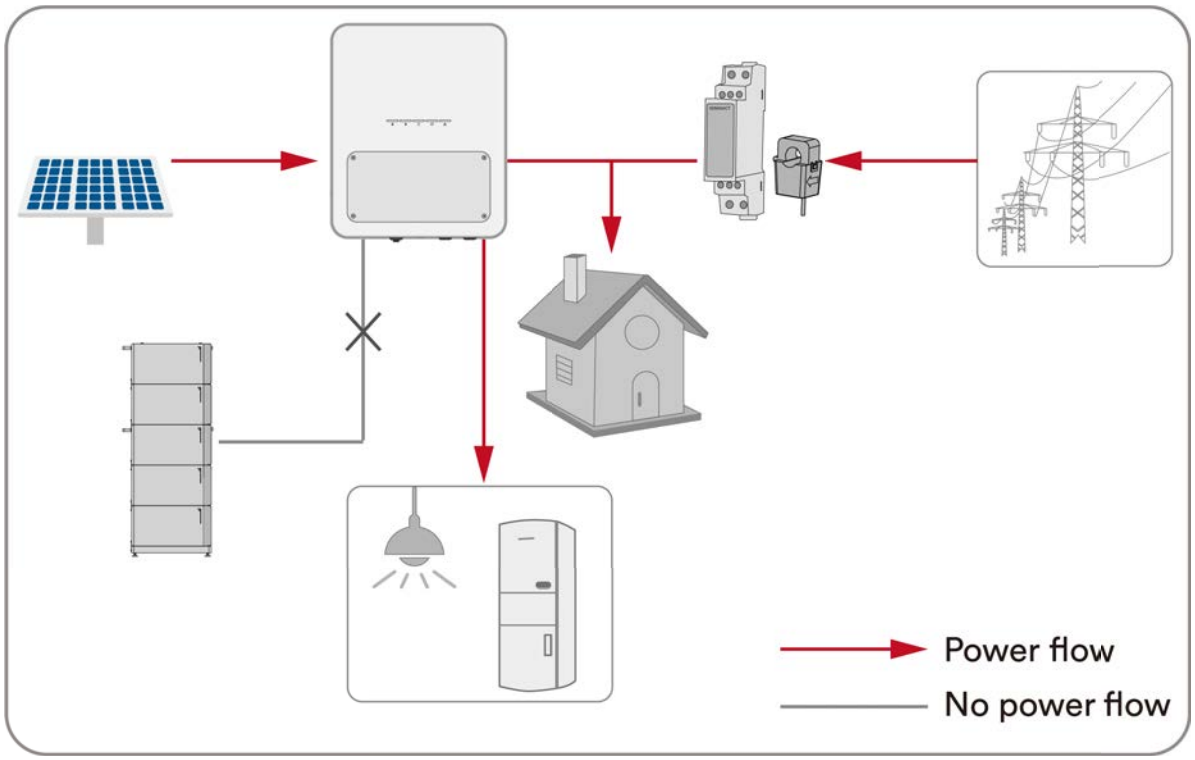
4.6.2 Reserve power mode

The battery is considered as a back-up energy storage device. PV power prioritises the charging of the battery if it is not completely charged. The battery discharges only during a loss of the utility grid.

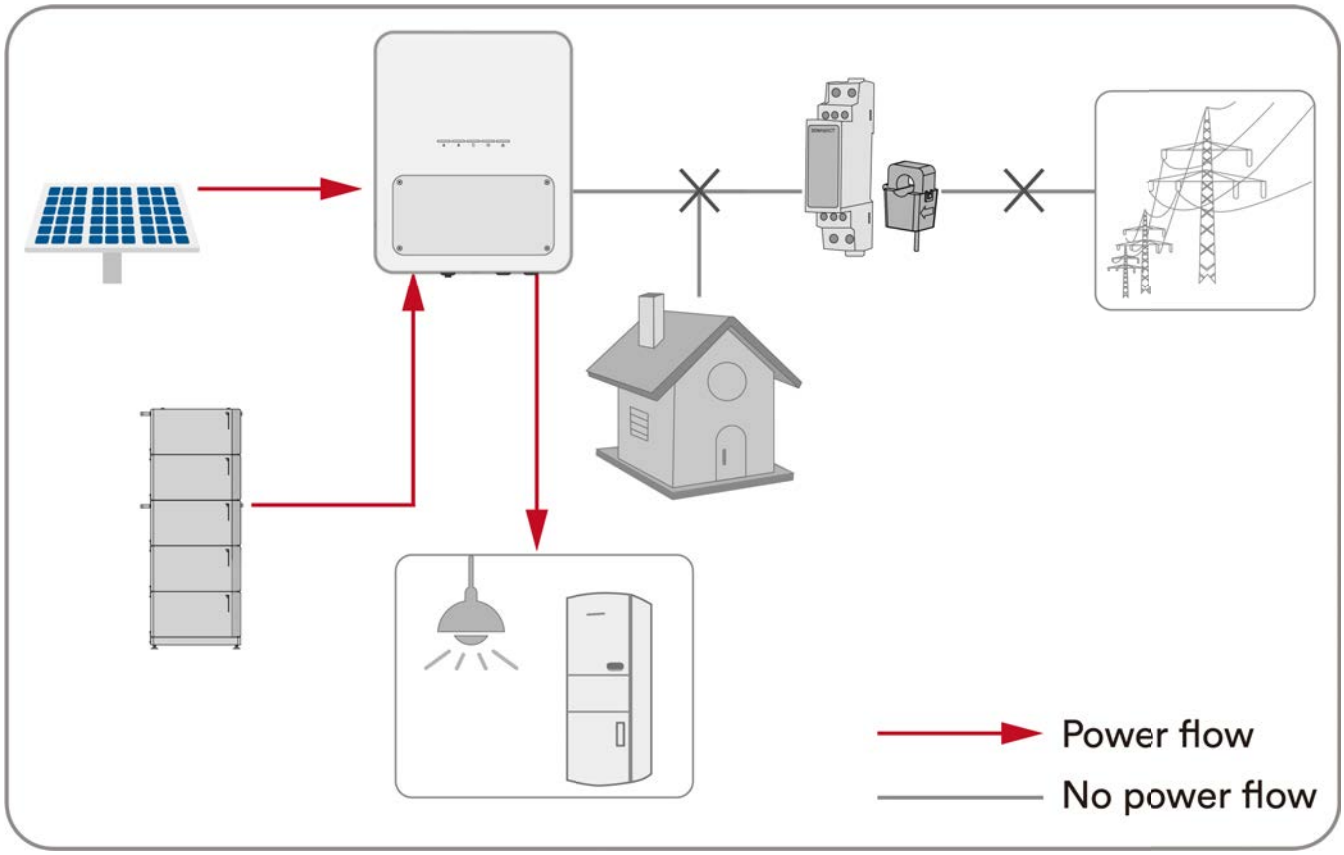
Case 1: The battery is not completely charged. PV power will prioritise the charging of the battery. The balance of load power, if required, is supplied from the utility grid.



Case 2: The battery is completely charged, the load power consumption is supplied by excess PV power and the balance, if required, is supplied by the utility grid.



Case 3: The battery discharges when there is a loss of the utility grid.

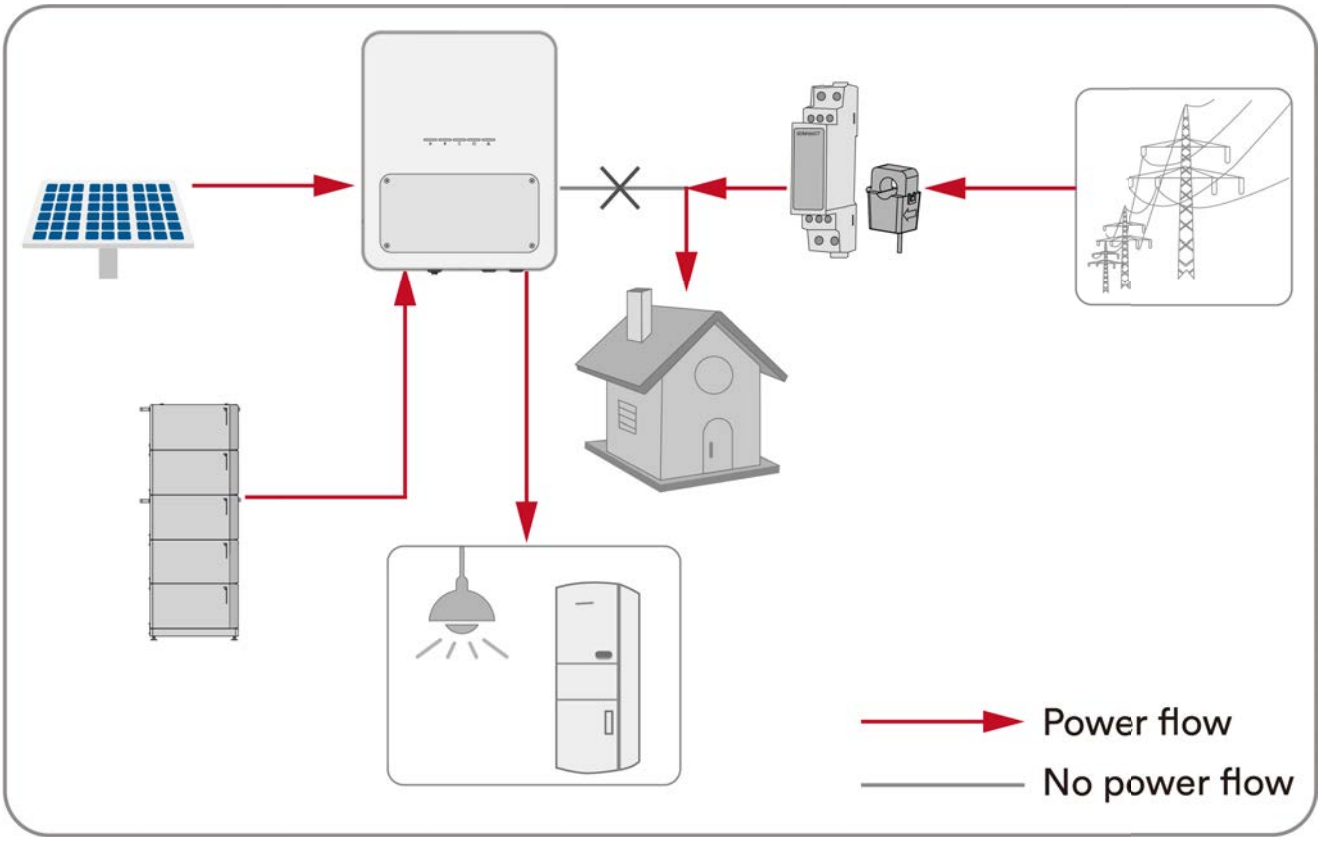


4.6.3 Custom Mode

Users can manage the energy according to their own needs, and set the daily regular charging and discharging on the app. Outside of these times the inverter operates in self-consumption mode.
This mode requires Ai-Dongle to connect to the network normally in order to function properly.

4.6.4 Off-grid mode

The product operates as a stand-alone inverter. Power is only supplied via the EPS port. No loads shall be connected to the normal AC output terminal.



4.6.5 Time of use Mode

Let the inverter charge or discharge the battery to the set SOC value within the time period set by the app, and the battery discharge power in the grid-connected state can be customized.

Time of use mode reasonably sets the expected SOC of the battery according to the energy change of PV in the day, which helps the energy storage inverter to store the PV power to the battery with maximum efficiency, reduces the cost of buying electricity from the grid, and improves the cost performance of the energy storage inverter. This mode requires WiFi stick to connect to the network normally in order to function properly.

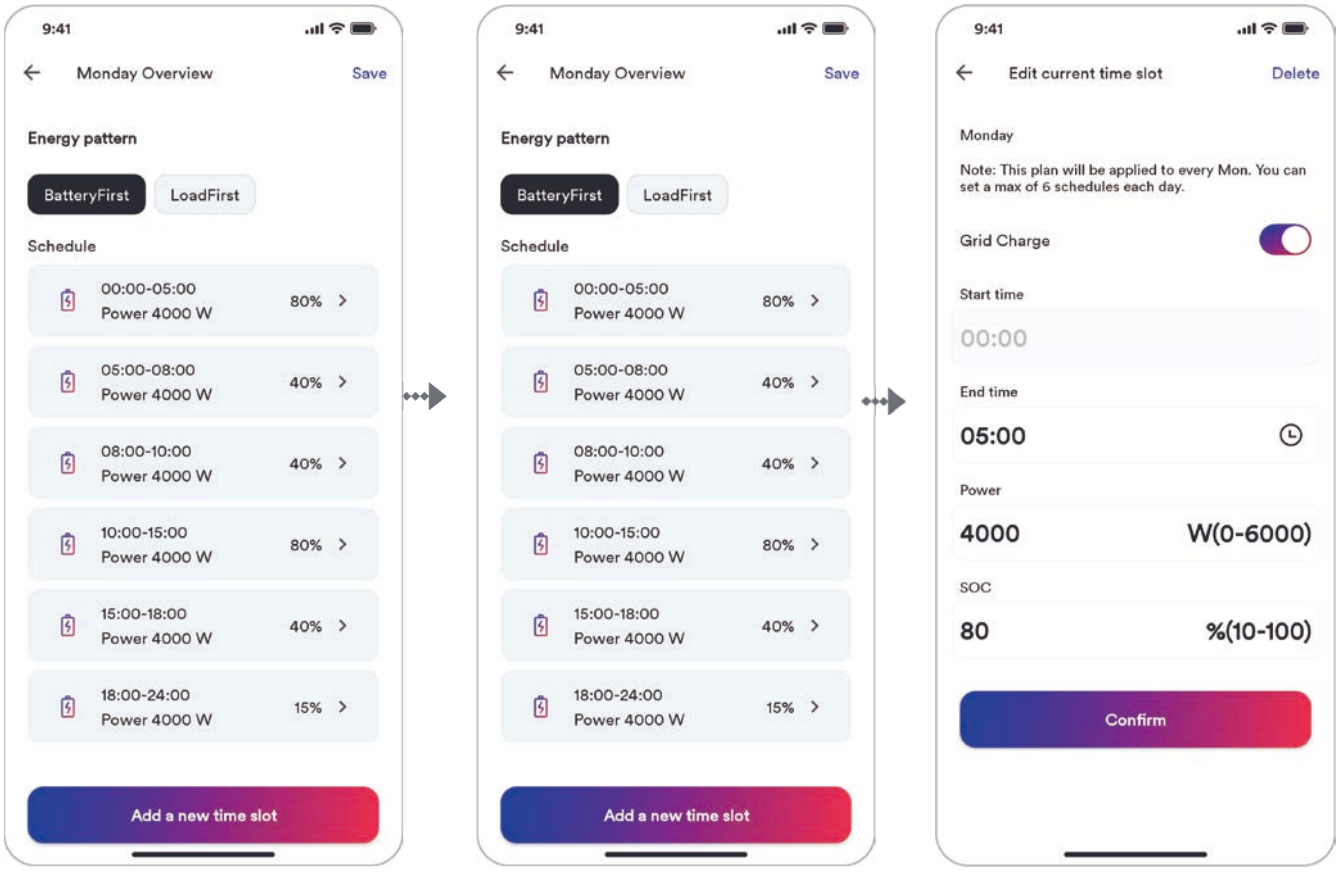
1. Battery first：PV power is firstly used to charge the battery and then used to power the load. If PV power is insufficient, grid will make supplement for battery and load simultaneously.

2. Load first：PV power is firstly used to power the load and then used to charge the battery. If PV power is insufficient, grid will make supplement for battery and load simultaneously.

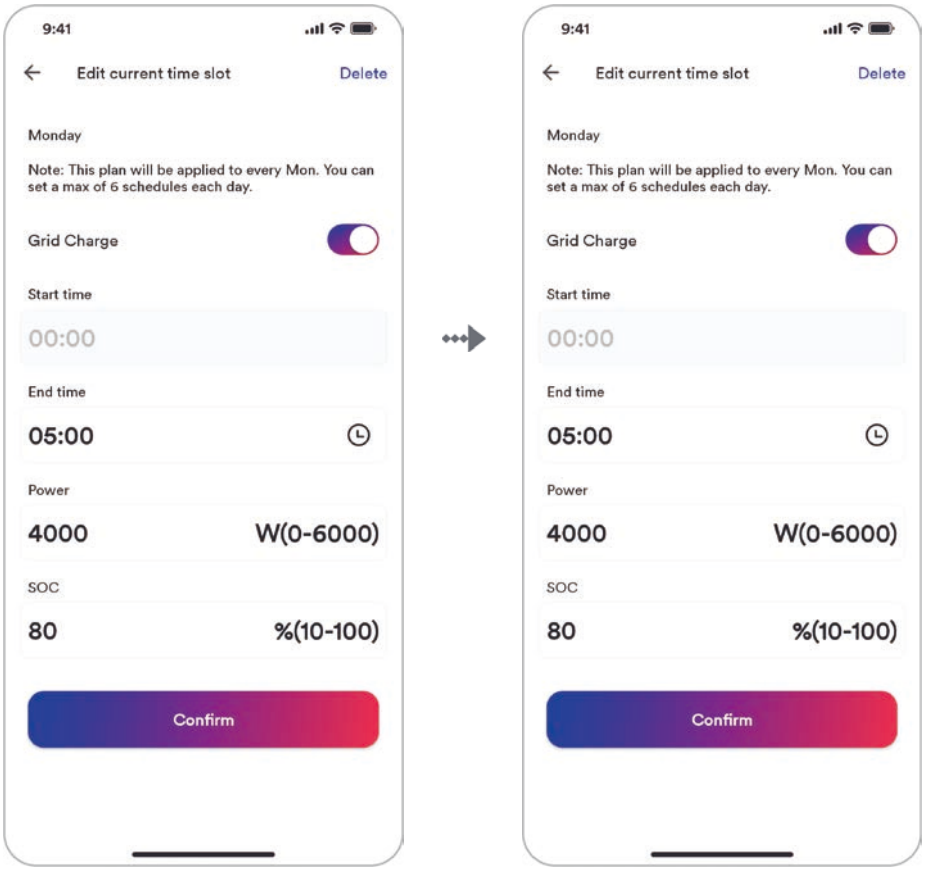
3. Grid Charge：utilize grid to charge the battery in a time period.

4. Power: The maximum allow-able discharge power of the battery when connected to the grid.

5. Battery (SOC %): battery SOC % at when the action is to happen.

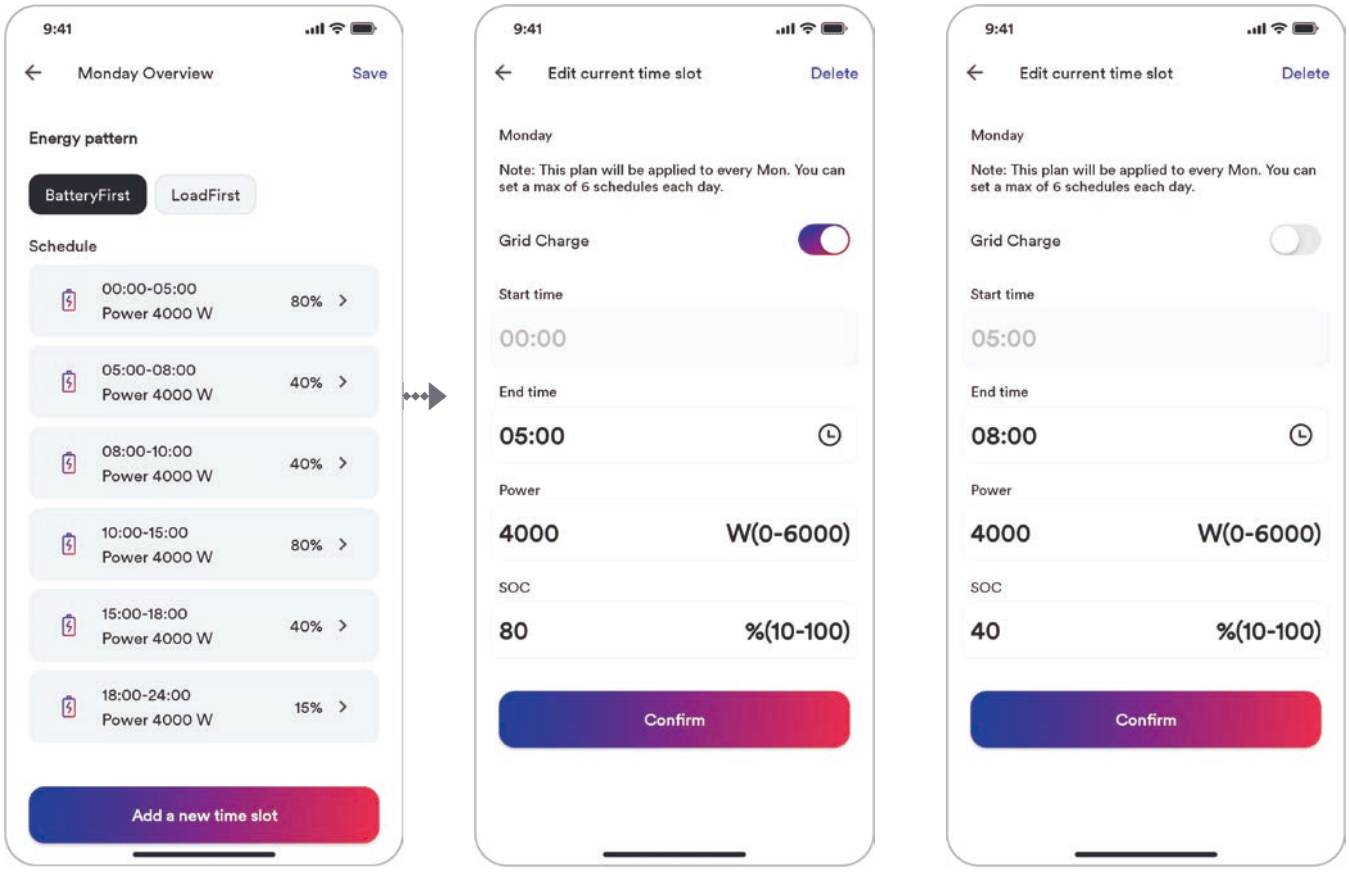

9:41
Monday Overview
Save
Energy pattern
BatteryFirst
LoadFirst
Schedule
00:00-05:00
Power 4000 W
80%
05:00-08:00
Power 4000 W
40%
08:00-10:00
Power 4000 W
40%
10:00-15:00
Power 4000 W
80%
15:00-18:00
Power 4000 W
40%
18:00-24:00
Power 4000 W
15%
Add a new time slot
9:41
Monday Overview
Save
Energy pattern
BatteryFirst
LoadFirst
Schedule
00:00-05:00
Power 4000 W
80%
05:00-08:00
Power 4000 W
40%
08:00-10:00
Power 4000 W
40%
10:00-15:00
Power 4000 W
80%
15:00-18:00
Power 4000 W
40%
18:00-24:00
Power 4000 W
15%
Add a new time slot
9:41
Edit current time slot
Delete
Monday
Note: This plan will be applied to every Mon. You can set a max of 6 schedules each day.
Grid Charge
Start time
00:00
End time
05:00
Power
4000
W(0-6000)
SOC
80
%(10-100)
Confirm

1 2 3

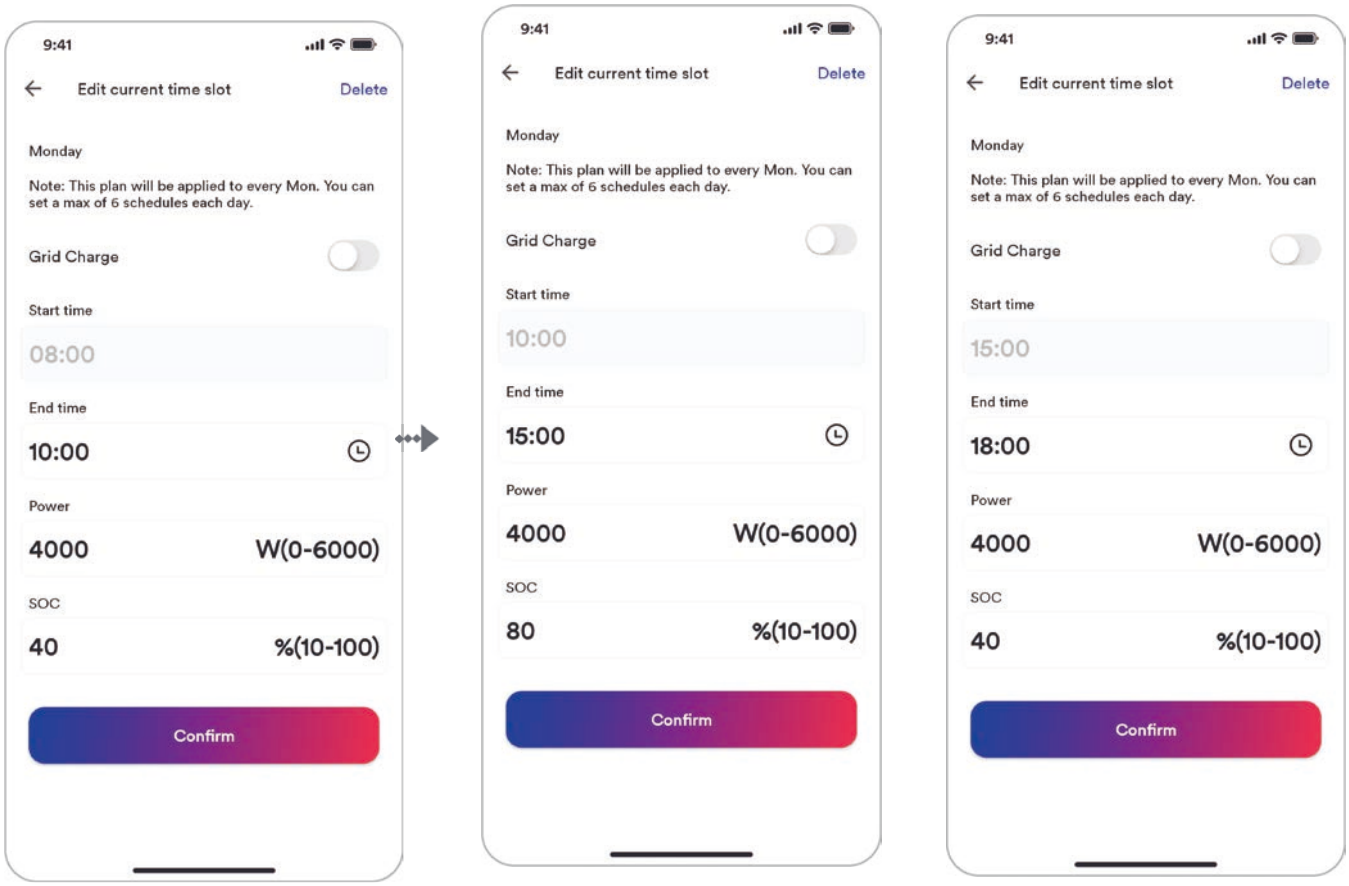

9:41
Edit current time slot
Delete
Monday
Note: This plan will be applied to every Mon. You can set a max of 6 schedules each day.
Grid Charge
Start time
00:00
End time
05:00
Power
4000
W(0-6000)
SOC
80
%(10-100)
Confirm
9:41
Edit current time slot
Delete
Monday
Note: This plan will be applied to every Mon. You can set a max of 6 schedules each day.
Grid Charge
Start time
00:00
End time
05:00
Power
4000
W(0-6000)
SOC
80
%(10-100)
Confirm

4 5

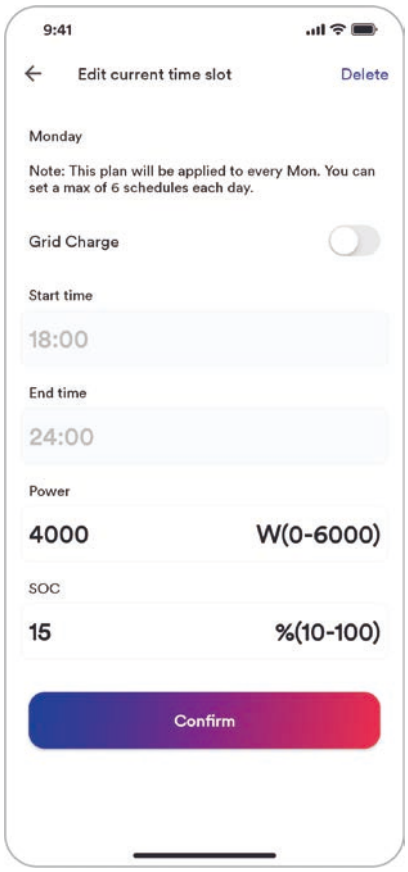
For example



1 2 3



4 5 6



7

2: During 00:00-05:00, when battery SOC is lower than 80%, it will use grid to charge the battery until battery soc reaches 80%.

3-4: During 05:00-08:00 and 08:00-10:00, when battery SOC is higher than 40%, hybrid inverter will discharge the battery until the Soc reaches 40%.

5: During 10:00-15:00, when battery SOC is higher than 80%, hybrid inverter will discharge the battery until the SOC reaches 80%.

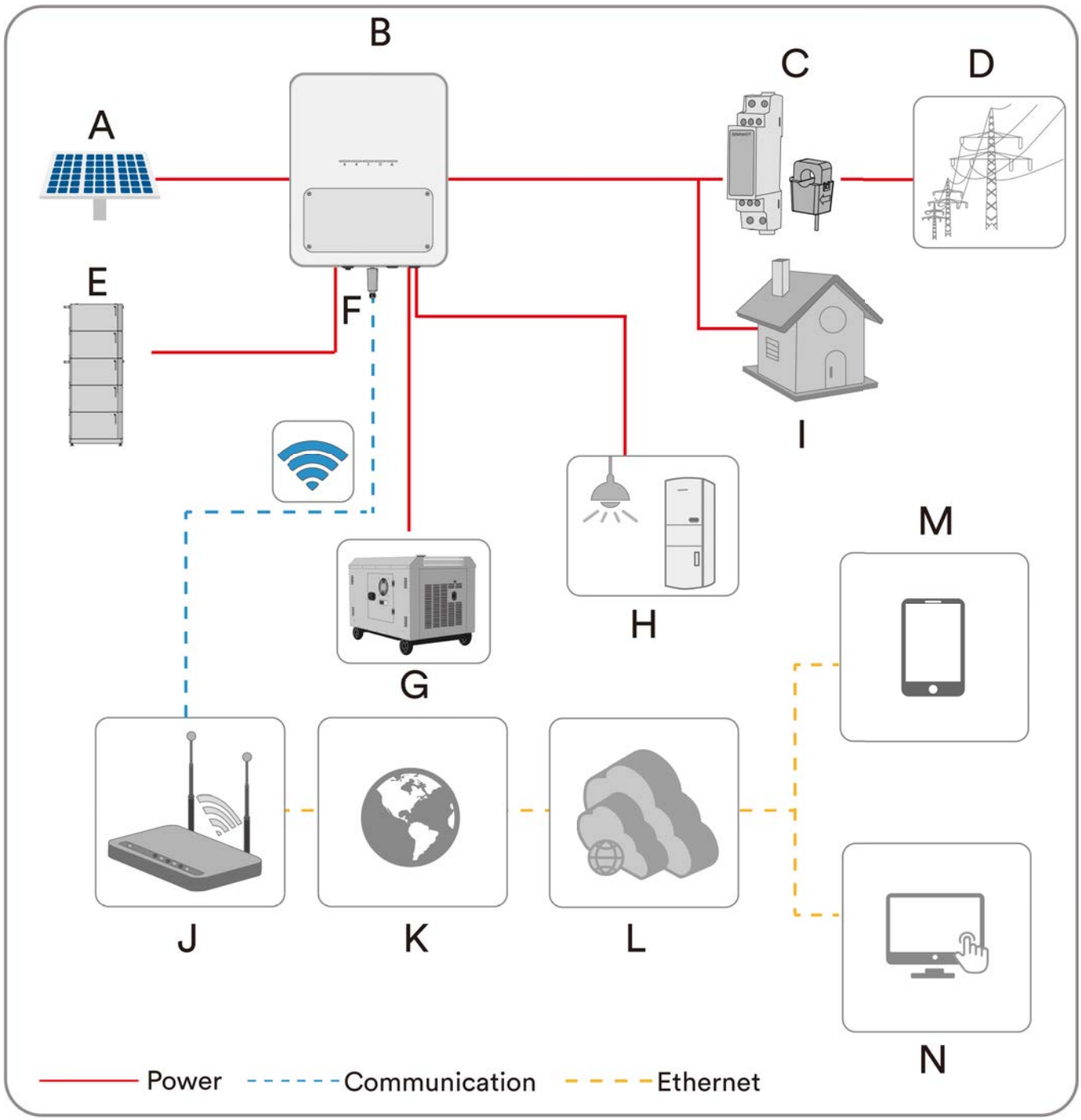
6: During 15:00-18:00, when battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%.

7: During 18:00-00:00, when battery SOC is higher than 35%, hybrid inverter will discharge the battery until the SOC reaches 35%.

4.7 Basic system solution

The product is a high-quality inverter that converts solar energy to AC power and stores excess energy production in a battery. It optimizes self-consumption, enables energy storage for future use, and supports grid feed-in.

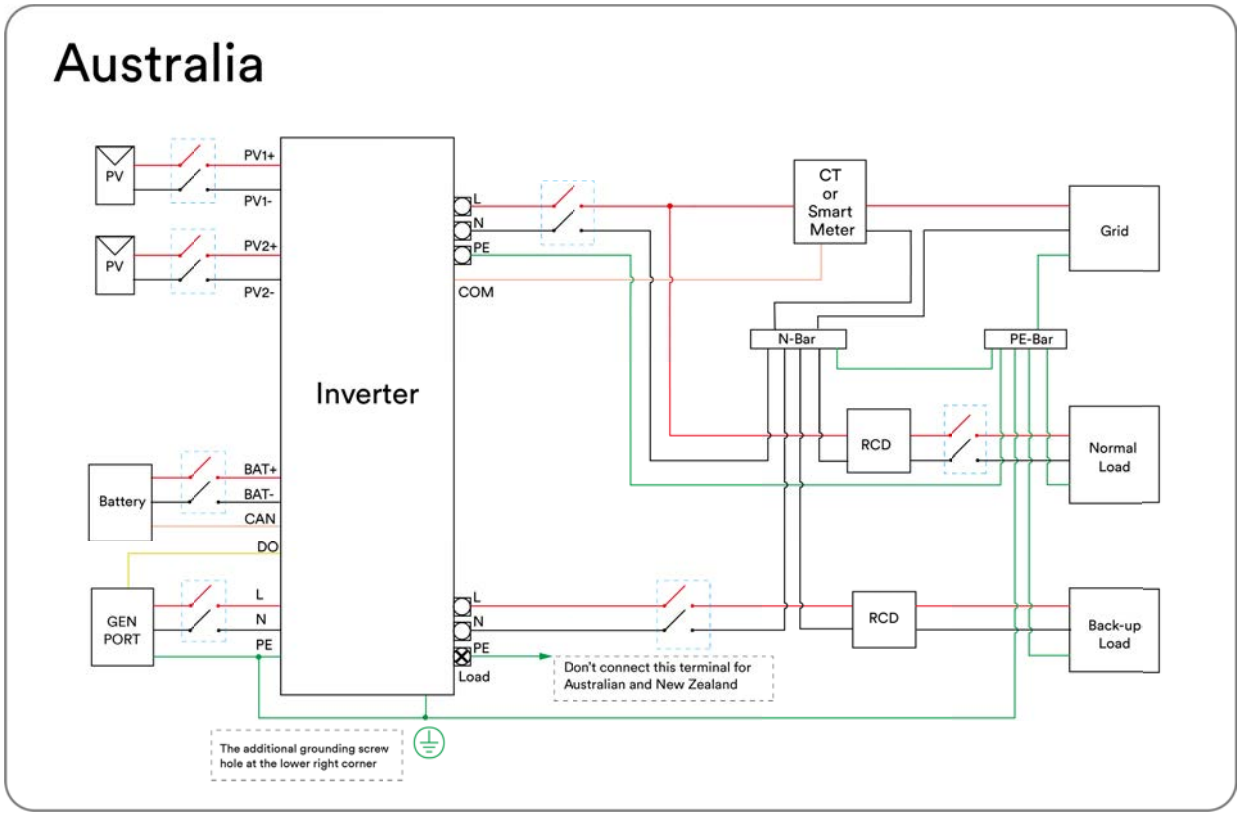
The basic application of this product as follow:



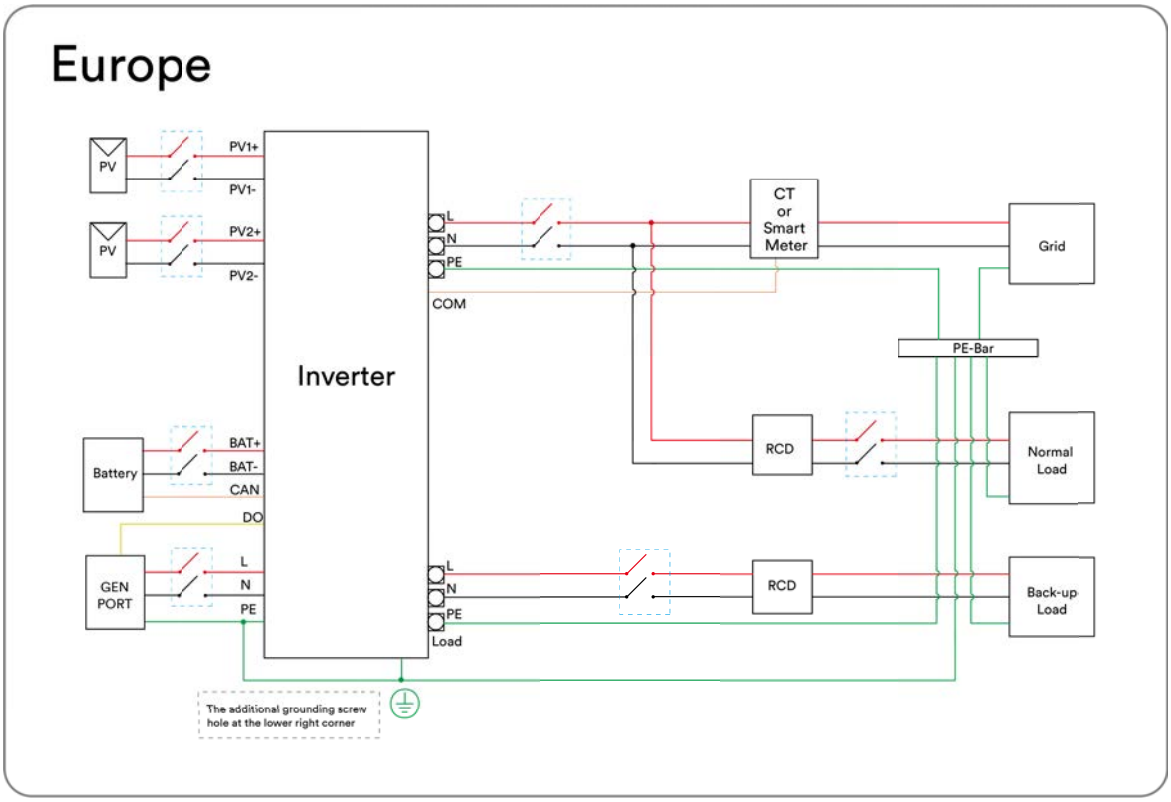
Object	Description	Remark
A	PV array	The product can connect to monocrystalline and polycrystalline silicon based PV modules and thin-film modules that require no functional grounding.
B	Hybrid inverter	ASW002-006K-SH series products have one battery (BAT) port.
C	Smart meter	The smart meter is the central device responsible for energy management. Communicate with the inverter through the RS485 protocol.
D	Utility grid	The product can connect to TN and TT grounding system grid.
E	Battery system	The product must only be operated in connection with an intrinsically safe lithium-ion battery system or a lead-acid battery approved by Solplanet
F	Ai-Dongle	The Ai-Dongle supports ethernet and WLAN communication. It is not recommended to use both communication methods at the same time.
G	Diesel generator	The product can connect to diesel generator. Batteries can be charged and EPS loads can be supplied by the diesel generator.
H	EPS Load	The EPS load directly connected to the EPS port of the inverter. The EPS load can be power supplied by the inverter after the utility grid is failure.
I	Normal load	The loads which are directly connected to the utility grid. The normal load will not be supplied with power when there is a grid failure.
J	Router	The product can connect to a router via Wi-Fi or an ethernet cable.
K	Internet	The inverter and battery data is sent to the Solplanet Cloud via the Internet.
L	Cloud server	The monitor information is stored at cloud server.
M	Smart phone	The APP can be installed on the smart phone and then review the monitor information.
N	Computer	The monitor information also can be review on the computer.

The system diagram of this product as follow:

For Australia and New Zealand, the neutral cable of On-grid side and EPS side must be connected together according to the wiring rules AS/NZS 3000. Otherwise the EPS function will not work.

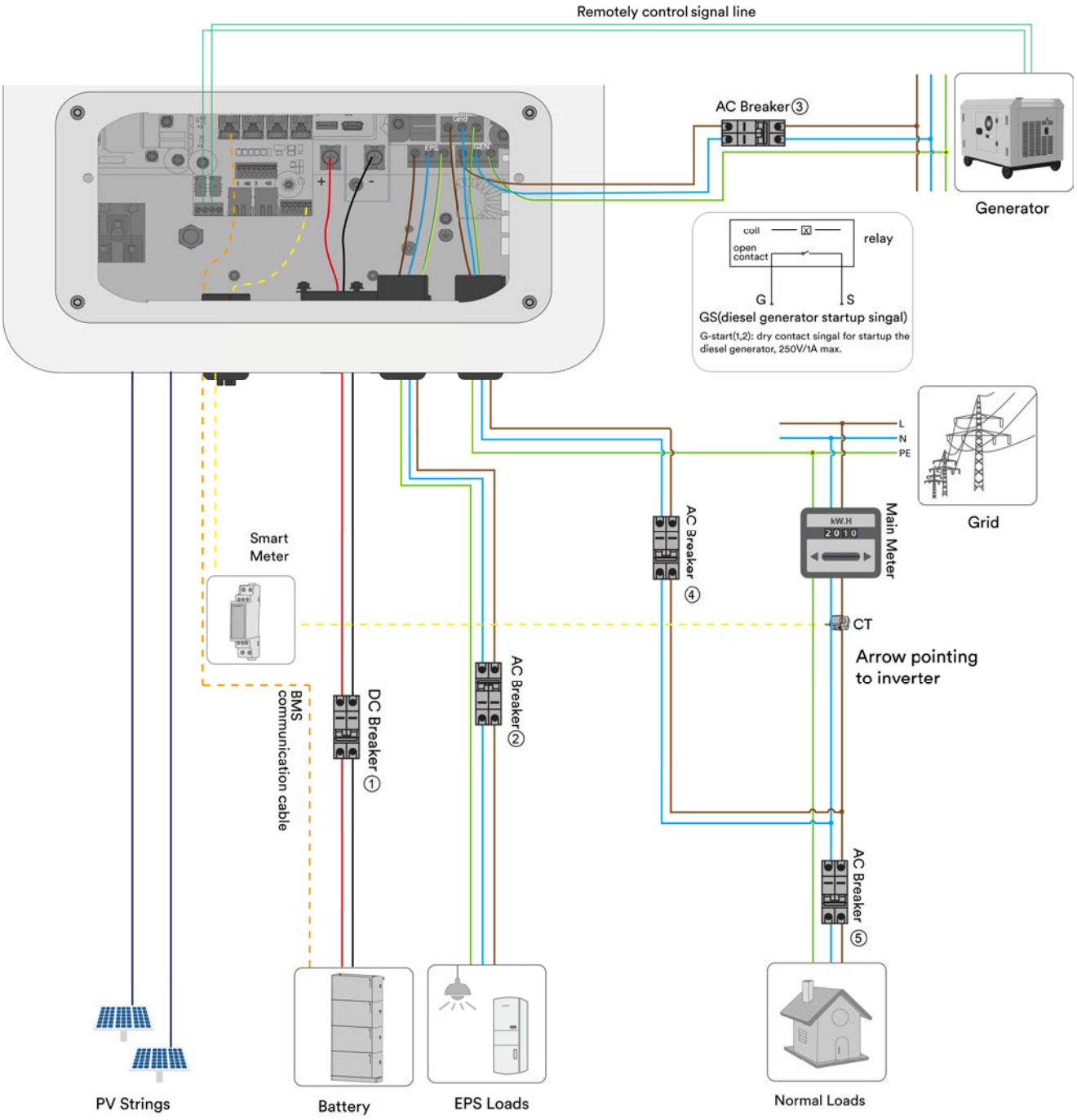


For other countries, the following diagram is an example for grid systems without special requirement on wiring connection.



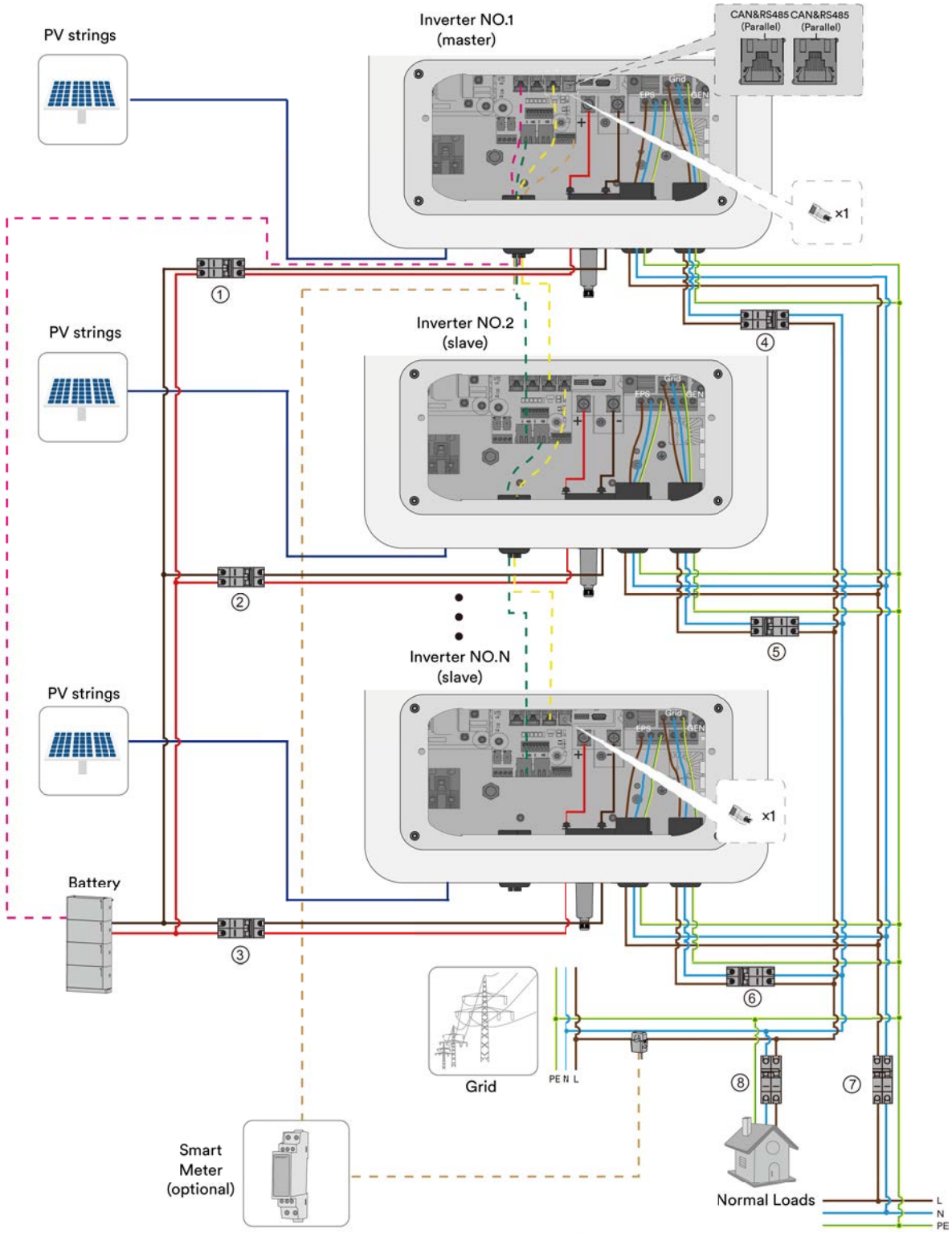
Smart meter connection refer to 6.8.6.

The wiring of a basic application as an example for grid connected systems without special requirements is shown below:



Breaker No.	ASW002K-SH	ASW2.50K-SH	ASW003K-SH	ASW3.68K-SH	ASW004K-SH	ASW005K-SH	ASW006K-SH
1	63A/100V DC Breaker	80A/100V DC Breaker	100A/100V DC Breaker		125A/100V DC Breaker	150A/100V DC Breaker	
2	16A/Greater than 300V AC Breaker	20A/Greater than 300V AC Breaker		25A/Greater than 300V AC Breaker		32A/Greater than 300V AC Breaker	40A/Greater than 300V AC Breaker
3							
4	25A/Greater than 300V AC Breaker	32A/Greater than 300V AC Breaker	40A/Greater than 300V AC Breaker			63A/Greater than 300V AC Breaker	
5	Depends on household load						

4.8 Parallel System



Breaker No.	ASW002K-SH	ASW2.50K-SH	ASW003K-SH	ASW3.68K-SH	ASW004K-SH	ASW005K-SH	ASW006K-SH
1	63A/100V DC Breaker	80A/100V DC Breaker	100A/100V DC Breaker		125A/100V DC Breaker	150A/100V DC Breaker	
2							
3							
4	25A/Greater than 300V AC Breaker	32A/Greater than 300V AC Breaker	40A/Greater than 300V AC Breaker			63A/Greater than 300V AC Breaker	
5							
6							
7	Greater than N*9.6A/ 300V AC Breaker	Greater than N*12A/ 300V AC Breaker	Greater than N*14.3A/ 300V AC Breaker	Greater than N*17.6A/ 300V AC Breaker	Greater than N*19.1A/ 300V AC Breaker	Greater than N*23.9A/ 300V AC Breaker	Greater than N*28.7A/ 300V AC Breaker
	N : number of parallel units						
8	Depends on household load						

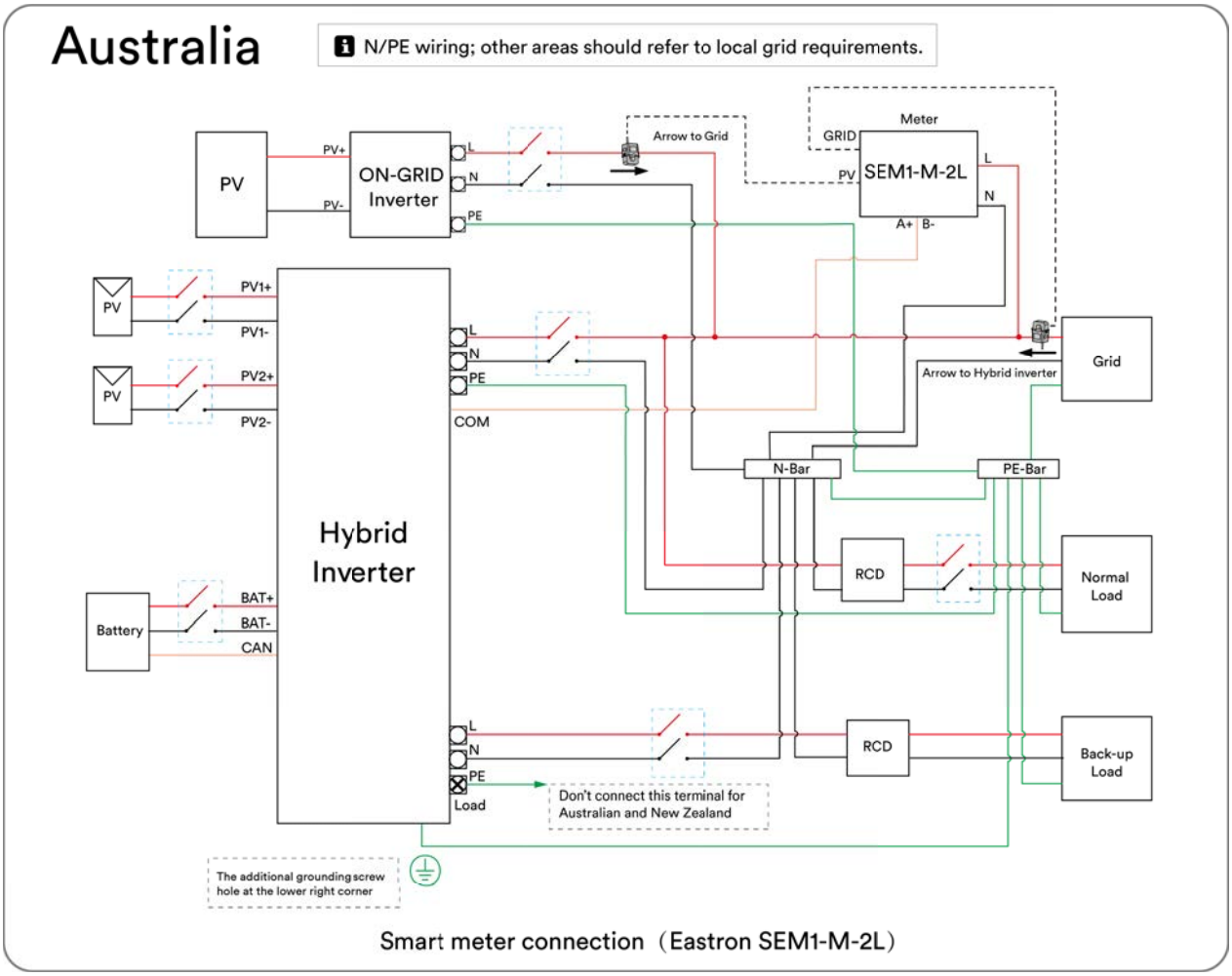
The parallel system supports the following meters. Customers can install different specifications of meters which can meet AC bus current requirement. Recommend purchasing smart meter from Soplanet, some functions will be limited if purchased from other sources.

Based on the normal household load, the following meter recommendation is made. (If the household load is too large to exceed the maximum current of the meter, choose different specifications of the meter according to their own situation)

<table>
<tr><th>Parallel units No.</th><th>ASW002K-SH</th><th>ASW2.50K-SH</th><th>ASW003K-SH</th><th>ASW3.68K-SH</th><th>ASW004K-SH</th><th>ASW005K-SH</th><th>ASW006K-SH</th></tr>
<tr><td>n=1</td><td rowspan="4">Eastron SDM120CT 40mA
(ESCT-TA16 100A/40mA)</td><td rowspan="3">Eastron SDM120CT 40mA
(ESCT-TA16 100A/40mA)</td><td colspan="3" rowspan="2">Eastron SDM120CT 40mA（ESCT-TA16 100A/40mA）</td><td colspan="2">Eastron SDM120CT 40mA（ESCT-TA16 100A/40mA）</td></tr>
<tr><td>n=2</td><td colspan="2" rowspan="2">Eastron SDM120CT 40mA（ESCT-TA24 200A/40mA）</td></tr>
<tr><td>n=3</td><td colspan="3" rowspan="3">Eastron SDM120CT 40mA（ESCT-TA24 200A/40mA）</td><td colspan="2" rowspan="2">Eastron SDM120CT 40mA（ESCT-TA24 300A/40mA）</td></tr>
<tr><td>n=4</td></tr>
<tr><td>n=5</td><td rowspan="2">Eastron SDM120CT 40mA
(ESCT-TA24 200A/40mA)</td><td rowspan="2">Eastron SDM120CT 40mA
(ESCT-TA24 200A/40mA)</td></tr>
<tr><td>n=6</td></tr>
</table>

4.9 AC couple solution

4.9.1 Single-phase grid with hybrid and on-grid inverters



Smart meter connection（Eastron SEM1-M-2L）

5 Mounting

5.1 Requirements for mounting

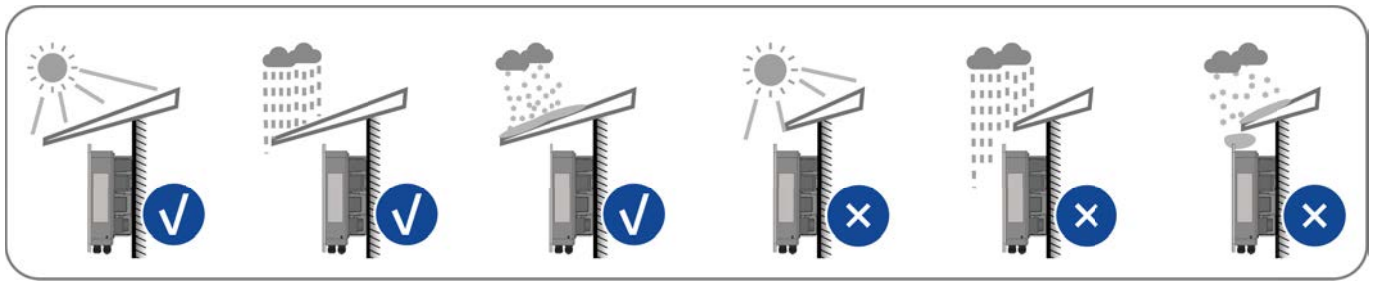
DANGER

Danger to life due to fire or explosion!

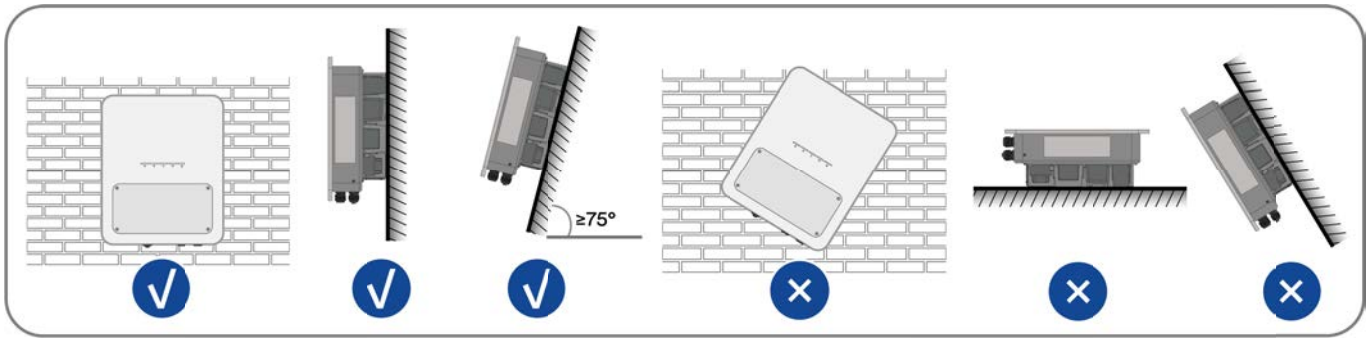
Despite careful construction, electrical devices can cause fires. This can result in death or serious injury.

- Do not mount the product in areas containing highly flammable materials or gases.
- Do not mount the inverter in areas where there is a risk of explosion.

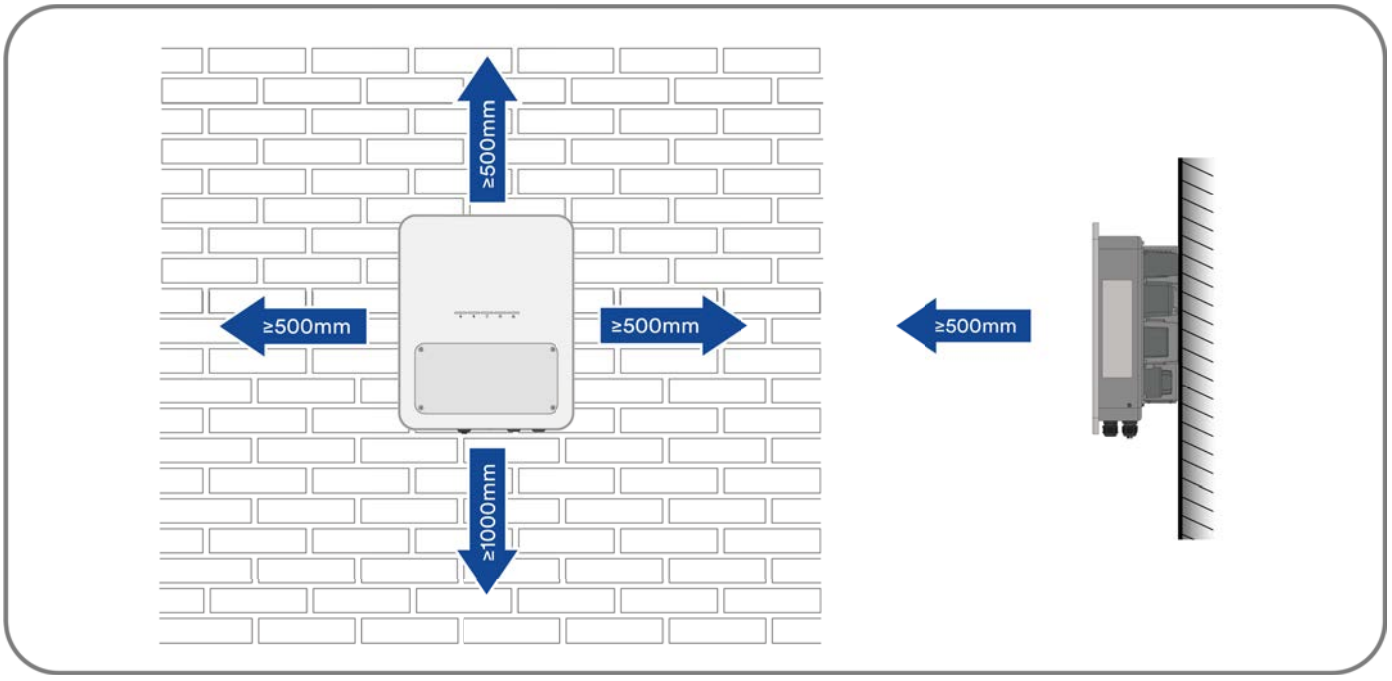
- The ambient temperature is recommended below 40°C to ensure optimal operation.
- A solid support surface must be available (e.g., concrete or masonry). Ensure that the installation surface is solid enough to bear four times the weight. When mounted on drywall or similar materials, the product emits audible vibrations during operation which could be perceived as annoying.
- The mounting location must be inaccessible to children.
- The mounting location should be freely and safely accessible at all times without the need for any auxiliary equipment (such as scaffolding or lifting platforms). Non-fulfillment of these criteria may restrict servicing.
- The mounting location must not be exposed to direct solar irradiation. If the product is exposed to direct solar irradiation, the exterior plastic parts might age prematurely and overheating might occur. When becoming too hot, the product reduces its power output to avoid overheating.



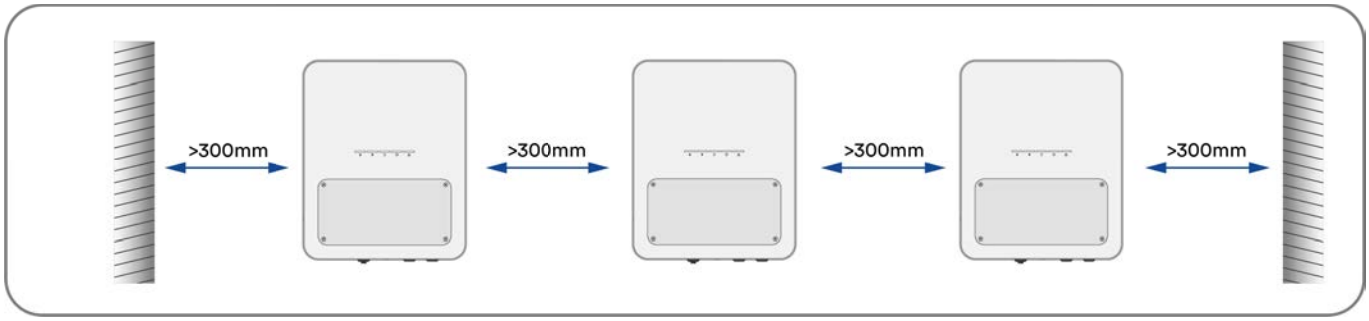
- Never install the inverter horizontally, or with a forward / backward tilt or even upside do- wn. The horizontal installation can result in damage to the inverter.



Maintain the recommended clearances to wall as well as to other inverters or objects.



- In case of multiple inverters, reserve specific clearance between the inverters.



- The product should be mounted such that the LED signals can be read off without difficulty.
- The DC load-break switch of the product must always be freely accessible.

5.2 Taking out and moving the product

Open the inverter packaging box, take the inverter out of the packaging box, and place the inverter at the designated installation location.

⚠CAUTION

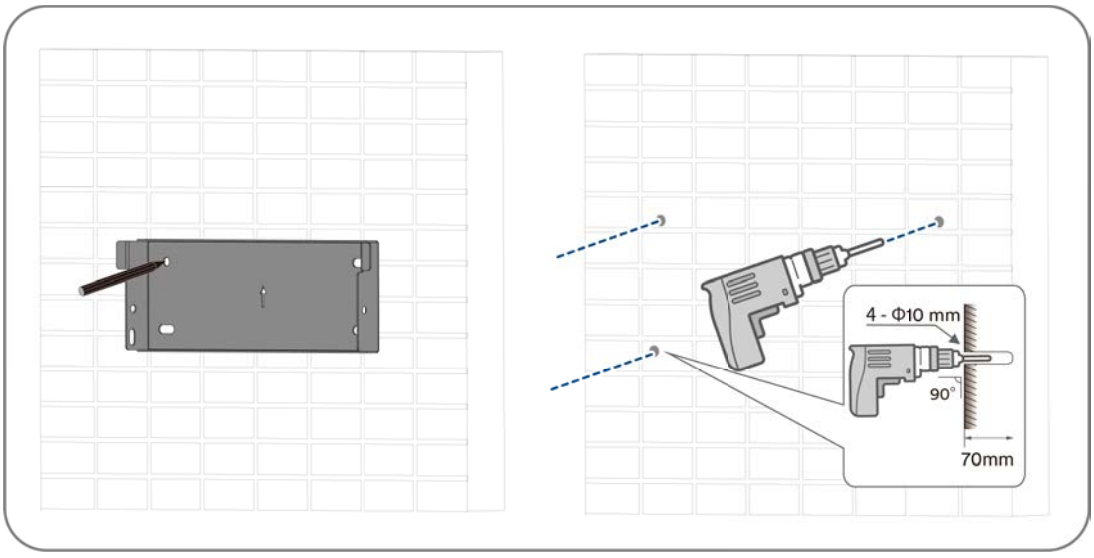
Risk of injury due to the weight of the product!

The net weight of this product is 22kg. If the inverter is lifted incorrectly during the installation, it may fall down and cause injury or equipment damage.

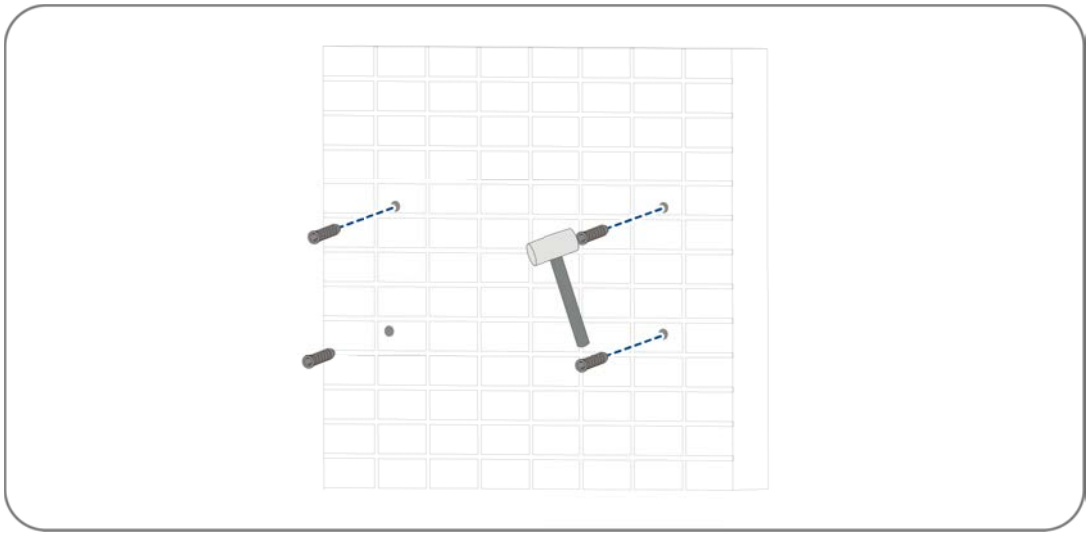
- Transport and lift the product carefully. Take the weight of the product into account.
- Wear suitable personal protective equipment for all work on the product.

5.3 Mounting

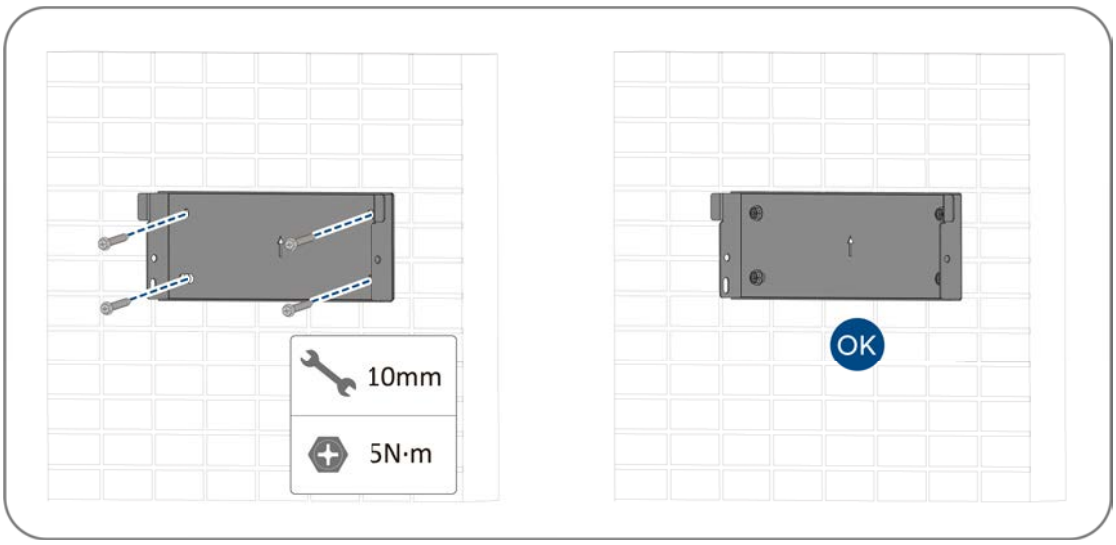
Step 1: Align the mounting-bracket horizontally on the wall with the arrow upwards. Mark the position of the drill hole. Set the wall mounting bracket aside and drill the marked holes with the diameter of 10mm. The depth of the holes should be about 70 mm. Keep the hammer drill bit perpendicular to the wall to avoid drilling inclined.



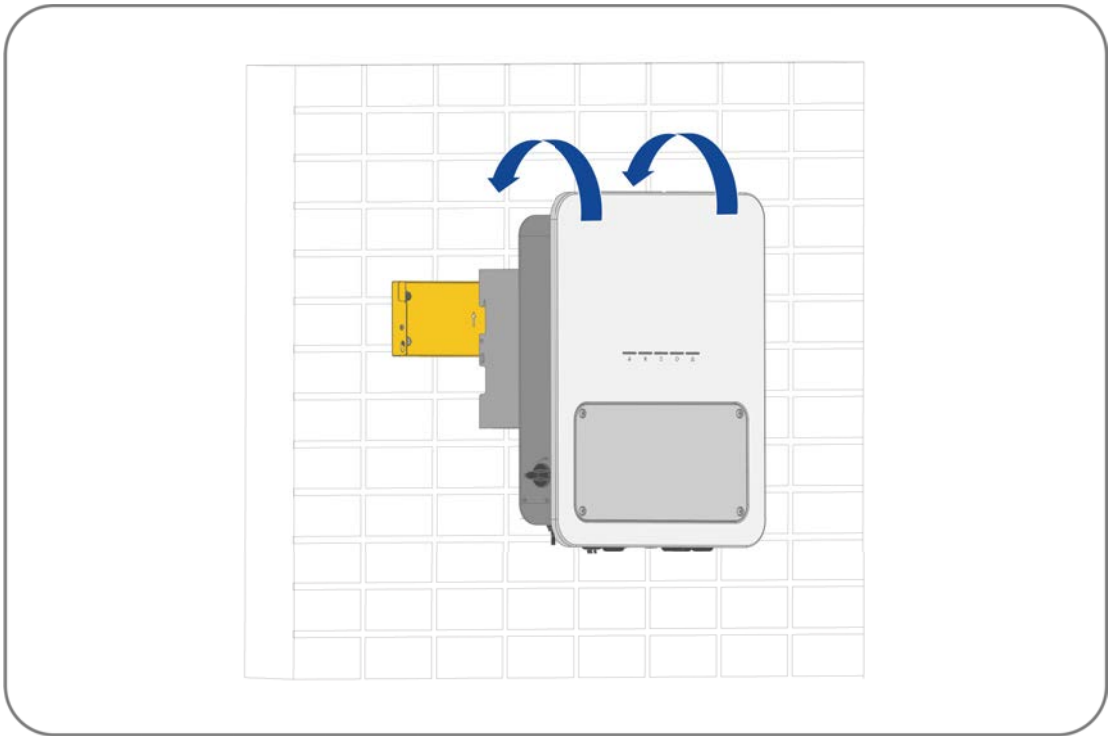
Step 2: Remove any dust from the hole, insert four expansion bolts into the holes, gently tap them into the hole with a rubber hammer.



Step 3: Align the mounting-bracket with the holes and fix using the expansion bolts.

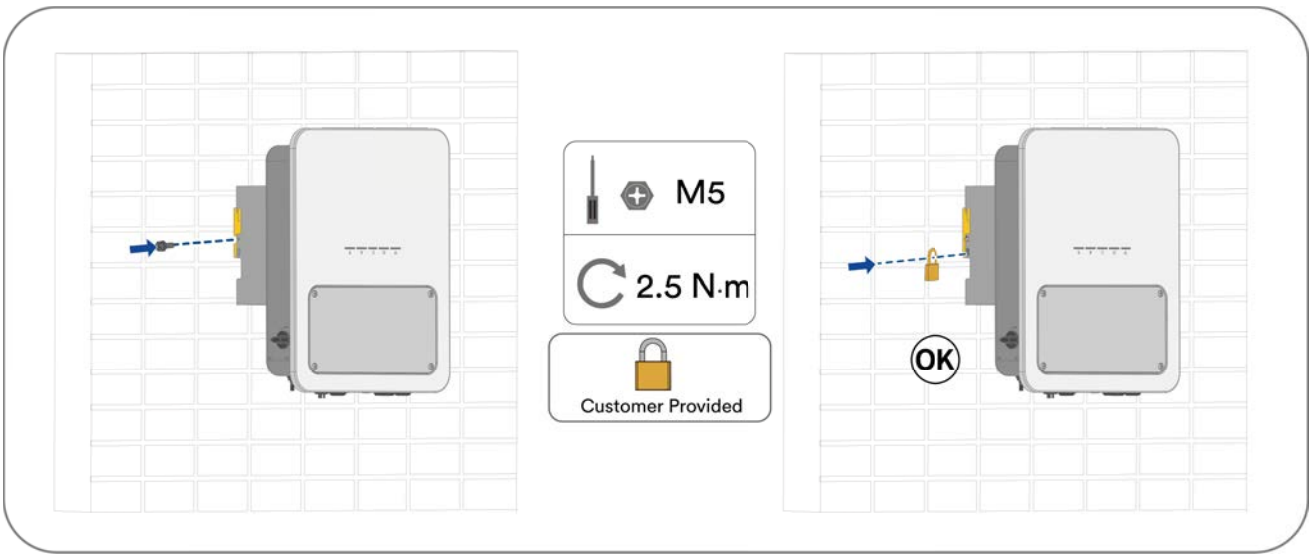


Step 4： Lift and place the inverter onto the mounting-bracket and ensure that the mounting flanges perfectly align with the mounting bracket.



Step 5： Secure the inverter by inserting screws into the threaded hole.

Step 6： To protect the inverter from theft, attach the padlock provided by customer through the wall mounting bracket and the inverter.



Complete the installation.

Ensure that the fixing points fit securely in the groove.

Customers can install anti-theft locks on the back of the inverter as required.

- The lock is not included in the package and can be purchased by the user.

6 Electrical connection

6.1 Connection port description

6.1.1 Bottom cable entry

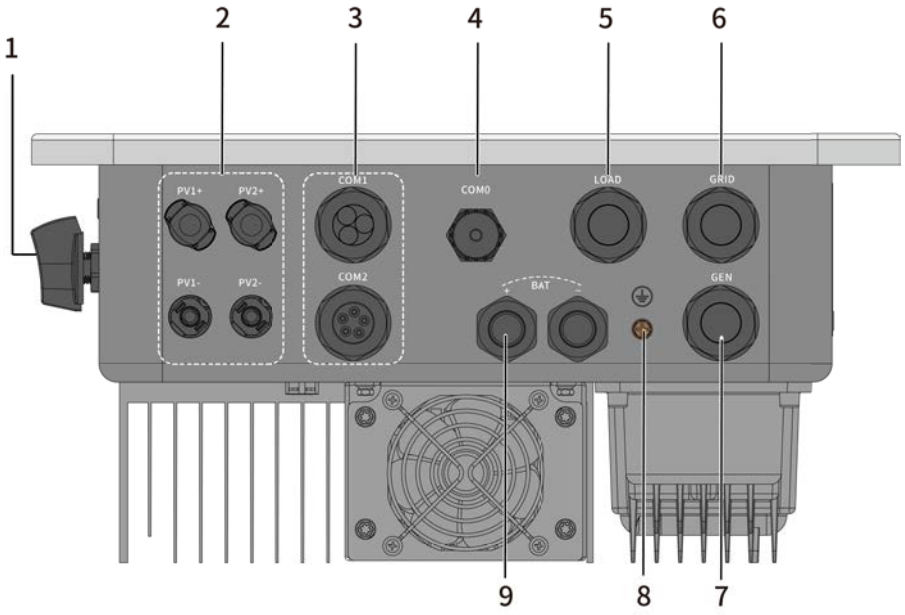


Figure shown here is for reference only. The actual product received may differ!

Object	Description
1	DC-switch
2	DC cable entry glands for PV string connection
3	Communication Ports (refer to 6.3 Interface Pinout Table)
4	Communication port for Ai-Dongle
5	AC cable entry gland for EPS load connection
6	AC cable entry gland for grid connection
7	AC cable entry gland for generator connection
8	Additional grounding screw
9	DC cable entry gland for battery connection

6.1.2 Internal wiring terminal

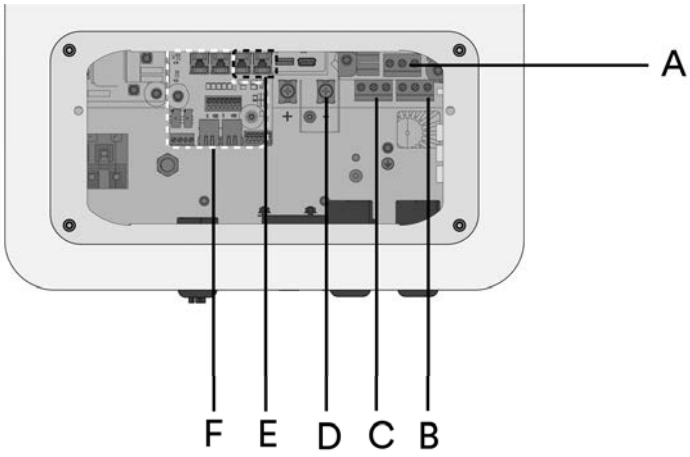
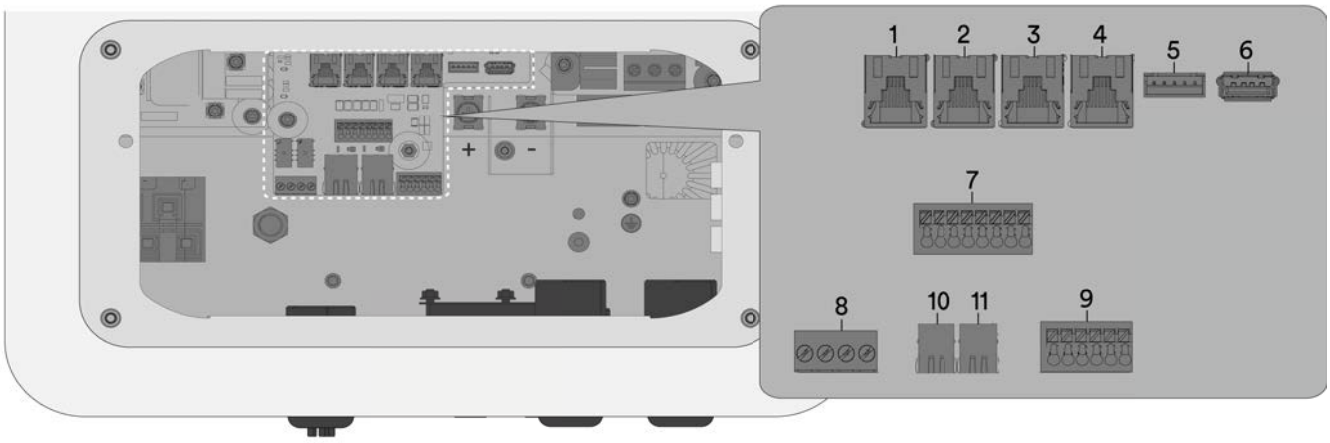


Figure shown here is for reference only. The actual product received may differ!

Object	Description
A	Terminal block for grid connection
B	Terminal block for generator connection
C	Terminal block for EPS load connection
D	Terminal block for battery connection
E	RJ45 ports used for parallel connection (refer to 6.3 Communication Interface)
F	Communication interface (refer to 6.3 Communication Intcerface)

6.1.3 Communication Interface

The inverter features a communication board with multiple interfaces, supporting connections such as LFP battery BMS, smart meter, and parallel inverters. The interface layout is shown below.



Interface Pinout Table

Num.	Label	Description	Terminal	PIN Definition							
				1	2	3	4	5	6	7	8
1	CN705	BMS	COM2	X	GND	X	CAN H	CANL	X	X	X
2	CN710	Monitor	COM2	RS485A	RS485B	GND	X	X	X	RS485A	RS485B
3	CN709	Parallel	COM1	CANBH	CANBL	GND	GND	PAR_CAN H	PAR_CA NL	RS485B	RS485A
4	CN708	Parallel	COM1	CANBH	CANBL	GND	GND	PAR_CAN H	PAR_CA NL	RS485B	RS485A
7	CN702	DI/DRM0/NS	COM1	DI1	DI2	DI3	DI4	DRM0	GND	GND	ON/OFF
10	CN712	ETH	COM2	TXOP1	TXON1	RXIP1	GND	GND	RXIN1	X	GND
11	CN711	ETH	COM2	TXOPP0	TXON0	RXIP0	GND	GND	RXIN0	X	GND

Num.	Label	Description	Terminal	PIN Definition							
				1	2	3	4	5	6	7	8
5	CN704	WIFI*	COM0	+5V	GND	GND	RS485A	RS485B			
6	J702	USB	X	VDD	USB_D-	USB_D+	GND				
8	CN706	DO	COM2	DO2_A	DO2_B	DO1_A	DO1_B				
9	CN713	PT100/CT/METER	COM1	3V3	PT100	CT+	CT-	METER_A	METER_B		

*It is wired internally before delivery.

Com port	Description	Function
1	BMS communication port	The CAN interface is used to connect the Battery Management System (BMS).
2	Monitor device	The RS485 interface (PIN 7, PIN 8) is used to connect the product to a third-party monitoring device, supporting Modbus RTU communication.
3	Parallel interface	RS485 interface used for inverter parallel operation. Ensures synchronization between inverters when multiple units are connected in parallel.
4	Parallel interface	CAN interface used for inverter parallel operation. Ensures synchronization between inverters when multiple units are connected in parallel.
5	Ai-Dongle internal connector	The port for connecting an Ai-Dongle to enable wireless communication and remote monitoring. Do not connect any other device to the USB port.
6	USB port	Use a USB flash drive to perform a one-click program upgrade.
7	Ripple control receiver/DRMs port/NS protection	Used to connect the ripple control receiver or DRM (Demand Response Mode) devices. Supports external control for load management and grid compliance. NS protection (between 12V to 24V): The product is equipped with one communication interface to connect an external central grid protection device.

8	DO1/DO2	Provides two digital outputs (DO1 and DO2) for external device control, such as starting/stopping a diesel generator or controlling intelligent loads like heat pumps or EV chargers.
9	Smart Meter/CT/PT100 Interface	Used to connect a smart meter, current transformer (CT), or PT100 temperature sensor. Allows measurement of export power and monitoring of battery temperature.
10/11	Ethernet	Used for Ethernet communication, supporting Modbus TCP/IP protocol and API integration for advanced monitoring and control.

6.2 Connecting additional grounding

The inverter is equipped with a grounding conductor monitoring device. This grounding conductor monitoring device detects when there is no grounding conductor connected and disconnects the inverter from the utility grid if this is the case. Hence the product does not require an additional grounding or equipotential bonding when operating.

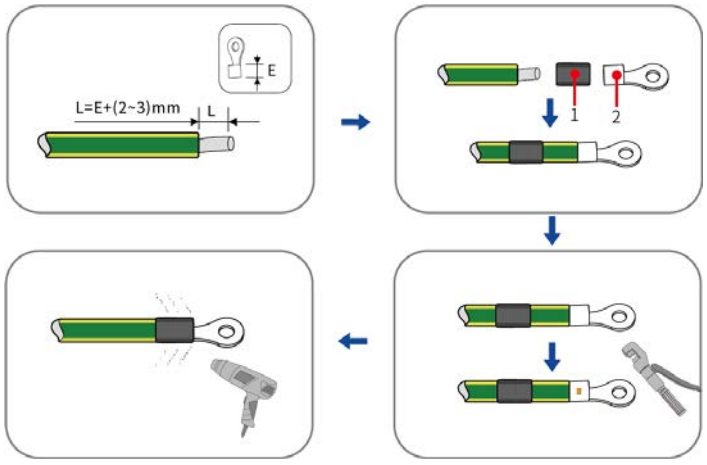
If the grounding conductor monitoring function is deactivated or the additional grounding is required by locally standard, you can connect additional grounding to the inverter.

Requirements for the secondary protection ground cable:

Item	Description	Note
1	Screw	M5, supplied
2	OT/DT terminal	Specifications M5, provided by the customer
3	Yellow and green ground cable	Same as the PE wire in the AC cable.

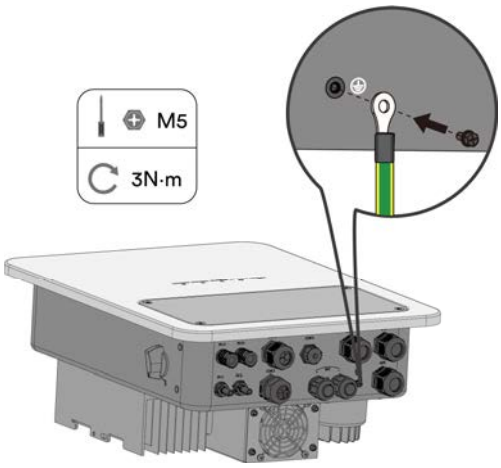
Procedure:

Step 1: Strip the grounding cable insulation. Insert the stripped part of the grounding cable into the ring terminal lug and crimp using a crimping tool.



1: Heat shrink tubing 2: OT/DT terminal (M5)

Step 2: Remove the screw on the ground terminal, insert the screw through the OT/DT terminal, and lock the terminal using a wrench.



Step 3: Apply paint to the grounding terminal to ensure corrosion resistance.

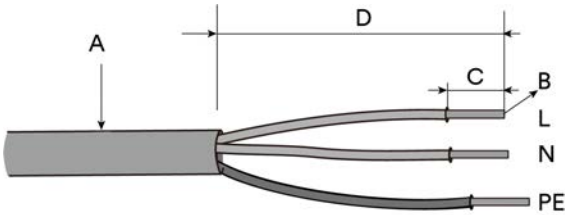
Complete the installation.

6.3 AC Grid Connection

6.3.1 Requirements for AC Grid Connection

Cable Requirements

The cable must be dimensioned in accordance with the local and national directives for the dimensioning of cables. The requirements for the minimum wire size derive from these directives. Examples of factors influencing cable dimensioning are: nominal AC current, type of cable, routing method, cable bundling, ambient temperature and maximum desired line losses.



Item	Description	Value
A	External diameter	18-25 mm
B	Copper cable conductor cross-section	5~8 mm² (According to current)
C	Insulation stripping length	12-14 mm
D	Sheath stripping length	approx. 80 mm

Residual current protection

The product is equipped with an integrated universal current-sensitive residual current monitoring unit inside. Hence the product does not require an external residual-current device (RCD) when operating.

If local regulations require the use of an RCD, please install a type A RCD with a protection limit of not less than 300 mA.

Overvoltage category

The inverter can be used in grids of overvoltage category III or lower in accordance with IEC 60664-1. This means that the product can be permanently connected to the grid-connection point of a building. In case of installations with a long outdoor cable route, additional measures to reduce overvoltage category IV to overvoltage category III are required.

AC circuit breaker

In PV systems with multiple inverters, protect each inverter circuit with a dedicated circuit breaker. The circuit breaker will also provide a point of isolation to allow electrical work to be carried out during installation or maintenance. Please refer to the local electrical regulations for further information.

Avoid connecting any consumer load between the AC circuit breaker and the inverter.

The selection of the AC circuit breaker rating depends on the wiring design (wire cross-section area), cable type, wiring method, ambient temperature, inverter current rating, etc. Derating of the AC circuit breaker rating may be necessary due to self-heating or if exposed to heat.

The maximum output current and the maximum output overcurrent protection of the inverters can be found in section 10 “Technical data”.

Grounding conductor monitoring

The inverter is equipped with a grounding conductor monitoring device. This grounding conductor monitoring device detects when there is no grounding conductor connected and disconnects the inverter from the utility grid if this is the case. Depending on the installation site and grid configuration, it may be advisable to deactivate the grounding conductor monitoring. This is necessary, for example, in an IT system if there is no neutral conductor present and you intend to install the inverter between two line conductors. If you are uncertain about this, contact your grid operator or Solplanet.

* It can be set on the APP according to customer requirements.

Safety in accordance with IEC 62109 when the grounding conductor monitoring is deactivated.

In order to guarantee safety in accordance with IEC 62109 when the grounding conductor monitoring is deactivated, carry out the following measure.

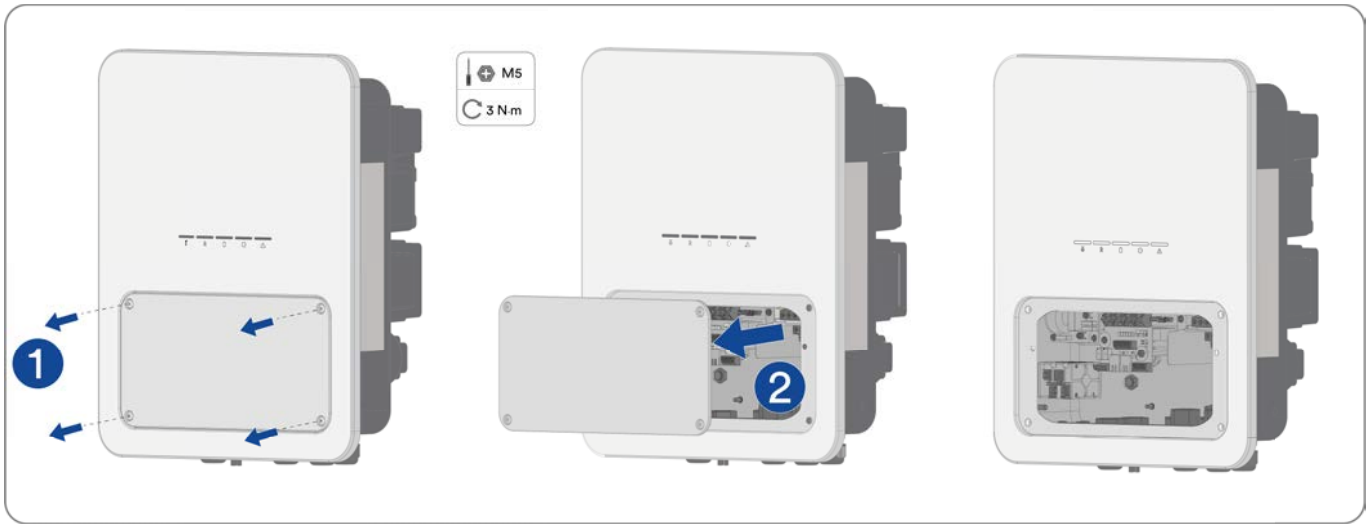
- Connect an additional grounding cable that has at least the same cross-section as the connected grounding conductor to the AC cable. This prevents touch current in the event of the grounding conductor on the AC cable failing.

6.3.2 Grid Cable Connection

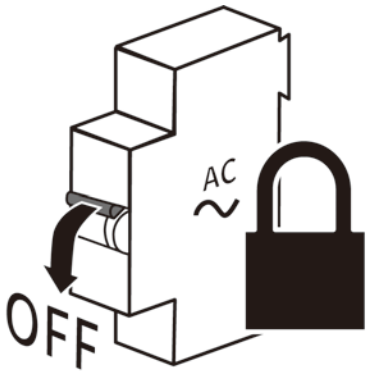
Procedure:

Step 1: Remove the cover of the lower wiring enclosure.

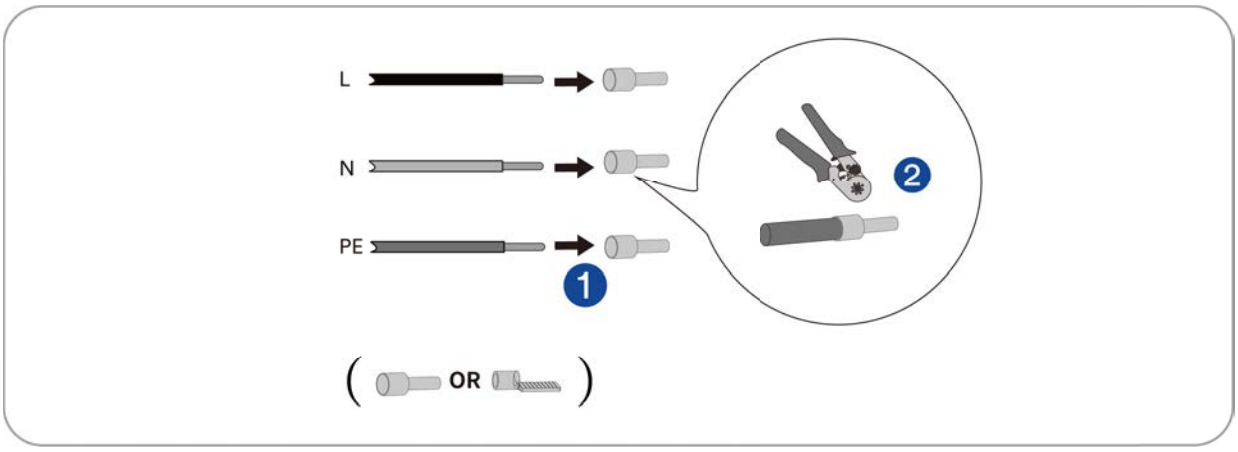
- The tool for opening the wiring enclosure is supplied with the inverter. After removing the cover, please put aside the tool and screws properly for later use. Do not dispose the tool and screws!
- Remove the cover in dry conditions and take the appropriate measures to ensure that the inverter remains dry during installation or maintenance. Avoid performing electrical work in outdoor areas under wet conditions at all times!
- Under no circumstances should the upper cover of the enclosure be removed. Removal will void the manufacture’rs warranty



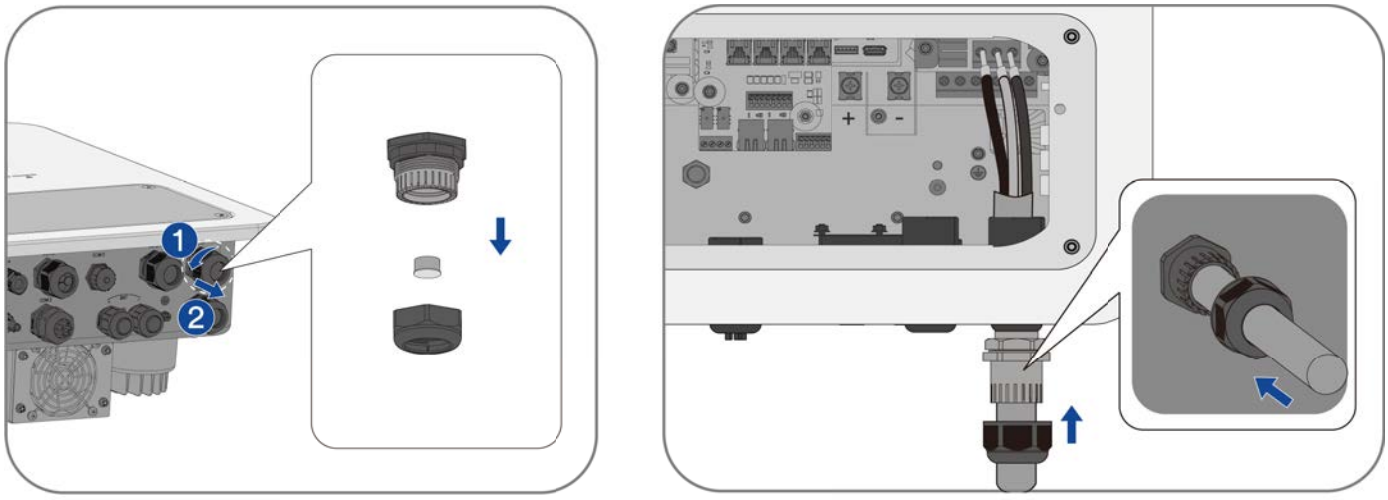
Step 2： Switch off the circuit breaker protecting the inverter circuit and and switch off and isolate all energy sources up stream and down stream of the circuit breaker and secure it against inadvertent energisation. Use an appropriately rated multimeter to ensure there is no AC voltage present on each of the terminals on the circuit breaker.



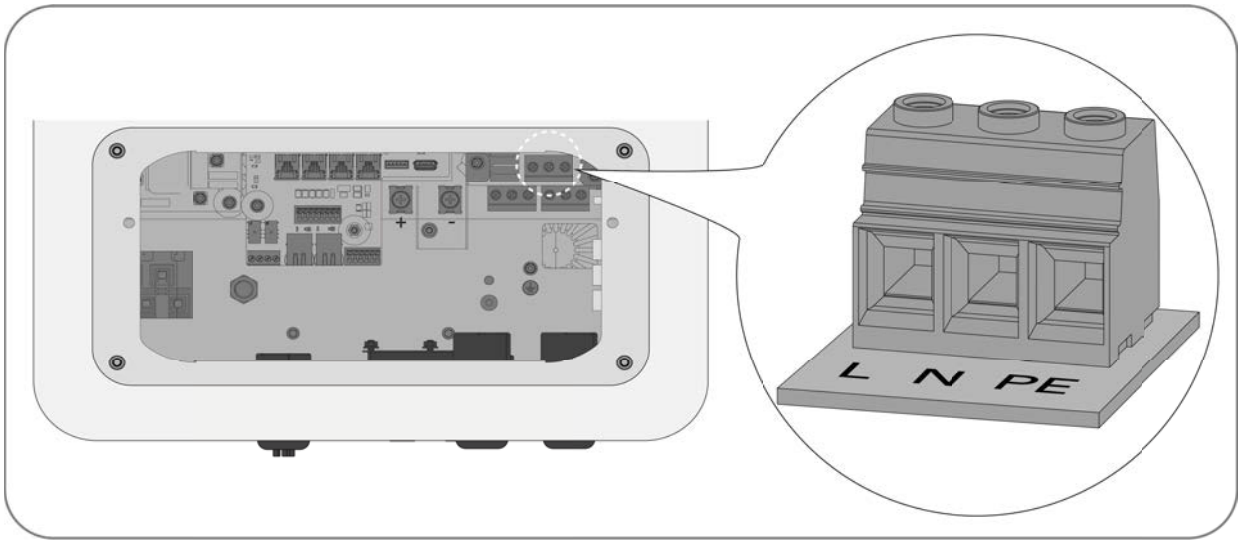
Step 3： Crimp appropriately sized bootlace ferrules onto the exposed wires of the cable using a suitable crimping tool.



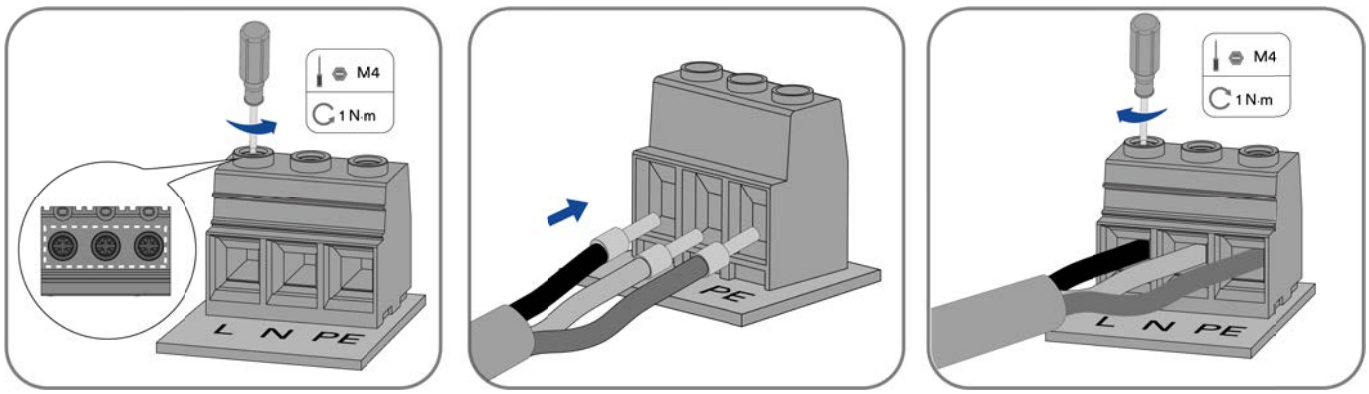
Step 4： Remove the AC grid cable gland nut and feed the AC cable into the wiring enclosure.



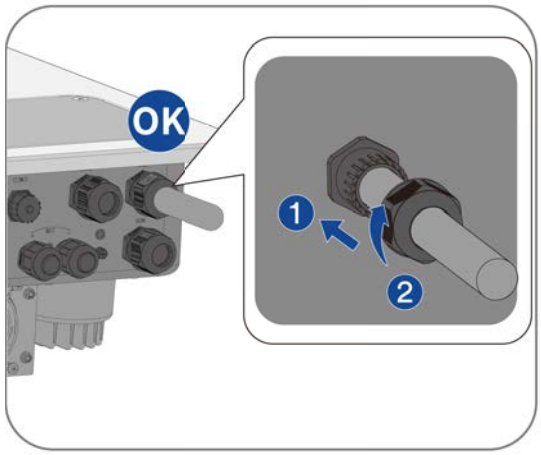
Step 5: Locate the AC grid terminal block.

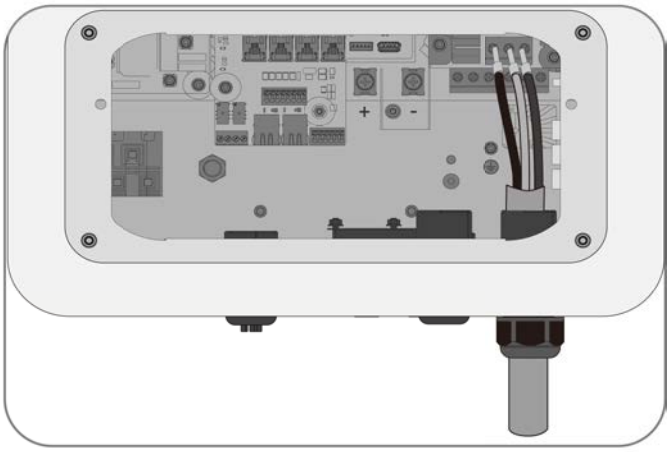


Step 6: Loosen the screws on the AC grid terminal block, insert the AC cable into the terminal, and tighten the screw in accordance with the specified torque settings shown in the image below.



Step 7: Tighten the AC grid cable gland nut onto the threaded gland body.



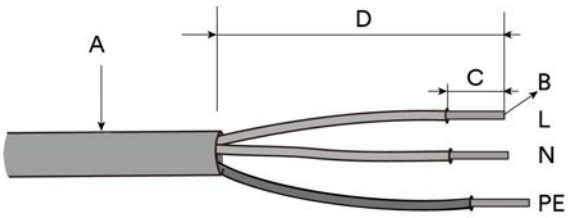


6.4 EPS Load cable connection

6.4.1 Requirements for the EPS Load connection

Cable Requirements

The cable must be dimensioned in accordance with the local and national directives for the dimensioning of cables. The requirements for the minimum wire size derive from these directives. Examples of factors influencing cable dimensioning are: nominal AC current, type of cable, routing method, cable bundling, ambient temperature and maximum desired line losses.



Item	Description	Value
A	External diameter	18-25 mm
B	Copper cable conductor cross-section	5~8 mm² (According to current)
C	Insulation stripping length	12-14 mm
D	Sheath stripping length	approx. 80 mm

6.4.2 EPS Cable Connection

⚠ DANGER

Danger to life due to live voltage on EPS port when inverter is without load !

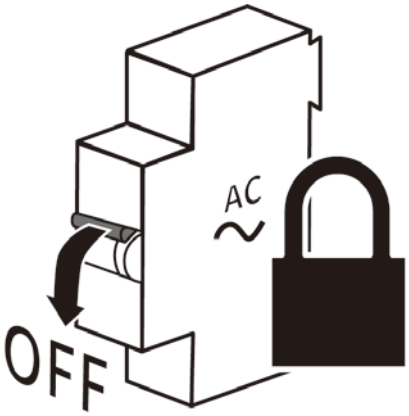
Even when the inverter is not connected to any load while powered on, the EPS port may still carry live voltage.

To avoid electric shock:

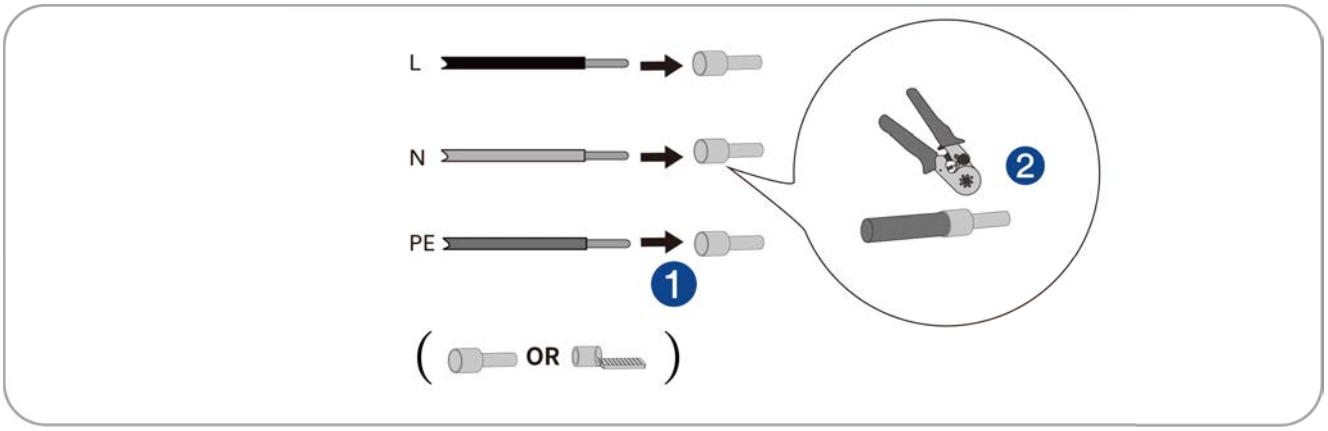
- Strictly follow the wiring instructions
- Ensure all system switches are turned off and that all sources of energy are isolated during installation or removal of EPS loads
- Use insulated tools
- Verify that voltage is not present on the EPS port is zero using a voltage tester before handling the EPS port
- Wear appropriate personal protective equipment (PPE)

Procedure:

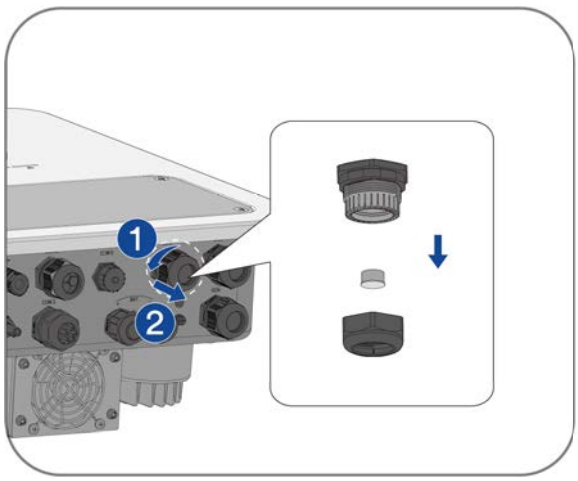
Step 1: Switch off the circuit breaker protecting the inverter circuit and and switch off and isolate all energy sources up stream and down stream of the circuit breaker and secure it against inadvertent energisation. Use an appropriately rated multimeter to ensure there is no AC voltage present on each of the terminals on the circuit breaker.

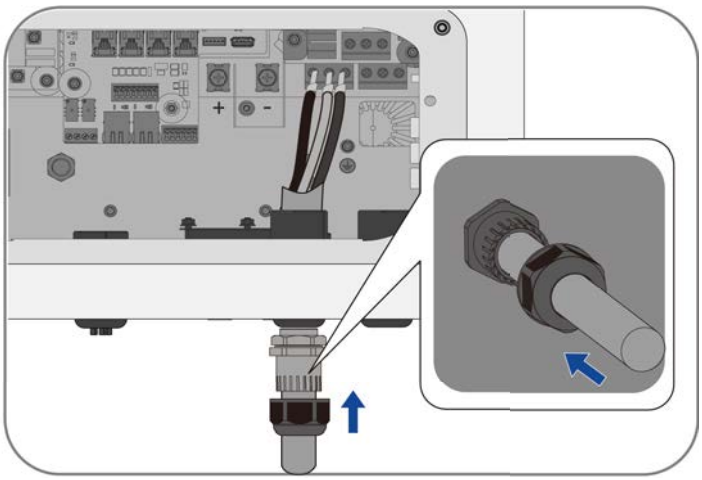


Step 2: Crimp appropriately sized bootlace ferrules onto the exposed wires of the cable using a suitable crimping tool.

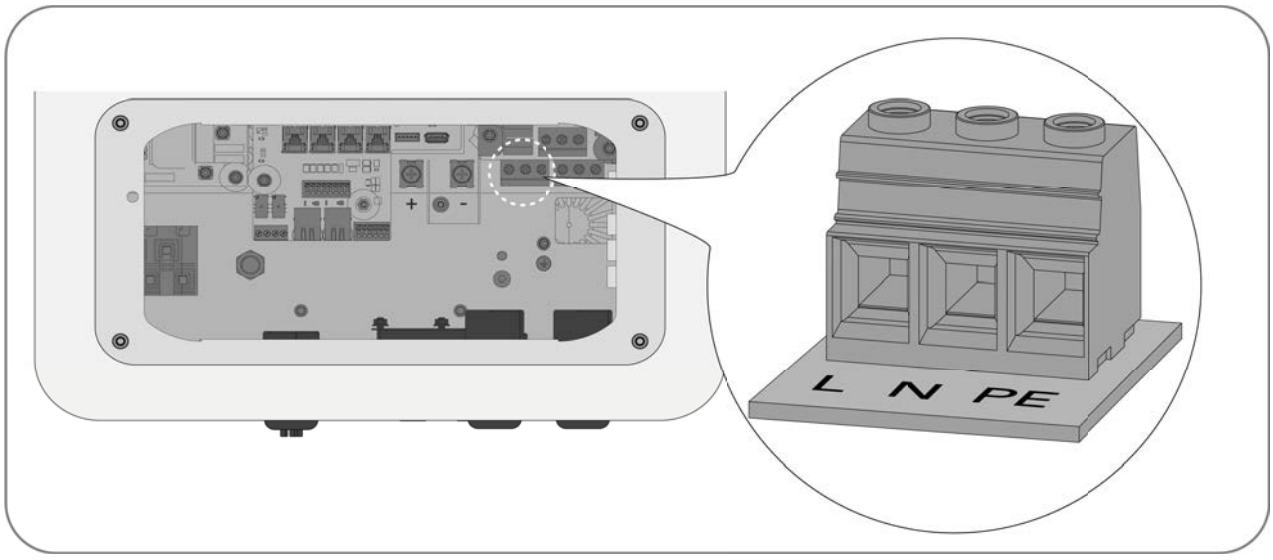


Step 3: Remove the EPS load cable gland nut and feed the EPS AC cable into the wiring enclosure.

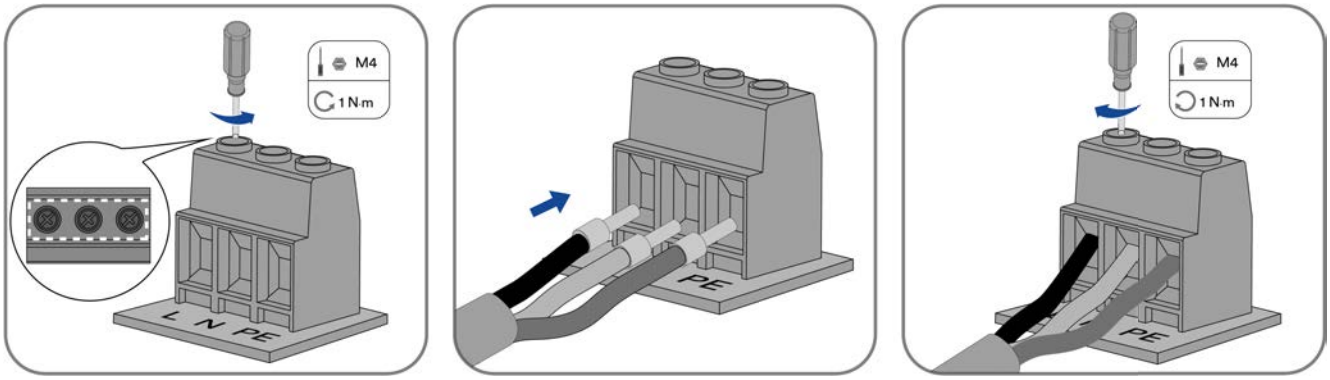




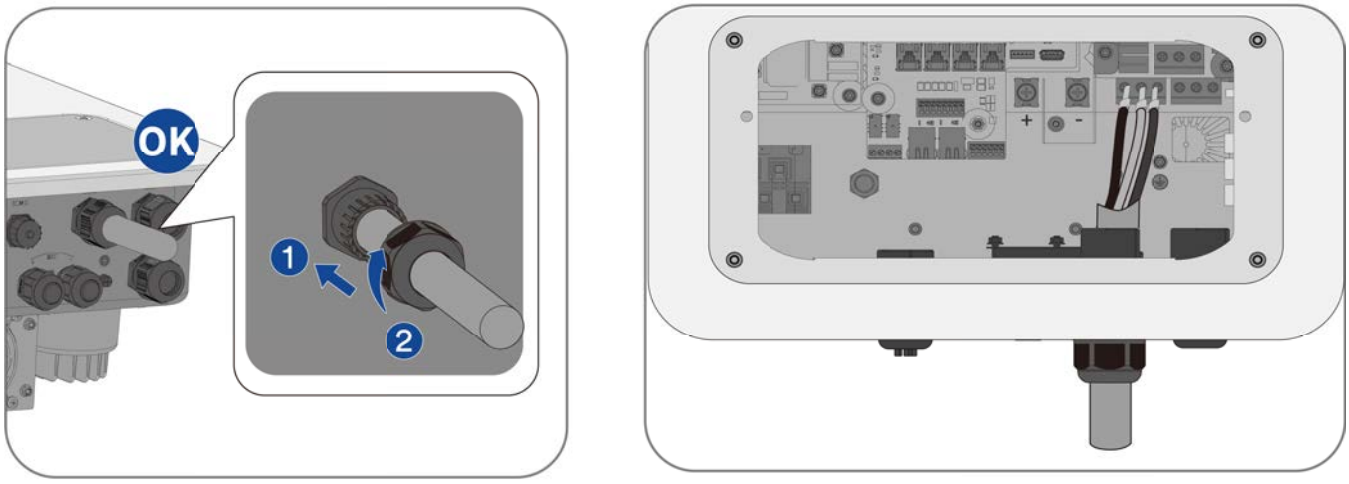
Step 4: Locate the EPS load terminal block



Step 5：Loosen the screws on the EPS load terminal block, insert the AC cable into the terminal block, and tighten the screw in accordance with the specified torque settings shown in the image below.



Step 6：Tighten the EPS load cable gland nut onto the threaded gland body.



Complete the installation.

6.5 Generator cable connection

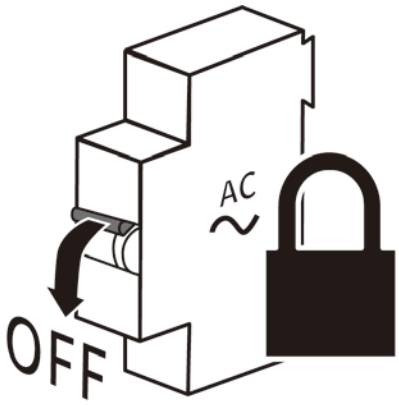
6.5.1 Requirements for the Generator connection

For Generator connection requirements, refer to “6.4.1 Requirements for the EPS Load connection” for details.

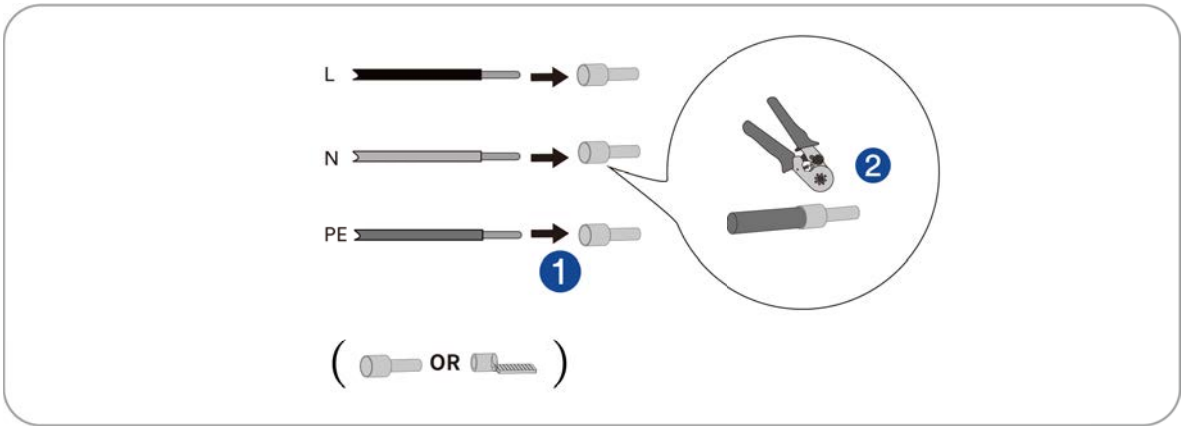
6.5.2 Assembling the Generator connectors

Procedure:

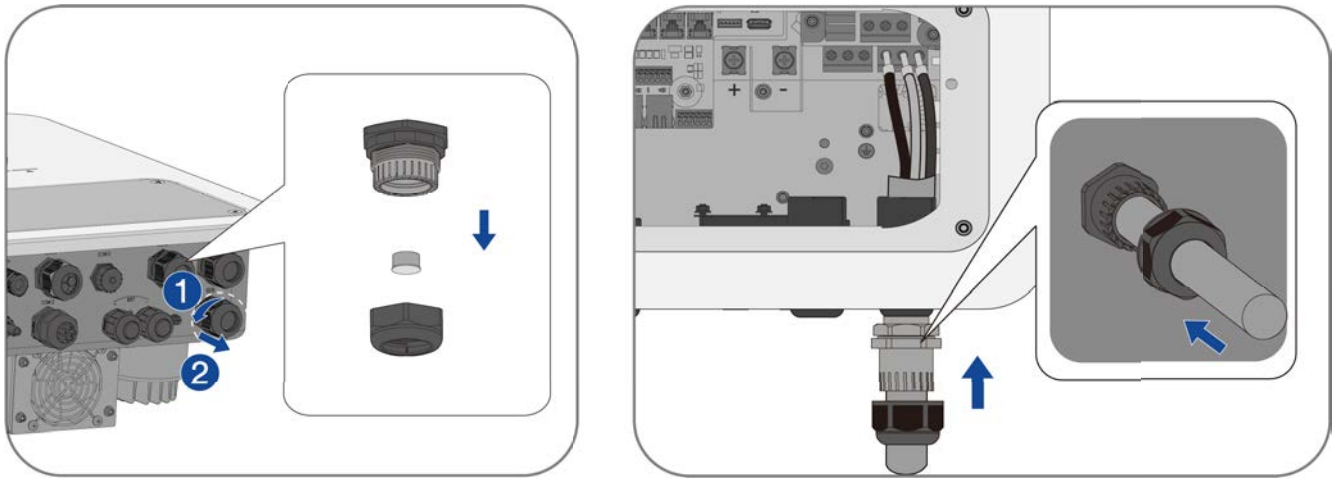
Step 1: Switch off the circuit breaker protecting the inverter circuit and and switch off and isolate all energy sources up stream and down stream of the circuit breaker and secure it against inadvertent energisation. Use an appropriately rated multimeter to ensure there is no AC voltage present on each of the terminals on the circuit breaker.



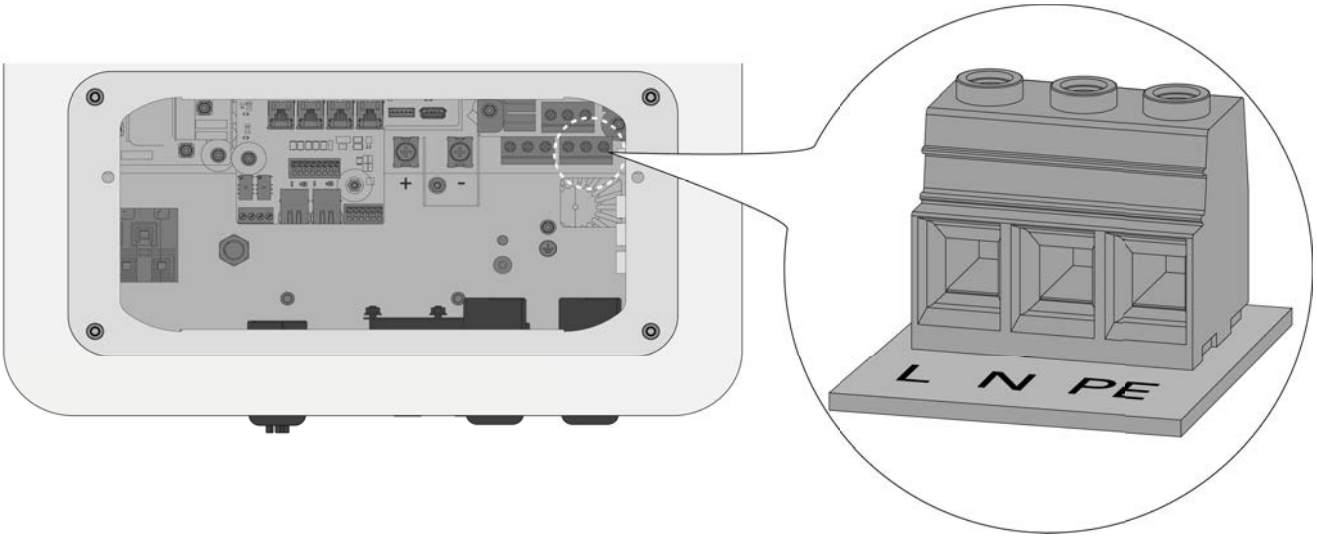
Step 2: Crimp appropriately sized bootlace ferrules onto the exposed wires of the cable using a suitable crimping tool.



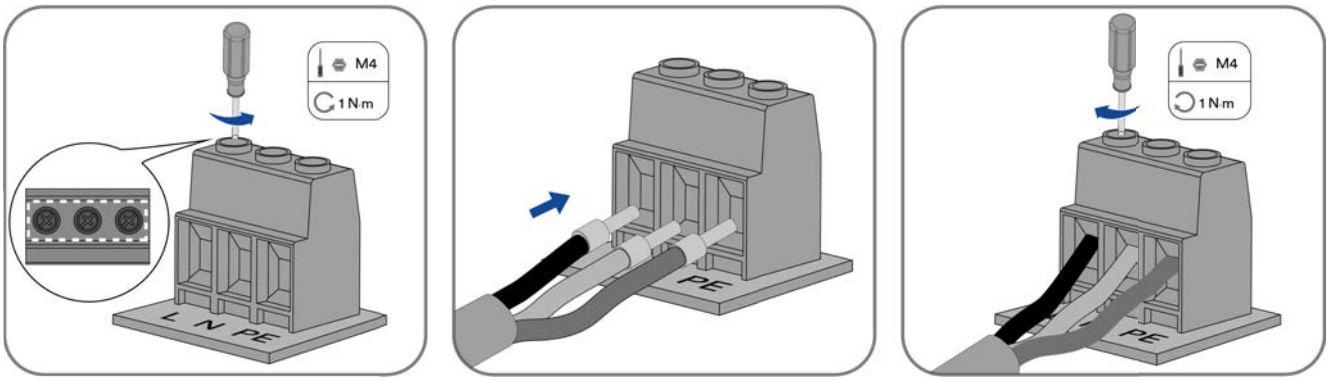
Step 3: Remove the Generator cable gland nut and feed the Generator cable into the wiring enclosure.



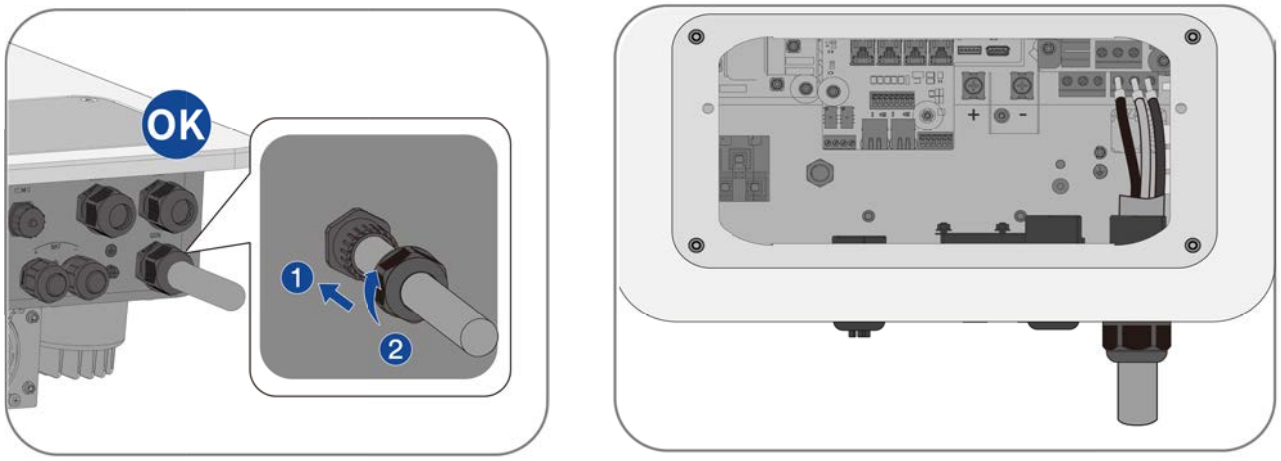
Step 4: Locate the generator terminal block



Step 5: Loosen the screws on the generator terminal block, insert the AC cable into the terminal block, and tighten the screw in accordance with the specified torque settings shown in the image below.



Step 6: Tighten the generator cable gland nut onto the threaded gland body.



Complete the installation.

6.6 DC connection

6.6.1 Requirements for the DC connection

The DC connection area may vary; please refer to the actual product!

Requirements for the PV modules per input:

- All PV modules should be of the same type.
- All PV modules should be aligned and tilted identically.
- On the coldest day based on statistical records, the open-circuit voltage of the PV modules must never exceed the maximum input voltage of the inverter.
- The maximum input current per PV module must be maintained and must not exceed the through fault current of the DC connectors.
- The connection cables to the inverter must be equipped with the connectors included in the scope of delivery.
- The thresholds for the input voltage and the input current of the inverter must be adhered to.
- Ensure correct polarity when terminating the PV strings into the PV terminal block.

6.6.2 Assembling the DC connectors

DANGER

Danger to life due to electric shock when live components or DC cables are touched!

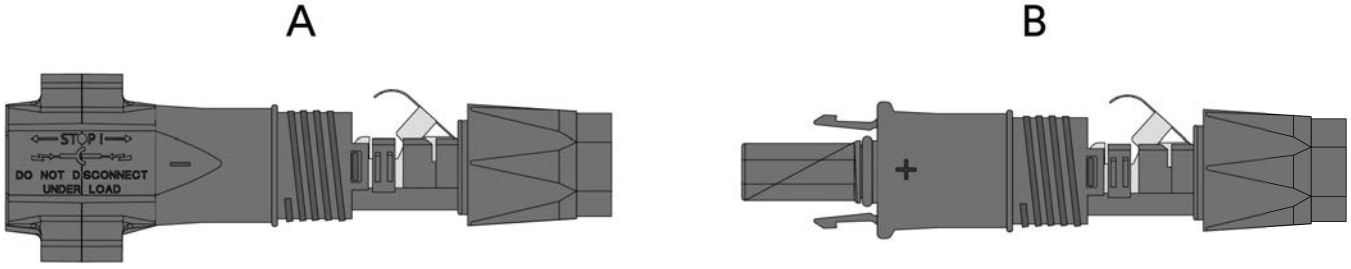
When exposed to light, the PV modules generate high DC voltage which is present in the DC cables. Touching live DC cables results in death or lethal injuries due to electric shock.

- Do not touch non-insulated parts or cables.
- Disconnect the product from voltage sources and ensure it cannot be reconnected before working on the device.
- Wear suitable personal protective equipment for all work on the product.

For connection to the inverter, all PV module connection cable must be fitted with the DC connectors provided. Assemble the DC connectors as described in the following.

DC connector:

Assemble the DC connectors as described below. Be sure to observe the correct polarity. The DC connectors are marked with the symbols “+” and “-”.

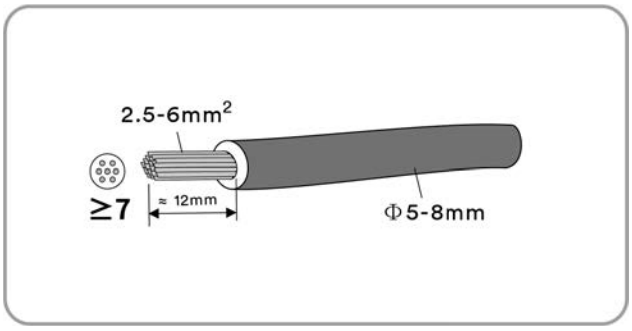


Cable requirements:

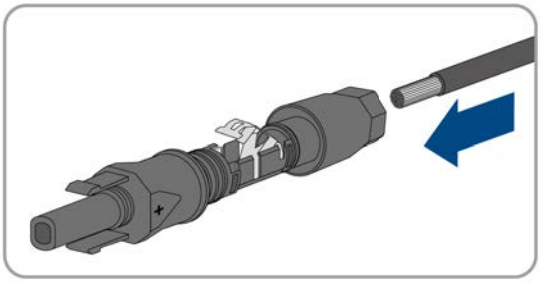
Item	Description	Value
1	Cable type	PV cable
2	External diameter	5-8 mm
3	Conductor cross-section	2.5-6 mm²
4	Number of copper wires	At least 7
5	The rated voltage	⩾1100v

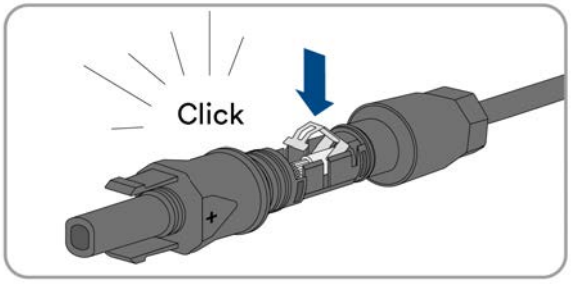
Procedure:

Step 1: Strip 12 mm off the cable insulation.

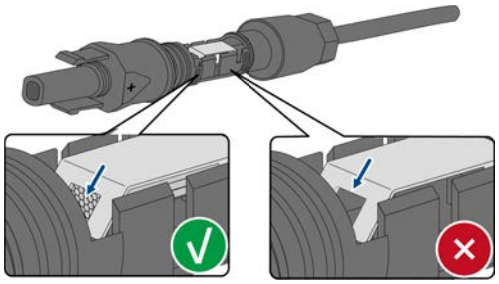


Step 2: Crimp the contacts with the corresponding cables. Crimping tool: PV-CZM-61100.

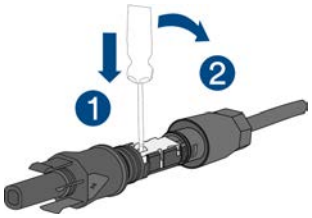




If the stranded wire is not visible in the chamber, the cable is not correctly inserted and the connector must be reassembled. To do this, the cable must be removed from the connector.

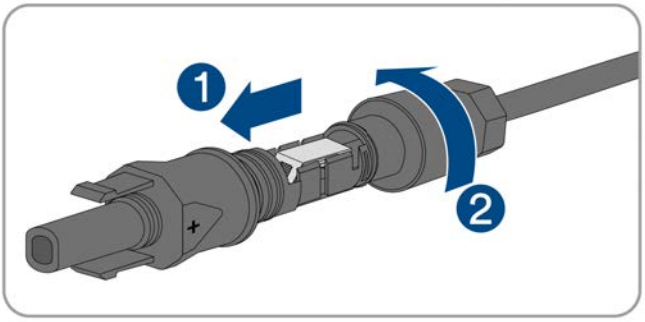


Release the clamping bracket. To do so, insert a screwdriver (blade width: 3.5mm) into the clamping bracket and pry the clamping bracket open.



Remove the cable and go back to step 2.

Step 3: Push the swivel nut up to the thread and tighten the swivel nut. (SW15, Torque: 2.0Nm)



6.6.3 Connecting the PV module

DANGER

Danger to life due to high voltages in the inverter!

When exposed to light, the PV modules generate high DC voltage which is present in the DC cables. Touching live DC cables results in death or lethal injuries due to electric shock..

- Before connecting the PV array, ensure that the DC switch is switched off and that it cannot be reactivated.
- Do not disconnect the DC connectors under load.

NOTICE

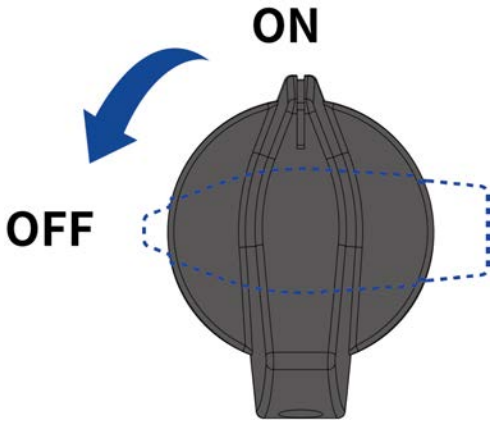
The inverter can be destroyed by overvoltage!

If the voltage of the strings exceeds the maximum DC input voltage of the inverter, it can be destroyed due to overvoltage. All warranty claims become void.

- Do not connect strings with an open-circuit voltage greater than the maximum DC input voltage of the inverter.
- Check the design of the PV system.

Procedure:

Step 1: Ensure that the individual miniature circuit-breaker is switched off and ensure that it cannot be accidentally reconnected.



Step 2: Ensure that the DC switch is switched off and ensure that it cannot be accidentally reconnected.

Step 3: Ensure that there is no ground fault in the PV array.

Step 4: Check whether the DC connector has the correct polarity.

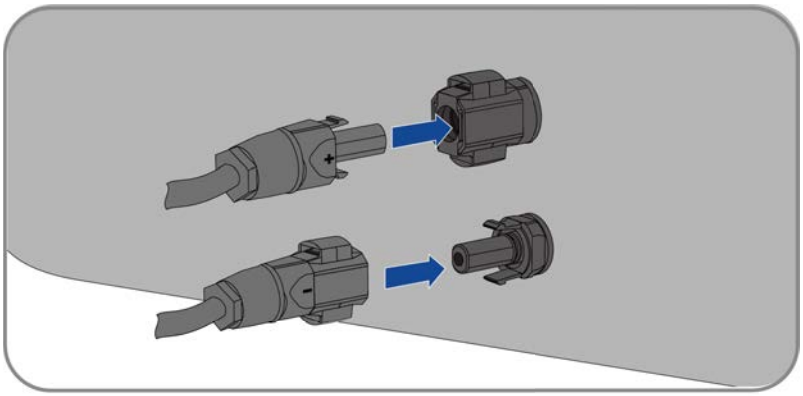
If the DC connector is equipped with a DC cable having the wrong polarity, the DC connector must be reassembled. The DC cable must always have the same polarity as the DC connector.

Step 5: Ensure that the open-circuit voltage of the PV array does not exceed the maximum DC input voltage of the inverter.

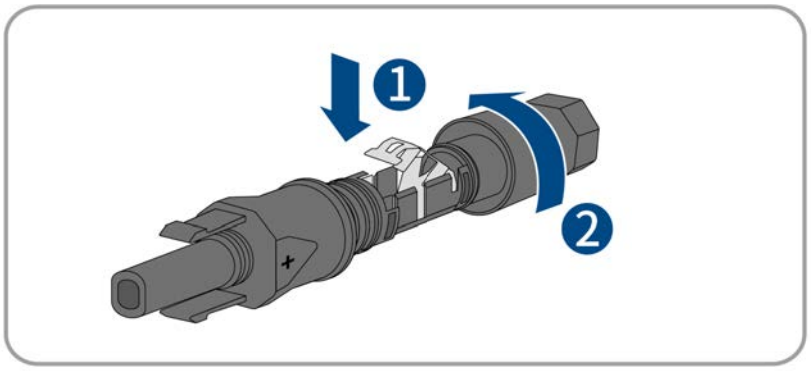
Step 6： Connect the assembled DC connectors to the inverter until they audibly snap into place.

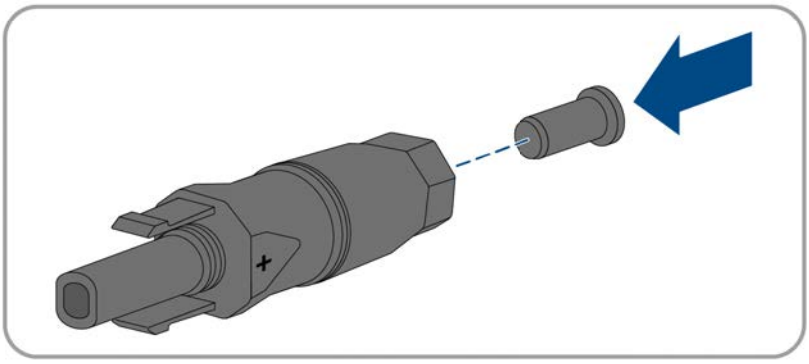
DC connector:

- Connect the assembled DC connectors to the inverter.

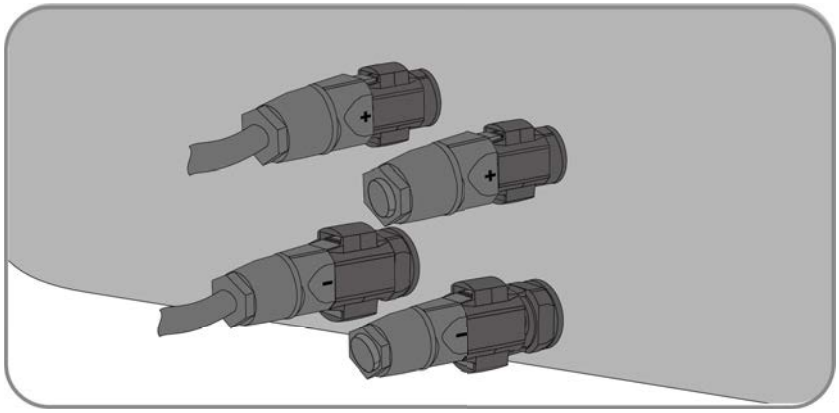


- For unused DC connectors, push down the clamping bracket and push the swivel nut up to the thread. Insert the DC connectors with sealing plugs into the corresponding DC inputs on the inverter.

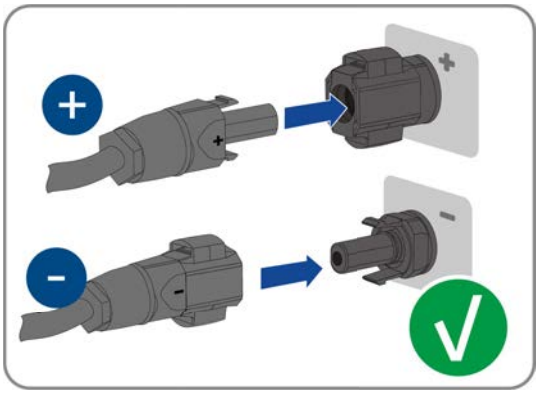




- Insert the DC connectors with sealing plugs into the corresponding DC inputs on the inverter.



Check the positive and negative polarity of the PV strings, and connect the PV connectors to corresponding terminals only after ensuring polarity correctness.



Step 7: Ensure that all DC connectors and the DC connectors with sealing plugs are securely in place.

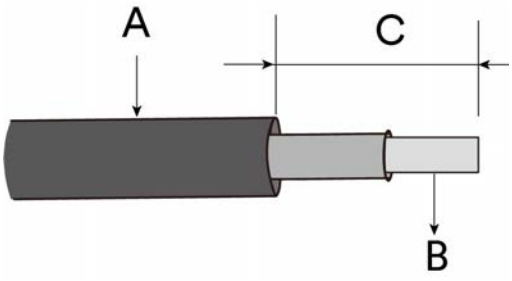
Complete the installation.

6.7 Battery connection

6.7.1 Requirements for the Battery Connection

Cable Requirements

Prepare the DC battery cable by stripping off the insulation on one end of the in accordance with the image below.

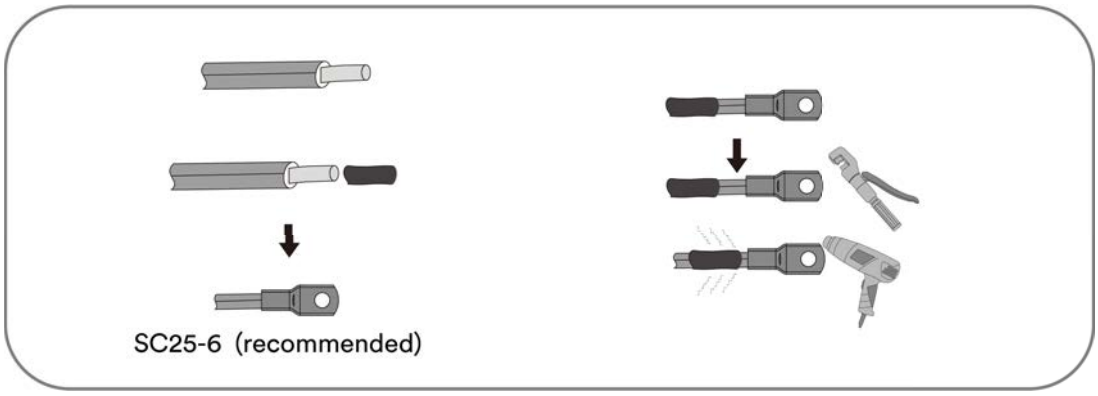


Item	Description	Value
A	External diameter	10-12 mm
B	Copper cable conductor cross-section	16-25 mm² (According to current)
C	Sheath stripping length	⩽ 55 mm

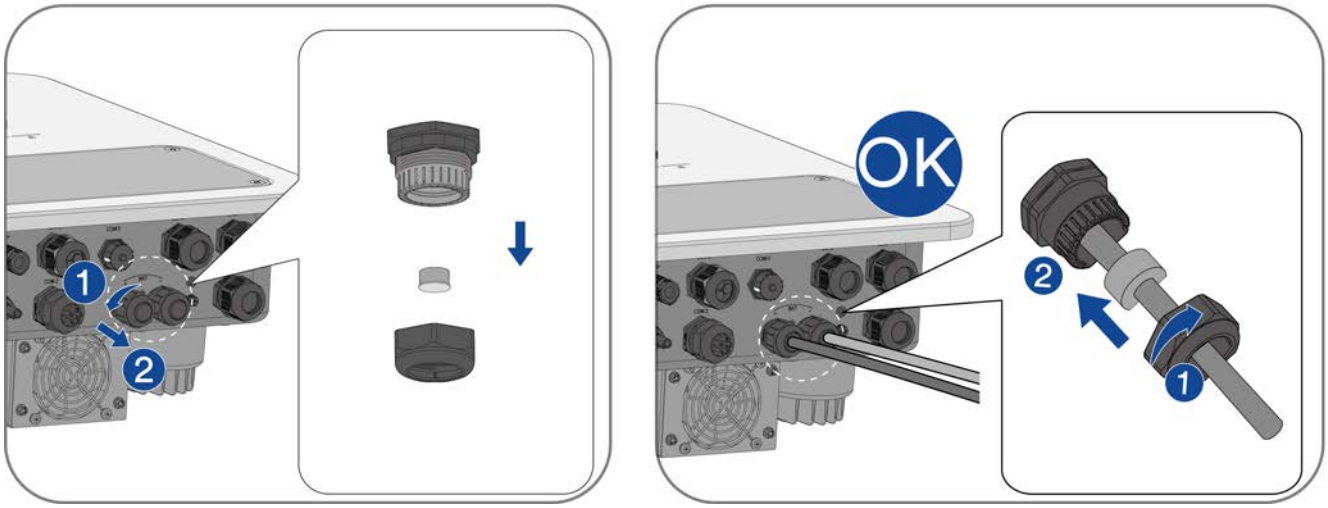
6.7.2 Assembling the Battery Connectors

Procedure:

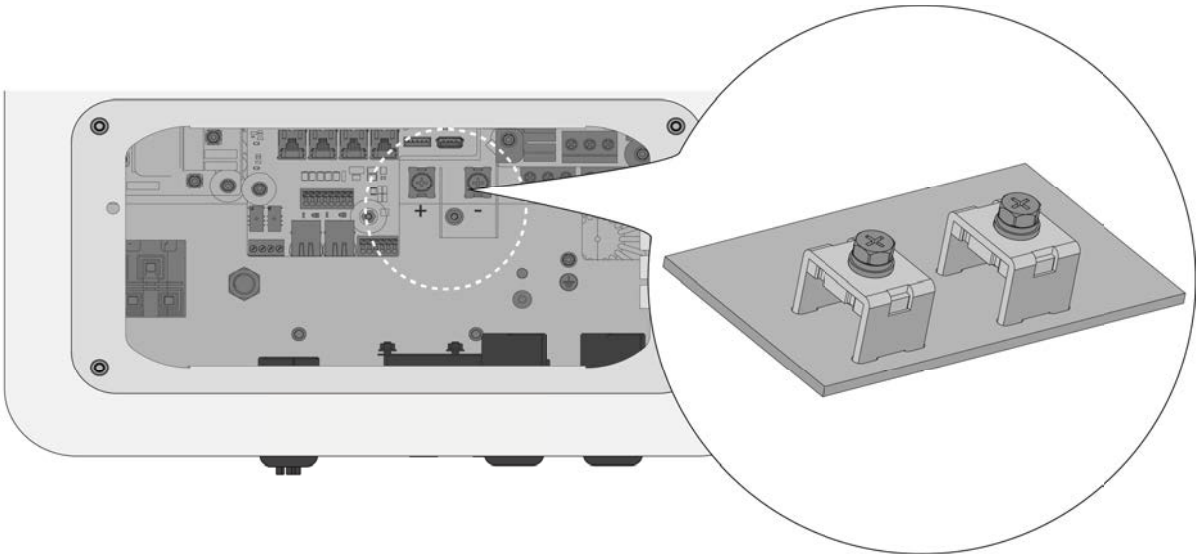
Step 1: Strip the cable insulation. Insert the exposed section of the cable into the ring terminal lug and crimp using a crimping tool.



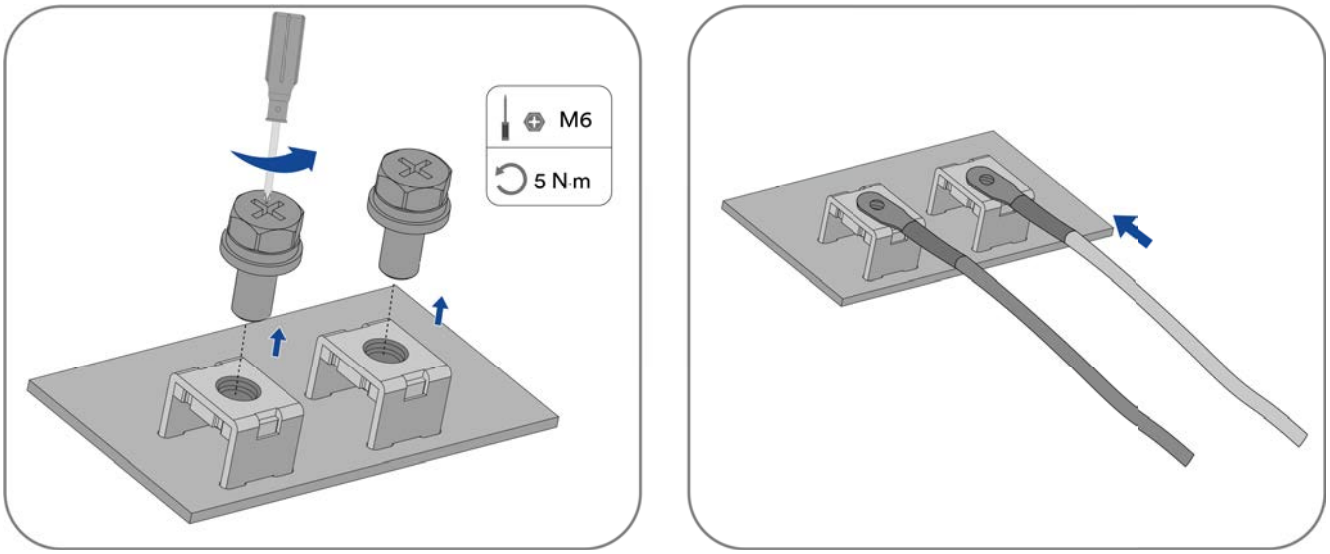
Step 2: Remove the battery cable gland nut and feed the battery DC cable into the wiring enclosure.

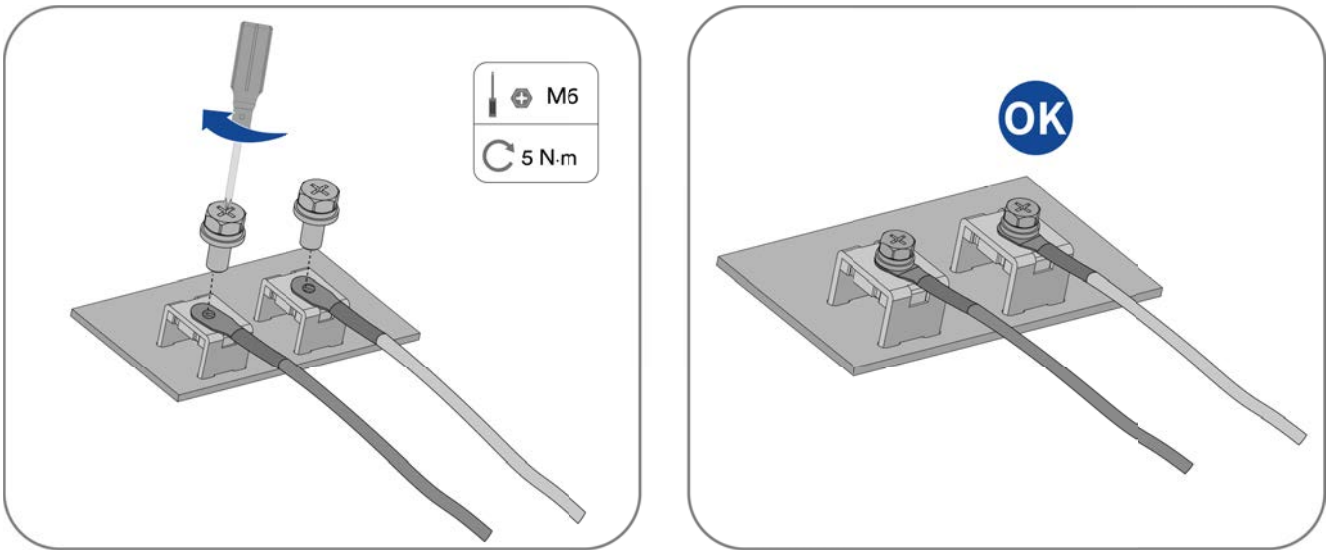


Step 3：Locate the battery terminal block.

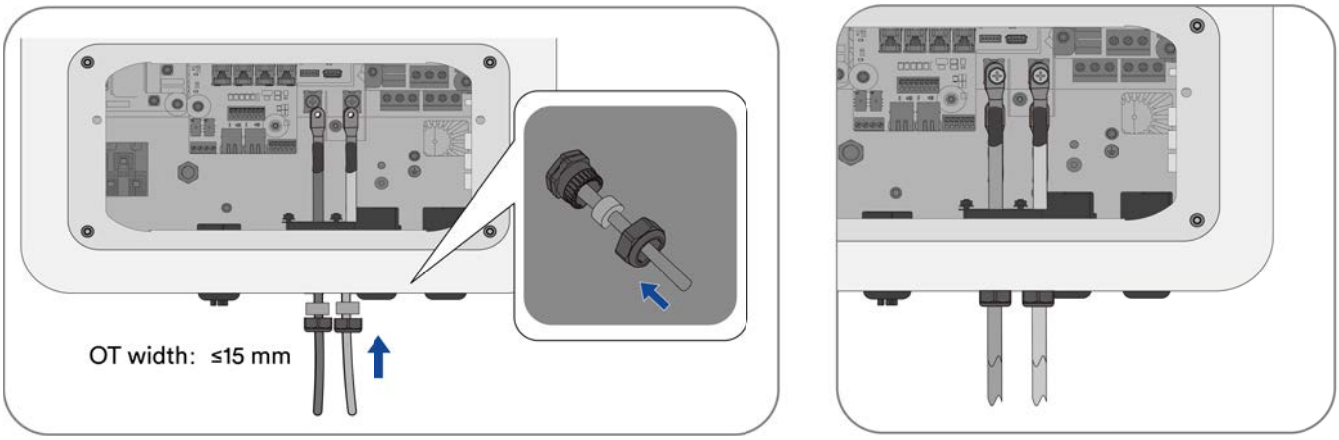


Step 4：Loosen the screws on the battery terminal block, insert the cable into the terminal block, and tighten the screw in accordance with the specified torque settings shown in the image below.





Step 5：Tighten the battery cable gland nut onto the threaded gland body.



Complete the installation.

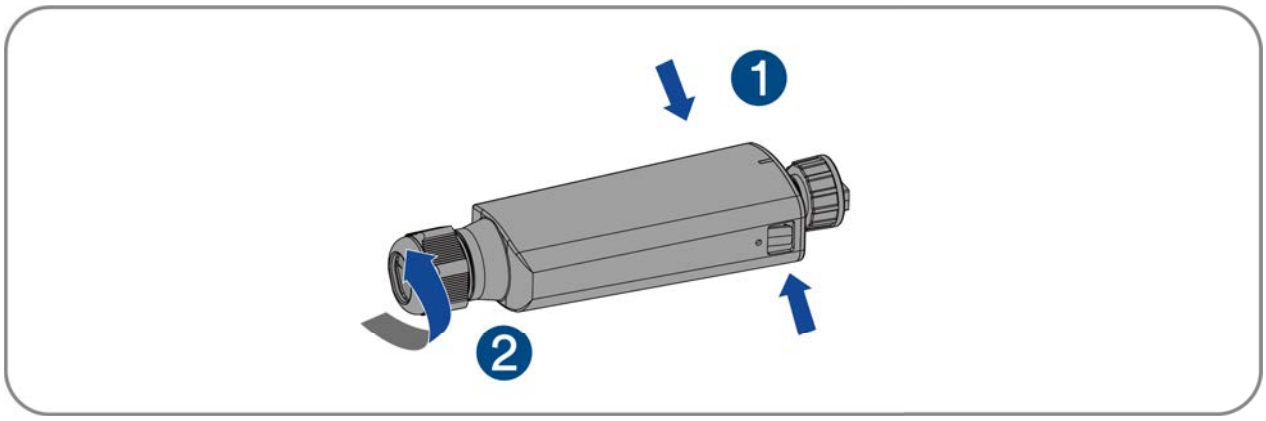
6.8 Communication equipment connection

- When selecting cables, ensure the cable outer diameter (OD) is ≤8. If 6 < OD ≤ 8, thread the cable through the COM1 gland. If OD < 6, thread the cable through the COM2 gland.

6.8.1 Ai-Dongle connection

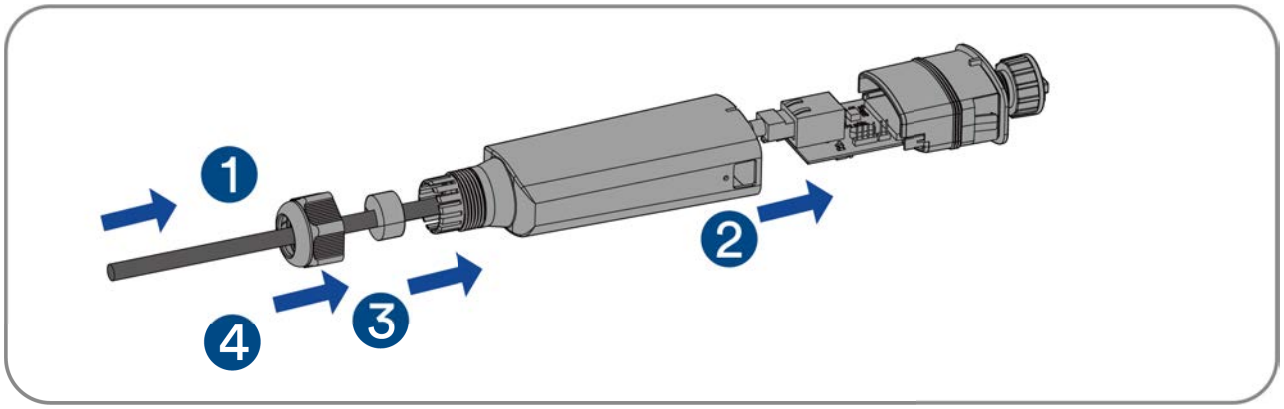
Procedure:

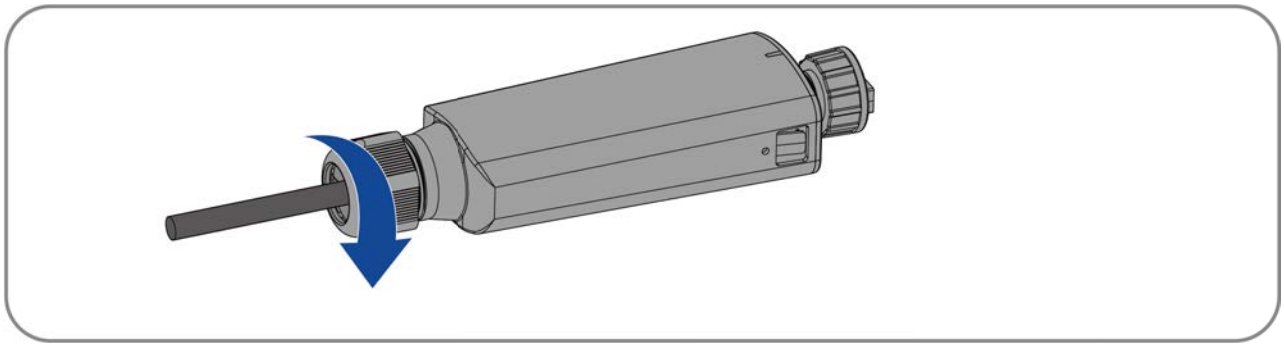
Step 1: Rotate the sealing nut, remove the sealing ring, Press the snaps on both sides of the stick to open the casing (Note:try not to touch the PCBA component).



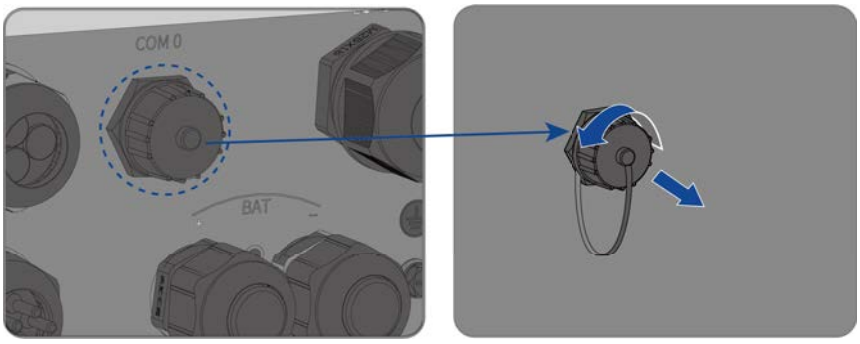
Step 2: Connect the communication cable to the wiring terminal according to the sequence shown in the following figure.

Step 3: Insert the wiring terminal into the Ai-Dongle body, adjust the communication cable, insert the sealing ring, and lock nut.

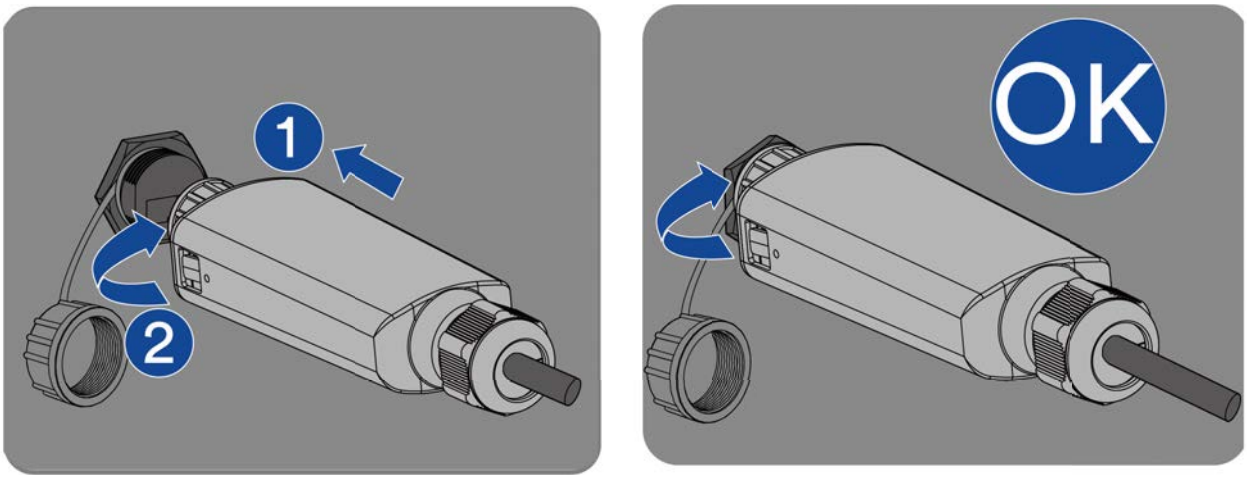




Step 4: Remove the cover of the Ai-Dongle port on the inverter and retain it.



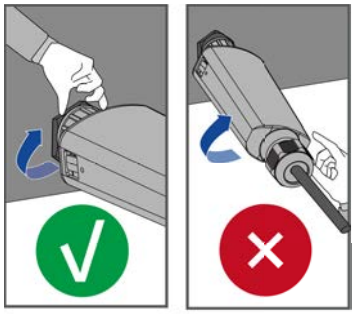
Step 5: Insert the Ai-Dongle into the connection port, hand-tighten the nut clockwise, ensure it's secure and the label is facing forward.



NOTICE

Rotating the communication modular will damage the communication modular!

The Ai-Dongle is secured by locking the nut for reliable connection. Avoid rotating the dongle body, as this may cause damage.



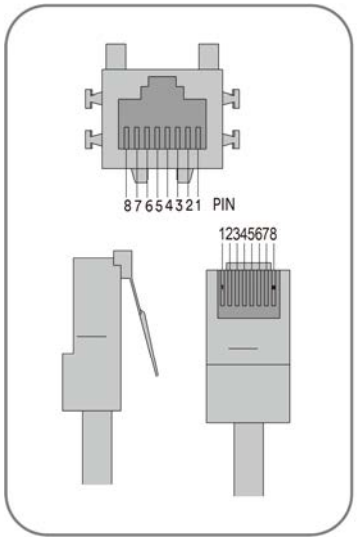
Lock only with the nut.

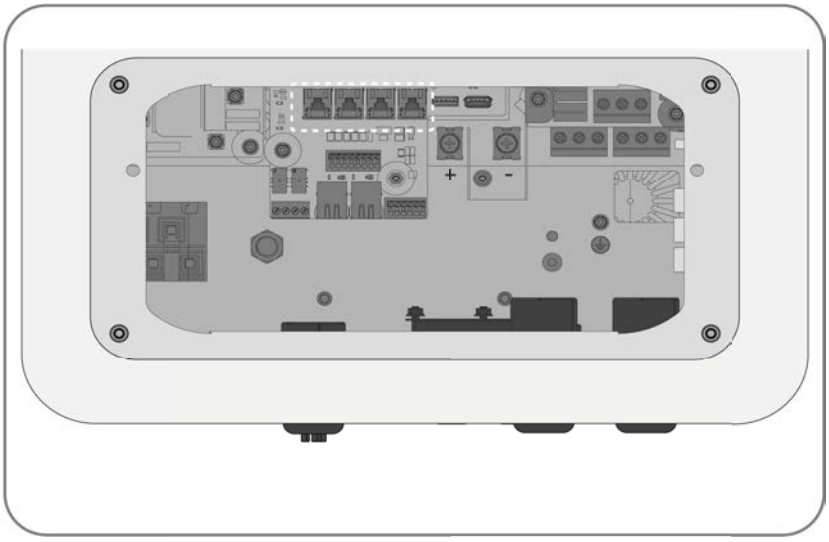
- Do not rotate the body of the Ai-dongle.

6.8.2 RJ45 connection

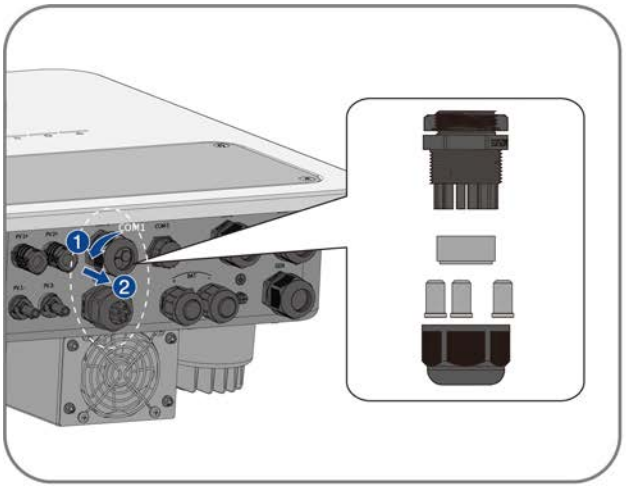
Procedure:

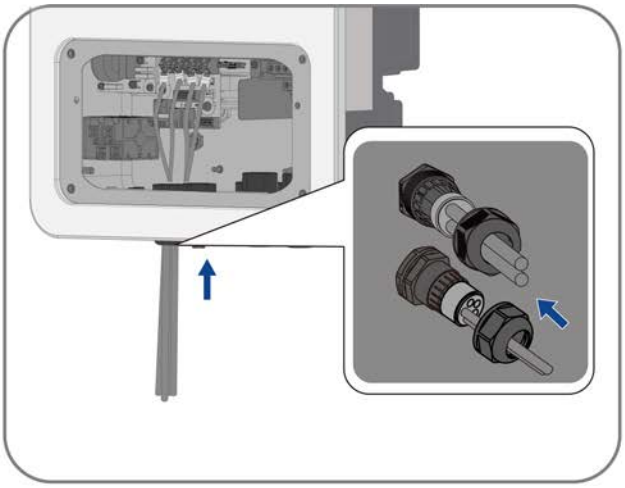
Step 1: Make the RJ45 cable and find the port of the RJ45 connection. Refer to 6.1.3 Interface Pinout Table.



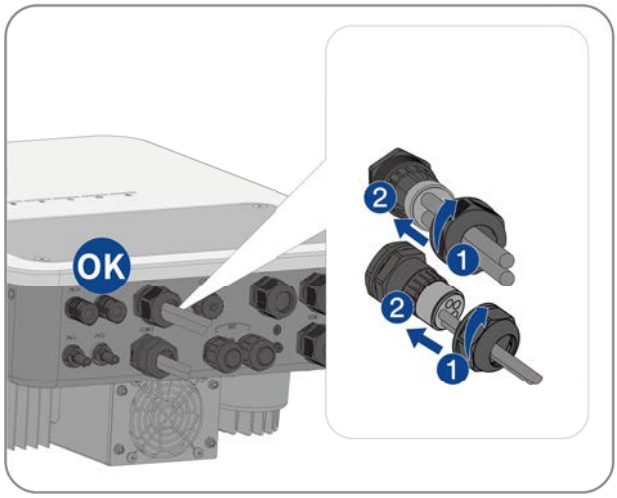


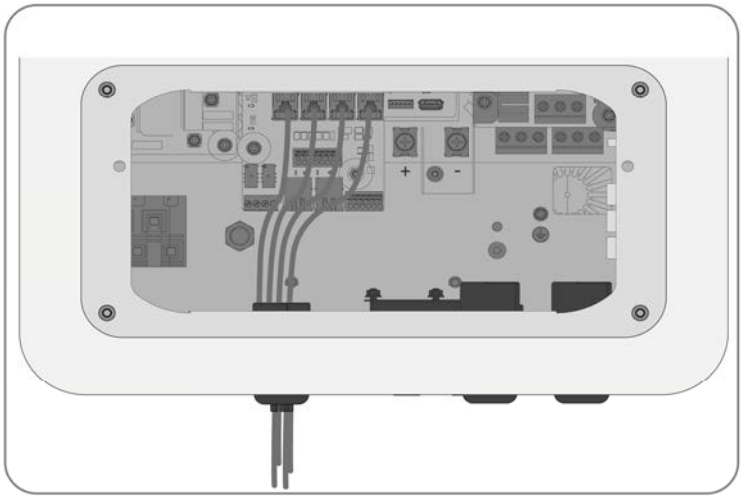
Step 2: Remove a COM 1/2 cable gland nut, insert the cable into the terminal, and insert the RJ45 connector into the port.





Step 3: Tighten the COM 1/2 cable gland nut onto the threaded gland body.



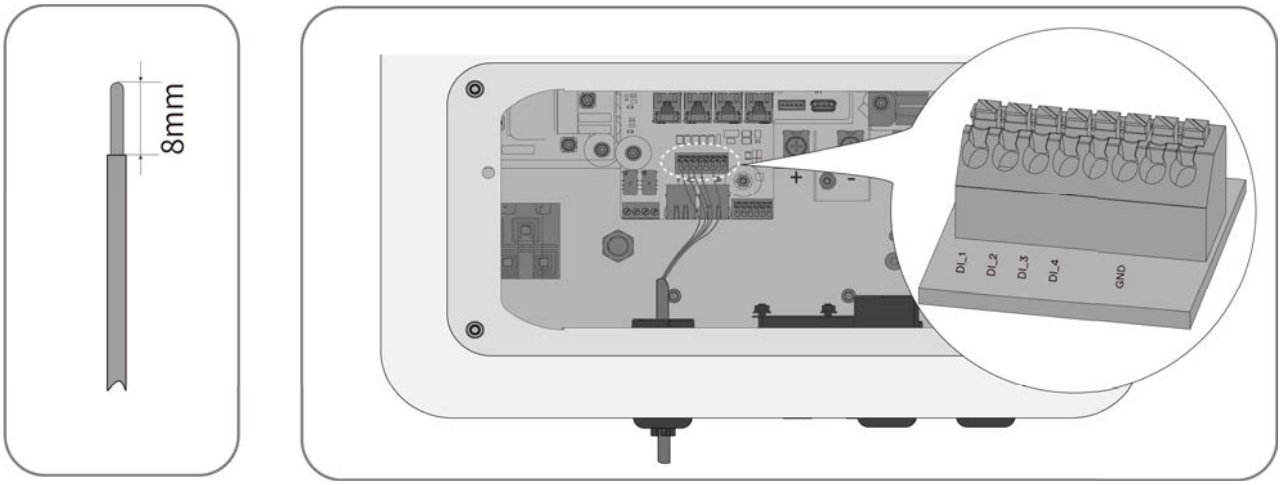


Complete the installation.

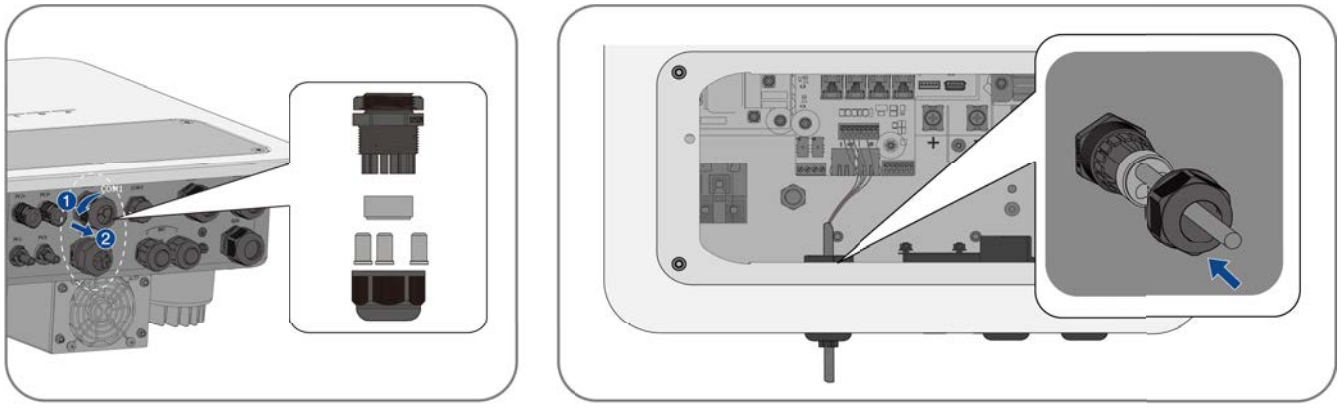
6.8.3 Ripple control connection

Procedure:

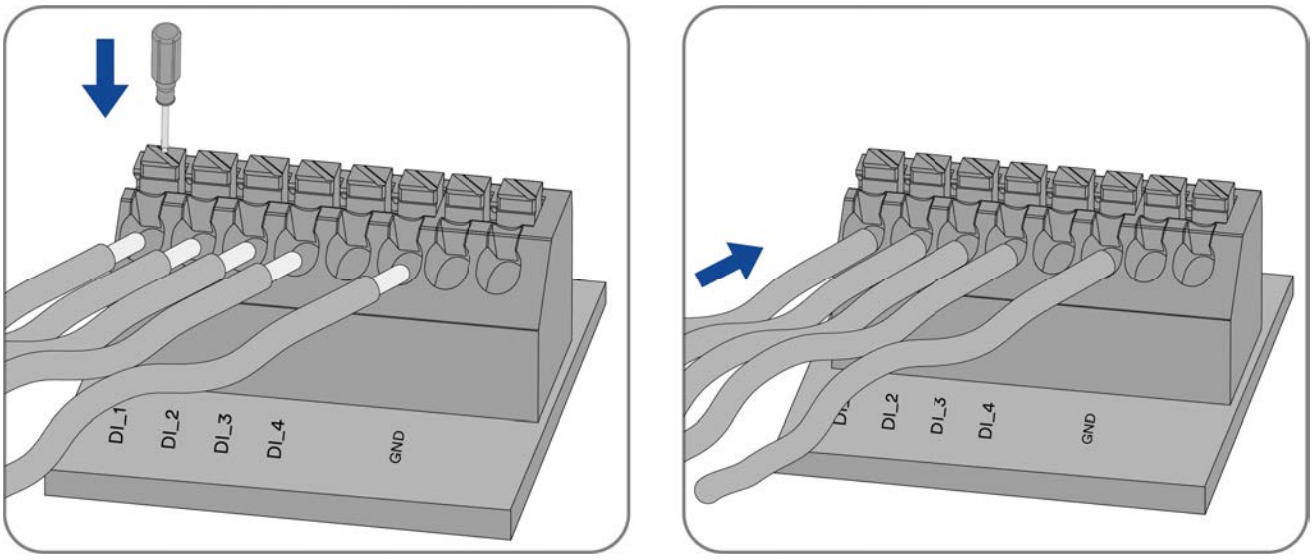
Step 1: Prepare the cable by stripping off the insulation on one end of the in accordance with the image below. Locate the DI pins on the Num.7 terminal block.



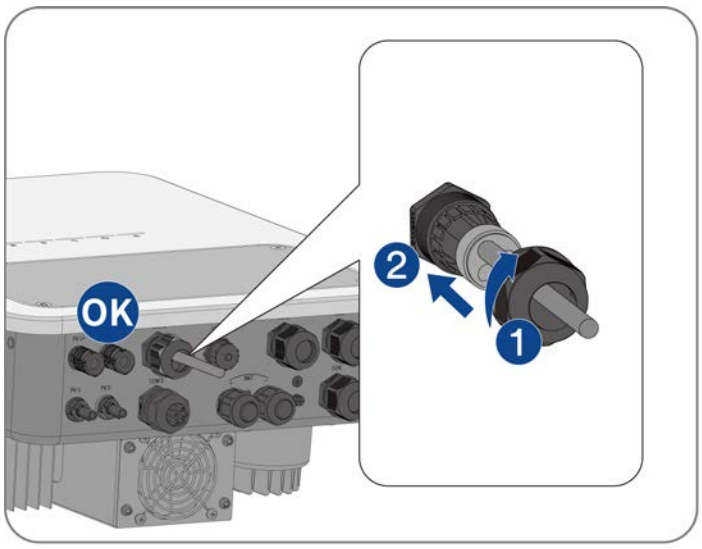
Step 2: Remove a COM 1 cable gland nut and insert the cable into the terminal.



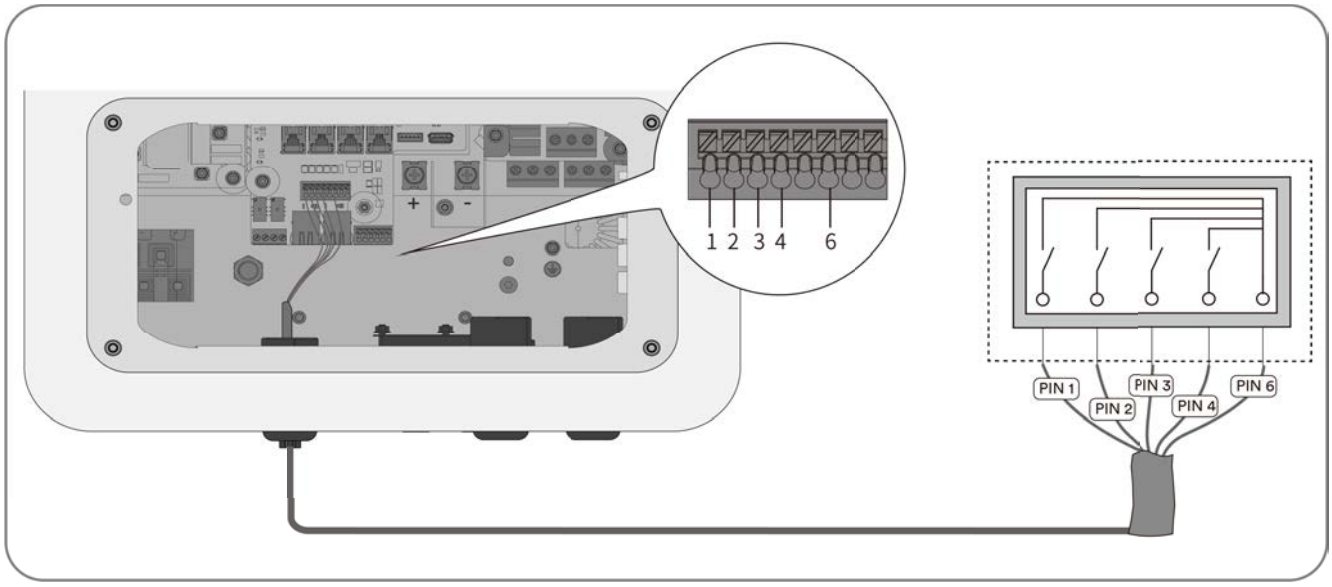
Step 3: Push down on the pin terminal and insert one of the cable wires. Repeat for the other pins as needed.



Step 4: Tighten the COM 1 cable gland nut onto the threaded gland body.



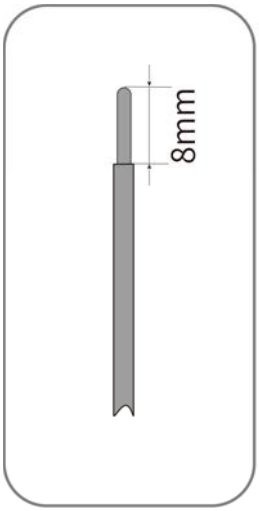
- Connect the network cable to ripple control receiver

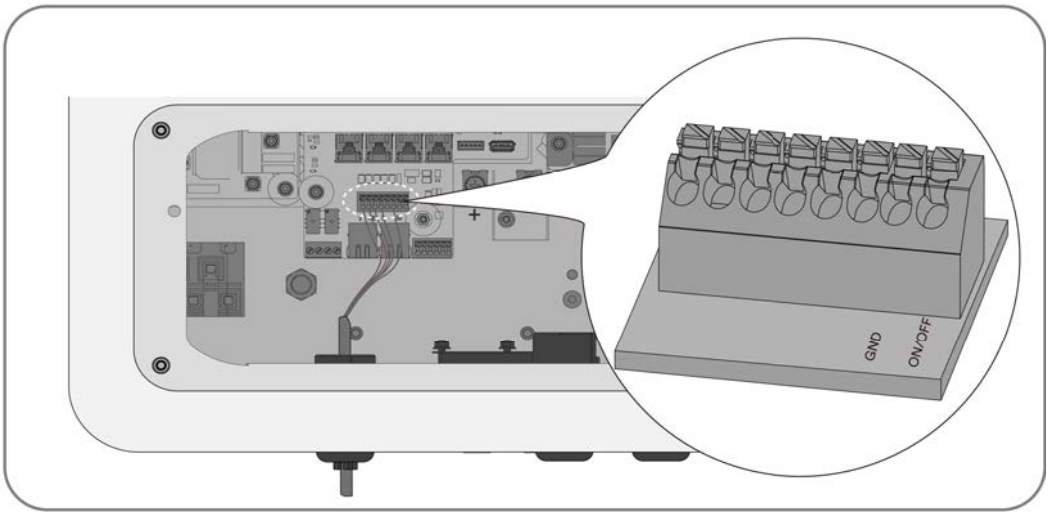


6.8.4 NS Protection Connection

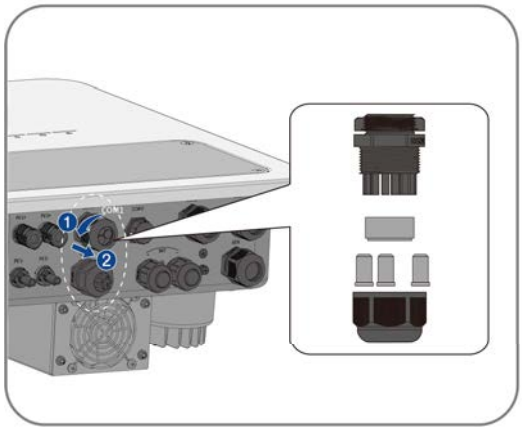
Procedure:

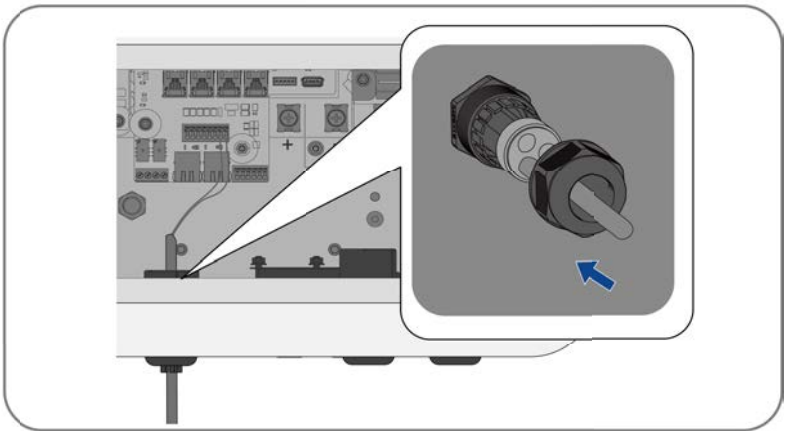
Step 1: Prepare the cable by stripping off the insulation on one end of the in accordance with the image below. Locate the pins on the Num.7 terminal block.



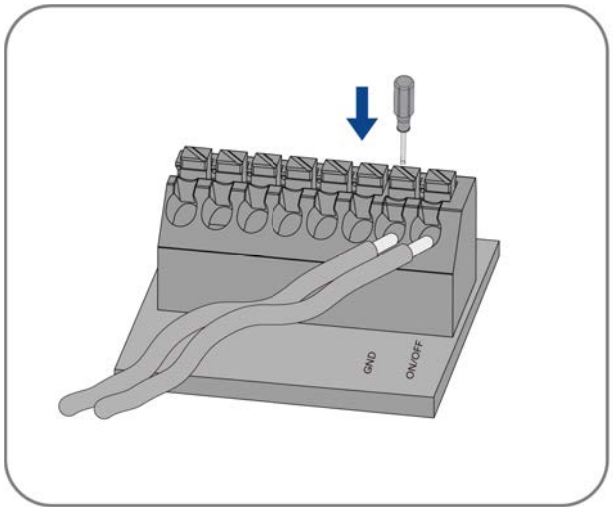


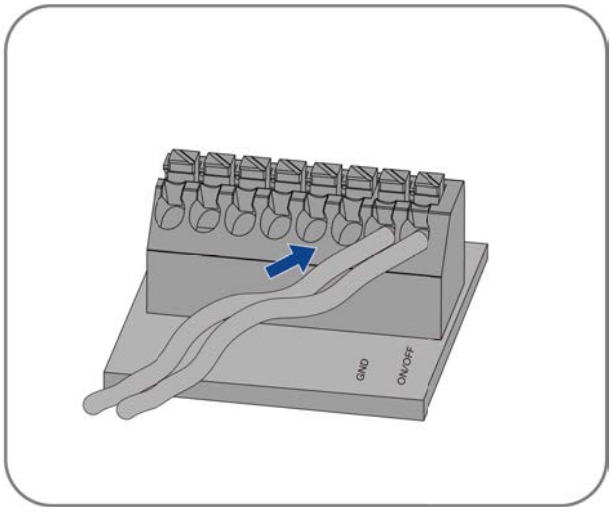
Step 2: Remove a COM 1/2 cable gland nut and insert the cable into the terminal.



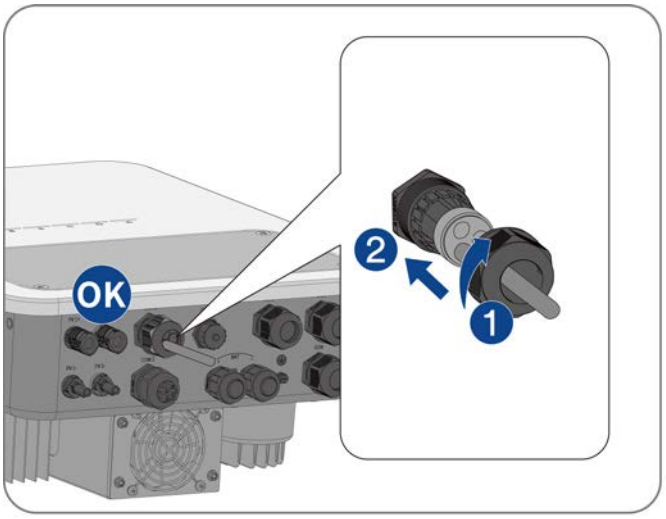


Step 3: Push down on the pin terminal and insert one of the cable wires. Repeat for the other pins as needed.

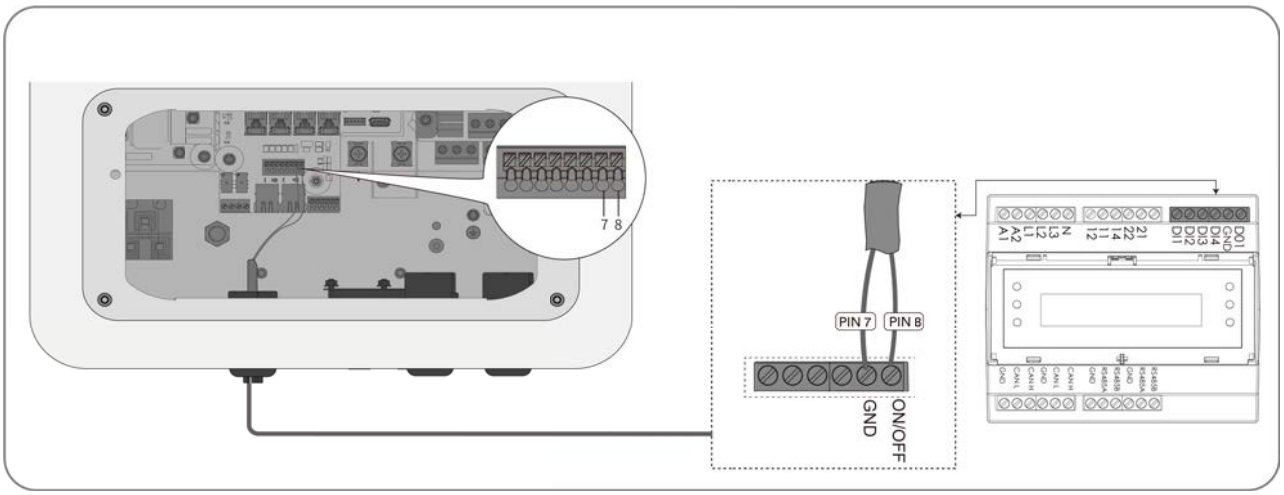




Step 4：Tighten the COM 1/2 cable gland nut onto the threaded gland body.



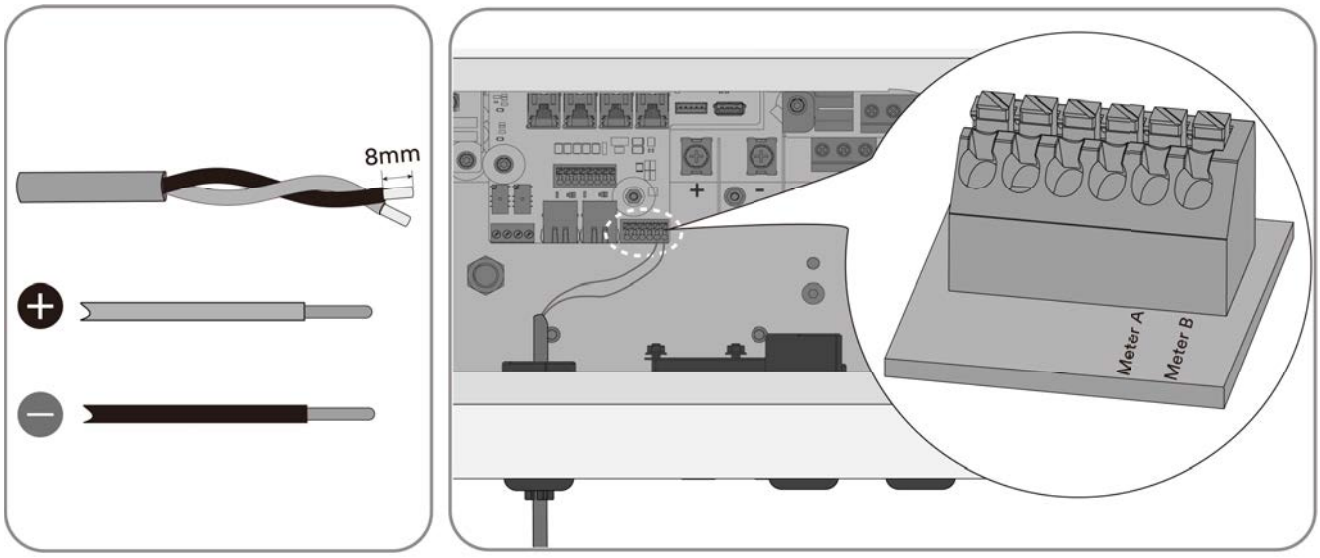
- Connect the network cable to NS protection device



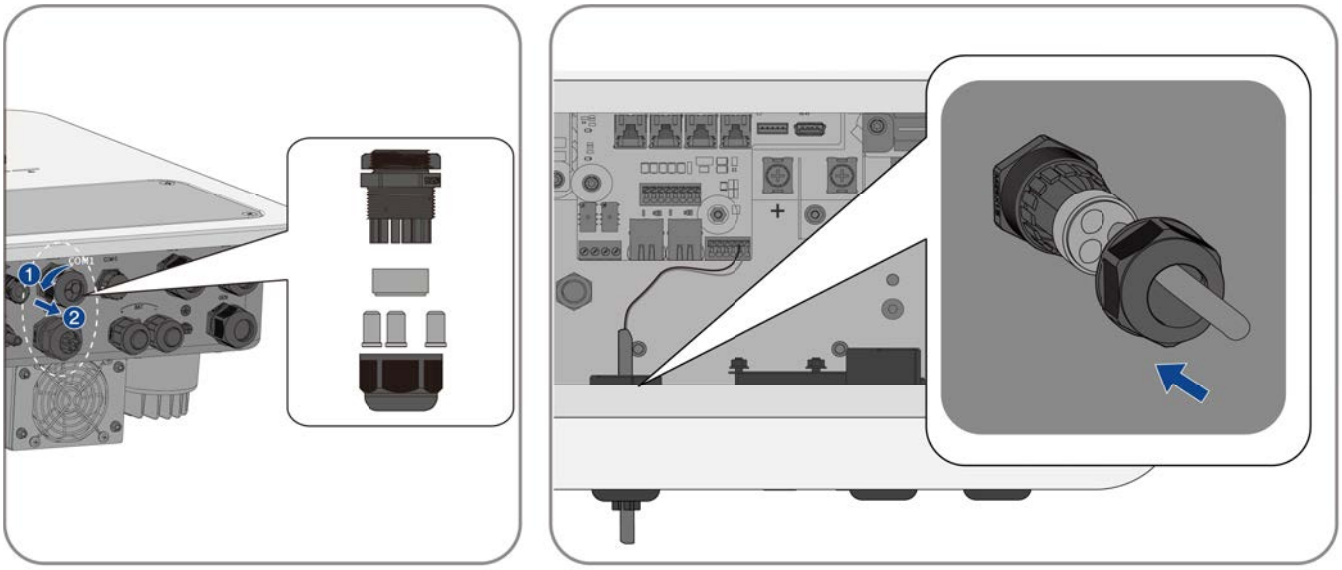
6.8.5 Smart Meter Connection

Procedure:

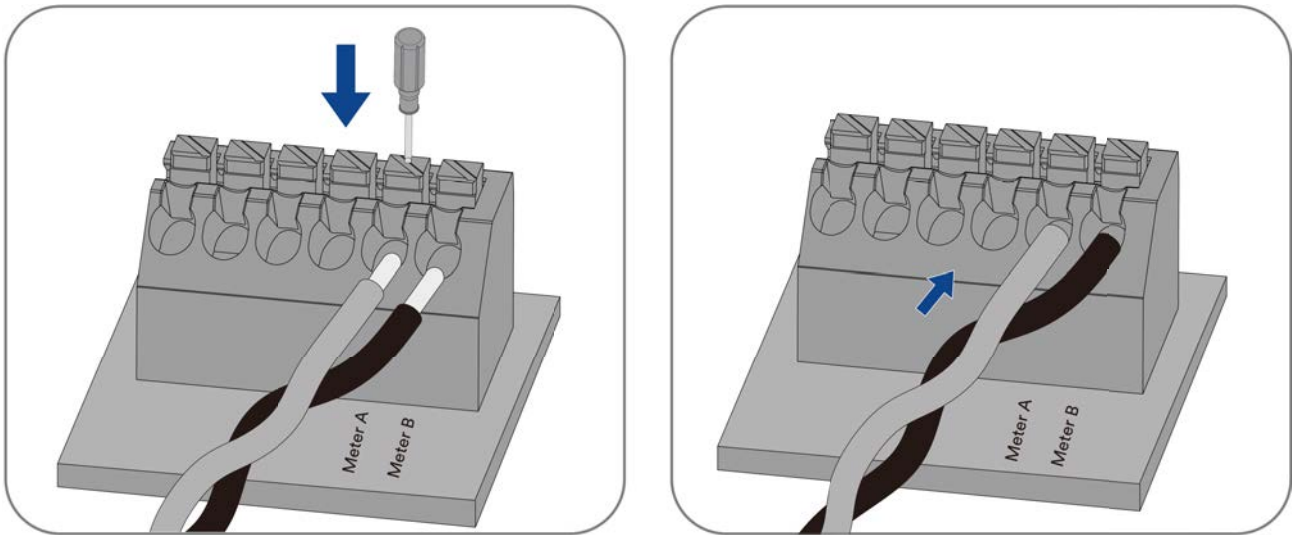
Step 1: Prepare the cable by stripping off the insulation on one end of the in accordance with the image below. Locate the RS485 pins on the Num.9 terminal block.



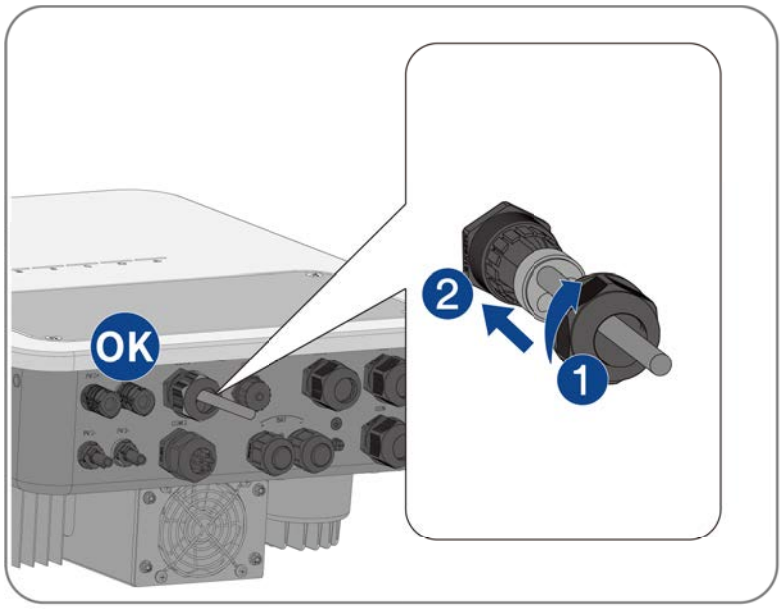
Step 2: Remove a COM 1/2 cable gland nut and feed cable into wiring enclosure.



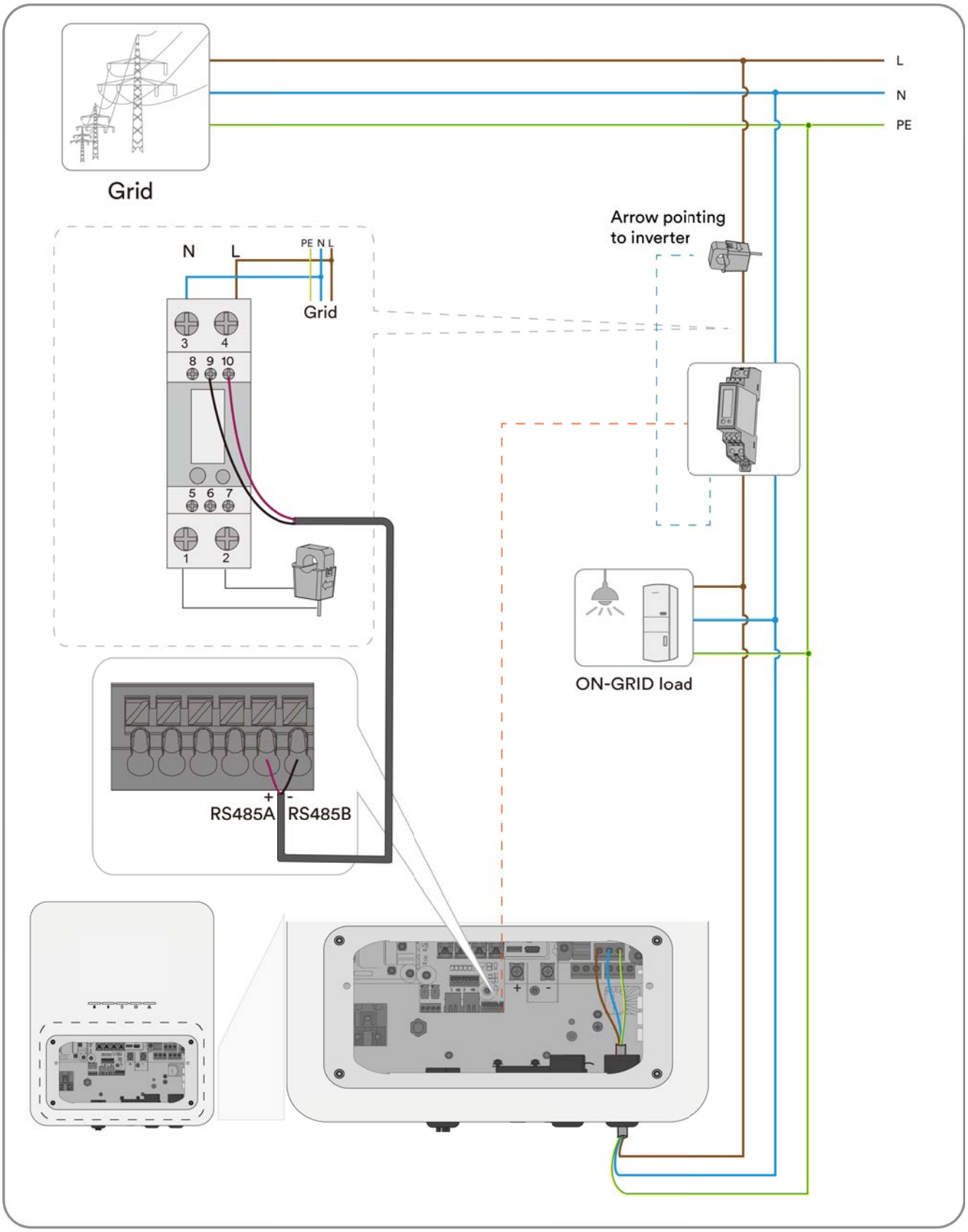
Step 3：Push down on the pin terminal and insert one of the cable wires. Repeat for the other pins as needed.



Step 4：Tighten the COM 1/2 cable gland nut onto the threaded gland body.



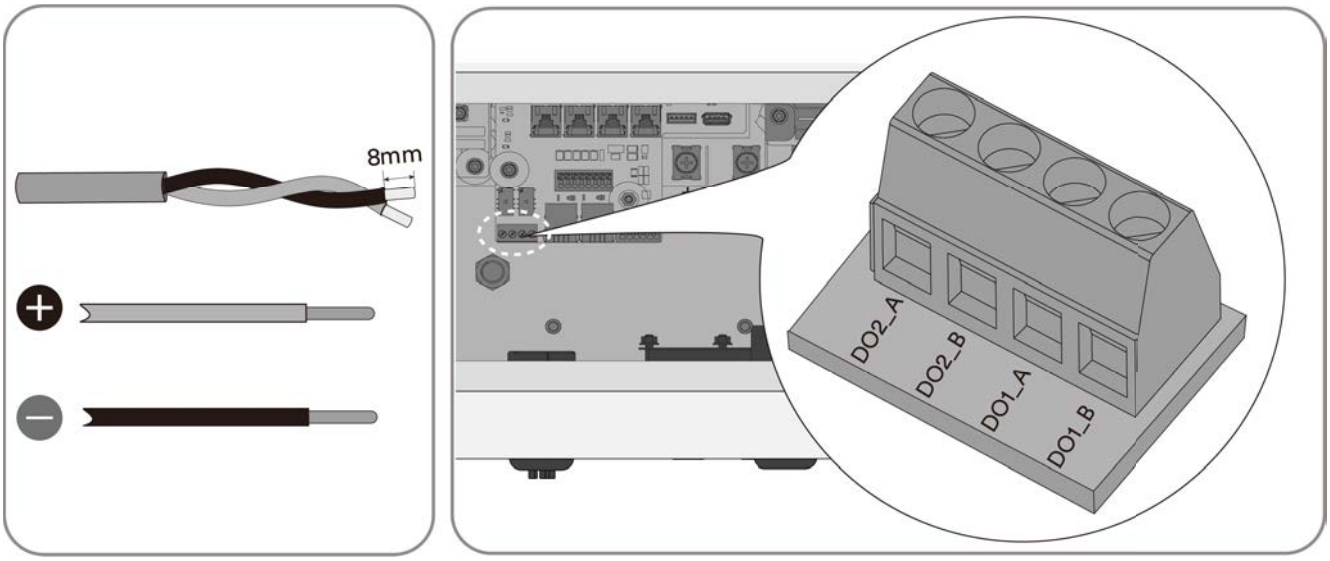
- Connect smart meter



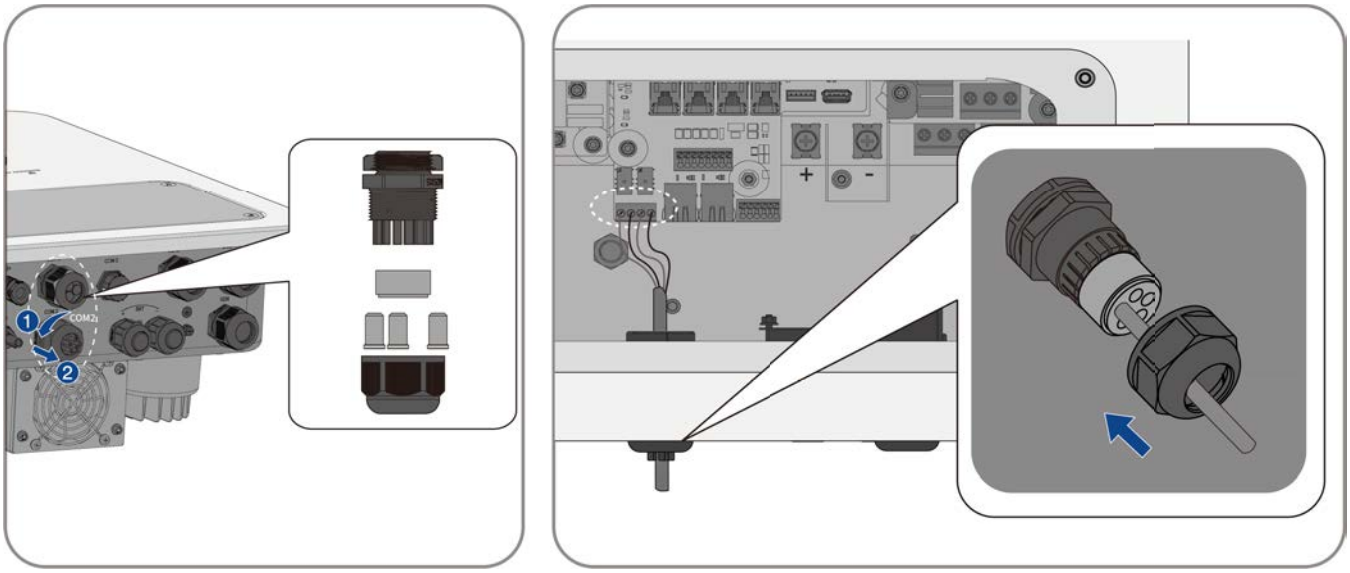
6.8.6 DO connection

Procedure:

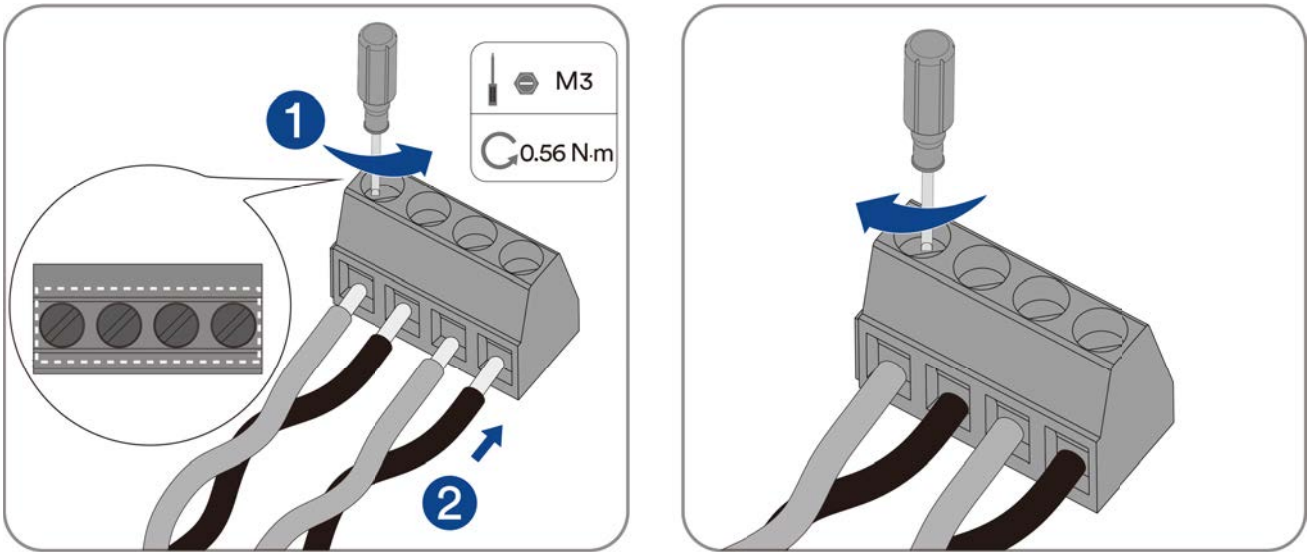
Step 1: Prepare the cable by stripping off the insulation on one end of the DO cable in accordance with the image below. Locate the DO pins on the Num.8 terminal block.



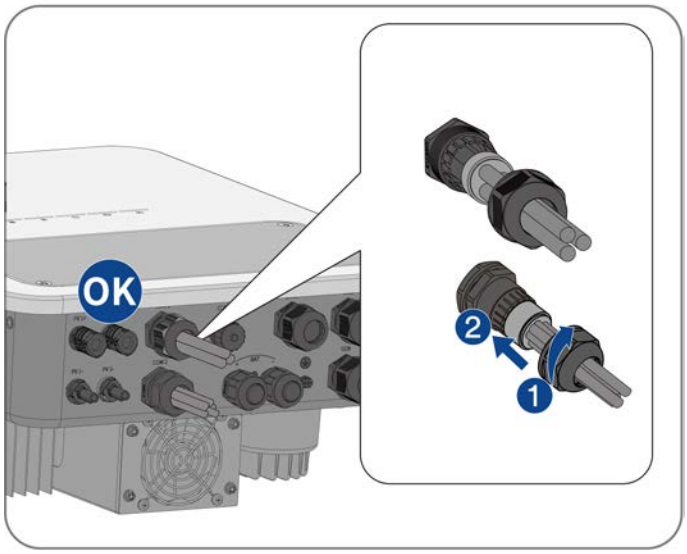
Step 2: Remove a COM 1/2 cable gland nut and feed cable into wiring enclosure.



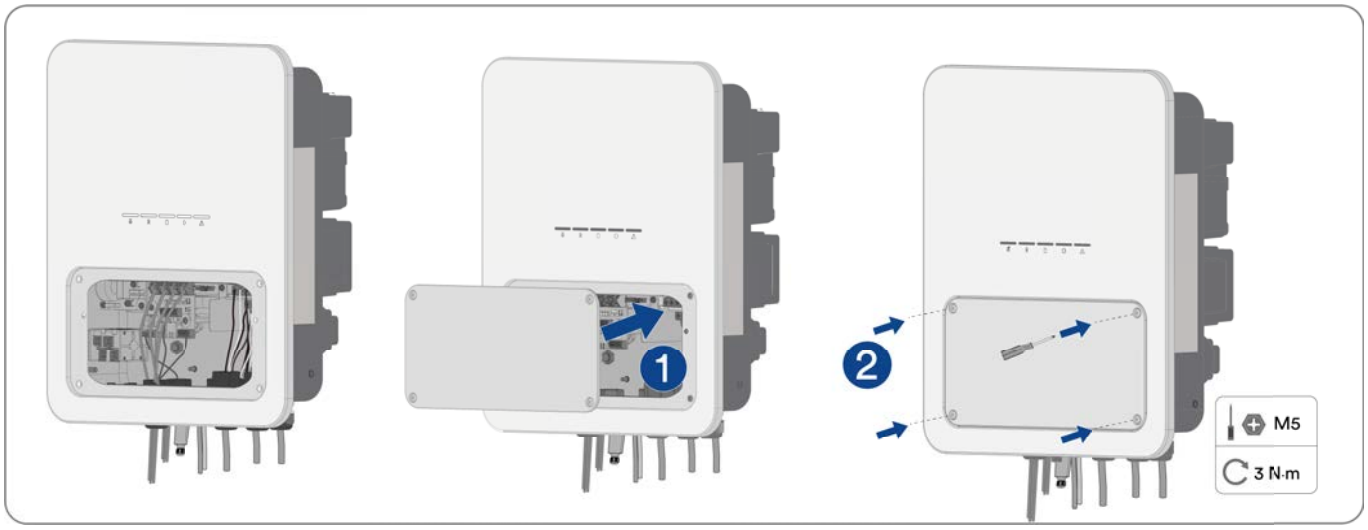
Step 3: Loosen the screws on the DO terminal block, insert the cable into the terminal block, and tighten the screw in accordance with the specified torque settings shown in the image below.



Step 4: Tighten the COM 1/2 cable gland nut onto the threaded gland body.



Step 5: Re-attach the lower wiring enclosure in accordance with the specified torque settings shown in the image below.



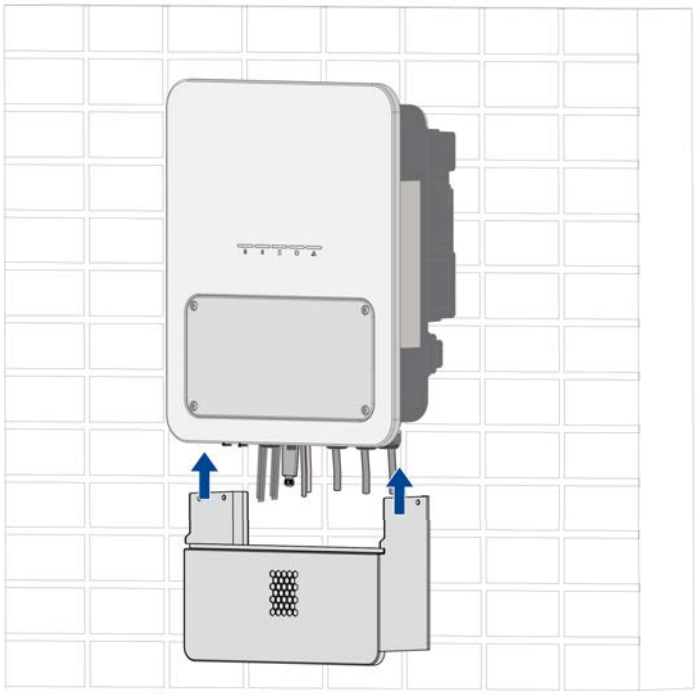
6.8.7 Protective Cover Installation (Optional)

NOTICE

- Please install the protective cover after finishing all electrical connections of the inverter.

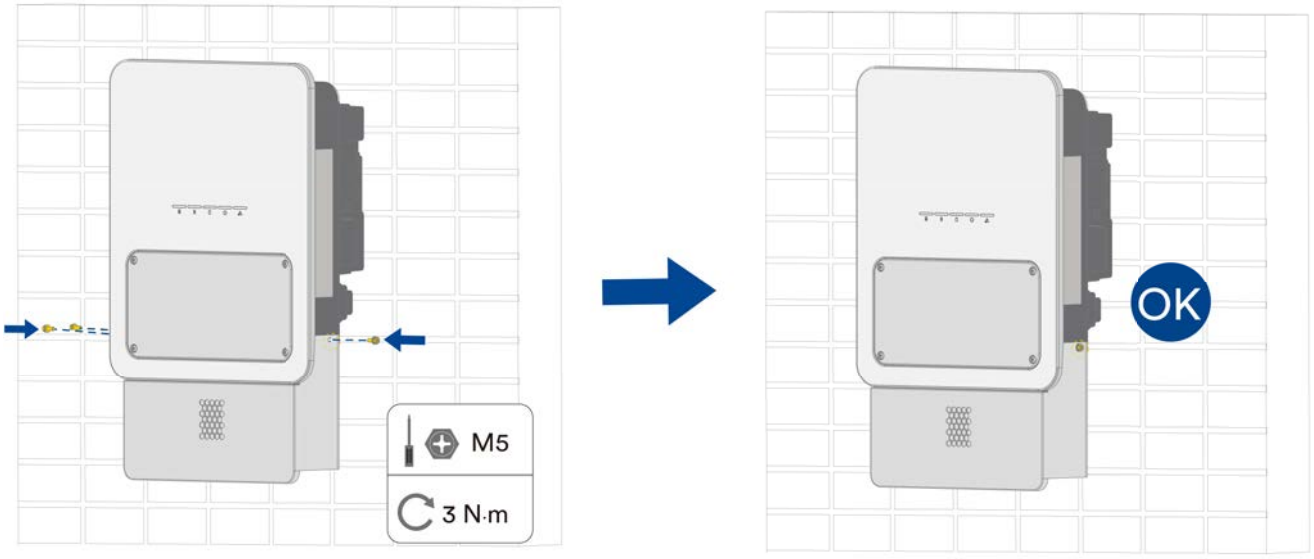
The installation procedure of the protective cover is as follows:

Step 1：After completing the electrical connections of the inverter, install the protective cover onto the bottom of the inverter, and then install the protective cover on the wall according to the following steps.



Step 2：Ensure that the threaded holes on the protective cover clips are aligned with the holes on the side of the inverter, tighten the screws, and secure the inverter to the protective cover.

Step 3：The installation of the protective cover is completed.



7 Commissioning and operating

7.1 Inspection before commissioning

⚠CAUTION

Danger to life due to high voltages on DC conductors!

When exposed to sunlight, the PV array generates dangerous DC voltage which is present in the DC conductors. Touching the DC and AC conductors can lead to lethal electric shocks..

- Only touch the insulation of the DC cables.
- Only touch the insulation of the AC cables.
- Do not touch ungrounded PV modules and brackets.
- Wear personal protective equipment, such as insulating gloves.

Check the following items before starting the inverter:

- Make sure the inverter DC switch and external circuit breaker are disconnected.
- Make sure the inverter has been correctly mounted with wall bracket.
- Make sure nothing is left on the top of the inverter.
- Make sure the communication cable and AC connector have been correctly wired and tightened.
- Make sure the inverter's exposed metal surface has a ground connection.
- Make sure the DC voltage of the strings does not exceed the permitted limits of the inverter.
- Make sure the DC voltage has the correct polarity.
- Make sure that the insulation resistance to ground is greater than the insulation resistance pro- tection value.
- Make sure the grid voltage at the point of connection of the inverter complies with the permitted value of the inverter.
- Make sure the AC circuit breaker complies with this manual and all applicable local standards.

7.2 Commissioning procedure

If all of the items mentioned above meet the requirements, proceed as follows to start up the inverter for the first time.

Step 1: Turn the DC switch of the inverter to "ON" position and start battery, but keep the breakers on EPS and grid port to "OFF" position.

Step 2: Connect the inverter with soplanet APP, For details, please refer to the user manual of the APP. Then set grid code, operation mode(refer to 4.7), merter or CT type, battery model and SOC limit refer to the user manual of the APP.

Step 3: Turn the breakers on EPS and grid port to "ON" position. If the irradiation and grid conditions meet requirements, the inverter will operate normally.

Step 4: Observe the LED indicator to ensure inverter operates normally, check the inverter and battery parameters in APP.

8 Solplanet APP

8.1 Download and install

The corresponding, free Solplanet app can be downloaded from the relevant app store and installed on a mobile device (smartphone or tablet) with an Android operating system (version 9.0 or newer) or iOS operating system (version 11.0 or newer).

Alternatively, scan the QR code below to download and install the app, following the on-screen instructions.

Android

iOS

The Solplanet app manual is subject to update without notice. For more product details and latest documents, please visit www.solplanet.net.

9 Decommissioning the product

9.1 Disconnecting the inverter from energy sources

Prior to performing any work on the product, always disconnect it from all energy sources as described in this section. Always adhere to the prescribed sequence.

⚠ WARNING

Danger to life due to electric shock from destruction of the measuring device due to overvoltage!

Overvoltage can damage a measuring device and result in voltage being present in the enclo- sure of the measuring device. Touching the live enclosure of the measuring device results in death or lethal injuries due to electric shock.

- Only use measuring devices with a DC input voltage range of 1100 V or higher.

Procedure:

Step 1: Turn off the miniature circuit breaker and secure against reconnection.

Step 2: Turn off the DC switch and secure against reconnection.

Step 3: Wait until the LEDs are off.

Step 4: Use a current clamp meter to ensure that no current is present in the DC cables.

⚠ DANGER

Danger to life due to electric shock when touching exposed DC conductors or DC plug contacts if the DC connectors are damaged or loose!

The DC connectors can break or become damaged, become free of the DC cables, or no longer be connected correctly if the DC connectors are released and disconnected incorrectly. This can result in the DC conductors or DC plug contacts being exposed. Touching live DC conductors or DC plug connectors will result in death or serious injury due to electric shock.

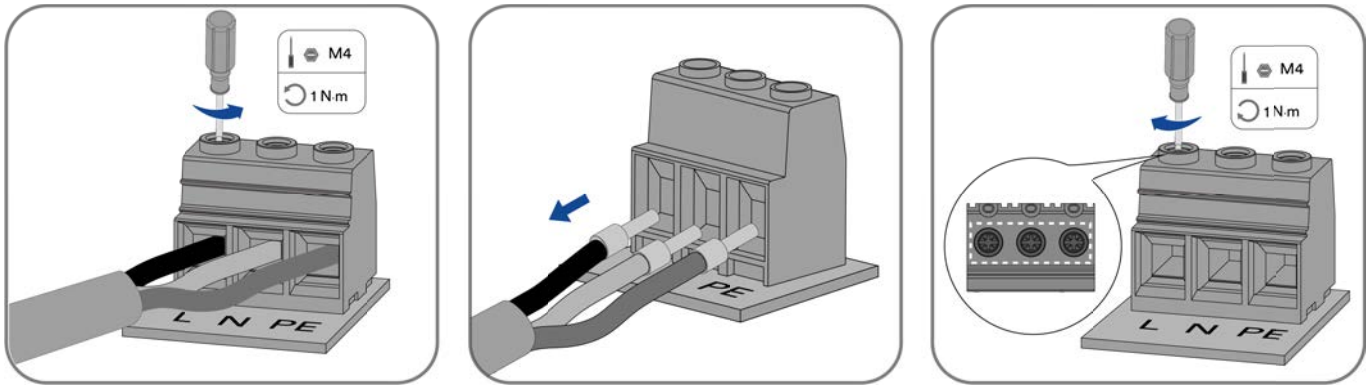
- Wear insulated gloves and use insulated tools when working on the DC connectors.
- Ensure that the DC connectors are in perfect condition and that none of the DC conductors or DC plug contacts are exposed.
- Carefully release and remove the DC connectors as described in the following.

Step 5: Remove the DC cable in reverse order by referring to 6.6 DC connection.

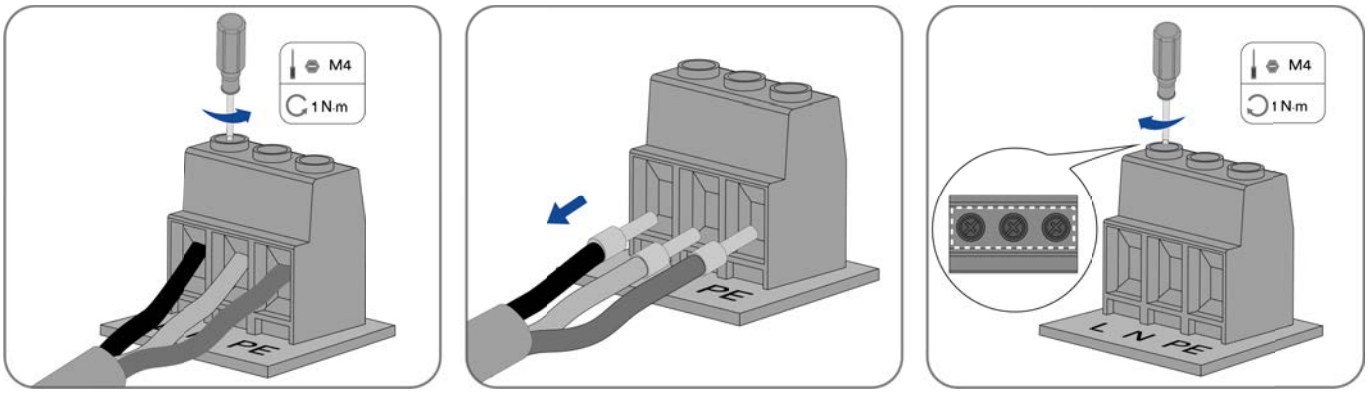
Step 6: Remove the magnetic ring from the DC negative terminal. Refer to Section 6.7.2 and disassemble the RSD module in reverse order.

Step 7: Ensure that no voltage is present between the positive terminal and negative terminal at the DC inputs using a suitable measuring device.

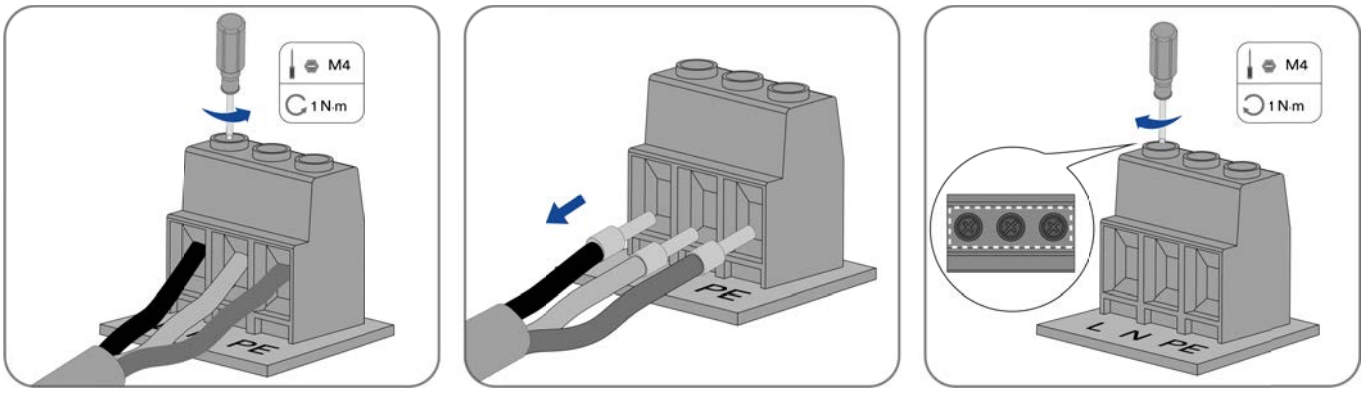
Step 8: Disconnect and remove the AC Grid cable in reverse order by referring to 6.3 AC Grid Connection.



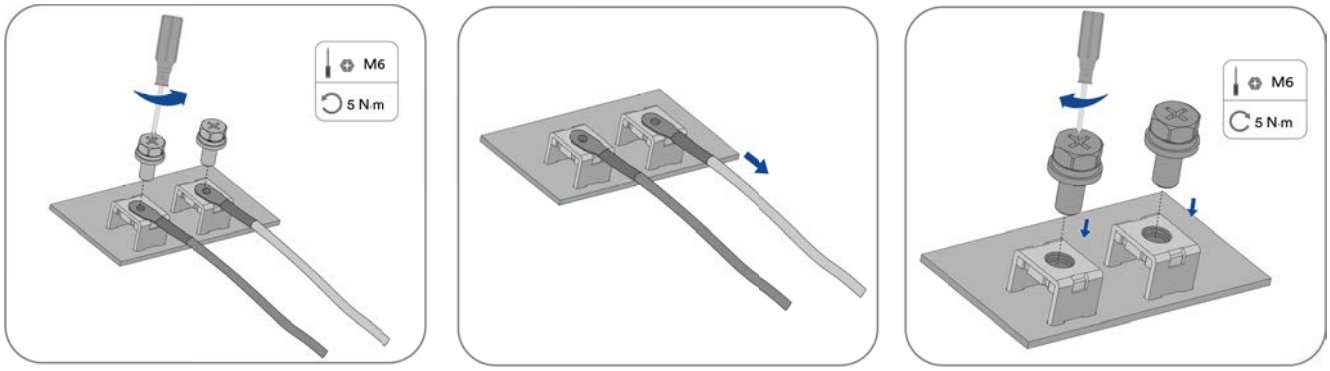
Step 9：Disconnect and remove the EPS cable in reverse order by referring to 6.4 EPS Load cable connection.



Step 10：Disconnect and remove the Generator cable reverse order by referring to 6.5 Generator cable connection.

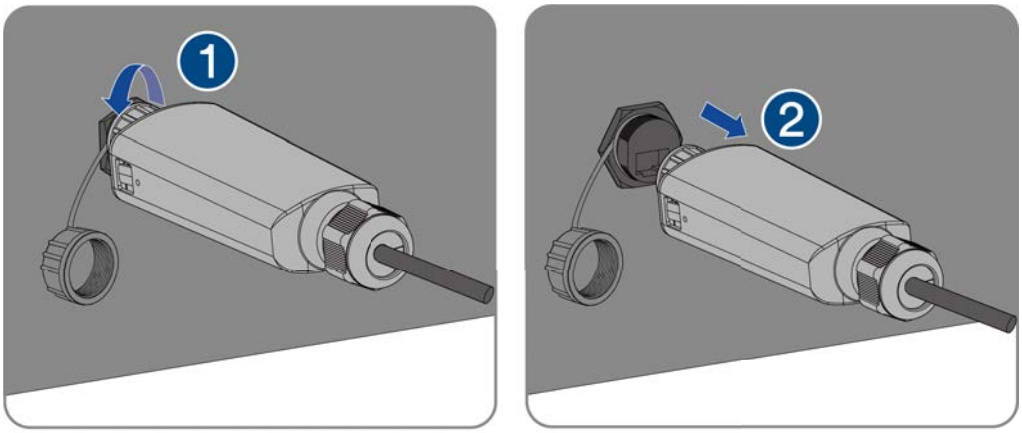


Step 11：Disconnect and remove the battery cable in reverse order by referring to 6.7 Battery connection.



Step 12：Disconnect and remove the communication cables in reverse order by referring to 6.9 Communication equipment connection.

Step 13: First the lock nut needs to be unscrewed before the dongle can be removed. Hold down the buckle on the side of the Ai-Dongle and pull out the Ai-Dongle terminal.



9.2 Dismantling the inverter

After disconnecting all electrical connections as described in Section 9.1, the inverter can be removed as follows

Procedure:

Step 1: Dismantle the inverter referring to “5.3 Mounting” in reverse steps.

Step 2: If necessary, remove the mounting bracket from the wall.

Step 3: If the inverter will be reinstalled in the future, please refer to “3.2 Product storage” for proper preservation.

10 Technical data

10.1 ASW002K/2.50K/003K/3.68K/004K/005K/006K-SH- EU&AU

Type	ASW002K-SH-EU	ASW2.50K-SH-EU	ASW003K-SH-EU&AU	ASW3.68K-SH-EU&AU	ASW004K-SH-EU&AU	ASW005K-SH-EU&AU	ASW006K-SH-EU&AU
DC Input							
Maximum power of PV array	4000 Wp	5000 Wp	6000 Wp	7360 Wp	8000 Wp	10000 Wp	12000 Wp
Maximum input voltage	550 V						
Rated input voltage	380 V						
Minimum input voltage	40 V						
Start voltage	50 V						
MPP voltage range	40-550 V						
MPP voltage range at Pnom	150~530 V						
Max. input current	20 A						
Maximum short circuit current (Isc PV)	25 A						
Maximum reverse current into the PV modules	0 A						
Number of independent MPP inputs	2						
Strings per MPP input	1						
Overvoltage category in accordance with ICE 60664-1	II						
AC Input and Output	ASW002K-SH-EU	ASW2.50K-SH-EU	ASW003K-SH-EU&AU	ASW3.68K-SH-EU&AU	ASW004K-SH-EU&AU	ASW005K-SH-EU&AU	ASW006K-SH-EU&AU
Rated output power at 230 V	2000W	2500W	3000W	3680W	4000W	5000W	6000W
Rated apparent power	2000VA	2500VA	3000VA	3680VA	4000VA	5000VA	6000VA
Maximum apparent power	2000VA	2500VA	3000VA	3680VA	4000VA	5000VA	6000VA
Rated grid voltage	220, 230, 240, L/N						
Grid voltage range	154 V-276 V						
Rated grid frequency	50 Hz/60 Hz						
Grid frequency range	45-55 Hz/55-65 Hz						
Rated output current at 220 V	9.0 A	11.3 A	13.6 A	16.7 A	18.1 A	22.7 A	27.2 A
Rated output current at 230 V	8.7 A	10.9 A	13.0 A	16.0 A	17.4 A	21.7 A	26.1 A
Rated output current at 240 V	8.3 A	10.4 A	12.5 A	15.3 A	16.6 A	20.8 A	25 A
Maximum output current	9.0 A	11.3 A	13.6 A	16.7 A	18.1 A	22.7 A	27.2 A
Max. input power from grid	4000 W	5000 W	6000 W	7200 W	7200 W	9000 W	9600 W
Max. input current from grid	17.3 A	21.7 A	26.1 A	31.3 A	31.3 A	39.1 A	41.7 A
Inrush current	<20% of nominal AC current for a maximum of 10ms						
Contribution to peak short-circuit current ip	77 A						
Initial short-circuit alternating current (Ik" first single period effective value)	88 A	88 A	88 A	88 A	88 A	88 A	88 A
Short circuit current continuous [ms] (max output fault current)	20 ms	20 ms	20 ms	20 ms	20 ms	20 ms	20 ms
Recommended rated current of AC circuit Breaker	32 A	32 A	32 A	40 A	40 A	50 A	50 A
Total harmonic distortion of the output current with total harmonic distortion of the AC voltage <2%, and AC power >50% of the rated power	<3% (of nominal power)						

Adjustable displacement power factor	0.8 leading to 0.8 lagging						
Overvoltage category in accordance with IEC 60664-1	III						
Battery data	ASW002K-SH-EU	ASW2.50K-SH-EU	ASW003K-SH-EU&AU	ASW3.68K-SH-EU&AU	ASW004K-SH-EU&AU	ASW005K-SH-EU&AU	ASW006K-SH-EU&AU
Max charging power	2000W	2500W	3000W	3680W	4000W	5000W	6000W
Max discharging power	2000W	2500W	3000 W	3680 W	4000 W	5000 W	6000 W
Battery voltage range	40~60 V						
Max charging current	50A	62.5 A	75A	90 A	100 A	120 A	135 A
Max discharging current	50A	62.5 A	75A	90 A	100 A	120 A	135 A
Rated charging current	50A	62.5 A	75A	90 A	100 A	120 A	135 A
Rated discharging current	50A	62.5 A	75A	90 A	100 A	120 A	135 A
Battery type	LiFePO4 / Lead-acid						
EPS load data	ASW002K-SH-EU	ASW2.50K-SH-EU	ASW003K-SH-EU&AU	ASW3.68K-SH-EU&AU	ASW004K-SH-EU&AU	ASW005K-SH-EU&AU	ASW006K-SH-EU&AU
Rated apparent power	2000W	2500W	3000 W	3680 W	4000 W	5000 W	6000 W
Max. output apparent power	2200VA	2750VA	3300 VA	4048 VA	4400 VA	5500 VA	6600 VA
Nominal output voltage	220, 230, 240, L/N						
AC grid frequency	50 Hz / 60 Hz						
Rated current at 230V	8.7 A	10.9 A	13.0 A	16.0A	17.4 A	21.8 A	26.1A
Max. continuous current at 230V	9.5 A	11.9 A	14.3 A	17.6 A	19.1 A	23.9 A	28.7 A
Peak output apparent power (off-grid up to 2s)	2 times of rated power, 2s						
Total harmonic distortion (THDv, linear load)	2%						
Switching time to battery-backup operation	<10 ms						
Generator data	ASW002K-SH-EU	ASW2.50K-SH-EU	ASW003K-SH-EU&AU	ASW3.68K-SH-EU&AU	ASW004K-SH-EU&AU	ASW005K-SH-EU&AU	ASW006K-SH-EU&AU
Max. intput apparent power	2200VA	2750VA	3300 VA	4048 VA	4400 VA	5500 VA	6600 VA
Max. input current	9.5 A	11.9 A	14.3 A	17.6 A	19.1 A	23.9 A	28.7 A
Rated AC voltage	220, 230, 240, L/N						
Rated AC frequency	50 Hz / 60 Hz						
Efficiency							
MPPT efficiency	99.90%						
Maximum efficiency	97.6%						
European weighted efficiency	97%						

(1) The voltage range meets the requirements of the corresponding national grid code.

(2) The frequency range meets the requirements of the corresponding national grid code.

10.2 General data

Type	ASW002K-SH-EU	ASW2.50K-SH-EU	ASW003K-SH-EU&AU	ASW3.68K-SH-EU&AU	ASW004K-SH-EU&AU	ASW005K-SH-EU&AU	ASW006K-SH-EU&AU
Width × height × depth	425 x 520 x 210 mm						

Weight	22 kg						
Topology	Non-isolated						
Operating temperature range	-25°C ... +60°C						
Allowable relative humidity range (non-condensing)	0% ... 100%						
Degree of protection for electronics in accordance with IEC 60529	IP66						
Climatic category in accordance with IEC 60721-3-4	4K4H						
Protection class (according to IEC 62103)	I/II(DC), III(AC)						
Pollution degree outside the enclosure	3						
Pollution degree inside the enclosure	2						
Max. operating altitude above mean sea level	3000 m						
Self-consumption (night)	<10W						
Cooling method	Natural cooling	Natural cooling	Natural cooling	Natural cooling	Natural cooling	Smart Fan cooling	Smart Fan cooling
Typical noise emission	typical <30dB						typical <35dB
Display	LED indicator, App						
Demand response mode in accordance with AS/NZS 4777.2	DRM0						
Export active power output	Via connecting Smart meter						
Earth Fault Alarm	cloud based, Visible						
Internet communication interfaces	Dongle: WiFi (2.4 GHz) / LAN (100 Mbps) Inverter: RS485 (ModBus RTU), LAN (100Mbps, Modbus TCP only)						
Mounting information	Wall mounting bracket						
Radio technology	WLAN 802.11 b/g/n						
Radio spectrum	WLAN with 2412 – 2472MHz band						
Maximum transmission power	100 mW						

10.3 Protective device

Protective devices	ASW002K-SH-EU	ASW2.50K-SH-EU	ASW003K-SH-EU&AU	ASW3.68K-SH-EU&AU	ASW004K-SH-EU&AU	ASW005K-SH-EU&AU	ASW006K-SH-EU&AU
DC reverse polarity protection	Integrated						
DC isolator	Integrated						
Ground fault monitoring	Integrated						
AC short- circuit current capability	Integrated						
Active anti-islanding protection	Integrated						
PV string current monitoring	Integrated						
DC current injection monitoring	Integrated						
Low voltage ride through	Integrated						
High voltage ride through	Integrated						
Overvoltage protection	DC Type II / AC Type III						

11 Troubleshooting

When the PV system does not operate normally, we recommend the following solutions for quick troubleshooting. If an error or warning occurs, there will have “Event Messages" display in the monitor tools. The corresponding corrective measures are as follows:

Error code	Message	Corrective measures
3	Relay check Fail	• Check the DC side condition (e.g. input voltage, poor contact, etc.) and remove any abnormality. • Disconnect EPS to check grid condition(e.g. voltage, frequency, poor condition,etc) and remove any abnormality, then restart it to check if the fault is disappear; • Make exchange of the inverter if complete the above guide with fault is still there.
4	DC Injection High	• Check DCI protection limit and adjust it to be 2A to observe is the fault disappear? • If the fault is still there, Check the grid condition(e.g., voltage, frequency, poor contact, etc.) • Test the surrounding environment for the presence of high-power equipment (e.g., generators, cranes, etc.), this fault may be related to the start and stop of this equipment. • Make exchange of the inverter if complete the above guide with fault is still there.
5	The result of Auto Test Function is fail	• Disconnect the inverter from the AC grid, PV module and battery and reconnect after 5 minutes. • Make exchange of the inverter if complete the above guide with fault is still there.
8	AC HCT Failure	• Disconnect the inverter from the AC grid, PV module and battery and reconnect after 5 minutes. • Make exchange of the inverter if complete the above guide with fault is still there.
9	GFCI Device Failure	• Disconnect the inverter from the AC grid, PV module and battery and reconnect after 5 minutes. • Make exchange of the inverter if complete the above guide with fault is still there.
10	Device fault	• Disconnect the inverter from the AC grid, PV module and battery and reconnect after 5 minutes. • If this fault is still being shown, contact the service. • The inverter temperature should be above -40℃
12	HW output over current	• Disconnect the inverter from the AC grid, PV module, battery and reconnect after 5 minutes, check is it solved? • If not, disconnect the load, and restart the inverter to check is it solved? • If the fault disappear, then connect the load one by one to check which load result this fault?

		• Make exchange of the inverter if complete the above guide with fault is still there.
33	Fac Failure:Fac Out of Range	• Check the grid and EPS frequency and observe how often major fluctuations occur. • Contact customer service if EPS frequency abnormal. If this fault is caused by frequent fluctuations, try to modify the operating parameters after informing the grid operator first.
34	AC Voltage Out of Range	• Check the grid voltage and grid connection on inverter. • Check the grid voltage at the point of connection of inverter. If the grid voltage is outside the permissible range due to local grid conditions, try to modify the values of the monitored operational limits after informing the electric utility company first. If the grid voltage lies within the permitted range and this fault still occurs, please call service.
36	GFCI Failure	Make sure the inverter is reliably grounded. • Only Disconnect PV module and restrart it to check is the fault on? Remove any abnormality. • Only Disconnect battery to check is the fault on? Remove any abnormality. • Only Disconnect Grid side to check is fault on? Remove any abnormality. • Disconnect EPS to check is fault on? Remove any abnormality.
37	PV Over Voltage	• Check the open-circuit voltages of the strings and make sure it is below the maximum DC input voltage of the inverter. • Make exchange of the inverter if the input voltage lies within the permitted range and the fault still occurs.
38	Isolation Fault	Make sure the inverter is reliably grounded. • Only Disconnect PV module and restrart it to check is the fault on? Remove any abnormality. • Only Disconnect battery to check is the fault on? remove any abnormality. • Only Disconnect Grid side to check is fault on? remove any abnormality. • Disconnect EPS to check is fault on? remove any abnormality.
40	Over temperature in inverter	• Check whether the airflow to the heat sink is obstructed. • Check whether the ambient temperature around the inverter is too high.
48	Average volt of ten minutes Fault	• Check the grid voltage at the point of connection of inverter. • If the grid voltage is outside the permissible range due to local grid conditions, try to modify the values of the monitored operational limits after informing the electric utility company first. • If the grid voltage lies within the permitted range and this fault still occurs, please call service.
65	PE wire connection fault	• Check if the ground line is connected to the inverter. • Ensure the grounding connection of the inverter is connected and reliable. • If this fault occurs often, contact Solplanet service.
69	External input signal fault	• If NS protection function is not needed, this function maybe enabled by mistake, disable this by APP.

		• If NS protection function is needed, check signal wire connection is right on CN702's PIN8&PIN7, if connection is right, use multimeter measure CN702's PIN8&PIN7 power voltage should lie in range of 10-24Vd.c.. • If this fault occurs often, contact Solplanet service.
70	AFCI Self Test Fail	• Make exchange of the inverter.
71	AFCI Fault	• Disconnect each MPPT tracker, and eliminate any abnormalities. • Make exchange of the inverter if complete the above guide with fault is still there.
76	Generator Voltage or Fac Out of Range	• Check whether the diesel generator works properly. • Check that the Gen-port is correctly connected. • Check whether the diesel generator is connected but set the port mode to smart load mode.
78	Generator or smart load Overloaded	• In generator mode: a) Check the maximum power setting of the generator machine. b) Check whether the load power exceeds the maximum limit. • In smart load mode: a) Check whether the smart load power exceeds the maximum limit.

Warning Code	Message	Corrective measures
34	PV1 input over current-software	• Disconnect the inverter from the AC grid, PV module and battery, and reconnect after 5 minutes to check is the problem solved? • Make exchange of the inverter if complete the above guide with fault is still there.
35	PV1 input over current-hardware	• Disconnect the inverter from the AC grid, PV module and battery, and reconnect after 5 minutes to check is the problem solved? • Make exchange of the inverter if complete the above guide with fault is still there.
36	PV2 input over current-software	• Disconnect the inverter from the AC grid, PV module and battery, and reconnect after 5 minutes to check is the problem solved? • Make exchange of the inverter if complete the above guide with fault is still there.
37	PV2 input over current-hardware	• Disconnect the inverter from the AC grid, PV module and battery, and reconnect after 5 minutes to check is the problem solved? • Make exchange of the inverter if complete the above guide with fault is still there.
40	BUS over voltage-software	• Check actual PV input voltage &AC voltage to make sure the voltage within the voltage range when installing the inverter; • If the fault reports during the inverter first installation, and also doesn't work for more than 6 months after production, then the fault may be caused by energy lack of capacitance. Then close the DC switch to charge the capacitor for one day to check is the problem solved? Make exchange of the inverter if it is not solved. Go to next steps to check when it is not new installation

		• Check BUS voltage in cloud; • If BUS voltage is over 550V when PV input voltage is most same with 500V, please decrease input voltage to check is the fault disappear? • If BUS voltage is over 550V when PV input voltage is most less than 500V, Make exchange of the inverter.
46	output over current-hardware	• Disconnect load to check is the warning still on? and remove any abnormality • Disconnect battery to chek is the warning still on? and remove any abnormality • Disconnect PV module to chek is the warning still on? and remove any abnormality • Make exchange of the inverter if complete the above guide with fault is still there.
47	Anti-islanding	• This warning may occurs when grid frequency or voltage instant un-stable or grid blackout occasionally. • If this warning occurs frequently, contact service.
162	DC offset current abnormal	• Disconnect the inverter from the AC grid, PV module and battery and reconnect after 5 minutes. • Make exchange of the inverter if complete the above guide with fault is still there.
175	Battery Soc Low	• Timely charge the battery, observe SOC value, it is normal if SOC value increases steabily. • if SOC value increases uneven, first charge the battery to be full, then make discharge of battery, it can explain battery package is normal when SOC value changing is even, or please make at least one time cycle of full charge and full discharge everyday to observe whether SOC value display is improved. • If the failure cannot be solved, please contact the service.
176	Battery Fault Status	• Check battery status in App; • Follow battery status to find battery fault troubleshooting.
177	Battery 1 Communication or Power Cable DisConnect	• Check whether the power cable of Battery is disconnected. • Check whether the communication cable of battery is disconnected. • If the problem is still not solved, contact Solplanet service.
178	EPS Output Over	• Decrease the load connection to check is this fault disappear? • Stop the inverter and restart with no EPS to check is this fault disappear? • Make exchange of the inverter if complete the above guide with fault is still there.
180	PV string inverse	• Check PV string/Battery positive and negative connection.
192	Meter or CT loss	• Check whether the smart meter or CT wiring is wrong. • Check whether the meter is the meter supported by the inverter mode. • Check whether the baud rate of the meter is 9600bps. • If the problem is still not solved, contact Solplanet service.

Warning Code	Battery error status details in App	Corrective measures
W176 Battery Error	Communication data	• Make inspection of the communication wiring loosen or abnormal between battery package and inverter. To supply power to the inverter through connecting inverter with the grid or PV. • If the failure cannot be solved, please contact the service.
	Cell or module overvoltage	• Stop charging; • Make discharging of battery; • Observe after multiple cyclyes of charging&discharging; • If the failure cannot be solved, please contact the service.
	Undervoltage of battery cells or modules	• Stop discharging; • Make charging of battery; • Observe after multiple cyclyes of charging&discharging; • If the failure cannot be solved, please contact the service.
	Cell temperature too high	• Stop working; • Observe site ambience, is ambience temperature high? • Check recent running condition, whether put it in rather high temperature ambience when not put it to work. • Wait to recover automatically.
	Cell temperature too low	• Stop working; • Observe site ambience, is ambience temperature too low? • Check recent running condition, whether put it in rather low temperature ambience when not put it to work. • Wait it to recover automatically.
	Discharge overcurrent	• Wait it to recover automatically. • Check external load connection status of battery packgae, check does the inverter work normally when only connects with inverter? • If the failure cannot be solved, please contact the service.
	Charging overcurrent	• Wait it to recover automatically. • Check charging status of battery packgae, check does the inverter work normally when only connects with one inverter? • If the failure cannot be solved, please contact the service.
	Internal communication error	• Restart battery equipment, check whether connection plug loosen, whether the connection screw is tighten between the pile battery package and control box; • If the failure cannot be solved, please contact the service.
	Cell imbalance	• Make at least one time cycle of charge&discharge everyday to make battery package balance mechanism. • If the failure cannot be solved or improved after one week, please contact the service.
	Low system insulation	• Confirm if there is any leakage or short circuit between the positive and

		negative terminals of the battery; • When insulation failure occurs, it is generally necessary to replace the faulty battery pack inside the battery; • If multiple insulation faults occur, it may be necessary to replace the entire battery.
	Voltage sensor failure	• Test is the connection screw tighten between battery pack and control box? restart battery pack. • If the failure cannot be solved, please contact the service.
	Temperature sensor failure	• Test is the connection screw tighten between battery pack and control box? restart battery pack. • If the failure cannot be solved, please contact the service.
	Contactor failure	• Hardware is defective, restart battery and check is the wiring cable loosen? • If the failure cannot be solved, please contact the service.
	Power-on self-test failure	• Restart Battery; • If the failure cannot be solved, please contact the service.
	IC self test failure	• Restart Battery; • If the failure cannot be solved, please contact the service.

Contact the service if you meet other problems not in the table.

12 Maintenance

12.1 Cleaning the contacts of the DC switch

⚠ DANGER

High voltage of PV string may cause life danger !

If the DC connector is disconnected while the PV inverter is working, electric arc may occur, causing electric shock and burns.

- Please disconnect the circuit breaker on the AC side first, and then disconnect the DC switch.

To ensure the normal operation of the DC input switch, it is necessary to clean the DC switch contacts every year.

Procedure:

Step 1: Disconnect the AC disconnector and prevent accidental restart.

Step 2: Rotate the DC switch handle from the “ON” position to the “OFF” position for 5 times.

12.2 Cleaning air inlet and outlet

⚠ CAUTION

Hot enclosure or heat sink may cause personal injury!

When the inverter is working, the temperature of the enclosure or heat sink will be higher than 70°C, and the contact may cause burns.

- Before cleaning the air outlet, shut down the machine and wait for about 30 minutes until the temperature of the enclosure decreases to normal temperature.

A huge amount of heat is generated in the process of running the inverter. The inverter adopts a controlled forced-air cooling method. In order to maintain good ventilation, please check to make sure the air inlet and outlet are not blocked.

Procedure:

Step 1: Disconnect the AC side circuit breaker and ensure that it cannot be accidentally reconnected.

Step 2: Disconnect the DC switch, rotate the DC switch handle from the “ON” position to the “OFF” position.

Step 3: Clean the air inlet and outlet of the inverter with a soft brush.

12.3 Fan maintenance

⚠ WARNING

Hot enclosure or heat sink may cause personal injury!

When the inverter is working, the temperature of the enclosure or heat sink may be higher than 70℃. Physical contact may cause burns.

- Before cleaning the air outlet, shut down the machine and wait approximately 30 minutes until the temperature of the enclosure decreases to a normal temperature.

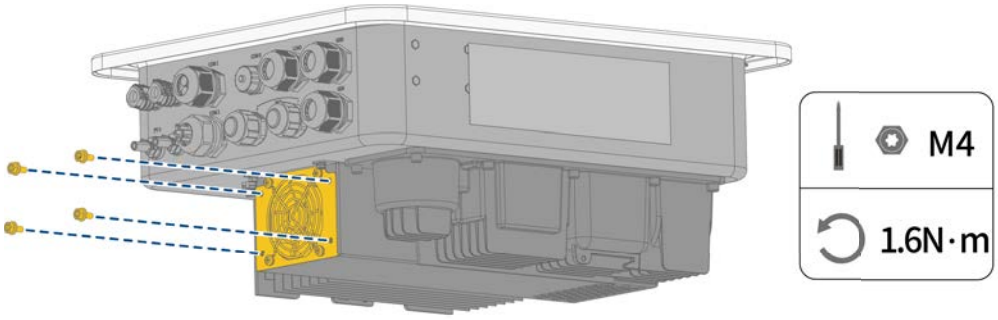
Fans inside the inverter are used to cool the inverter during operation. If the fans do not operate normally, the inverter may not be cooled down and inverter efficiency may decrease. Therefore, it is necessary to clean the dirty fans and replace the broken fans in time.

Procedure:

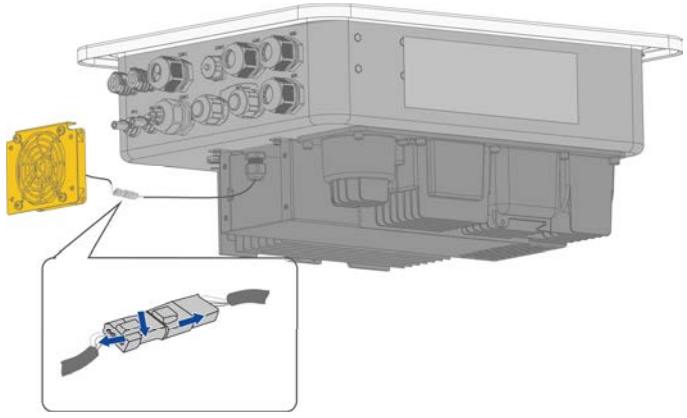
Step 1: Turn OFF the AC circuit breaker downstream of the AC output of the inverter and ensure that it cannot be inadvertently turned ON.

Step 2: Disconnect the DC switch and rotate the DC switch handle from the “ON” position to the “OFF” position. Wait for approximately 30 minutes until the heatsink temperature is reduced to normal temperature.

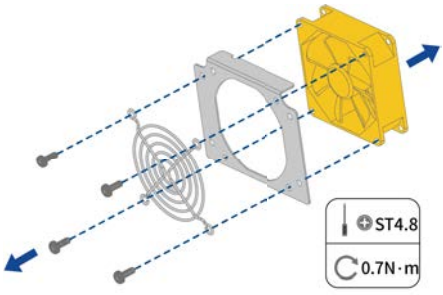
Step 3: Loosen the screw on the sealing plate of the fan module.



Step 4: Loosen the screw on the sealing plate of the fan module.



Step 5: Remove the screws at the bottom of the fan. Use a clean cloth, brush, or vacuum cleaner to clean the fan, or replace the faulty fan directly.



Step 6: Reinstall the fan back to the inverter in reverse order and restart the inverter.

13 Recycling and disposal

Dispose of the packaging and replaced parts according to the rules applicable in the country where the device is installed.



Do not dispose of the product together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.

14 EU declaration of conformity

Within the scope of the EU directives

- Radio Equipment Directive 2014/53/EU (L 153/62-106. May 22. 2014) (RED)
- Restriction of the use of certain hazardous substances 2011/65/EU (L 174/88, June 8, 2011) and 2015/863/EU (L 137/10, March 31,2015) (RoHS)

AISWEI Technology Co., Ltd. confirms herewith that the inverters described in this manual are in compliance with the fundamental requirements and other relevant provisions of the above mentioned directives.

The entire EU Declaration of Conformity can be found at www.solplanet.net.

15 Service and warranty

If you have any technical problems concerning our products, please contact Solplanet service. We require the following information in order to provide you with the necessary assistance:

- Inverter device type
- Inverter serial number
- Type and number of connected PV modules
- Error code
- Mounting location
- Installation date
- Warranty card

Warranty terms and conditions can be downloaded at www.solplanet.net.

When the customer needs warranty service during the warranty period, the customer must pro- vide a copy of the invoice, factory warranty card, and ensure the electrical label of the inverter is legible. If these conditions are not met, Solplanet has the right to refuse to provide with the relevant warranty service.

16 Contact

EMEA

Service email: service.EMEA@solplanet.net

APAC

Service email: service.APAC@solplanet.net

LATAM

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https://solplanet.net/contact-us/





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