Solplanet



ASW015K-TH/ASW020K-TH/ASW025K-TH

ASW29.9K-TH/ASW030K-TH

Three phase hybrid inverter

User Manual

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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.

The contents of this user manual may be updated or revised due to on-going product development and continuous improvement. The information in this guide is subject to change without notice. The latest version of this document, the quick installation guide and further information are to be found 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:

- ASW015K-TH
- ASW020K-TH
- ASW025K-TH
- ASW29.9K-TH
- ASW030K-TH

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.
- Not adhering to the prescribed instructions may potentially void the manufacturer's warranty. If in doubt please contact the local Solplanet service team.

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 four MPP trackers and one or two battery connections that feeds the direct current of the PV array into the connected battery or converts it to grid-compliant three-phase current and then feeds it into onsite loads and the utility grid. The product also can convert the DC current supplied by the battery into grid-compliant three phase current. The product supports bi-directional AC power flow which allows the batteries to be charged by grid supplied AC 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 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).
- 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.
- 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 may cause personal injury or damage to property.
- The product must only be operated in connection with an intrinsically safe lithium-ion battery approved by Solplanet. The entire battery voltage range must be completely within the permissible input voltage range of the product. The latest version of the Solplanet battery compatibility list can be found in PDF format at www.solplanet.net.
- The product must only be used in countries for which it is approved by Solplanet 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 associated live components can cause lethal electric shocks. Disconnecting the DC connectors from the product under load, an electric arc may expose the userto 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 provided by 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 !

Regardless ofthe AC breaker and the PV switch of the inverter being switched off or disconnected, the parts of the system may still be live when the battery is providing power duringbackup 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.

- Ensure the battery is not fully discharged before commissioning the system.
- Contact the battery manufacturer before proceeding 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 incorrectly 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.
- Handle PV module cables only by its 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 risk of fatal electric shock from damages to the measuring device caused by 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 a measurement span equal to or higher than maximum voltage range of the product.

⚠ 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 incorrectly handled 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 appropriately before touching any component.

ℹ

The country grid code set must be set correctly.

Setting a country grid code which is not valid for your country and purpose, can cause a disturbance within the PV system and lead to problems with the grid operator. When selecting the country grid code set, please 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

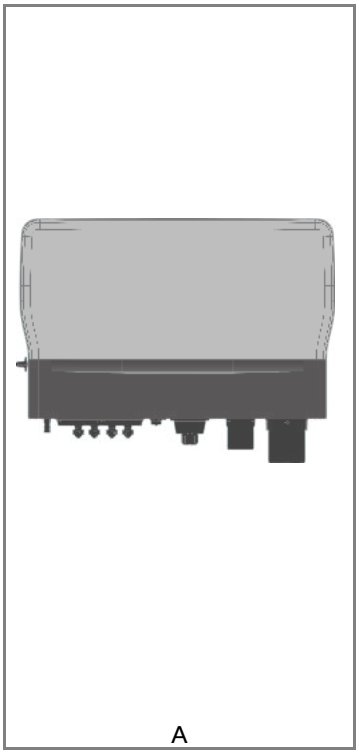
	Beware of a danger zone! This symbol indicates that the product must be additionally grounded if additional grounding or equipotential bonding is required at the installation site.
	Beware of high voltage and operating current! The product operates at a high voltage and current. Work on the product must only be carried out by skilled and authorized personnel.

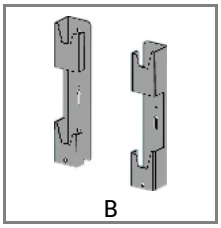
	Beware of hot surfaces! The product can become hot during operation. Avoid contact during operation.
	WEEE Designation Do not dispose of the product together with household waste. Dispose the product in accordance with local disposal regulations for electronic waste applicable in the country of installation.
	CE marking The product complies with the requirements of the applicable EU directives.
	Certification mark The product has been tested by TÜV and obtained the quality certification mark.
	CE marking The product complies with the requirements of the applicable EU directives.
	Capacitor discharge Danger to life due to high voltages in the inverter. Do not touch live parts for at least 5 minutes after disconnection from the power sources.
	Observe the documentation Read and understand all documentation supplied with the product.

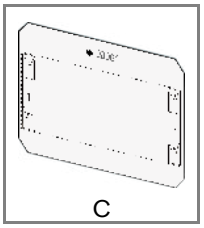
3 Unpacking and storage

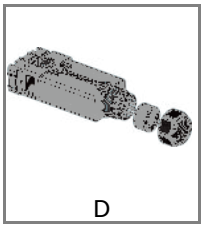
3.1 Scope of delivery

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

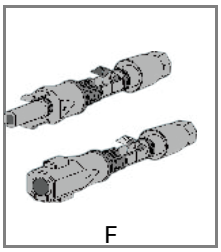

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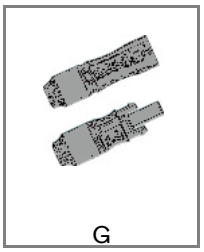

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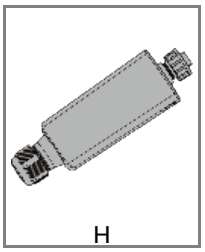

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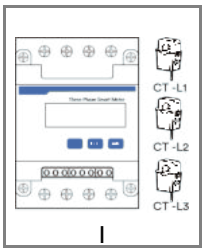

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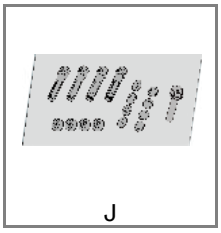

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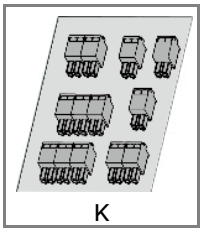

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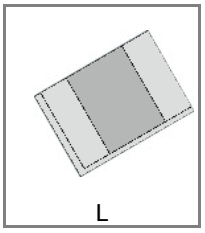

H



I


J


K


L

Object	Description	Quantity	
A	Inverter	1	
B	Mounting Bracket	1	
C	Mounting Bracket Template	1	
D	AC Connector	1	
E	Diesel Generator Connector (Reserved)	1	
	EPS Load Connector		
F	DC Connector(pair, positive & negative)	ASW015-020K-TH	4
		ASW025-030K-TH	8
G	Battery Connector(pair, positive & negative)	ASW015-020K-TH	1
		ASW025-030K-TH	2
H	Ai-Dongle	1	
I	Smart Meter(CTs included)	1	
J	Fastener Package	1	
K	Communication Terminal Package	1	

L	Document package	1

3.2 Product storage

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

- Store the inverter in the original packaging.
- The storage temperature must be between -30°C to +60°C, and the storage relative humidity must be between 0 and 100%, non-condensing.
- The the inverter shall not be tilted or inverted when stored.
- Check the scope of delivery for completeness and any visible external damage. if it has been stored for half a year or more.
- For battery storage you can refer to the battery related user manuals.

4 Inverter overview

4.1 Product description

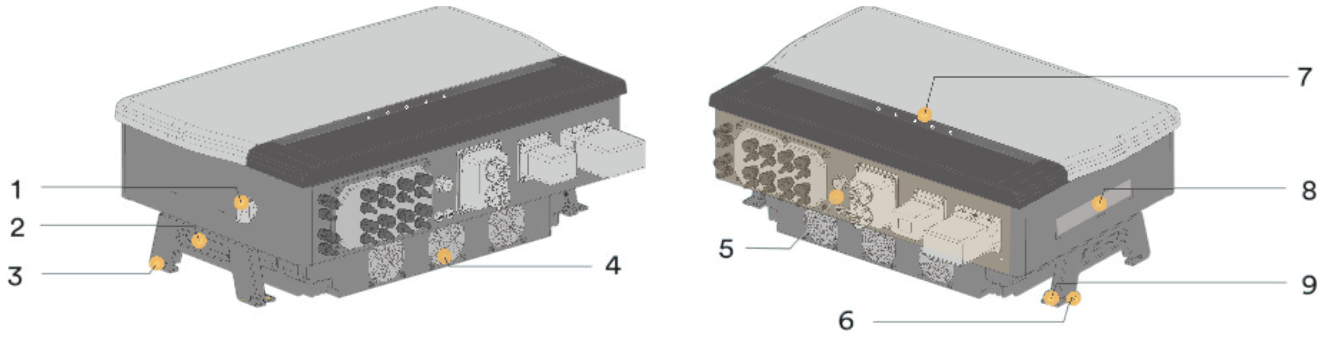
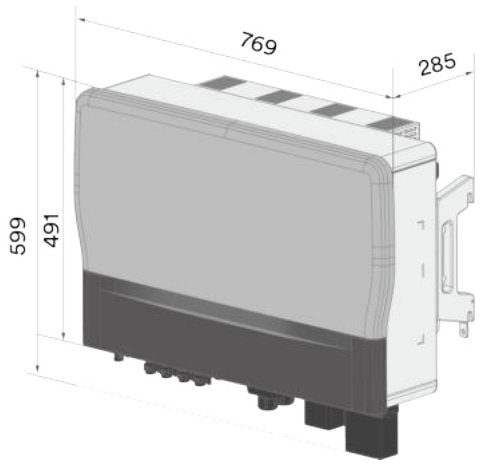


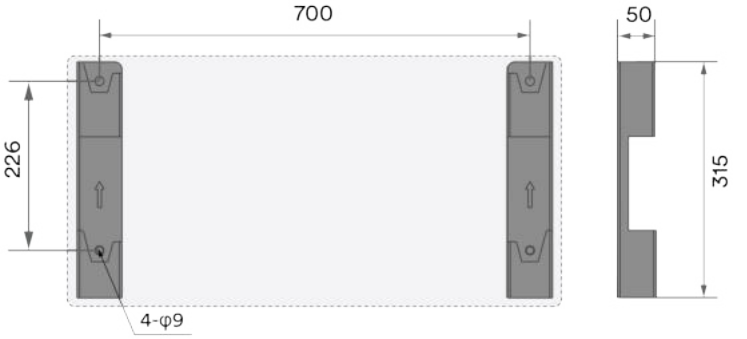
Figure shown here is for reference only. The actual product received may differ.

Object	Name	Description
1	DC switch	Used to isolate the inverter from a DC input source. e.g. PV array
2	Recessed grip	Used to handle the inverter.
3	Mounting flange	Used to hang the inverter onto the mounting bracket.
4	Cooling fan	For inverter cooling.
5	Electrical connection interface	Includes AC terminals, DC connectors, battery connectors, EPS Load terminal, generator terminal (Reserved), communication ports and an additional grounding terminal. For details, refer to "6.1 Connection Interface description".
6	Inverter threaded security hole	Used for securing the inverter to the mounting bracket. Located on the right side of the inverter.
7	LED indicator panel	Indicates the current working state of the inverter.
8	Type Labels	The type label clearly identifies the product. The type label must remain permanently attached to the product. This includes, but is not limited to, warning symbols, nameplates, and QR codes for product libraries.
9	Anti-theft holes	For installation of anti-theft locks.

4.2 Dimensions



Unit：mm

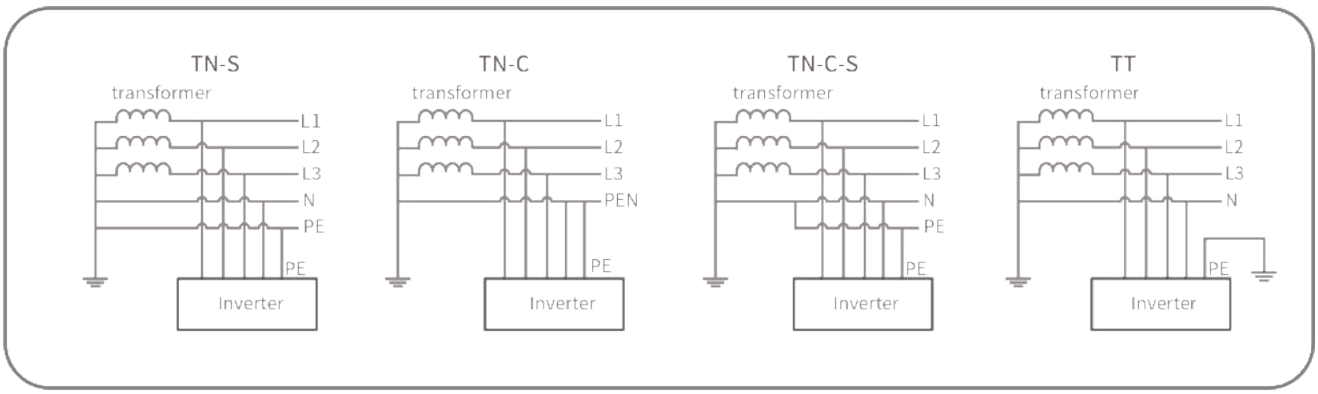


4.3 LED indicator

Function	LED		Description
SOLAR		Green Solid ON	The product operates normally and the PV array is available.
		Green Blinking	The product is self-checking automatically, or the firmware is being updated.
		OFF	Power from the PV array is not available.
BAT		Green Solid ON	The product operates normally and the battery energy is available.
		Green Blinking	The product is self-checking automatically, or the firmware is being updated.
		OFF	Power from the battery is not available.
ERROR		Yellow Solid ON	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 Solid ON	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		Green Solid ON	The EPS port the product is available and operates normally.
		Red Solid ON	The EPS port operates abnormally.
		OFF	The EPS port of product stop operation.
GRID		Green Solid ON	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 Solid ON	The GRID port operates abnormally without battery.
		OFF	The GRID port is disconnected, or grid operates abnormally with battery, or the grid voltage is less than the safety voltage(36V) in off-grid mode, or product stop operation.

4.4 Supported grid types

The grid network types 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 20 V.

4.5 Terminology

The product is equipped with the following interfaces and functions, for more information, refer to 6.8:

Ai-Dongle

The product is equipped with an Ai-Dongle as standard, which it connects to the user interface of 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 product is equipped with several RS485 interfaces. Some RS485 interfaces are available via RJ45 ports and other RS485 interfaces are available via terminal blocks. RS485 can be connected to the third-party monitoring device or to the smart meter, etc.

CAN Interface

The product is equipped with CAN interfaces.

The CAN interface is used to connect the BMS (Battery Management System) of the battery.

ETHERNET Interface (Reserved)

The product is equipped with two ethernet interfaces. The ETH interface is used to support TCP/IP communication protocol, which can be connected to router.

Modbus RTU

The product is equipped with a modbus interface. A third-party communication device complying with the Solplanet Modbus protocol can be connected to the inverter.

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 then uses this information to control the inverter's active power in order to prevent the inverter from exceeding the agreed export power limit.

The product is delivered with current transformers (Reserved) and a smart meter as standard. Either the current transformers or the smart meter (not both simultaneously) can be used to measure the export active power.

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

Multifunction Relay (Reserved)

The product is equipped with two multifunction relays. This terminal is reserved for two digital output. For more information, please contact Solplanet service.

ON/OFF interface

This product has the function of starting/shutting down the inverter by means of a dry contact. For more information, please contact Solplanet service.

NS protection

Depending on the total of the maximum apparent power of all power generation systems and storage systems at a network connection point ΣSAmax, maybe the central NS protection at the central meter panel should be installed.

The product is equipped with an interface to connect the central NS protection device.

External output device

This product is equipped with external output function. When the inverter is in the “ON” status, it will provide a 12 Vdc. For more information, please contact Solplanet service.

Inverter demand response modes (DRED)

The product shall detect and initiate a response to all supported demand response commands according to the AS/NZS 4777.2 standard. The product only supports the demand response mode DRM 0.

Ripple control receiver interface

Network security management requires that the power generation systems and storage systems must be able to reduce their active power to a value specified by the network operator at the network connection point without disconnecting from the network. Normally the grid company maybe use the ripple control receiver to do Network security management in Germany.
The product is equipped with an interface to connect the ripple control receiver.

Ai-Hub_DI interface (Reserved)

The terminal is a DI signal interface sent from the AI-HUB to the inverter. For more information, please contact with Solplanet service.

Current transformer interface (Reserved)

The current transformers can be used to measure the active power at the grid connection point. The three current transformers can be connected to terminal.

EPS/Back-up function

The inverter is equipped with a back-up function which acts as an emergency power supply (EPS). The back-up function ensures that the inverter, via the EPS output, continues to provide three phase power to supply emergency loads in the event of a utility grid failure. Power is provided by the battery and the PV array.

During back-up mode, the battery can continue to be charged from the PV array.

As soon as the utility grid is available again, the product will automatically re-connect to the grid and resume supplying power to the loads connected on the grid side.

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 color LED indicator will light up. At the same time, the error code 38 will be sent to the Solplanet Cloud.

4.6 Energy Management

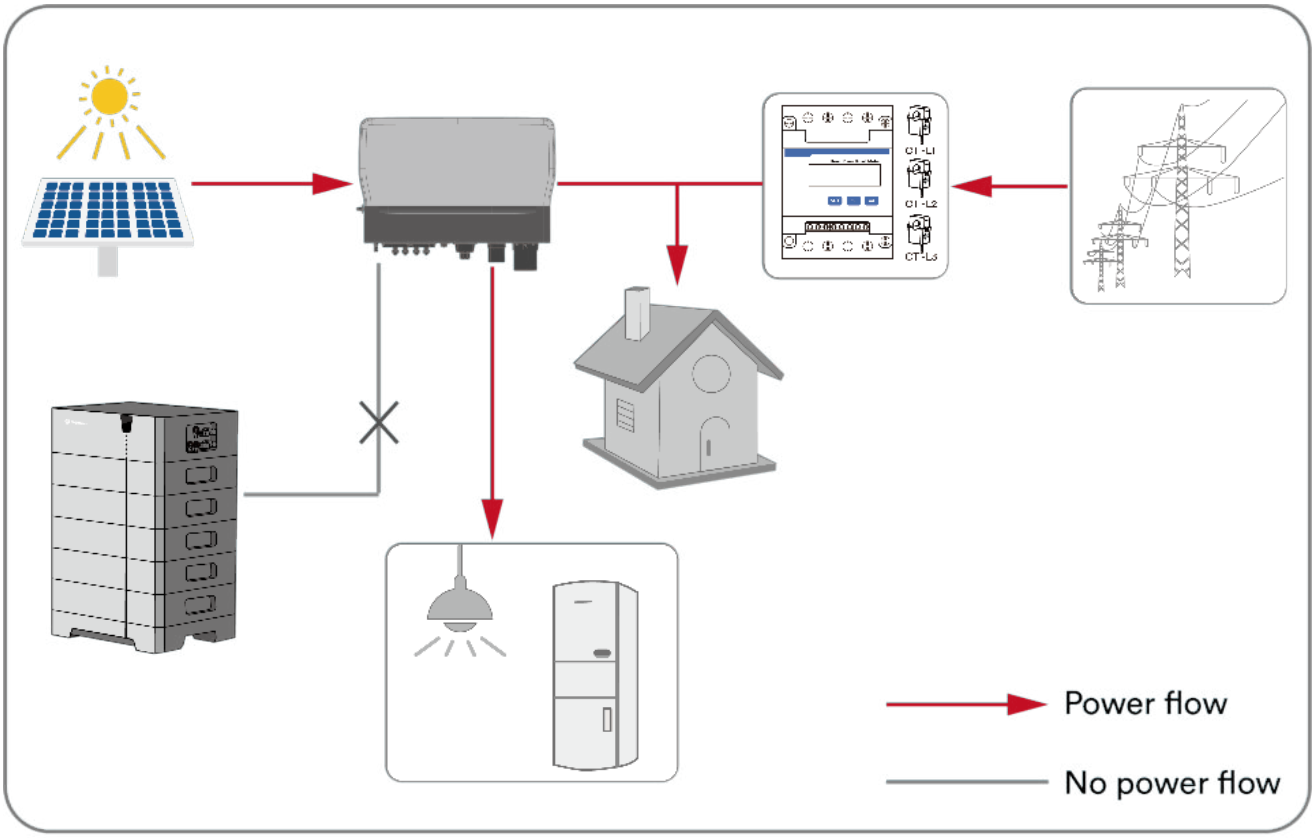
The energy management mode selected should be based on the user's application and preference. There are four energy management modes that can be chosen.

Self-Consumption mode

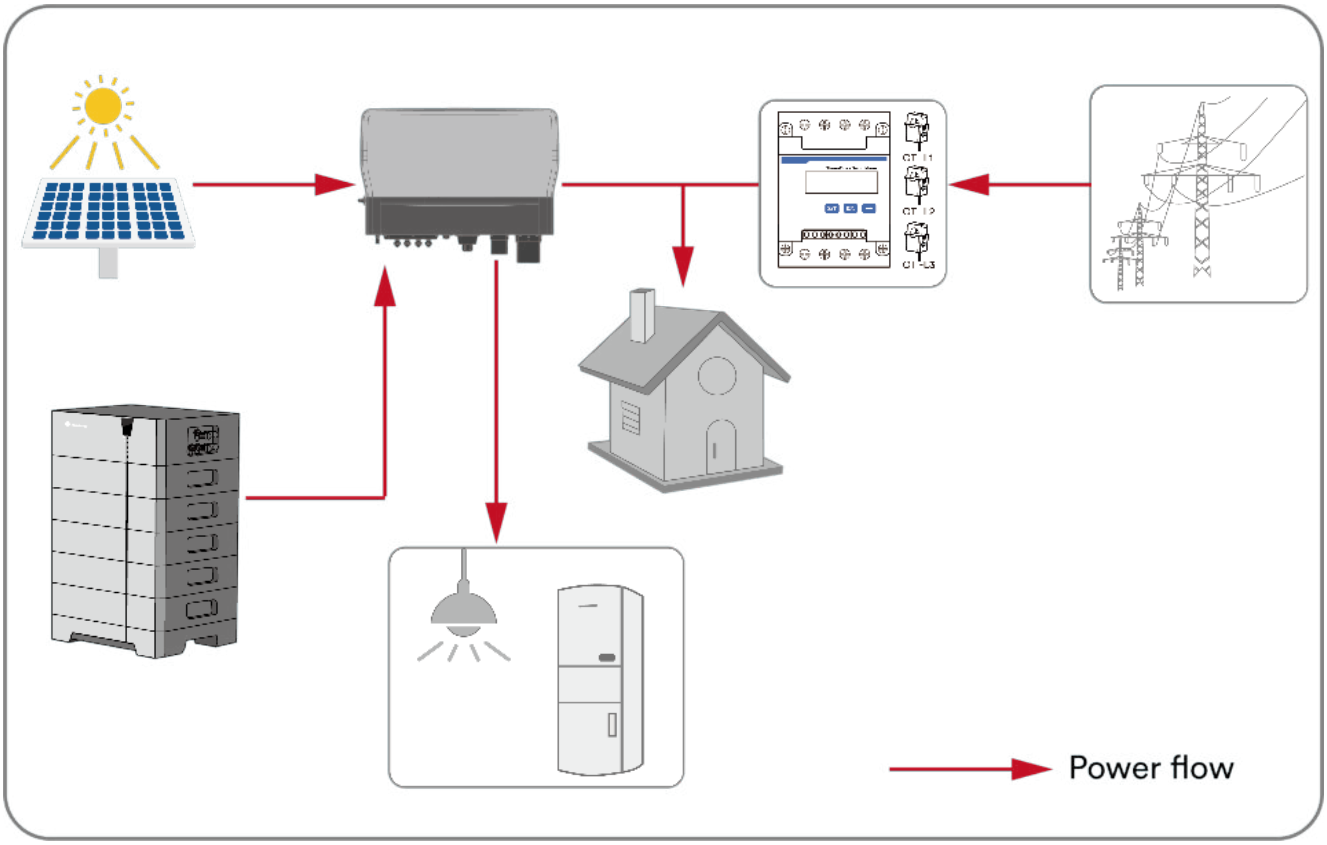
Self-consumption prioritises the supply of the load with PV and battery energy resulting in an increase of the self- consumption and self-sufficiency rates.

Energy management during the daytime:

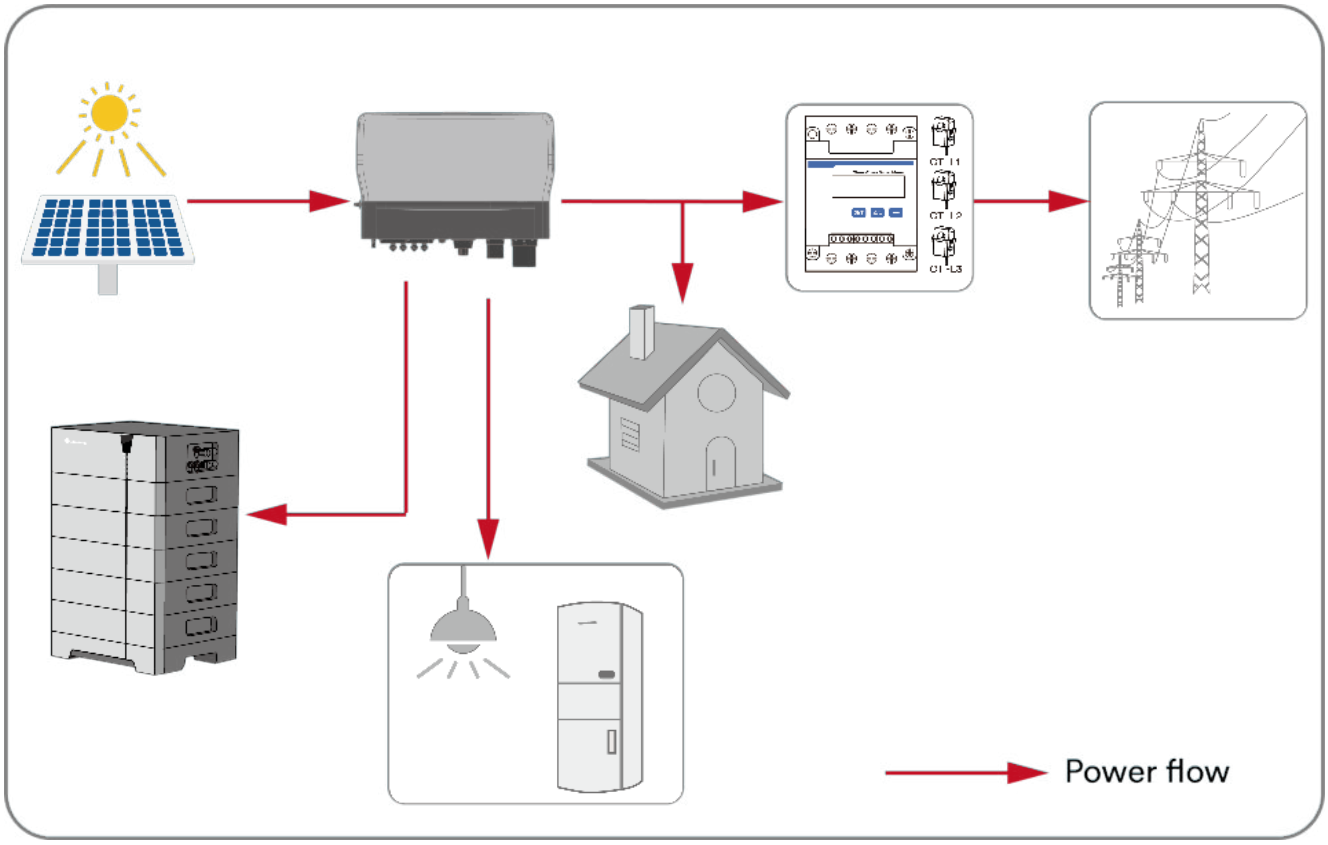
Case 1: PV power generation is lower than the power consumption and there is no battery energy available. The balance of load power, if any, is supplied from the utility grid.



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.



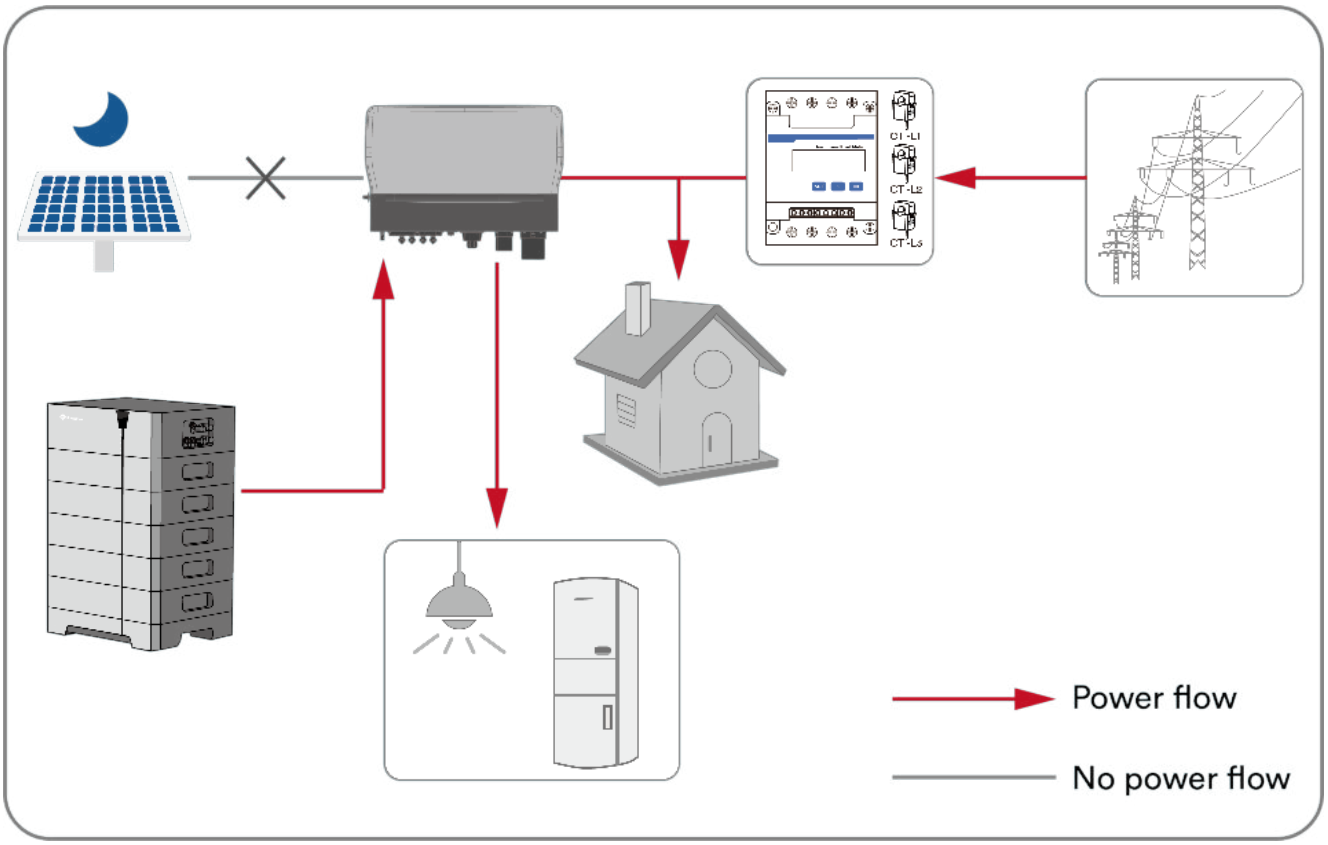
Case 3: PV power generation is larger than the power consumption. Battery charging via PV energy is prioritised. PV energy is exported to the utility grid if it is greater than the load and when the battery is completely charged.



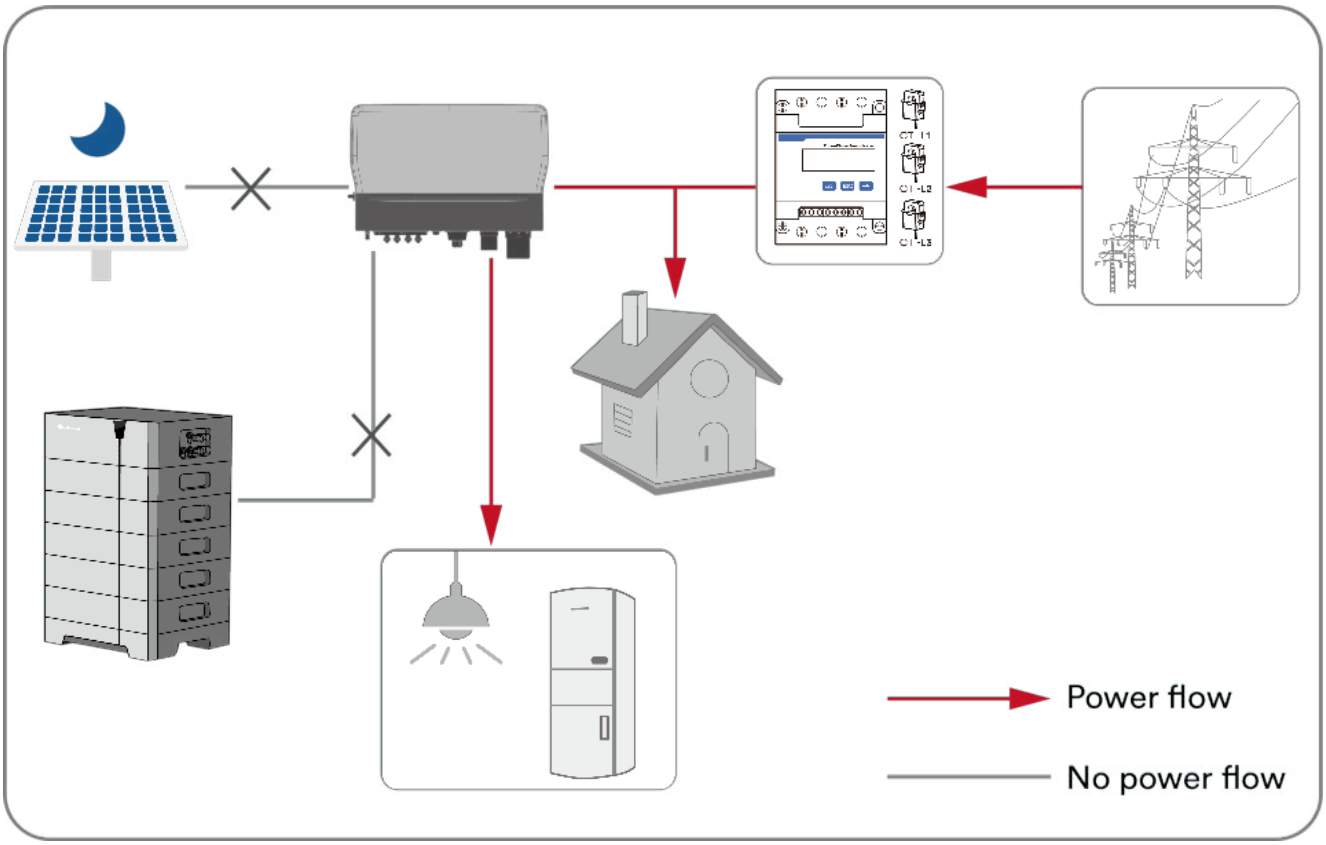
Energy management during the night:

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.



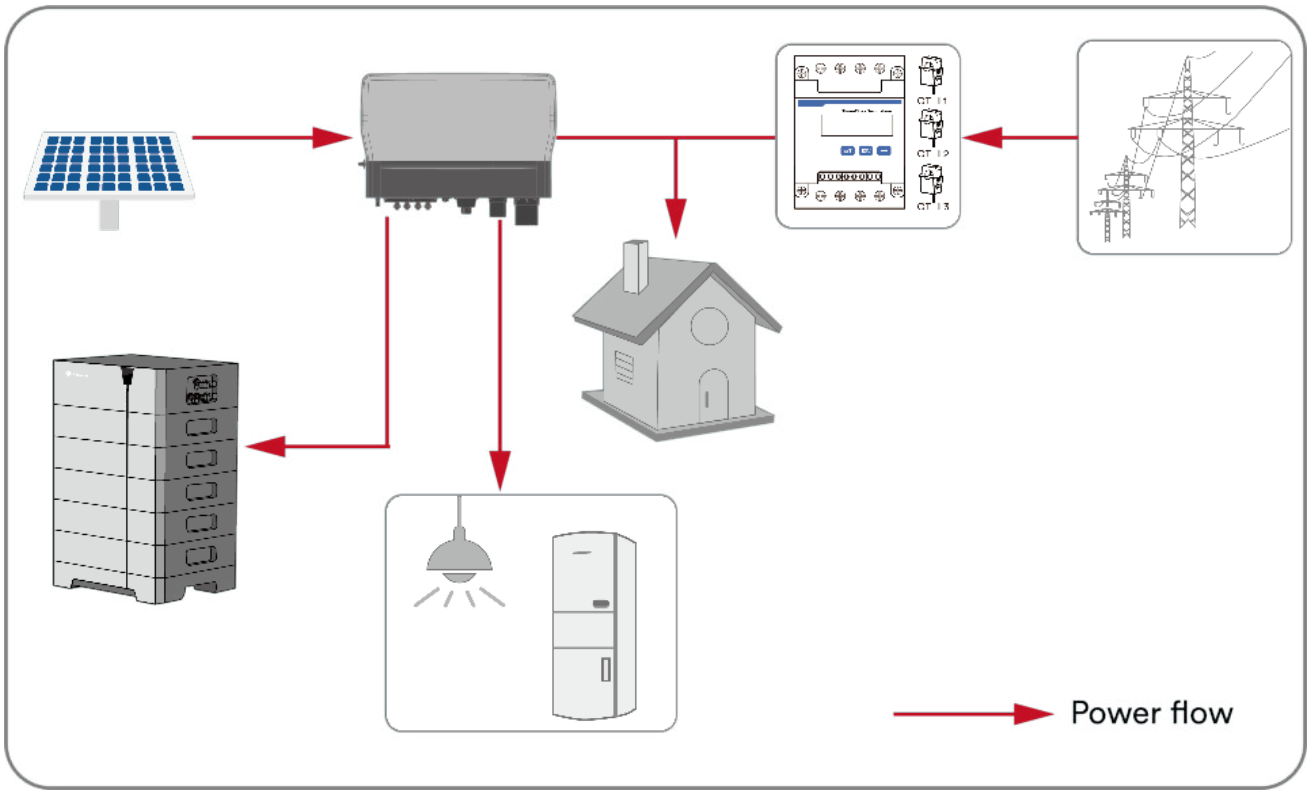
Case 2: Battery energy not available. The load power consumption will be supplied by the utility grid.



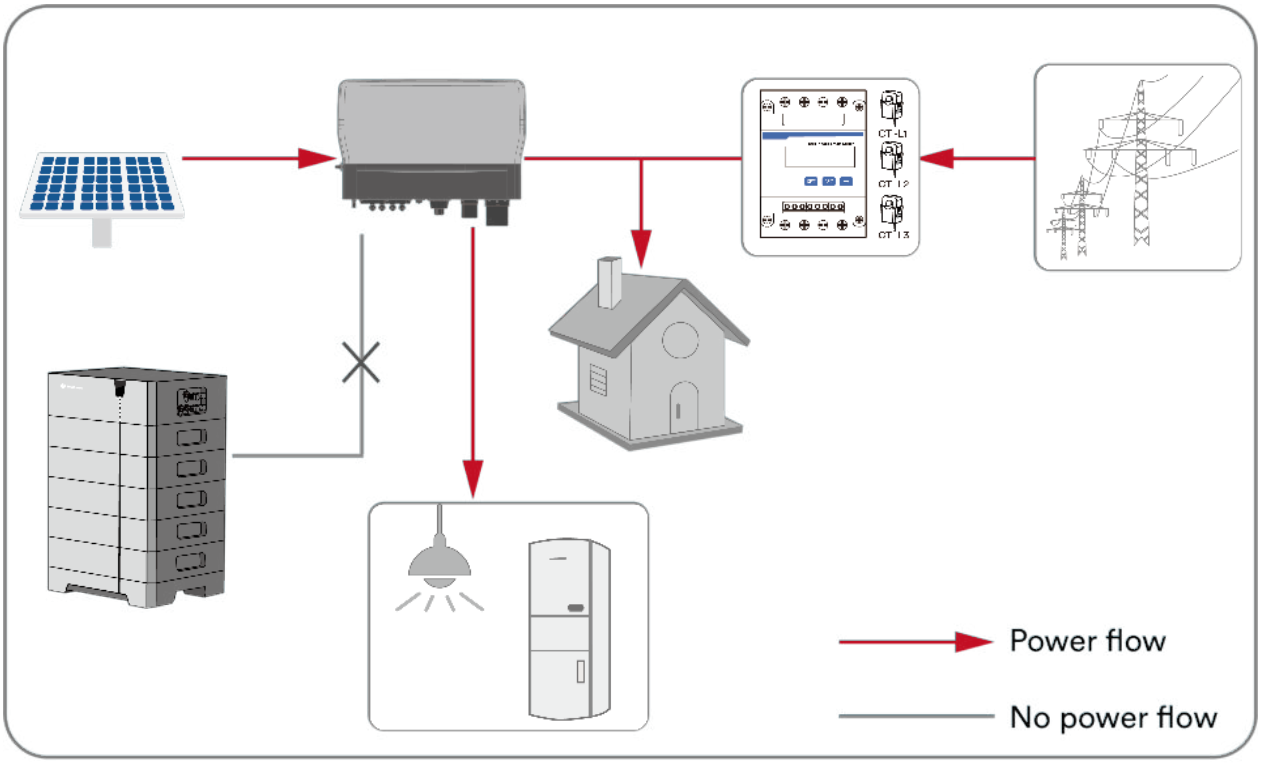
Reserve mode

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.

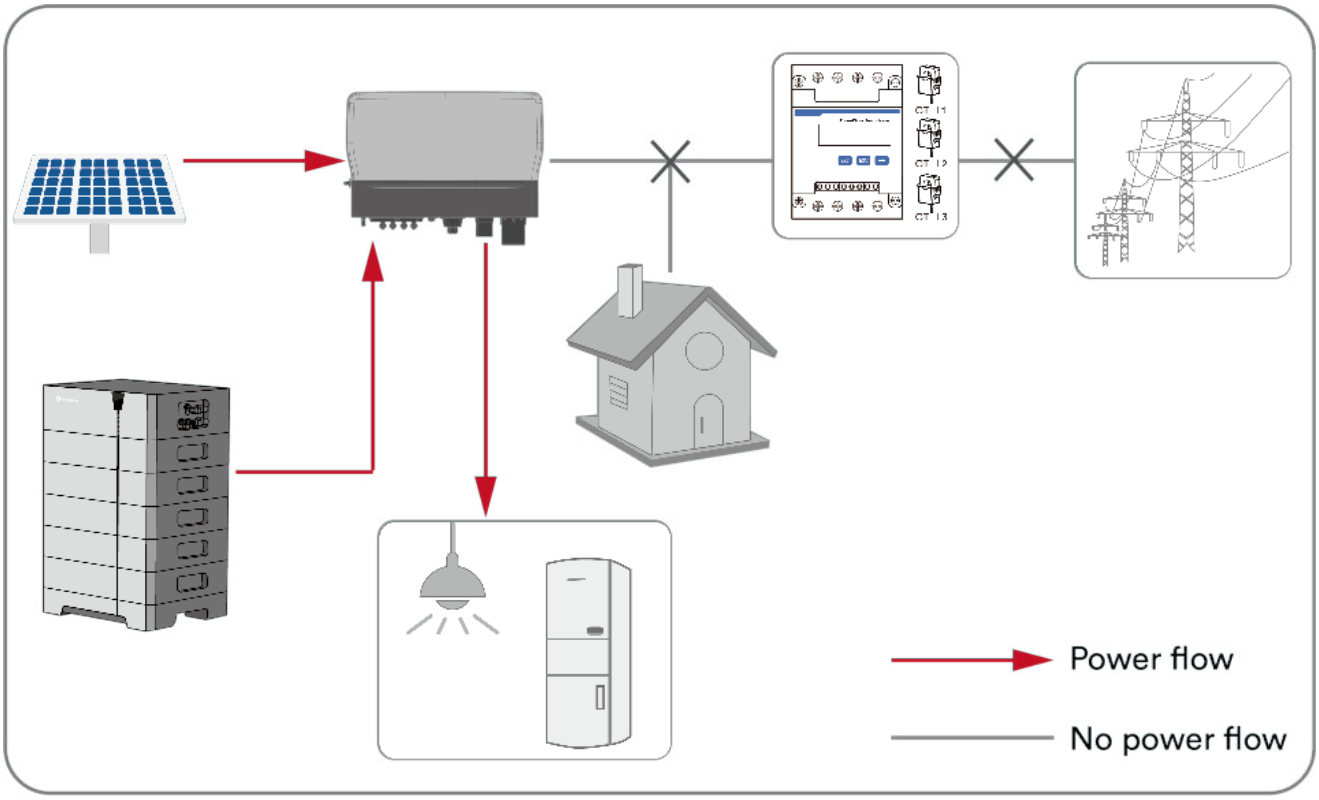
Case 1: The battery is not completely charged. PV power will prioritise the charging of the battery. The balance of load power, if required, is supplied from the utility grid.



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.


Power flow
No power flow

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.

Custom mode

Users can manage the system according to their own needs, and set daily regular charging and discharging schedules via the app. Outside of the schedules, the system operates in self-consumption mode.

Time of use mode

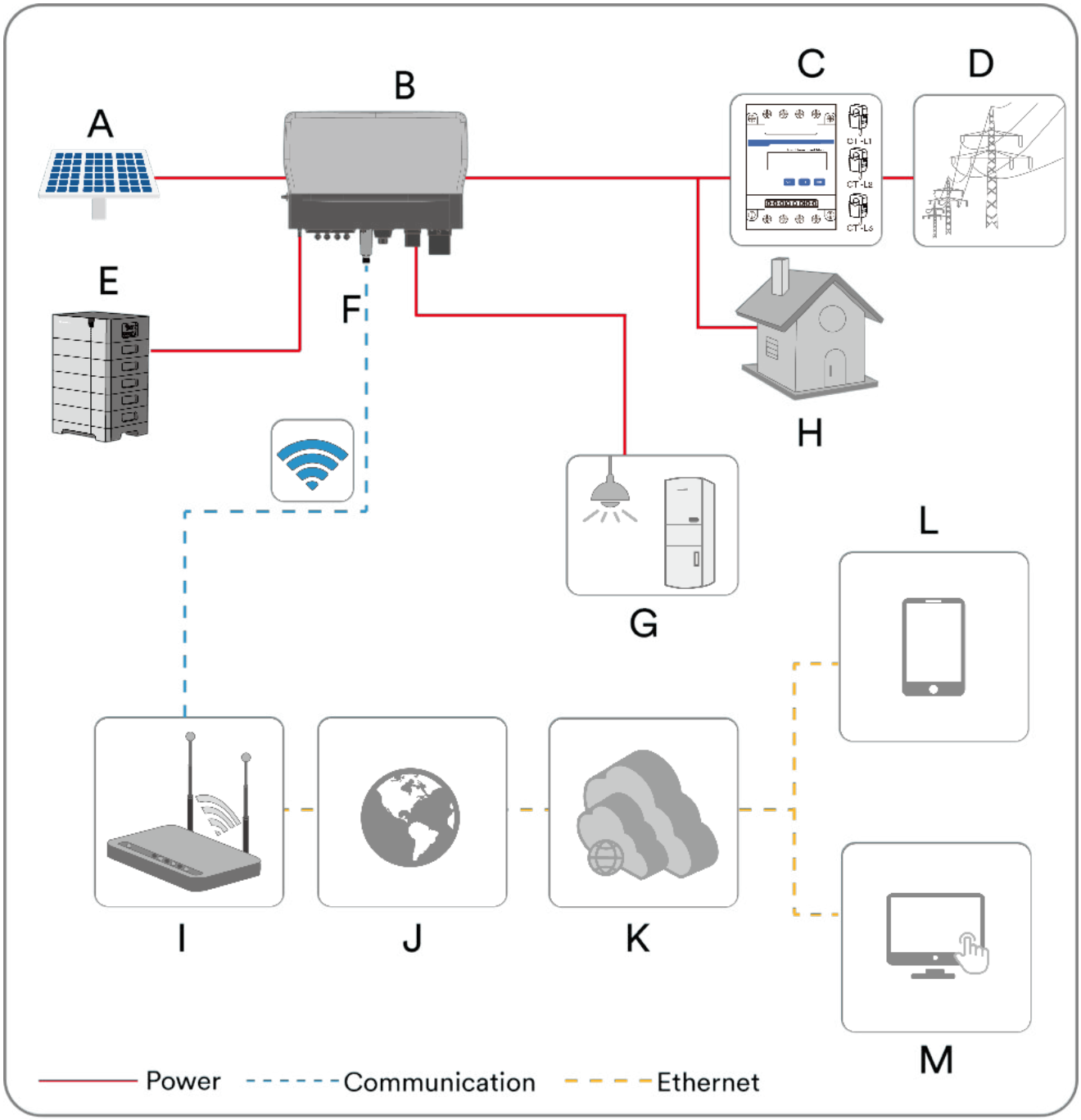
If the user chooses load first, then the inverter will operate in self-consumption mode when the grid charge is disabled. If grid charge is enabled, then the inverter will operate in back-up mode (battery SOC below the set point) or self-consumption mode (battery SOC above the set point.)

If the user chooses battery first, the PV power will first charge the battery when grid charge is disabled. If grid charge is enabled, the inverter will operate in back-up mode (when battery SOC is below the set point) or self-consumption mode (when battery SOC is above the set point).

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 is as follows:

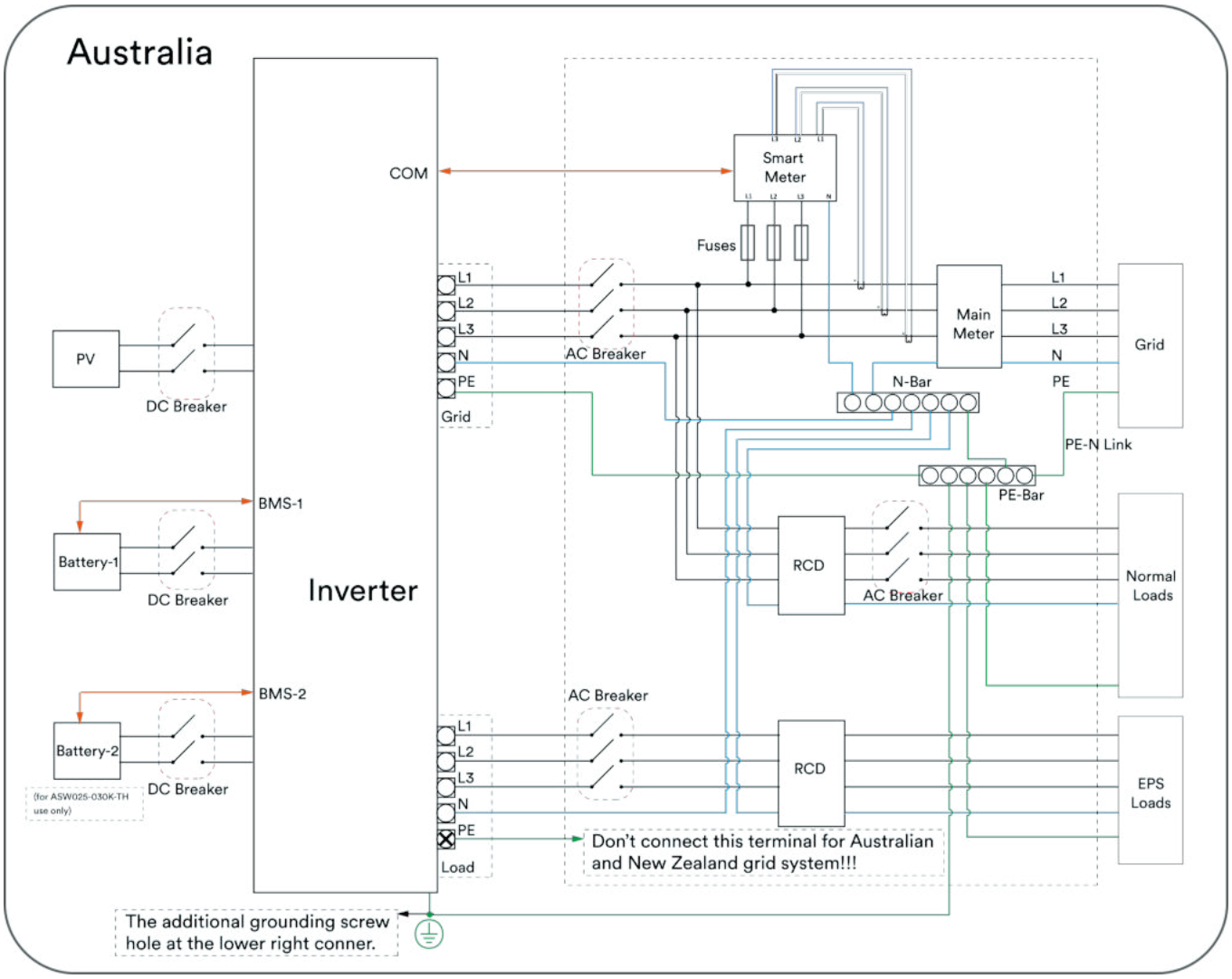


Object	Description	Remark
A	PV array	The product can connect to monocrystalline and polycrystalline silicon based PV modules and thin-film modules that require no functional grounding.

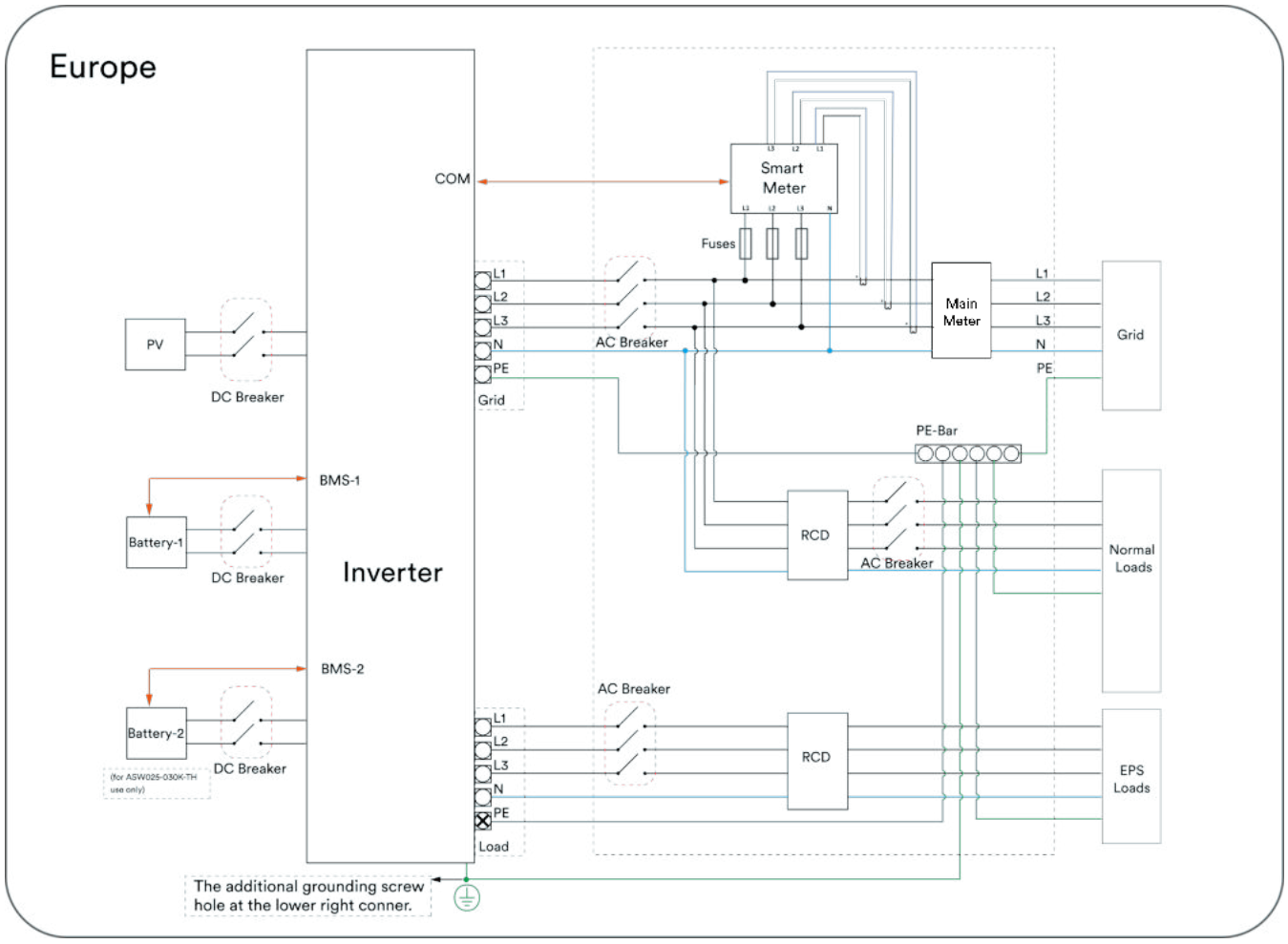
B	Hybrid inverter	ASW015-020K-TH series products have one battery (BAT) port. ASW025-030K-TH series products have two BAT ports.
C	Smart Meter(CTs included)	The smart meter(CHINT DTSU666)measures the power at the point of connection. The smart meter also can be replaced by three current transformers (Reserved)which connect directly to the inverter.
D	Utility grid	The product can connect to TN and TT grid network types.
E	Battery system	The product must only be operated in connection with an intrinsically safe lithium-ion battery system 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	EPS Load	The EPS loads directly connect to the EPS port of the inverter. The EPS loads can be supplied with power from the inverter when there is a grid failure.
H	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.
I	Router	The product can connect to a router via Wi-Fi or an ethernet cable.
J	Internet	The inverter and battery data is sent to the Solplanet Cloud via the Internet.
K	Cloud server	The inverter and battery data is stored on the Solplanet cloud server.
L	Smart Mobile Device	The Solplanet app can be installed on a smart mobile device to view the PV plant information.
M	Computer	The inverter and battery data can also be viewed via a computer which is logged into the Solplanet cloud desktop web application.

The system diagram of this product as follow:

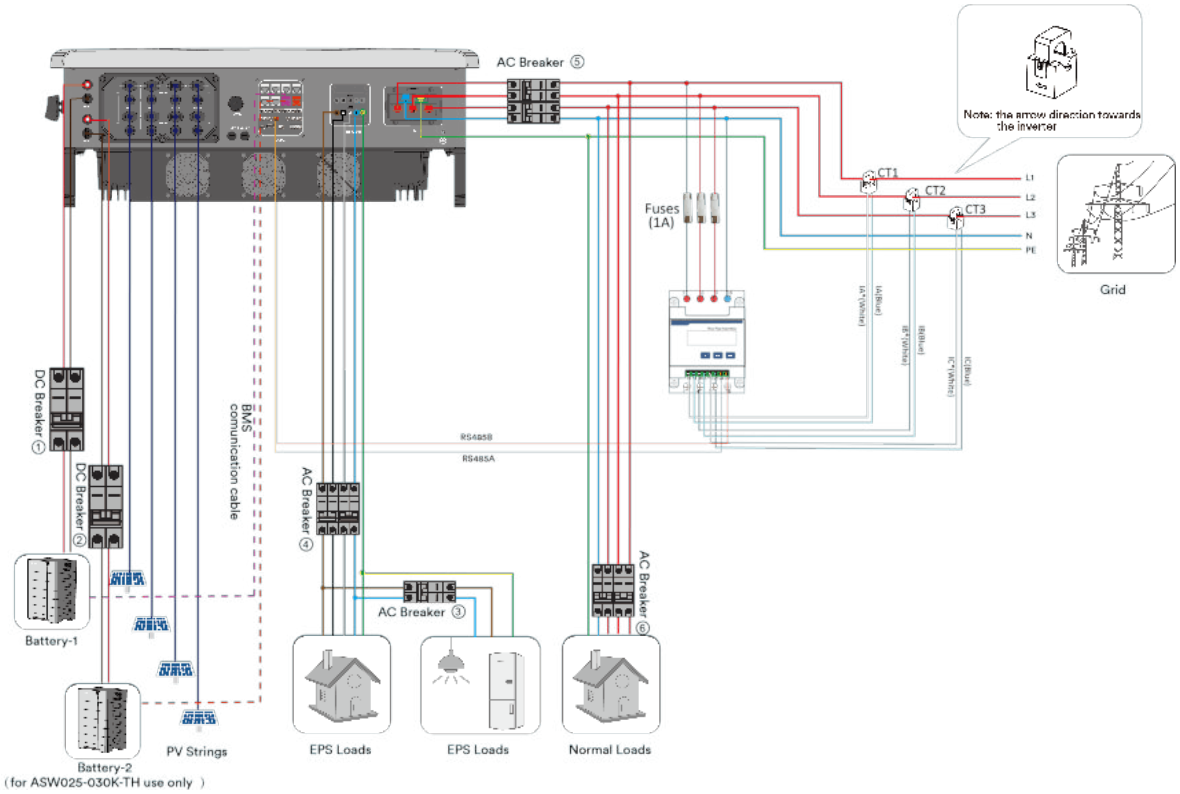
For Australia and New Zealand, the neutral cable of the On-grid side and EPS side must be connected together according to the wiring rules AS/NZS 3000, otherwise the EPS function will not work.



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



The wiring of smart meter:



<table>
<tr><th>Breaker No.</th><th>ASW015K-TH</th><th>ASW020K-TH</th><th>ASW025K-TH</th><th>ASW29.9K-TH</th><th>ASW030K-TH</th></tr>
<tr><td>1</td><td colspan="2">63 A/1000 V DC Breaker</td><td colspan="3" rowspan="2">63 A/1000 V DC Breaker</td></tr>
<tr><td>2</td><td>/</td><td>/</td></tr>
<tr><td>3</td><td rowspan="3">63 A/400 V AC Breaker</td><td rowspan="3">80 A/400 V AC Breaker</td><td colspan="3" rowspan="3">100 A/400 V AC Breaker</td></tr>
<tr><td>4</td></tr>
<tr><td>5</td></tr>
<tr><td>6</td><td colspan="5">Dependent on the normal loads which should be checked by an installer</td></tr>
</table>

5 Mounting

5.1 Requirements for mounting

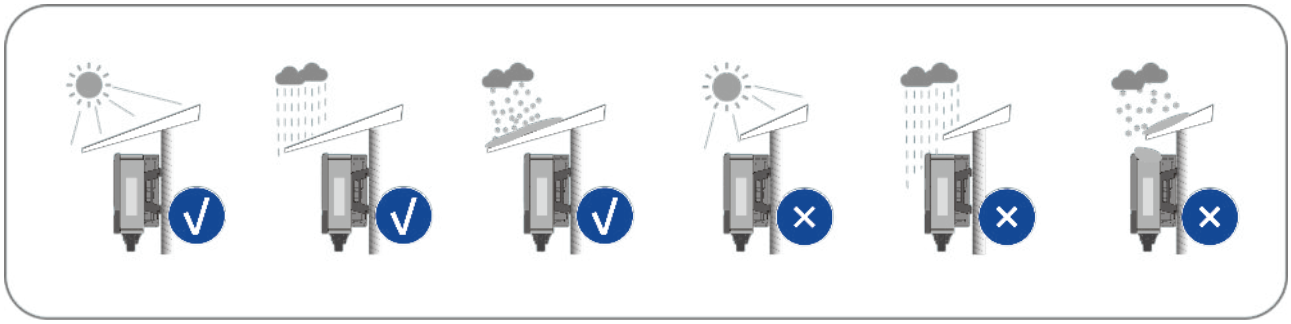
DANGER

Danger to life due to fire or explosion !

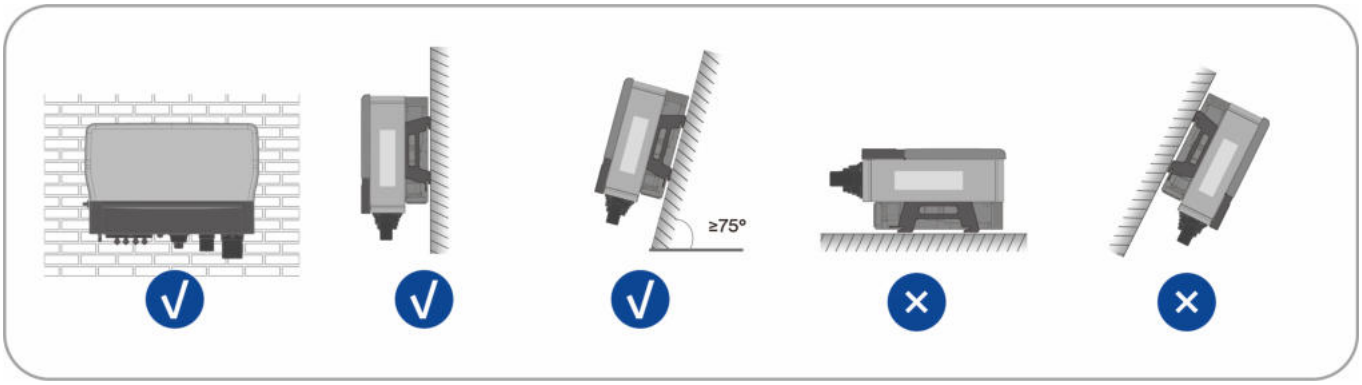
Despite careful construction, electrical devices can cause fires. This can result in death or serious injury.

- 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.

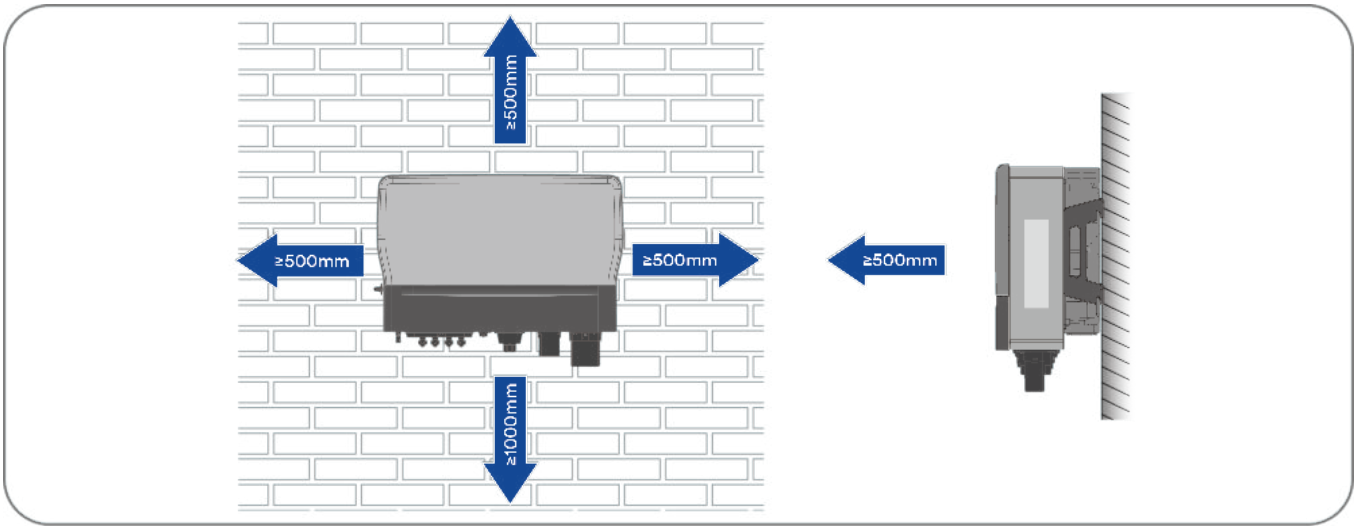
- To ensure optimal operation, an ambient temperature below 60°C is recommended.
- A solid support surface must be available (e.g., concrete or masonry). Ensure that the installation surface is solid enough to bear four times the weight of the inverter. When mounted on drywall or similar materials, the product mayemit audible vibrations during operation.
- The mounting location must be inaccessible to children.
- The mounting location should be freely and safely accessible to authorised personnel at all times without the need for any auxiliary equipment (such as scaffolding or lifting platforms). Non-fulfillment of these criteria may impede servicing and system troubleshooting.
- Do not expose the mounting location to direct solar irradiation. Exposure to direct solar irradiation can cause the exterior plastic components to age prematurely and may result in overheating. Under high temperatures, the product will reduce its power output accordingly to avoid overheating.



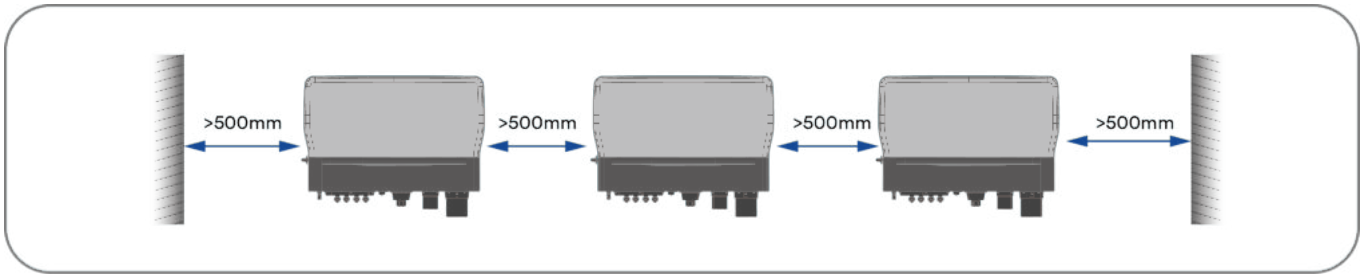
- Never install the inverter horizontally, or with a forward / backward tilt or even upside down. Horizontal installation can lead to damage to the inverter.



- Maintain the recommended clearances to other walls and to other inverters or objects.



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



- Mount the product in a way that allows for easy recognition and reading of the LED signals.
- The DC switch of the product must always be readily accessible.

5.2 Taking out and moving the product

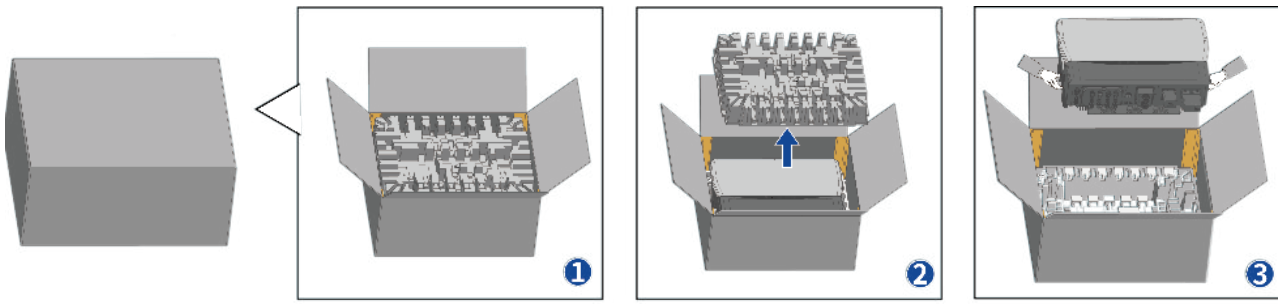
Open and remove the inverter out of the packaging, and place at the designated installation location.

⚠CAUTION

Risk of injury due to the weight of the product!

The net weight of this product is 50.5~58 kg. Incorrectly lifting the inverter during installation could cause it to fall, leading to 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

CAUTION

Danger of personal injury due to falling inverter!

If the hole depth and distance are not correct, the inverter may fall off the wall.

- Before inserting the bolts into the wall, measure the depth of the hole.

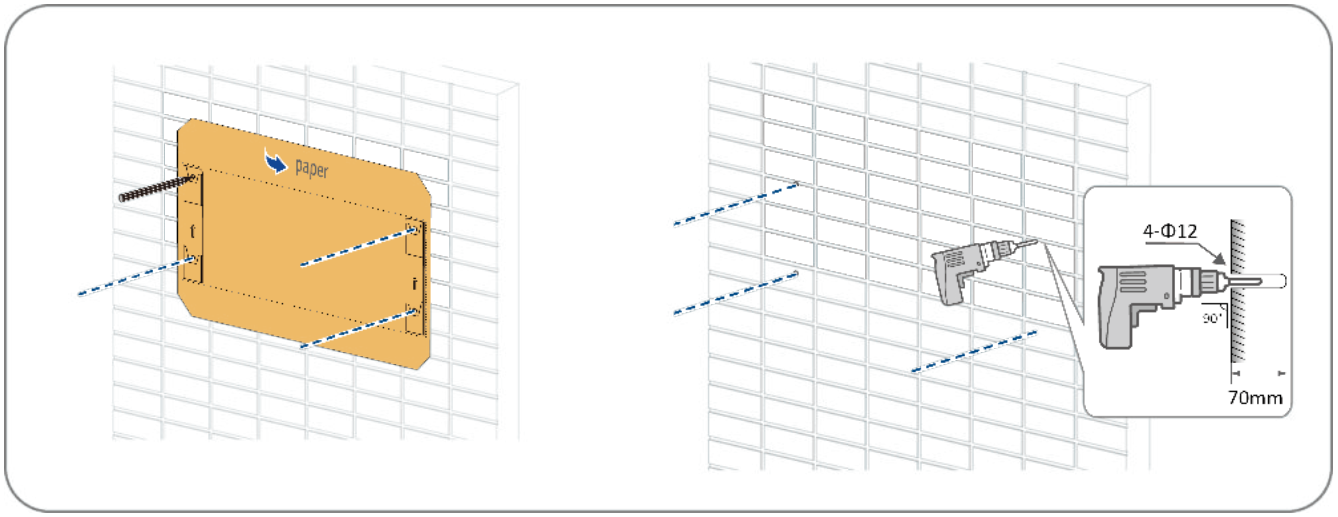
CAUTION

Damage to electrical cables and utility service lines can cause personal injury!

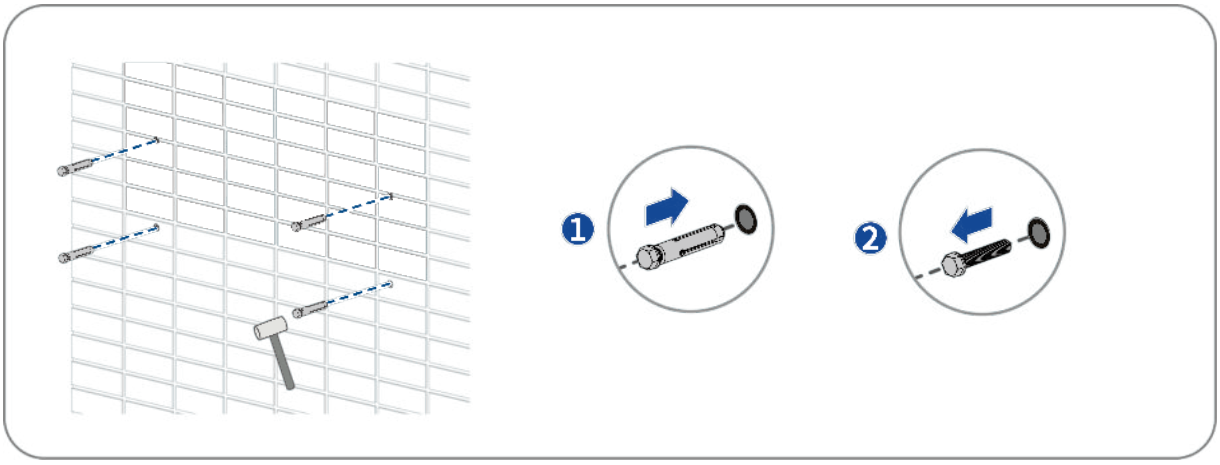
Electrical cables or utility service lines (gas or water) may be mounted externally on walls.

- Ensure no cables or utility service lines mounted on the wall or inside the wall cavity are damaged when drilling.

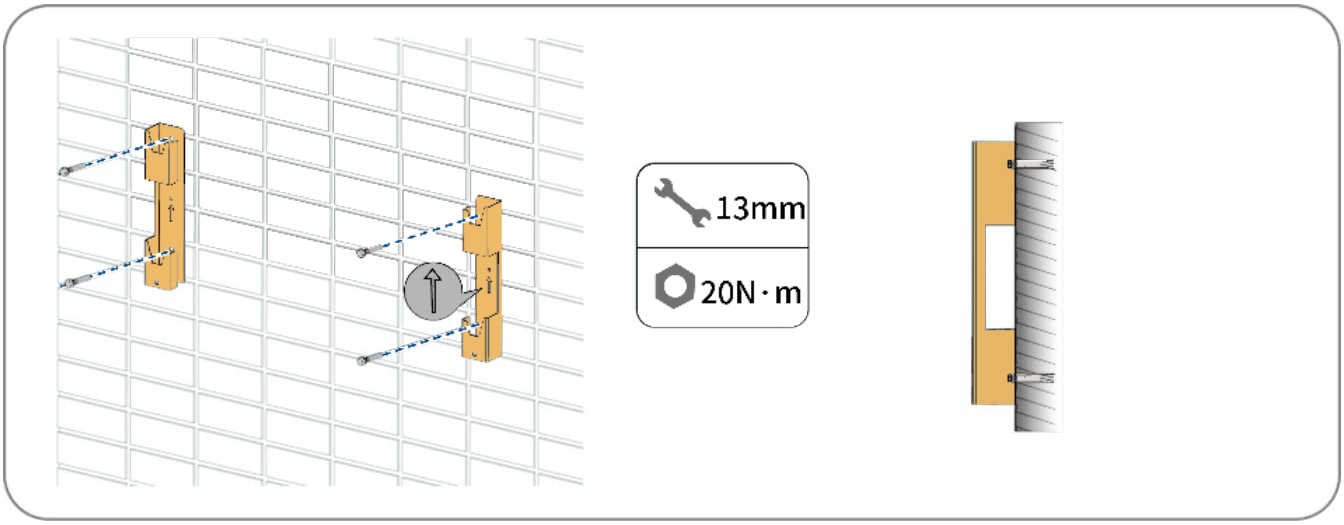
Step 1: Remove the mounting bracket template from the accessory bag and place the template horizontal to the wall with the arrow facing up. Mark the drilling position. Remove the template and drill the marked hole with a diameter of 12 mm. Drill to a depth of approximately 70 mm. Maintain the hammer drill perpendicular to the wall during drilling.



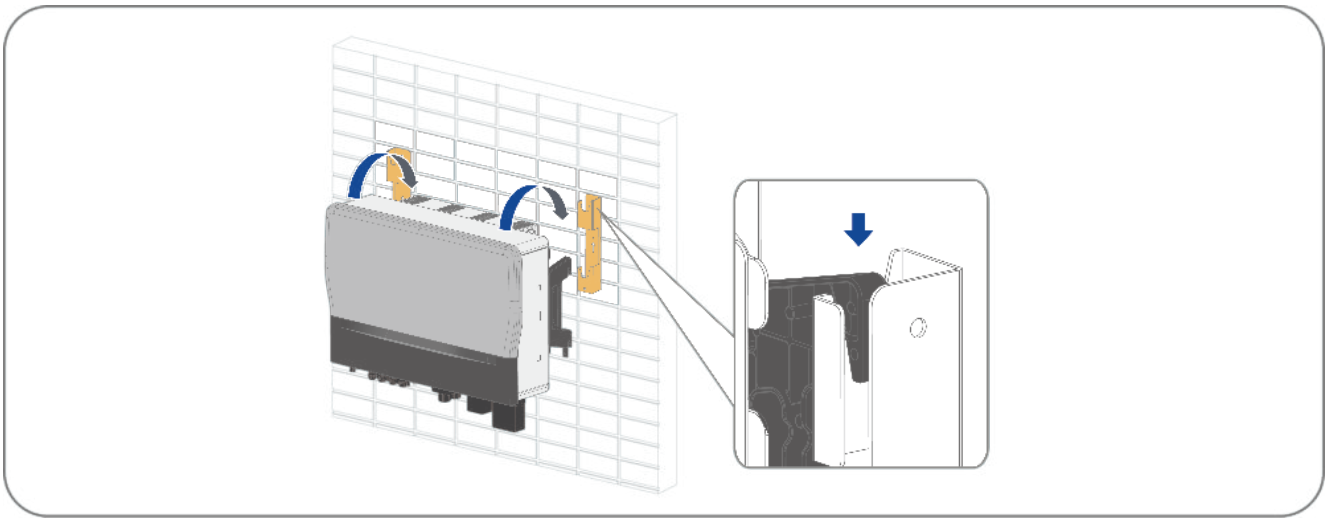
Step 2: Remove any dust from the hole, insert four expansion bolts into the hole, gently tap them into the hole with a rubber hammer. Fix the bolt tail, and remove the nut, spring washer and flat washer and reserve them for the next step.



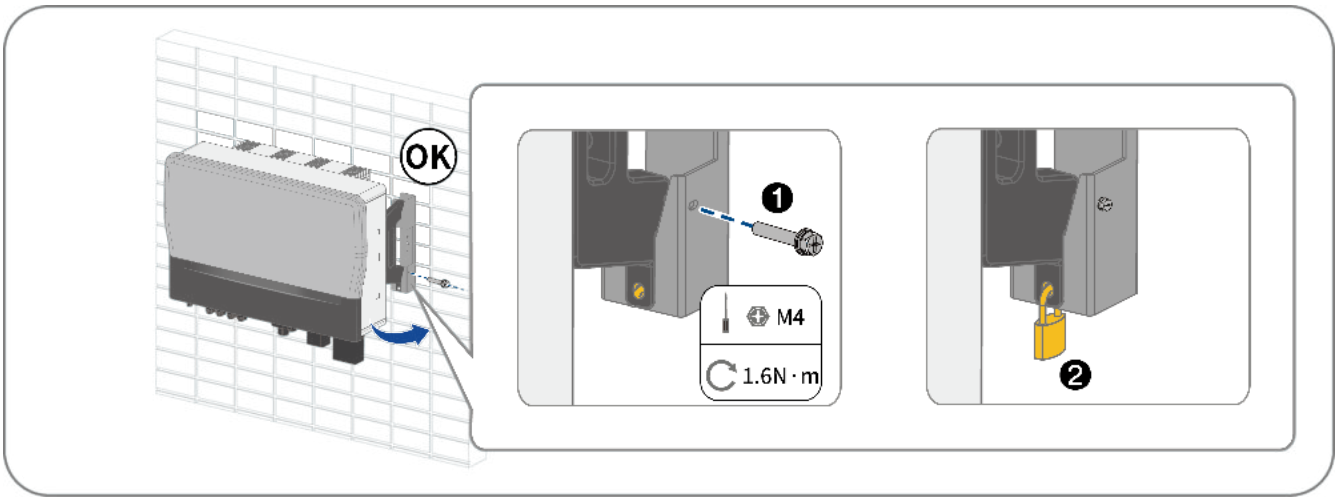
Step 3: Fix the mounting bracket using the expansion bolts.



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



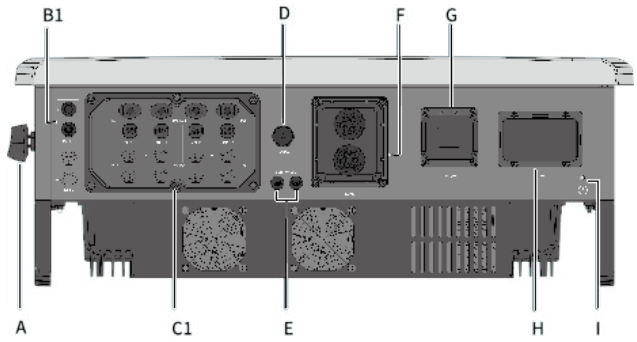
Step 5： Secure the inverter by inserting screws into the threaded security hole. The inverter has an added anti-theft feature which allows the placement of anti-theft lock if required.



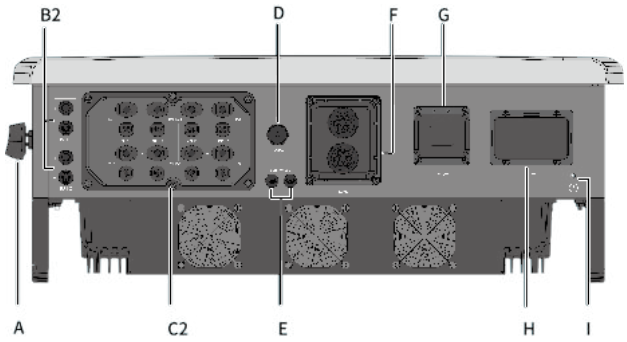
Installation complete.

6 Electrical connection

6.1 Connection Interface Description



ASW015-020K-TH (left)



ASW025-030K-TH (right)

Item	Description
A	DC-Switch
B1/2	Battery Connector Port
C1/2	PV Input
D	Ai-Dongle Port
E	Ventilation valve Port
F	Communication Ports
G	Diesel Generator Connector Port (Reserved)
	EPS Load Connector Port
H	AC Connector Port
I	Additional Grounding Screw

6.2 Connecting additional grounding

The inverter is equipped with a residual current monitoring unit (RCMU). The RCMU 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.

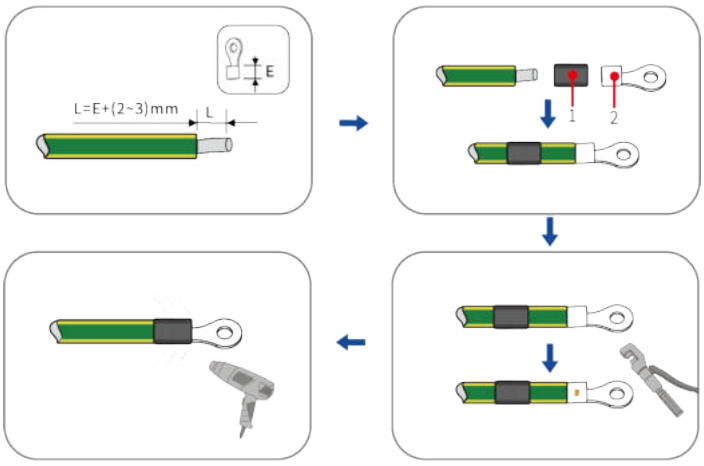
If the grounding fault monitoring function is deactivated or the additional grounding is required by locally standard, you can connect additional grounding to the inverter.

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.

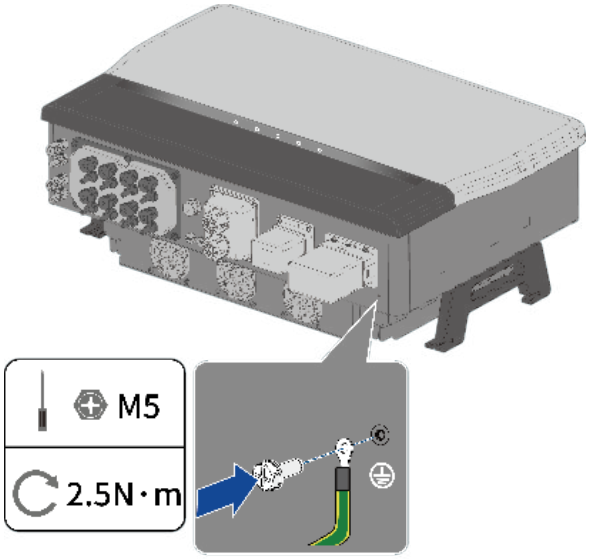
Procedure:

Step 1： Strip the grounding cable insulation. Insert the exposed section 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 tighten the screw onto the terminal using a screwdriver.



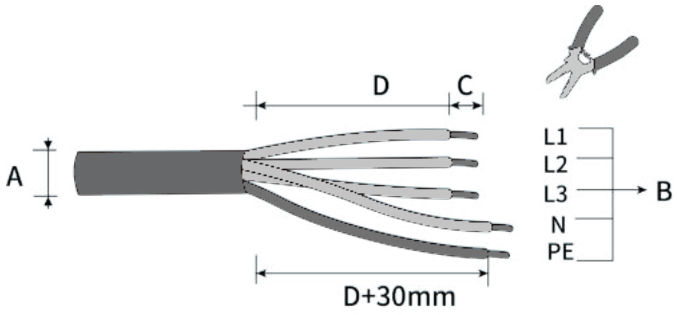
Step 3： Apply paint to the grounding terminal to ensure corrosion resistance.

Installation Complete.

6.3 Grid AC connection

6.3.1 Requirements for AC Grid connection

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.

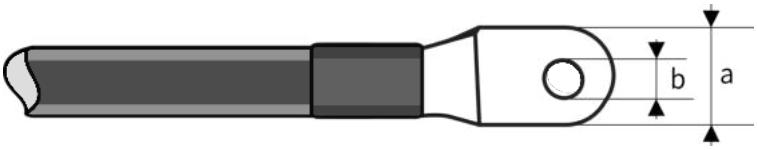


Item	Description	Value
A	External diameter	16…35 mm
B	Copper cable conductor cross-section	16~50 mm²
C	Insulation stripping length	Meeting OT/DT terminal specification
D	Sheath stripping length	130 mm

Requirements for M8 OT/DT Terminal

OT/DT terminals (not included in the delivery scope) are required for connecting AC cables to the terminal block.

Purchase the OT/DT terminals according to the following requirements.



Item	Description
A	a ≤ 22 mm
B	8.5 mm ≤ b ≤ 10.5 mm

Ensure that the selected cable lug makes direct contact with the copper wire. If there are any problems, contact the manufacturer of the terminal.

Direct contact between the copper bar and the aluminium cable will cause electrochemical corrosion and impair the reliability of electrical connection.

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 is dependent 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”.

Ground fault monitoring

The inverter is equipped with a grounding fault monitoring device. This grounding fault monitoring device detects when there is no grounding fault 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 fault 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.

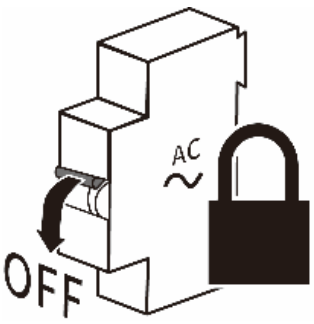
Safety in accordance with IEC 62109 when the grounding fault monitoring is deactivated.

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

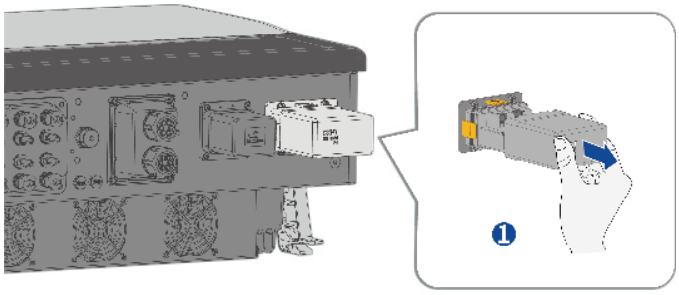
- Connect additional grounding that has at least the same cross-section as the connected grounding conductor to the AC cable. This prevents touch current in the event of the grounding conductor on the AC cable failing.

6.3.2 AC cable connection

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

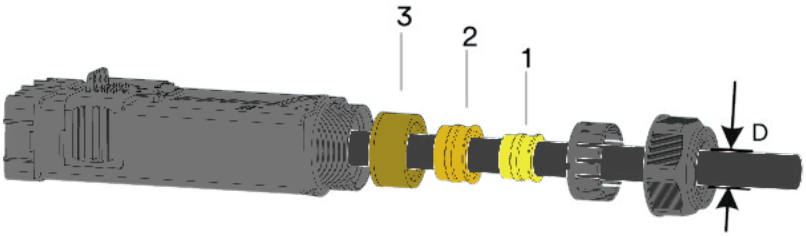


Step 2： Remove the AC protective cover from the inverter and take out the AC connector from the accessory kit.



Step 3：Remove the cover of the AC connection terminal and select the appropriate sealing ring according to the diameter of the cable.

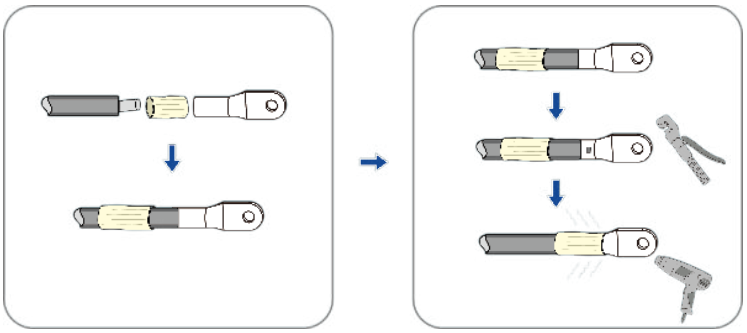
Step 4：Feed the AC cable through the cable fittings.



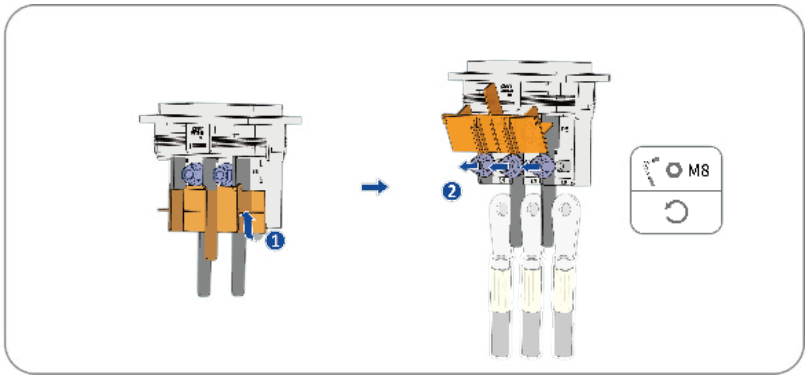
Diameter of wire D	Seal Combination
16~22mm	1+2+3
22~28mm	2+3
28~35mm	3

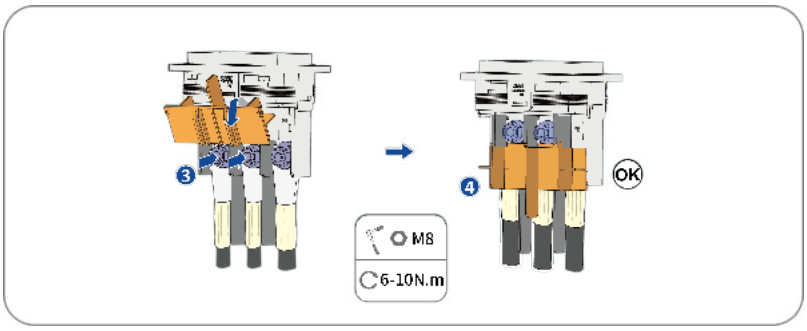
Step 5：Strip the insulation from the individual wires for L1 / L2 / L3 / N and PE (ground) so that the wire strands and insulation can be crimped into an OT/DT terminal, reference 6.3.1.

Step 6：Guide the heat shrink tubing over the uninsulated crimp point and crimp the OT/DT terminal.

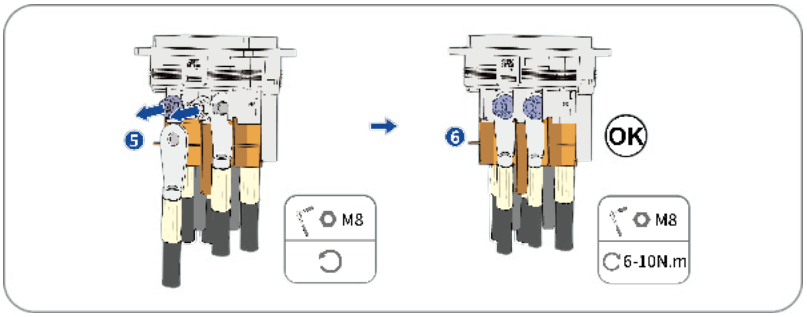


Step 7：Lift the cable spacer upwards, loosen the nuts marking the grounding points L1,L2,L3 in reserve, place the holes of the crimped terminals onto the studs of the corresponding terminals, the grounding points are secured with the nuts provided. Lower the spacer to its original position.



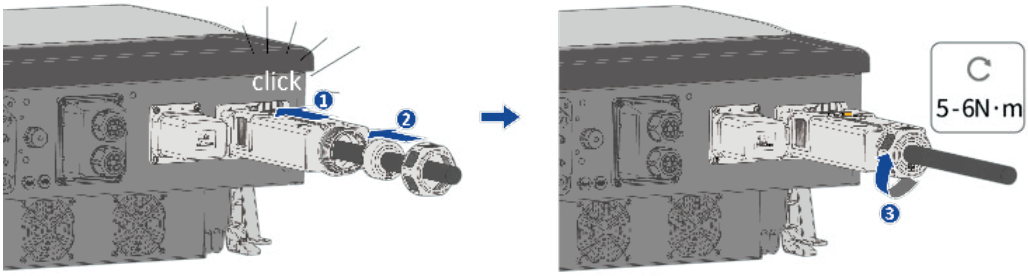


Step 8： Loosen the nut marking the grounding point N,PE proceed to lay the round hole of the crimped terminal onto the stud of the corresponding terminal, the grounding point must be secured with the provided nut.

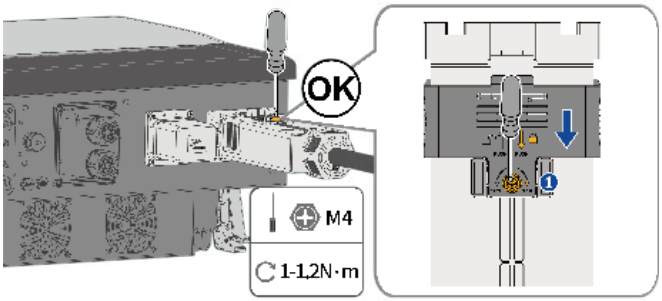


Step 9： Gently pull on the cable backwards to ensure the connection is secure.

Step 10： Insert the body into the machine end until it “clicks”, then tighten the nut with an open-end wrench.



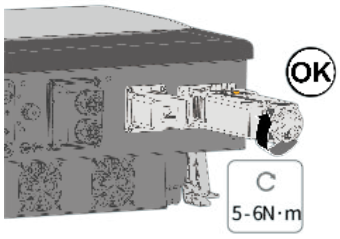
Step 11： Push down on the locking mechanism on the AC connector and lock the AC connector box with the screwdriver .



Complete the installation.

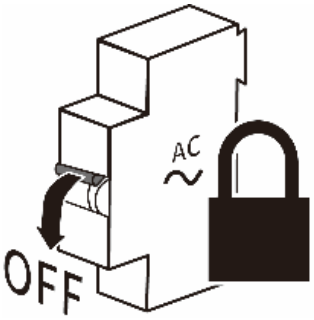
NOTICE

The AC connector at customer side has to be tightened and sealed properly regardless if there is no grid connection

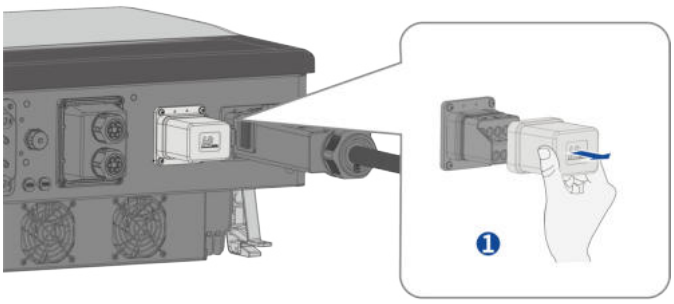


6.4 EPS Load / Diesel Generator cable connection

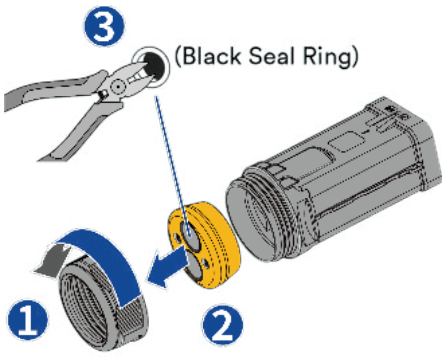
Step 1: Switch off the circuit breaker protecting the inverter circuit and and switch off and isolator all energy sources up stream and down stream of the circuit breaker and secure it against inadvertent switch on. Using an appropriately rated multimeter to ensure there is no voltage present on each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



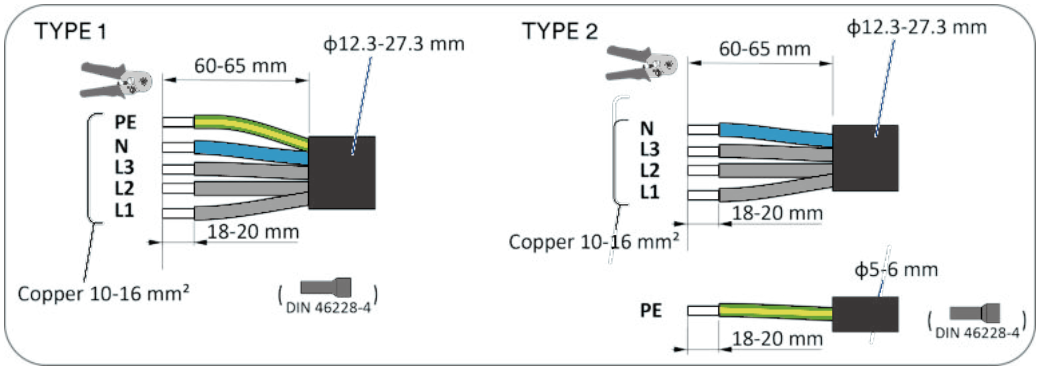
Step 2: Remove the LOAD/GEN port protection cover from the inverter and take out the LOAD/GEN connector from the kit.



Step 3: Unfasten the cable fitting for LOAD /GEN connection, unscrew the cable connector for the load/generator connection, remove the smallest black sealing ring and cut the hole with a tool.

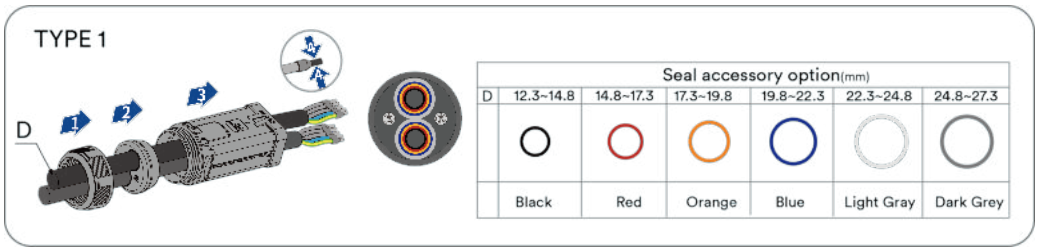


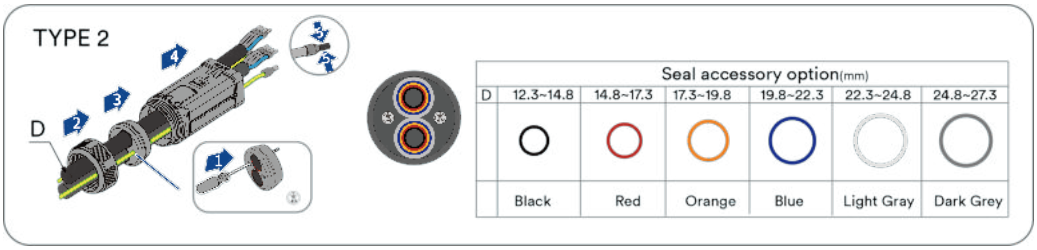
Step 4: Load/GEN cable requirements are as follows, stripped as shown.



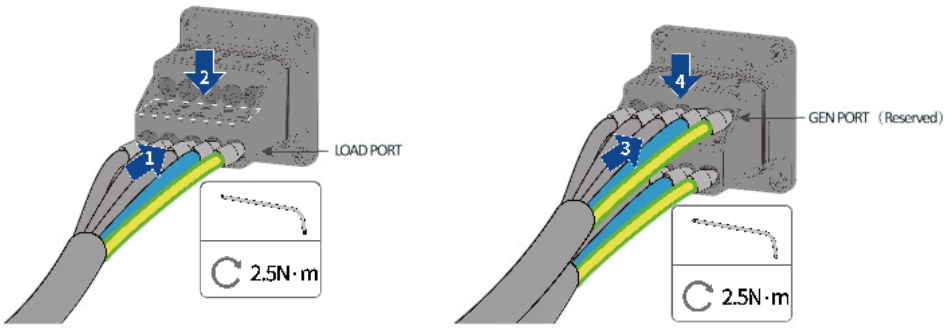
Step 5: Feed cable through cable glands, select the appropriate sealing ring according to the wire diameter.

Step 6: LOAD/GEN cable requirements: strip as shown, crimp conductors to suitable bootlace ferrule (DIN 46228-4, customer-provided).

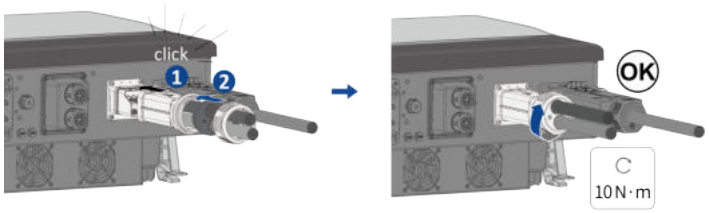




Step 7: Insert the ground (PE), neutral (N) and L1, L2 and L3 conductors, using bootlace ferules when necessary, into the load connector terminal, , then into the corresponding connections in the terminal block of the GEN connector in the order shown in the arrows below, and tighten the screws using a hey key. (GEN connections currently reserved)



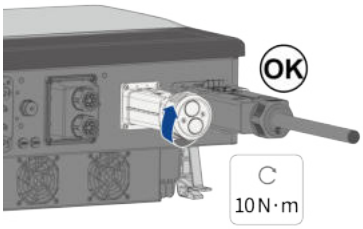
Step 8: Insert the body into the machine end until it “clicks”, then tighten the nut with an open-end wrench.



Complete the installation.

NOTICE

The EPS/Diesel generator connector has to be tightened and sealed properly regardless if there is no load or diesel generator connected.



6.5 PV DC Connection

6.5.1 Requirements for the DC connection

Requirements for the PV modules per input:

- All PV modules in the same string and MPPT 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.
- Ensure each PV module's input current stays within the DC connectors' max current limits.
- 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.
- The positive connection cables of the PV modules must be equipped with the positive DC connectors. The negative connection cables of the PV modules must be equipped with the negative DC connectors.

6.5.2 Assembling the DC connectors

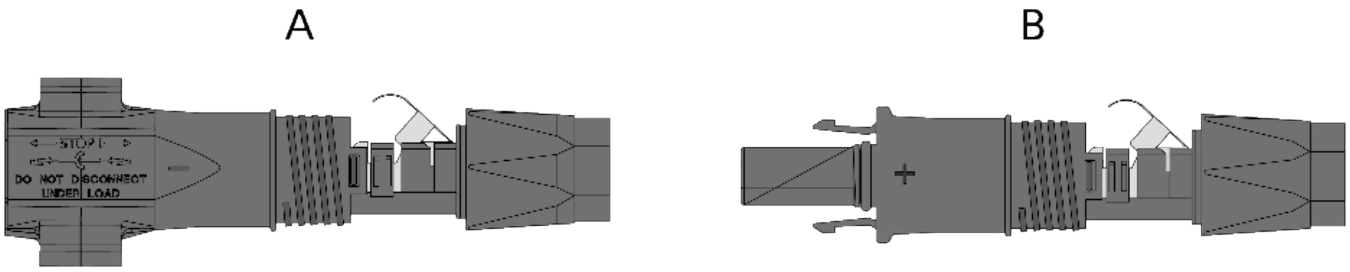
DANGER

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.

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

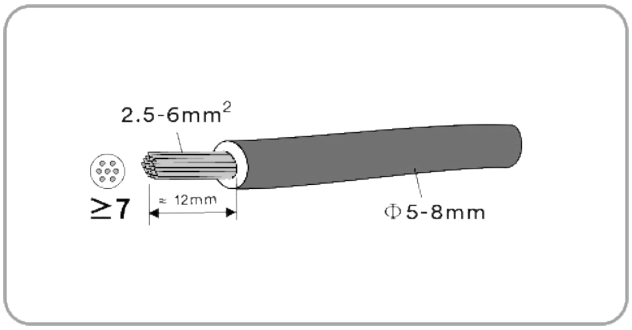


Cable requirements:

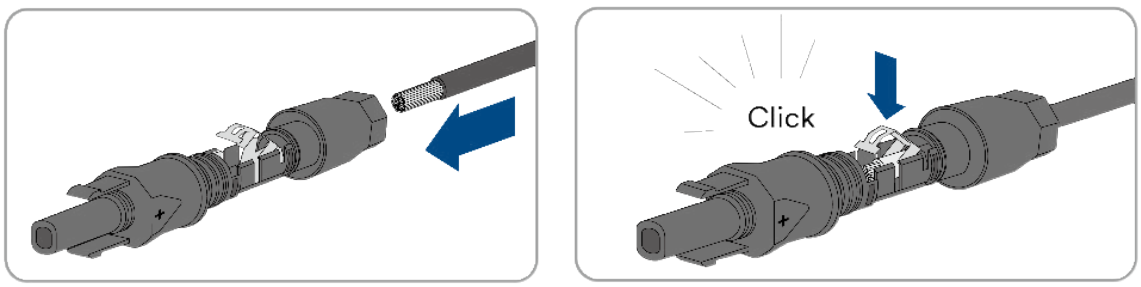
Item	Description	Value
1	Cable type	PV cable
2	External diameter	5-8 mm
3	Conductor cross-section	2.5-6 mm²
4	Number of copper strands	At least 7
5	The rated voltage	≥1100v

Procedure:

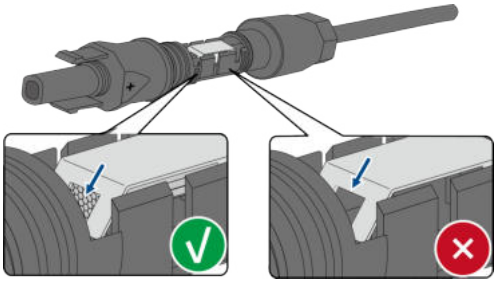
Step 1： Strip 12 mm of cable insulation from the cable.



Step 2： Guide the cable into the connector housing and push down on the wire clamp. A “click” sound is heard when the wire clamp is correctly secured.

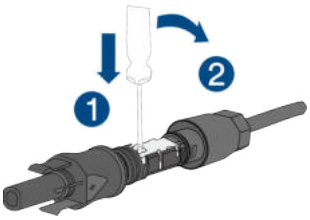


If the stranded wire is not visible in the chamber, the cable is not correctly inserted and the connector must be reassembled. To do this, the cable must be removed from the connector.

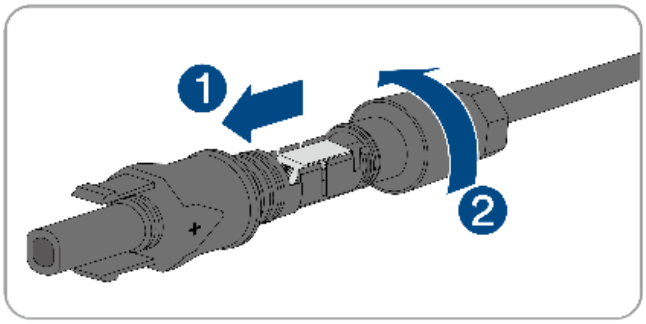


Release the wire clamp. To do so, insert a screwdriver (blade width: 3.5mm) into the wire clamp and pry the wire clamp open.

Remove the cable and go back to step 2.



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



6.5.3 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

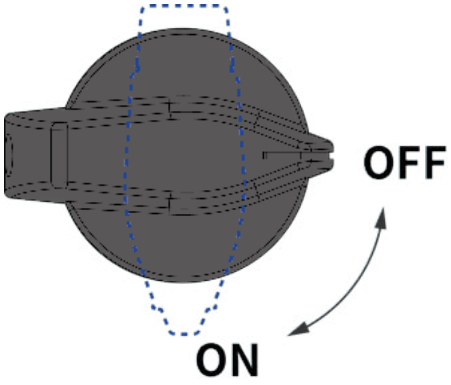
The inverter can be damaged by overvoltage!

If the voltage of the strings exceeds the maximum DC input voltage of the inverter, it may become damaged 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 DC switch is switched off and ensure that it cannot be inadvertenly switched on.



Step 2: Ensure that there is no ground fault in the PV array.

Step 3: Check whether the DC connectors have been installed with the correct polarities.

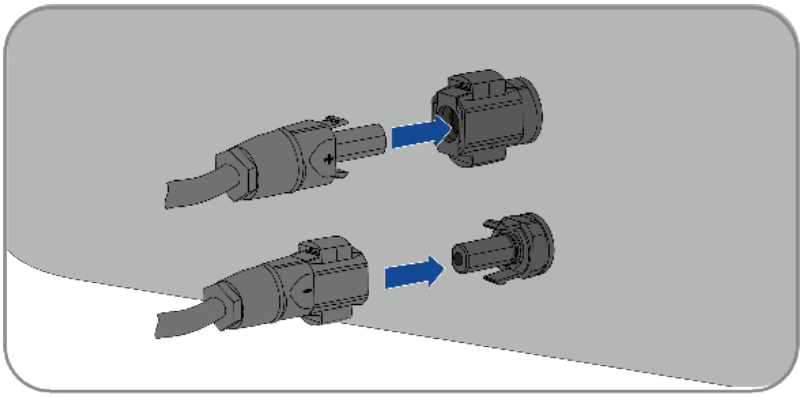
If the DC connector connected to a DC cable with the wrong polarity, the DC connector must be reassembled and connected to a DC cable with the correct polarity. The DC cable must always have the same polarity as the DC connector.

Step 4: Ensure that the open-circuit voltage of the PV array does not exceed the maximum DC input voltage of the inverter.

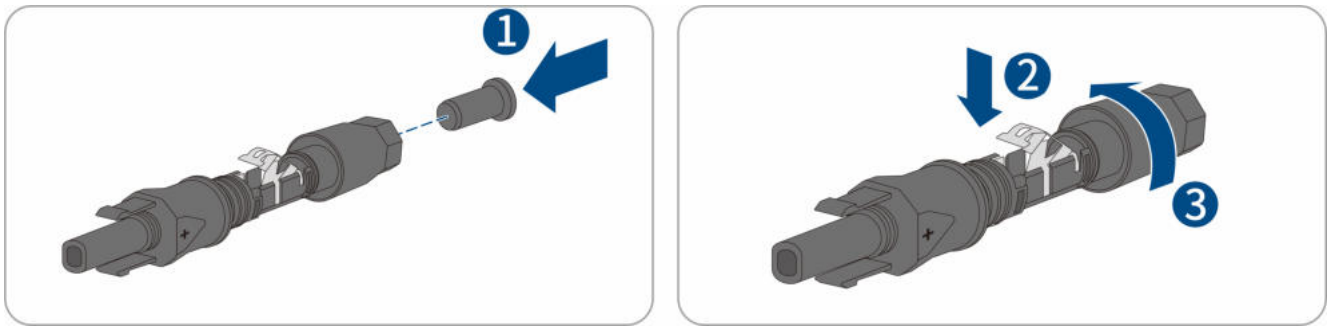
Step 5: Connect the assembled DC connectors to the inverter until they audibly click into place.

NOTICE
Do not use DC switch during the operation of the inverter, otherwise it will cause the inverter to stop or even damage the inverter.

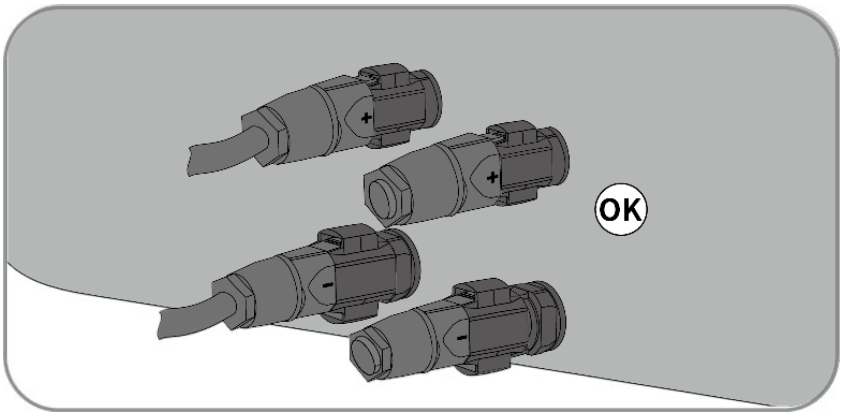
- Connect the assembled DC connectors to the inverter.



- For unused DC connectors, push down the wire clamp and push the sealing nut up to the thread. Insert the unused 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.



6.6 Battery connection

6.6.1 Requirements for the Battery connection

Assemble the Battery connectors as described in the following section.

Before connecting the battery, it is important to make sure that the battery is officially listed in the hybrid-battery compatibility list, please download the list from the website: https://solplanet.net.

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



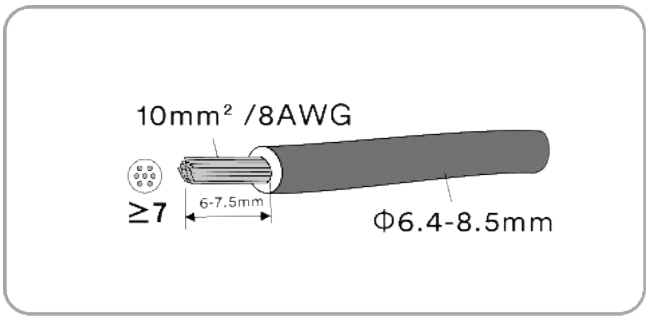
Cable requirements:

Item	Description	Value
1	External diameter	6.4-8.5 mm
2	Conductor cross-section	10 mm² / 8AWG
3	N Number of copper strands	At least 7
4	The rated voltage	≥1100v

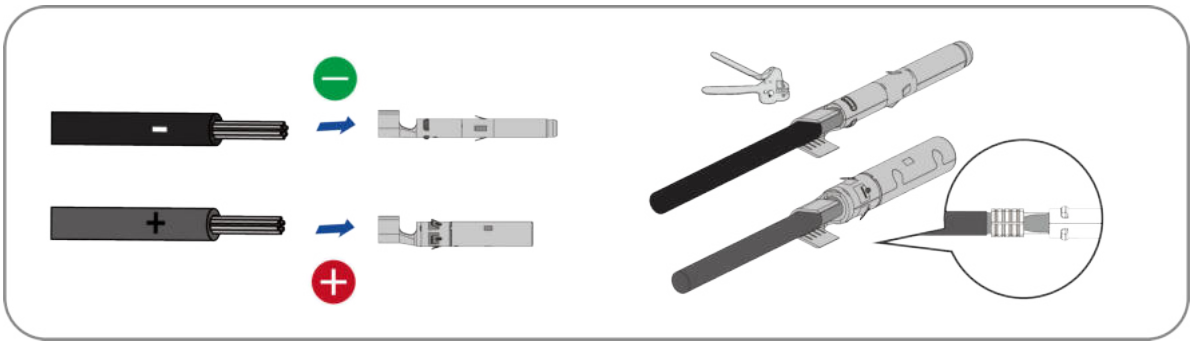
6.6.2 Assembling the Battery Connectors

Procedure:

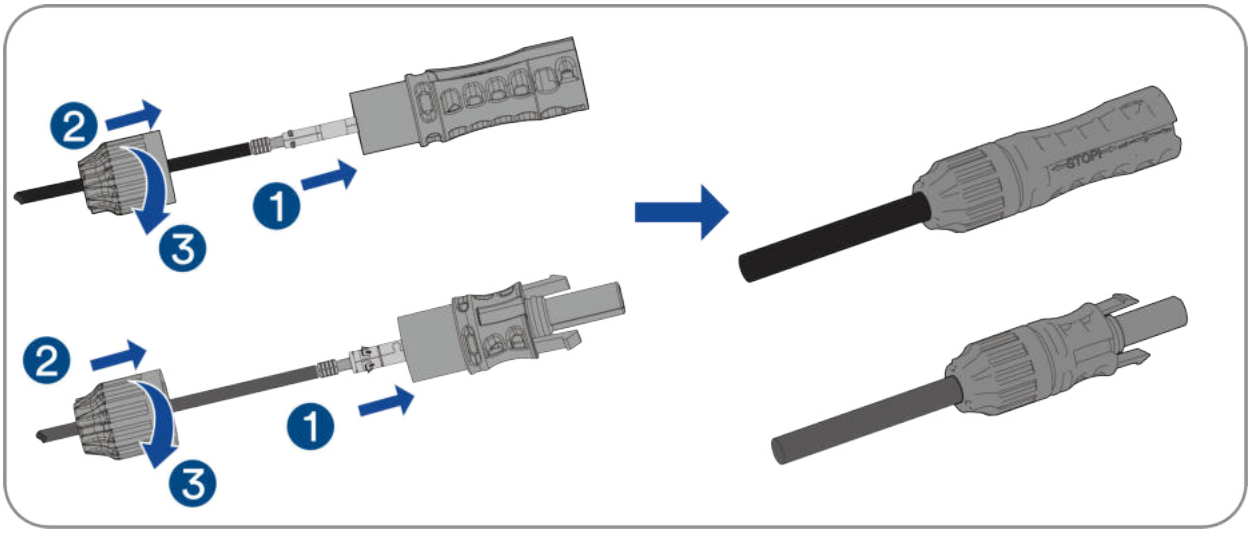
Step 1: Strip 6-7.5 mm of the cable insulation from the cable.



Step 2: Assemble the cable ends with the appropriate crimping tools.



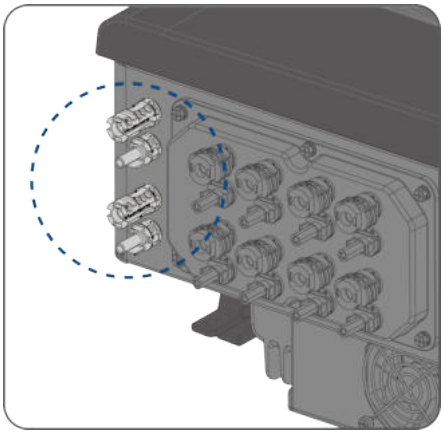
Step 3: Insert the cable through cable gland, and insert into the housing until it snaps into place. Gently pull the cable backwards to ensure firm connection. Tighten the cable gland and the housing (Torque 4Nm).



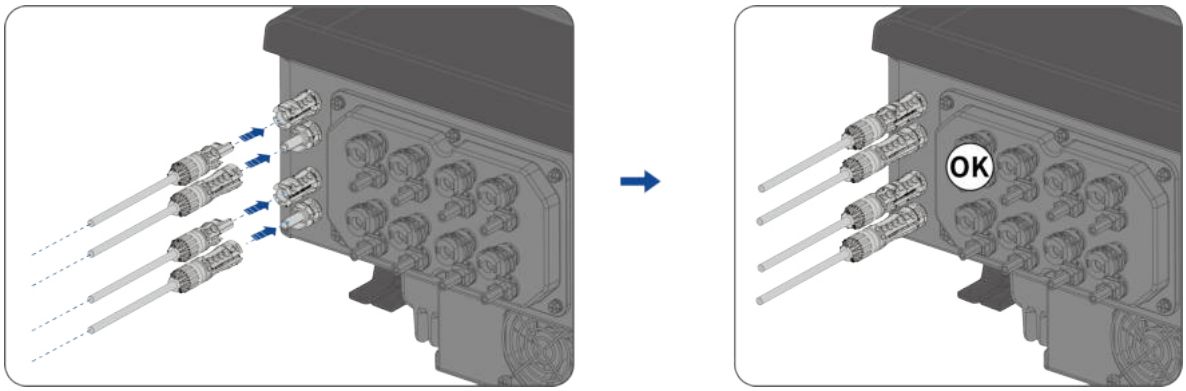
Step 4: Ensure that the cable is correctly positioned.

6.6.3 Connecting the battery connectors

Step 1: Remove the dust and waterproof cover of the battery connector on the inverter.



Step 2: Connect the assembled battery connectors to the inverter.

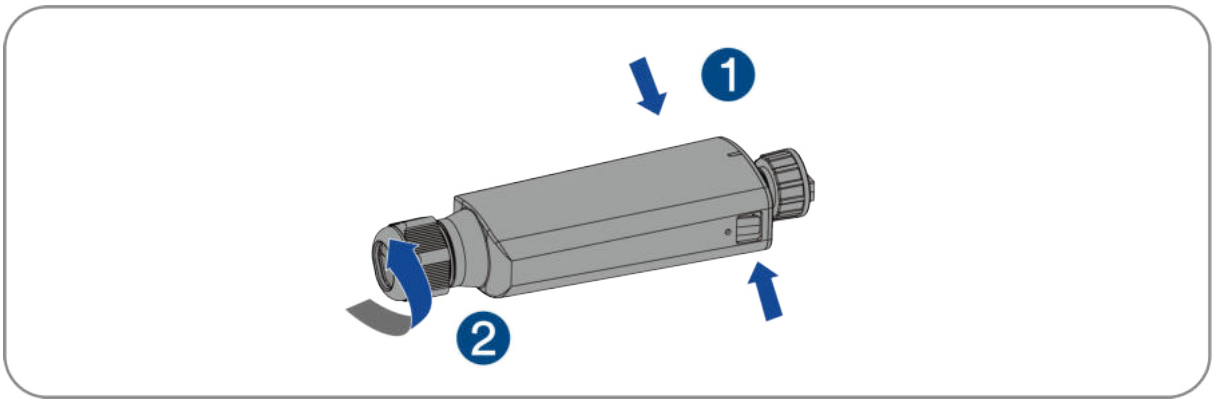


Complete the installation.

6.7 Ai-Dongle connection with LAN cable

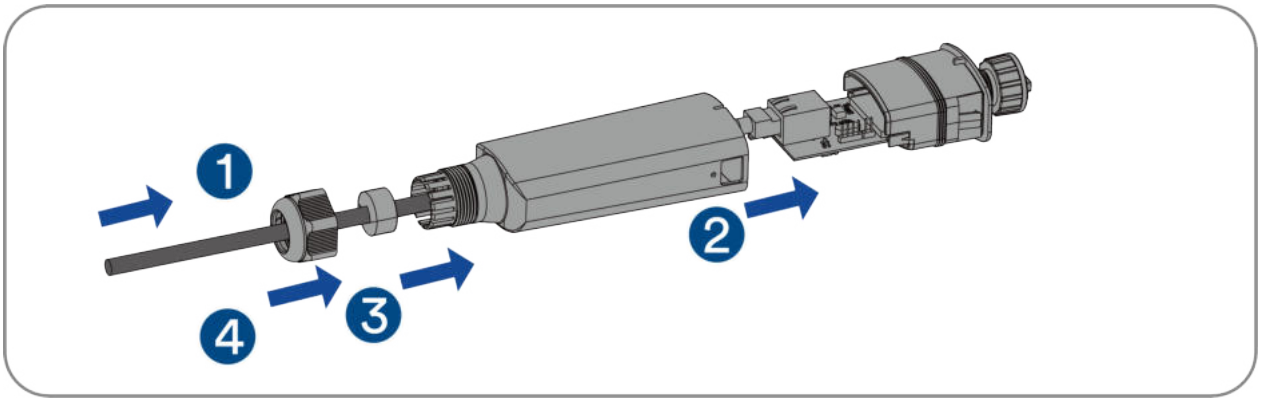
Procedure:

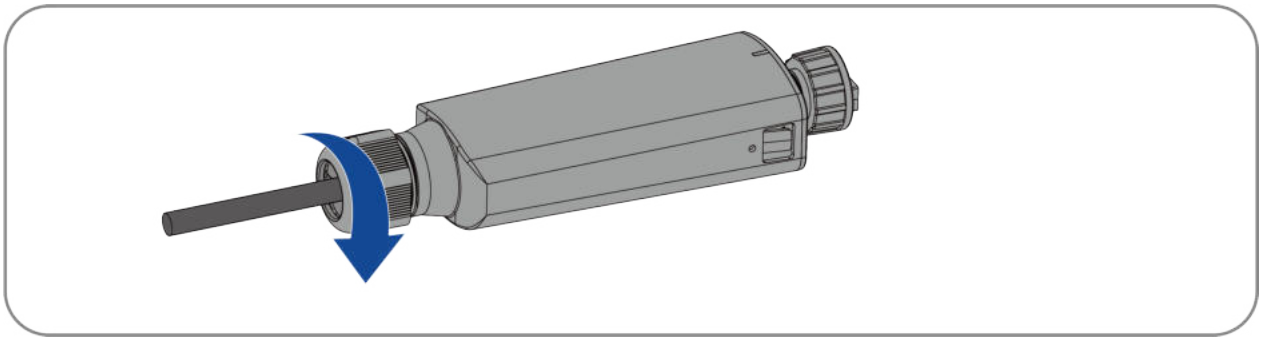
Step 1: Rotate the sealing nut, remove the sealing ring, Press the clips on both sides of the Ai-dongle to open the casing (Note:try not to touch the PCBA component).



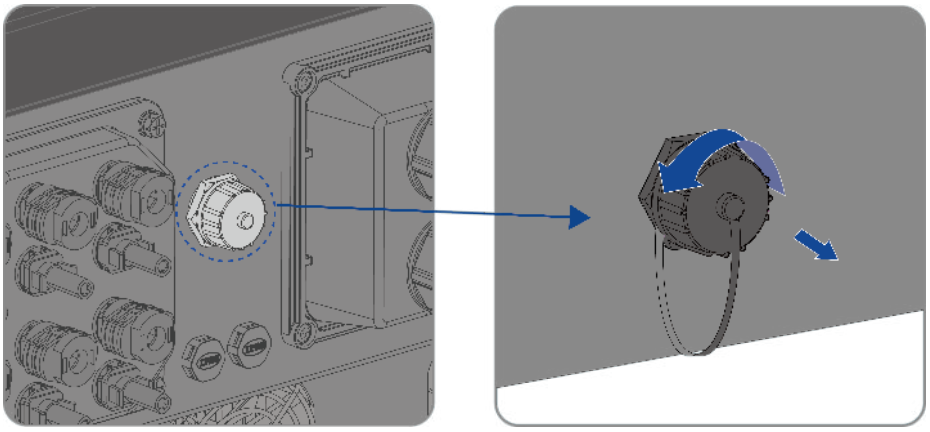
Step 2: Connect the communication cable to the wiring terminal according to the sequence shown in the following figure.

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

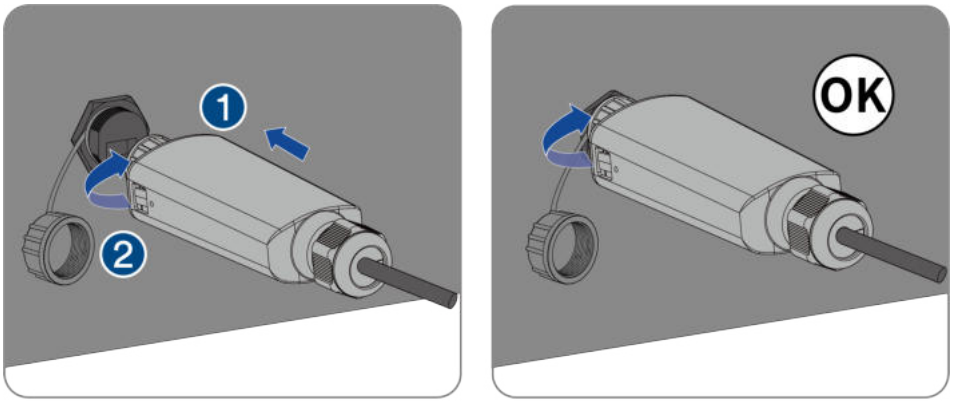




Step 4： Remove the cover of the Ai-Dongle port on the inverter and retain it .



Step 5： Connect the Ai-Dongle to the Ai-Dongle port and secure it by tightening the locking nut. Ensure the Ai-Dongle is securely connected with the label clearly visible.



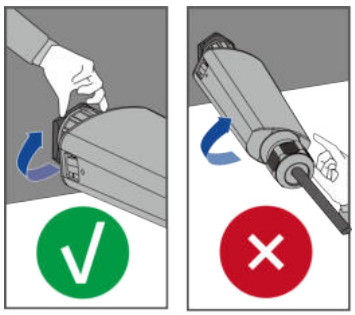
Complete the installation.

NOTICE

Rotating the body of the Ai-dongle will damage it!

The Ai-dongle body is protected by a locking nut to protect the ensure a secure connection. If it is rotated, the Ai-dongle may become damaged.

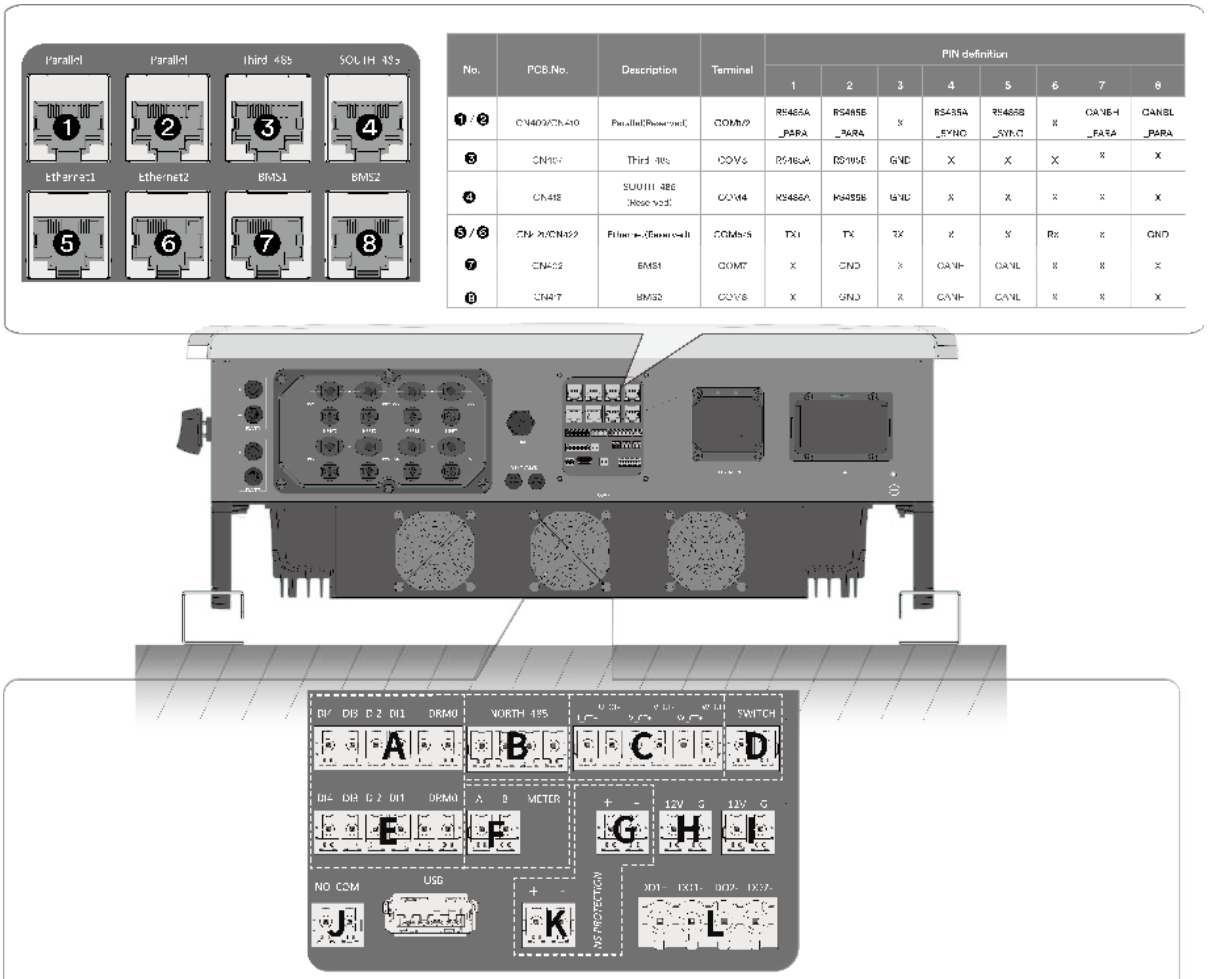
- It can only be locked with the supplied nut.
- Do not rotate the body of the Ai-dongle.



6.8 Communication Equipment Connection

6.8.1 Communication Interface Description

The inverter features a communication board with multiple interfaces, supporting connections like the lithium battery BMS, smart meter, Ripple control receiver, and parallel inverters (reserved). The interface layout is shown below



No.	PCB.No.	Description	Terminal	PIN definition							
				1	2	3	4	5	6	7	8
❶/❷	CN409/CN410	Parallel(Reserved)	COM9	RS485A_PARA	RS485B_PARA	X	RS485A_SYNC	RS485B_SYNC	X	CANH_PARA	CANL_PARA
❸	CN407	Third 485	COM5	RS485A	RS485B	GND	X	X	X	X	X
❹	CN418	SOUTH 485 (Reserved)	COM4	RS485A	RS485B	GND	X	X	X	X	X
❺/❻	CN425/CN422	Ethernet(Reserved)	COM5/6	TX1	TX	TX	X	X	Rx	X	GND
❼	CN422	BMS1	COM7	X	GND	X	CANH	CANL	X	X	X
❽	CN417	BMS2	COM8	X	GND	X	CANH	CANL	X	X	X

No.	PCB.No.	Description	Terminal	PIN definition					
				1	2	3	4	5	6
A/E	CN405/CN408	DI*4/DRM0	6pin	Ripple Control Receiver Device				DRMS Device	
				DI_4	DI_3	DI_2	DI_1	REF GEN/0	Com LOAD/Oor GND
B	CN414	North_485 (Reserved)	4pin	RS485A	RS485B	GND	\	\	
C	CN406	CT (Reserved)	6pin	Current Transformer L1		Current Transformer L2		Current Transformer L3	
				Red	Black	Red	Black	Red	Black
D	CN411	ON/OFF	2pin	DI	GND	\		\	
F	CN413	Meter	2pin	RS485A	RS485B	\		\	
G/K	CN416/CN412	NS protection	2pin	NS-Protection (network and system protection) Device		\		\	
				Positive	Negative				
H/I	CN404/CN415	External output_12V	2pin	Selv_12V	GND	\		\	
J	CN420	AI-HUB_DI (Reserved)	2pin	DI	GND	\		\	
L	CN401	DO1/DO2 (Reserved)	4pin	Multifunctional Relay				\	
				DO1		DO2			
				A	B	A	B		

Com port	Description	Function
USB	USB port	The firmware can be stored in a USB stick. The product will update automatically after inserting a USB stick into the USB interface.
RJ45-1/2	Parallel port (Reserved)	Reserved for parallel function.
RJ45-3	Third_485 port	This RS485 interface is used to connect the product to a third-party monitoring device.
RJ45-4	SOUTH_485 port (Reserved)	Reserved for devices with 485 communications.
RJ45-5/6	Ethernet port (Reserved)	The product is equipped with two ethernet interfaces. The ETH interface is used to support TCP/IP communication protocol, which can be connected to router. Choose either one of the two interfaces.
J45-7/8	BMS communication port	This CAN interface is used to connect the BMS of the battery. The RJ45-7 is used to connect the BMS of the battery that is connected to the BAT1 port，the RJ45-8 is used to connect the BMS of the battery that is connected to the BAT2 port.
Terminal-A/E	DRMs device /Ripple control receiver device	Terminal block A/E can be used to connect the DRMs device and a ripple control receiver. The PIN definition is shown as in the above table. Note that PIN 6 (GND) is a common for both devices. Choose either one of the two interfaces.
Terminal-B	North_485 interface(Reserved)	This RS485 interface is reserved.
Terminal-C	Current transformer interface (Reserved)	Terminal block C can be used to connect three current transformers (CT´s). CT´s can be used to measure the active power at the grid connection point. The PIN definition is shown in the table above. These CT´s are optional and should be used if the smart meter is not installed.
Terminal-D	ON/OFF Device	Terminal block D is used as a dry contact to startup/shutdown the inverter.
Terminal-F	Smart Meter	Terminal block F can be used to connect the smart meter.
Terminal-G/K	NS-protection (network and system protection) Device	The product is equipped with one communication interface to connect an external central grid protection device. Choose either one of the two interfaces.
Terminal-H/I	External output	This product is equipped with external output function. This function can be connected to terminal block H/I. When the inverter is in “ON” status, it will provide 12 Vdc.
Terminal-J	AI-HUB_DI(Reserved)	The terminal block J is a DI signal interface sent from the AI-HUB to the inverter.
Terminal-L	Multifunction Relay (Reserved)	The product is equipped with two multifunction relays which are reserved.

6.8.2 Communication cable connection

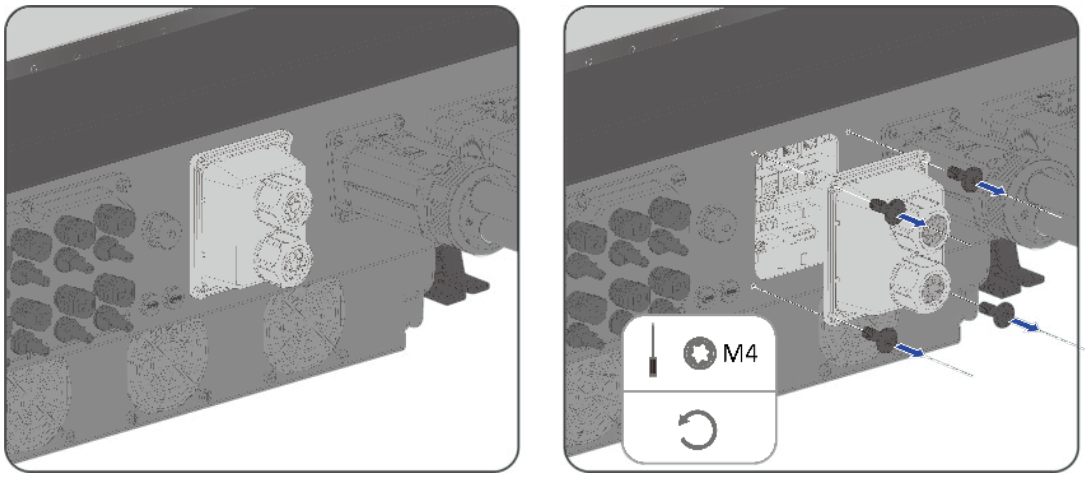
The communication interface has provisions for three different types of connectors shown in Step 2:

Type 1: Push in connector

Type 2: RJ45 connector

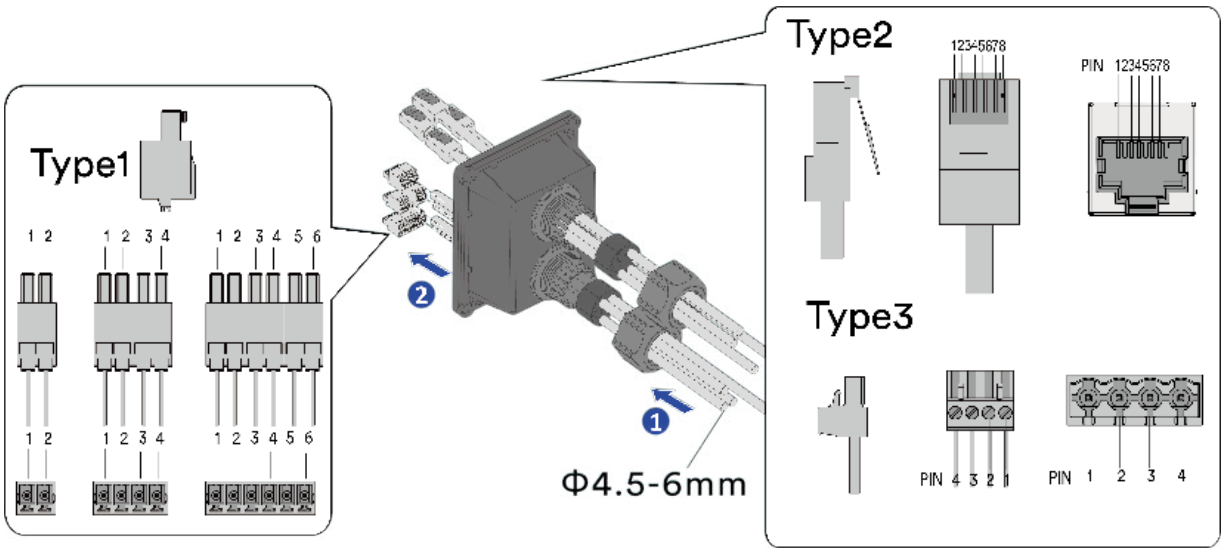
Type 3: Plug-in screw connector

Step 1： Remove the communication cover.

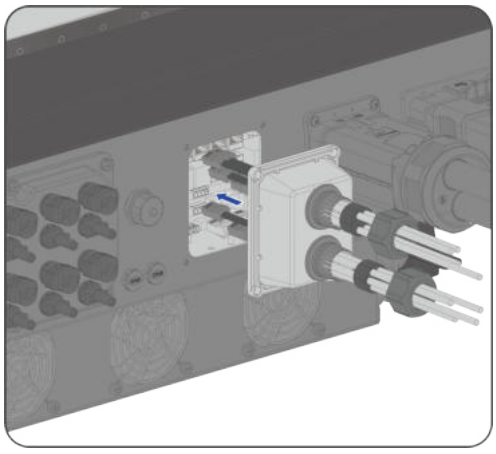


Step 2： Insert the required communication cable(s) through the communication cover and ensure the correct connector is used and secured onto the cable(s).

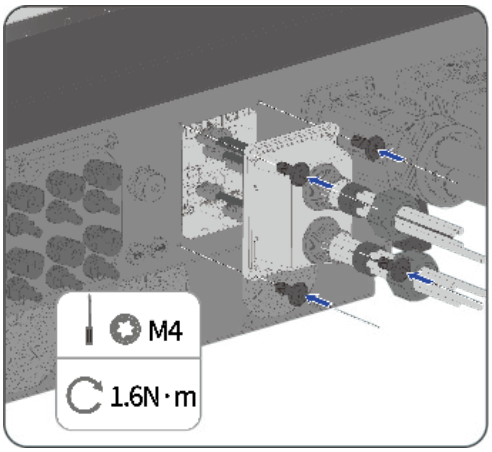
The wiring terminal crimping sequence is illustrated below:



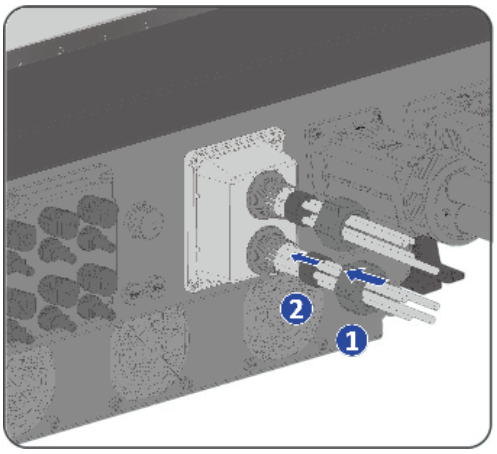
Step 3： Connect the communication cable to the corresponding communication port.

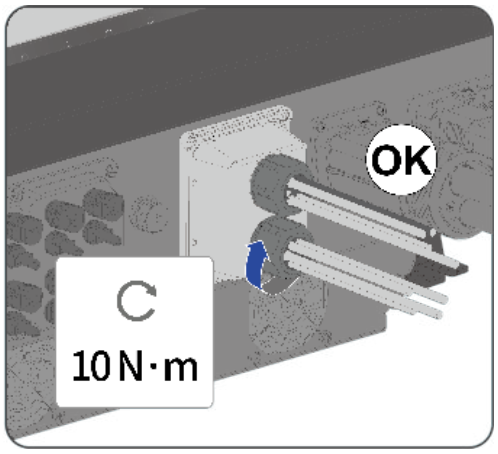


Step 4： Install the communication cover on the inverter.



Step 5： Tighten the cable gland nuts.

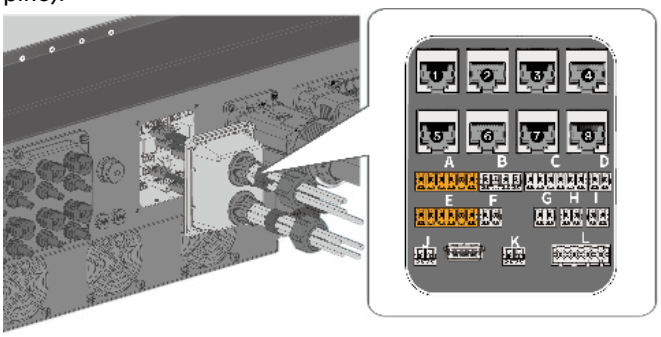


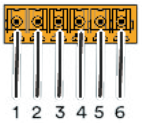


Complete the installation.

6.8.3 Ripple control receiver connection

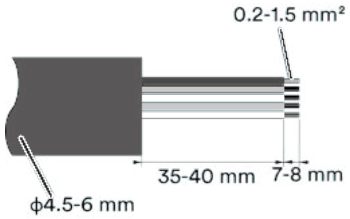
The product is equipped with two interfaces (terminal block A/E) to connect a Ripple Control Receiver device. Choose either one of the two interfaces. The Ripple control receiver device can be connected to terminal block A/E (pin1~pin4，pin6).





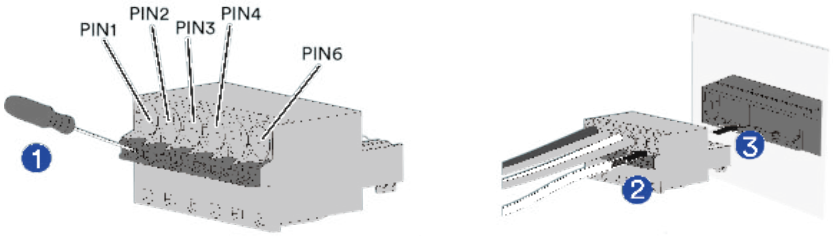
Position	PIN	Assignment
A/E	1	DI_4
	2	DI_3
	3	DI_2
	4	DI_1
	5	REF GEN/0
	6	COM LOAD/0or GND

Step 1： Remove the cable jacket and strip the wire insulation.

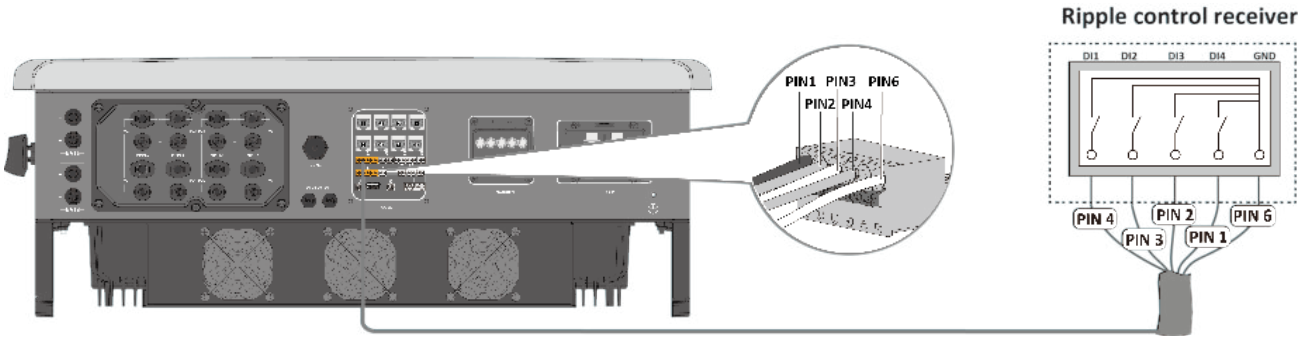


Step 2： Remove the push-in connector from the accessory pack. Insert the stripped wires into the push-in terminal connector.

Step 3： Insert the push-in connector into the connection panel and ensure the connection is secure.



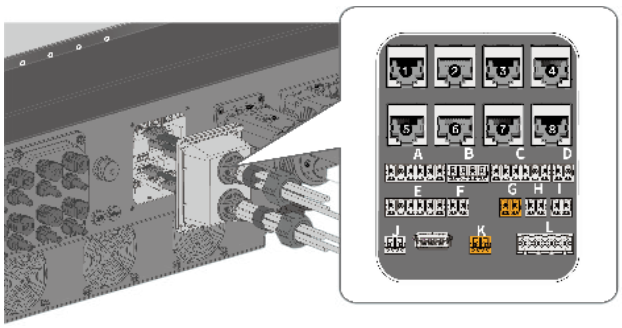
Step 4： Strip the insulation of the other end of the cable and terminate the wire into the terminal of the ripple control receiver according to the ripple control receiver requirements. Refer to the user manual of the ripple control receiver for further information.



Installation completed.

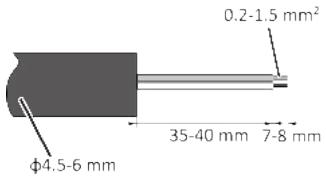
6.8.4 NS protection connection

The product is equipped with two connections (terminal block G/K) for connection to an external central grid protection device. Choose either one of the two interfaces.



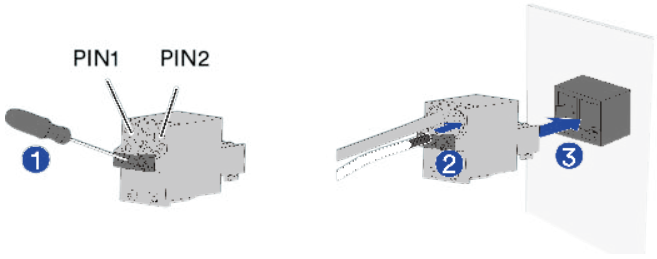
	Position	PIN	Assignment
	G/K	1	Positive (+)
		2	Negative (-)

Step 1： Remove the cable jacket and strip the wire insulation.

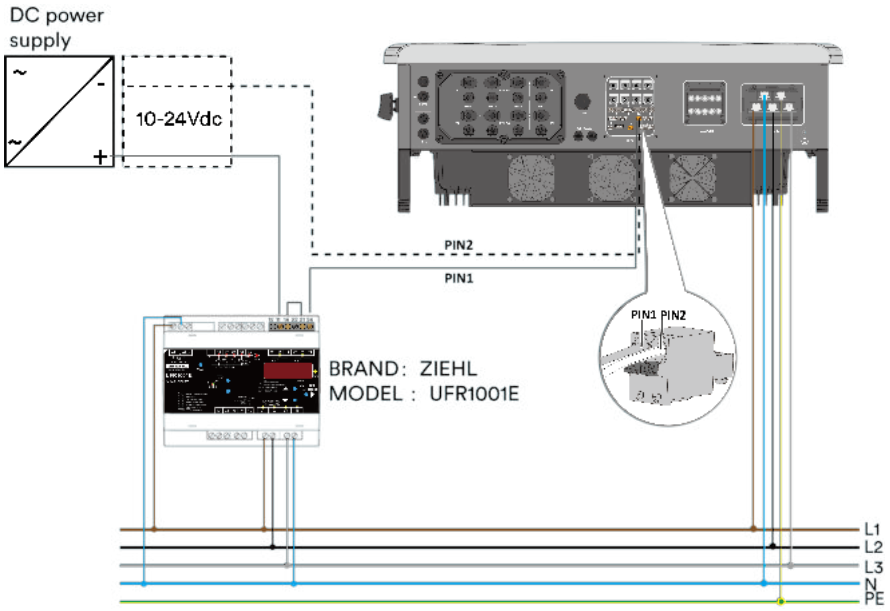


Step 2： Remove the push-in connector from the accessory pack. Insert the stripped wires into the push-in terminal terminals.

Step 3： Insert the push-in connector into the connection panel and ensure the connection is secure.



Step 4： Strip the insulation of the other end of the cable and terminate the wire into the terminal according to external protection device requirements. Refer to the user manual of the external protection device for further information.

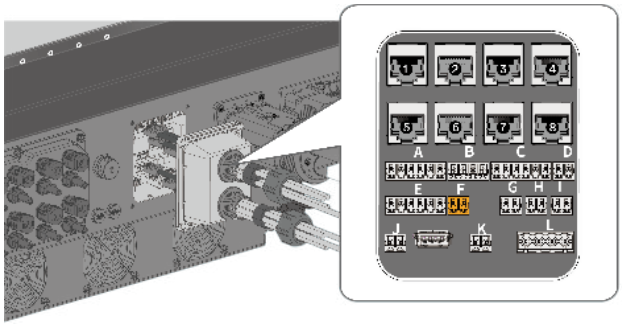


Installation completed.

The Figure above is as reference and the manual of the third party device should be consulted, as also the manuals of other brands.

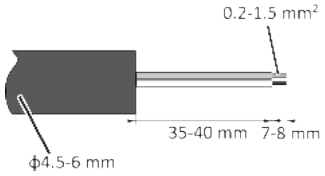
6.8.5 Smart meter connection

The product is equipped with a RS485 interface (terminal block F, pin 1 and 2) which can be used to connect the supplied smart meter.



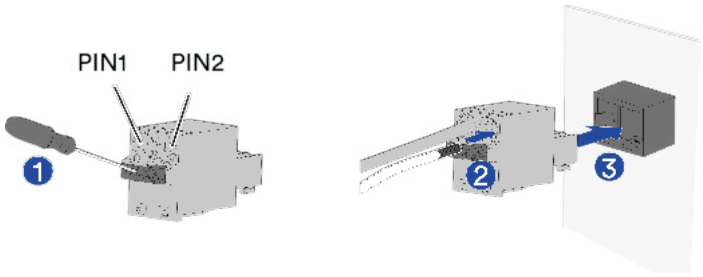
	Position	PIN	Assignment
	F	1	RS485A
		2	RS485B

Step 1： Remove the cable jacket and strip the wire insulation.

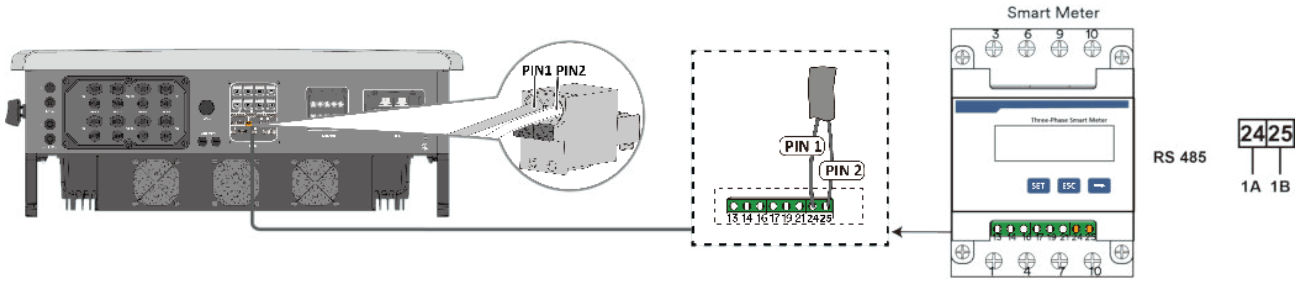


Step 2： Remove the push-in connector from the accessory pack. Insert the stripped wires into the push-in terminals.

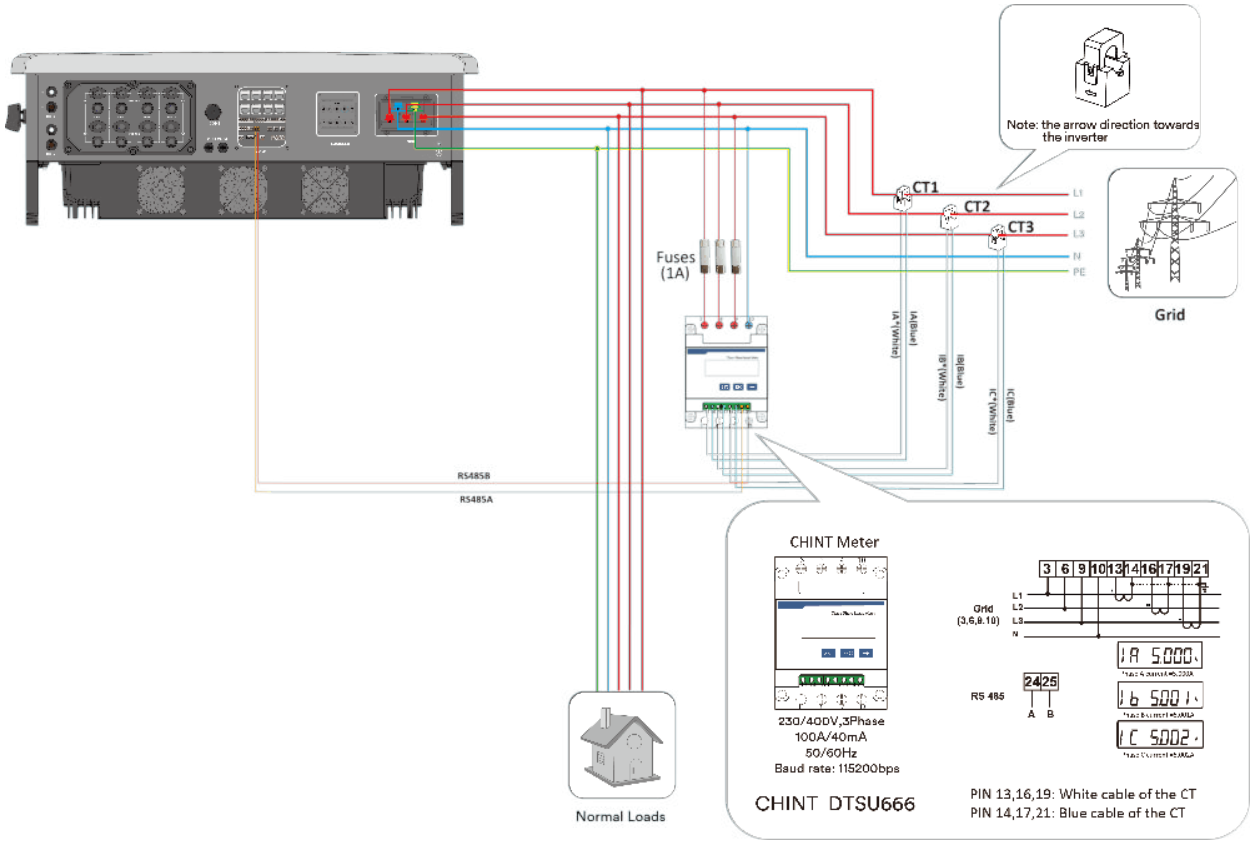
Step 3： Insert the push-in connector into the connection panel and ensure the connection is secure.



Step 4： Strip the insulation of the other end of the cable and terminate the wire into the terminal according to the smart meter requirements.



The specific smart meter connections are shown below:

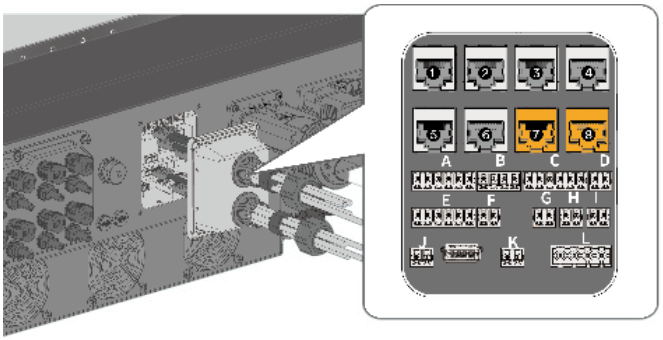


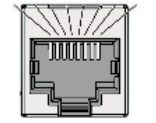
Installation completed.

6.8.6 BMS Connection

Ensure that RJ45- ❼ and RJ45-❽ are connected correctly. If they are reversed, communication will not be possible.

- The inverter provides two CAN ports for connecting to the BMS of the battery: RJ45- ❼ for connecting to the BMS of battery 1 and RJ45- ❽ for connecting to the BMS of battery 2.
- i.e., for ASW015-020K-TH, only one battery can be connected to RJ45- ❼ ; for ASW025-030K-TH, RJ45- ❼ is connected to the BMS of battery 1, RJ45- ❽ is connected to the BMS of battery 2.

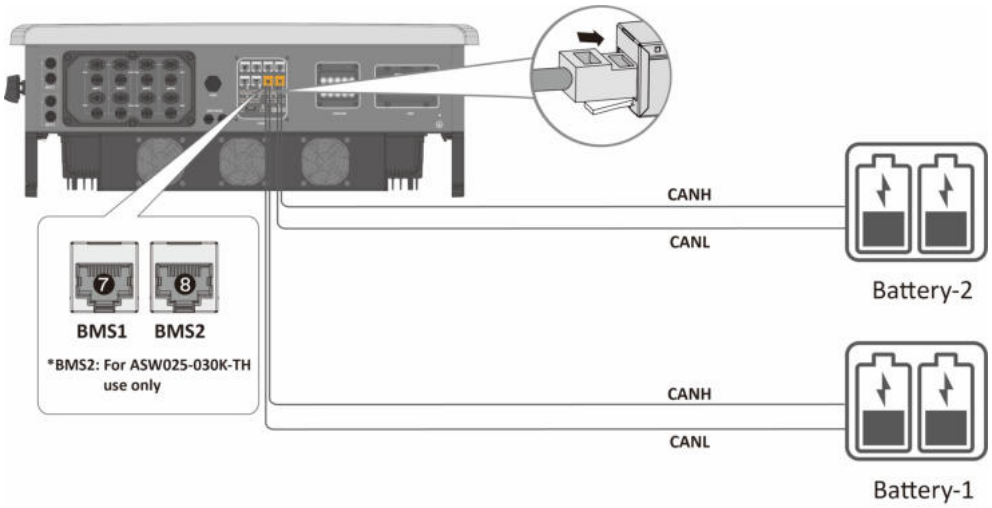




Position	PIN	Assignment
❼(BMS1) / ❽(BMS2)	1	/
	2	GND
	3	/
	4	CANH
	5	CANL
	6	/
	7	/
	8	/

Step 1： Plug the network cable port into the connection panel.

Step 2： Plug the other end of the network cable into the battery communication port, refer to the battery user manual.



Complete the installation.

7 Commissioning and operation

7.1 Inspection before commissioning

⚠CAUTION

Danger to life due to high voltages on DC conductors!

When exposed to sunlight, the PV array generates 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 turned off.
- Make sure the inverter has been correctly mounted with wall bracket.
- Make sure the top side of the inverter is free of objects.
- 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 do 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 allowed local insulation resistance protection 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 turn on the battery, keep the breakers on EPS (if used) and grid port to "OFF" position.

Step 2： Connect to the inverter via the Soplanet APP, For details, please refer to the latest Solplanet app manual.

Step 3： Turn the breakers on EPS (if used) and grid port to "ON" position. If the start-up conditions are met, the inverter will operate normally.

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

Android

iOS

8.2 Revision History

The revision log provides a description of each document update. The latest version includes all updates from previous versions.

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

Version	Change Description	APP software version	Date
V01	/	4.5.0	2024.12
V02	5.1 Chapter Configuration Parameter Sweep Chart (Add Ground Builder Sweep Function)	4.6.0	2025.02
	Remove home page headings related to “Plants”, “Fault” and “Service”.	4.7.0	

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

Dangerous voltage due to two operating voltages!

Severe injuries or death may occur if the cables and/or terminals/busbars in the device are touched. The discharge time of the capacitors is up to 5 minutes.

- Only appropriately qualified electricians authorized by the mains supply network operator are permitted to open and maintain the device.
- Before opening the device: Disconnect the AC and DC sides and wait at least 5 minutes.

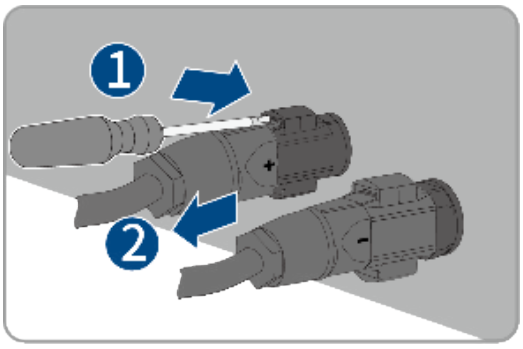
⚠ DANGER

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 instructions.

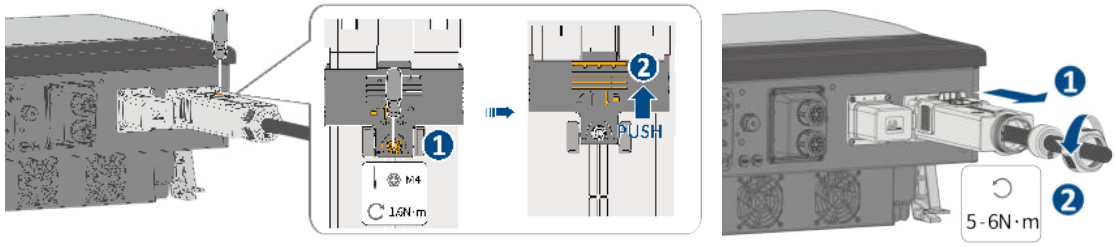
Step 5: Loosen and remove the DC connector. To do so, insert a flat-blade screwdriver or an angled screwdriver (blade width: 3.5mm) into one of the side slots and pull the DC connectors out.



Step 6： Ensure that no voltage is present between the positive terminal and negative terminal at the DC inputs on the inverter side using a suitable measuring device.

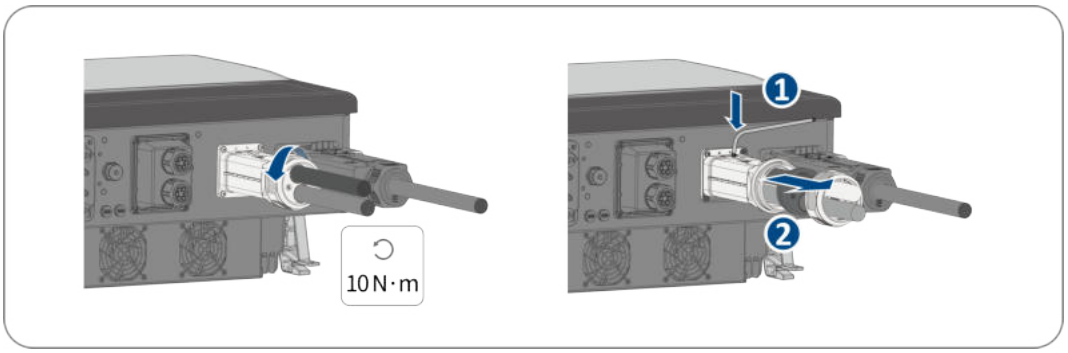
Step 7： Loosen and remove the AC connector.

Unlock instructions	
1. Unlock Terminal as shown.	2. Hold the main body and pull it back to complete the disassembly.



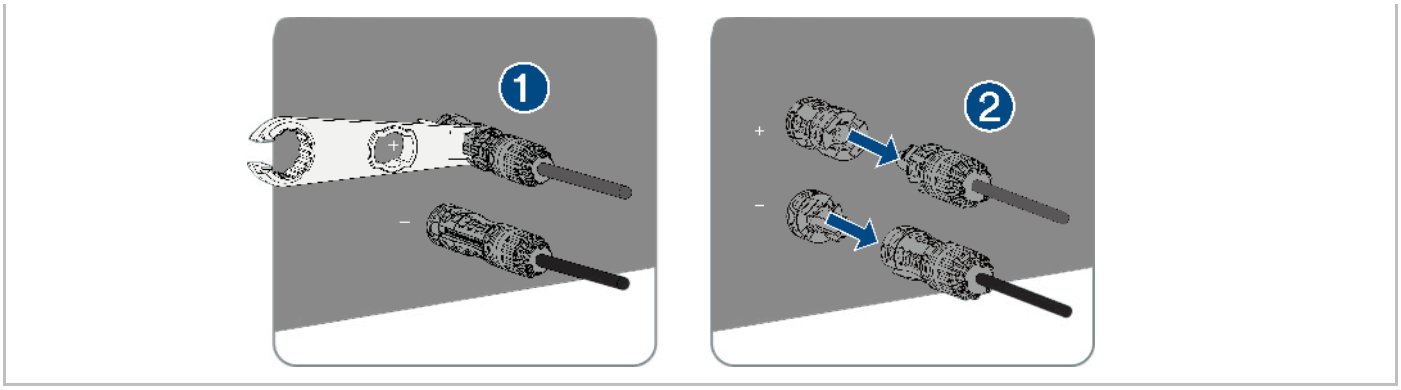
Step 8： Loosen and remove the LOAD / GEN connector.

Unlock instructions	
1. Turn the nut in the opposite direction.	2. Press to the unlocking position with the built-in wrench, hold the main body and pull it back to complete the disassembly.



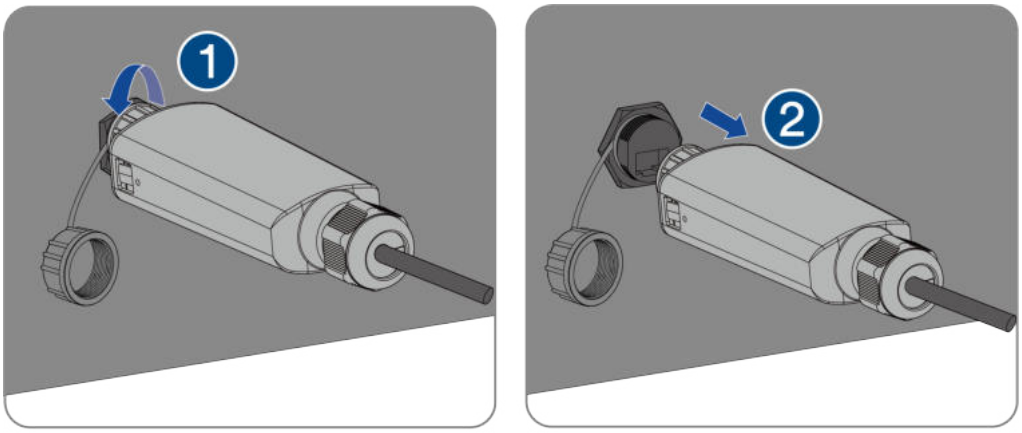
Step 9： Loosen and remove the battery connector.

Unlock instructions
If you need to remove the positive and negative battery connectors from the inverter battery connector input, use the disassembly lever hand insert the fixed bayonet as shown in the picture below and press down firmly, gently unplug the battery connector.



Step 10： Remove the communication cover. Remove the communication cable in reverse order by referring to 6.8 Communication equipment connection.

Step 11： 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 wall-mounting bracket from the wall.

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

10 Technical data

10.1 ASW015/020/025/29.9/030K-TH

Type PV Port	ASW015K-TH	ASW020K-TH	ASW025K-TH	ASW29.9K-TH	ASW030K-TH
Maximum power of PV array	30000 Wp	40000 Wp	50000 Wp	59800 Wp	60000 Wp
Maximum input voltage	1000 V				
Minimum input voltage	95 V				
Start voltage	180 V				
Rated input voltage	630 V				
MPP voltage range	150 - 950 V				
MPP voltage range at Pnom	375-850 V	500-850 V	315-850 V	375-850 V	375-850 V
Maximum operating input current	20 A		40 A		
Maximum short circuit current (Isc PV)	25 A		50 A		
Number of independent MPP inputs	4				
Strings per MPP input	1		2		
Maximum inverter backfeed current to the array	0 A				
Surge protection	Type II, SPD				
Overvoltage category as per IEC 62109-1	II				
Battery Port	**ASW015K-TH**	**ASW020K-TH**	**ASW025K-TH**	**ASW29.9K-TH**	**ASW030K-TH**
Maximum voltage	800 V				
Voltage range	120 V to 800 V				
Maximum charge power from PV and grid	30000 W	40000 W	50000 W	59800 W	60000 W
Maximum charge power from grid	15000 W	20000 W	25000 W	29900 W	30000 W
Maximum discharge power	15000W	20000 W	25000 W	29900 W	30000 W
Maximum charge / discharge current	50 A / 50 A		2*50 A / 2*50 A		
Battery type	LiFePO4				
Overvoltage category as per IEC 62109-1	II				
Grid port	**ASW015K-TH**	**ASW020K-TH**	**ASW025K-TH**	**ASW29.9K-TH**	**ASW030K-TH**
Nominal output active power at 230 V	15000 W	20000 W	25000 W	29900 W	30000 W
Rated apparent power at cosφ = 1	15000 VA	20000 VA	25000 VA	29900 VA	30000 VA
Maximum apparent power at cos φ = 1	16500 VA	22000 VA	27500 VA	32890 VA	33000 VA
Nominal voltage	220 V / 380 V [3/N/PE] 230 V / 400 V [3/N/PE] 240 V / 415 V [3/N/PE]				
Voltage range	270-480 V (Phase to Phase)				
Nominal frequency	50 Hz/60 Hz				
Frequency range	45-55 Hz/55-65 Hz				
Rated output current at 220 V	22.7 A	30.3 A	37.9 A	45.3 A	45.5 A
Rated output current at 230 V	21.7 A	29.0 A	36.2 A	43.3 A	43.4 A
Rated output current at 240 V	20.8 A	27.8 A	34.7 A	41.5 A	41.7 A
Rated output apparent power	15000 VA	20000 VA	25000 VA	29900 VA	30000 VA
Maximum output apparent power	16500 VA	22000 VA	27500 VA	32890 VA	33000 VA
Maximum continuous output current	23.9 A	31.9 A	39.8 A	47.6 A	47.8 A

Max. input power from grid	30000 W	40000 W	50000 W	50000 W	50000 W
Max. input current from grid	43.5 A	58.0 A	72.5 A	72.5 A	72.5 A
Contribution to peak short-circuit current Ip	130 A	130 A	150 A	150 A	150 A
Initial short-circuit alternating current (Ik" first single period effective value)	23.9 A	31.9 A	39.8 A	47.6 A	47.8 A
Short circuit current continuous (Ik" max output fault current)	23.9 A	31.9 A	39.8 A	47.6 A	47.8 A
Inrush current	< 20 % of nominal AC current for a maximum of 10ms				
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)				
Power factor range	0.8 inductive ... 0.8 capacitive				
Number of feed-in phase	3P				
Recommended rated current of AC circuit breaker	63 A	80 A	100 A	100 A	100 A
Surge protection	MOV /SPD (Type II ,optional)				
Overvoltage category as per IEC 62109-1	III				
EPS port	**ASW015K-TH**	**ASW020K-TH**	**ASW025K-TH**	**ASW29.9K-TH**	**ASW030K-TH**
Nominal voltage	220 V / 380 V [3/N/PE] 230 V / 400 V [3/N/PE] 240 V / 415 V [3/N/PE]				
Nominal frequency	50 Hz / 60 Hz				
Rated output apparent power	15000 VA	20000 VA	25000 VA	29900 VA	30000 VA
Maximum output apparent power during on-grid mode	16500 VA	22000 VA	27500 VA	32890 VA	33000 VA
Maximum output apparent power during off-grid mode	16500 VA	22000 VA	27500 VA	32890 VA	33000 VA
Maximum peak output apparent power during off-grid mode (< 10 second)	30000 VA	40000 VA	45000 VA	45000 VA	45000 VA
Maximum continuous output current	23.9 A	31.9 A	39.8 A	47.6 A	47.8 A
Power Factor Range (off-grid)	0.8 inductive ... 0.8 capacitive				
Overvoltage category as per IEC 62109-1	III				
Efficiency	**ASW015K-TH**	**ASW020K-TH**	**ASW025K-TH**	**ASW29.9K-TH**	**ASW030K-TH**
Maximum efficiency	98.0%		98.4%		
European weighted efficiency	97.2%		97.9%		

(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	ASW015K-TH	ASW020K-TH	ASW025K-TH	ASW29.9K-TH	ASW030K-TH
Width × height × depth	769 mm / 491 mm / 285 mm				
Weight	50.5kg		58kg		
Climatic category in accordance with IEC 60721-3-4	4K4H				
Pollution degree outside the enclosure	3				
Pollution degree inside the enclosure	2				

Operating temperature range	-30 °C ... +60 °C	
Allowable relative humidity range (non-condensing)	0 ... 100%	
Maximum operating altitude above mean sea level	4000 m	
Typical noise emission	< 35 dB(A)@1 m	< 55 dB(A)@1 m
Self-consumption (night)	< 10 W	
Topology	Non-isolated	
Cooling method	Smart cooling	
Degree of protection for electronics in accordance with IEC 60529	IP66	
Protection class in accordance with IEC 62109-1	I	
Distribution system	TN-C-system, TN-C-S-system, TN-S-system, TT-system	
Display	LED indicator & APP	
Demand response mode in accordance with AS/NZS 4777.2	DRM0	
Earth Fault Alarm	Cloud based, Visible	
Export active power output	Via connecting Smart meter	
Communication Interfaces	Dongle: Wi-Fi (2.4 GHz) / LAN (100 Mbps) Inverter: RS485 (Modbus RTU)	
Radio technology	WLAN 802.11 b/g/n	
Radio spectrum	2.4 GHz	
Maximum transmission power	100 mW	
Mounting information	Wall Mounting Bracket	
DC connector type	Sunclix	
AC Connector type	CNNT DSTB38-05	
EPS/GEN Connector type	HDB-76i10	
Battery Connector type	MC4	

10.3 Protective device

Protective devices	ASW015K-TH	ASW020K-TH	ASW025K-TH	ASW29.9K-TH	ASW030K-TH
DC reverse polarity protection	Integrated				
DC isolator	Integrated				
AC short- circuit protection	Integrated				
Ground fault monitoring	Integrated				
All-pole sensitive residual current monitoring unit	Integrated				
Active anti-islanding protection	Integrated				
PV string current monitoring	Integrated				
DC current injection monitoring	Integrated				
DC surge protection	Integrated				
AC surge protection	Integrated				

11 Troubleshooting

When the PV system is not functioning properly, we recommend the following solutions for quick troubleshooting. In case of errors or warningsan 'Event Message' is displayed on the monitoring tool and the LEDs indicate the abnormal status.

Error code	Message	Corrective measures
3-5 8,9	Permanent Fault	• Disconnect the inverter from the battery, the grid and the PV array and reconnect after 3 minutes. • If this fault is still being shown, contact the service. • The inverter temperature should above -40℃.
10	Device fault	• Disconnect the inverter from the battery, the grid and the PV array and reconnect after 3 minutes. • If this fault is still being shown, contact the service. • The inverter temperature should above -40℃.
12	HW output over current	• Disconnect the inverter from the AC grid, PV module, battery and reconnect after 5 minutes, check if it is solved. • If not, disconnect the load, and restart the inverter to check that it is solved. • If the fault disappear, then connect the load one by one to check which load result this fault. • Claim an exchange of the inverter if complete the above guide with fault is still there.
33	Grid frequency fault	• 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	Grid voltage fault	• 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 fault	• Make sure the grounding connection of the inverter is reliable. • Make a visual inspection of all PV cables and modules. • If this fault is still shown, contact the service.
37	PV over voltage fault	• Check the open-circuit voltages of the strings and make sure it is below the maximum DC input voltage of the inverter. If the input voltage lies within the permitted range and the fault still occurs, please call service.
38	Isolation fault	• Check the PV array's insulation to ground and make sure that the insulation resistance to ground is greater than 1 Mohm. Otherwise, make a visual inspection of all PV cables and modules. • Make sure the grounding connection of the inverter is reliable. • If this fault occurs often, contact the service.
40	Over temperature fault	• Check whether the airflow to the heat sink is obstructed. • Check whether the ambient temperature around the inverter is too high.
48	10 minutes average over voltage 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 with 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 Terminal block G/K's PIN1&PIN2, if connection is right, use multimeter measure Terminal block G/K's PIN1&PIN2 power voltage should lie in range of 10-24Vd.c.. • If this fault occurs often, contact Solplanet service.

Contact the service if you meet other problems or error codes not described 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 may be higher than 70 ℃ and may cause injury due to burns.

- Before cleaning the air outlet, shut down the machine and wait for about 30 minutes until the inverter is safe to touch.

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.

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

Service email: service.LATAM@solplanet.net

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





AISWEI Technology Co., Ltd.