ASW1000S-S2 / ASW1500S-S2 / ASW2000S-S2

ASW2500S-S2 / ASW3000S-S2 / ASW3300S-S2

Single phase string inverters User Manual

Table of contents

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:

- ASW1000S-S2
- ASW1500S-S2
- ASW2000S-S2
- ASW2500S-S2
- ASW3000S-S2
- ASW3300S-S2

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 Safety warning symbols guide

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.

NOTE

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

Information that is important for a specific topic or goal, but is not safety relevant.

2 Safety

2.1 Intended use

- The product is a transformerless PV inverter which converts the direct current of the PV generator into grid-compatible single-phase alternating current and then feeds the single-phase alternating current into the public power grid.
- The product is intended for indoor and outdoor applications.
- The product must only be connected with PV modules of protection class II (in accordance with IEC 61730, application class A). Do not connect any sources of energy other than PV modules to the product.
- 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 used in countries for which it is approved by Solplanet and the grid operator.
- 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 in accordance with 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!

When exposed to sunlight, the PV array generates dangerous DC voltage which is present in the DC conductors and the live components of the product. Touching the DC conductors or the live components can cause to lethal electric shocks. If the DC connectors are disconnected from the product under load, an electric arc may occur leading to electric shock and burns.

- Do not touch non-insulated parts or cables.
- Do not touch the DC conductors.
- Do not touch any live components of the product.
- Do not open the product.
- 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.
- Disconnect the product from voltage 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 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 results in death or lethal injuries due to electric shock.

- Disconnect the product from voltage sources and ensure it cannot be reconnected before working on the device.
- The DC switch may be operated whilst the inverter is in operation.
- Do not touch any parts of the substructure or frame of the PV array.
- Do not connect PV strings with ground faults to the product.

⚠ WARNING

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

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

- Only use measuring devices with a DC input voltage range of 500 Vdc or higher.

⚠ WARNING

Risk of burns due to hot enclosure parts!

Some parts of the enclosure can become hot during operation, touching these parts may cause burns.

- Only touch the DC switch when the inverter is running.
- Do not touch any parts other than the enclosure lid of the product during operation.

⚠ WARNING

Risk of injury due to weight of product!

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

- Transport and lift the product carefully. Take the weight of the product into account.
- Qualified person should wear appropriate personal protective equipment.

NOTE

Damage to the inverter due to electrostatic discharge.

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

- Ground yourself before touching any component.

ℹ

The country grid code must be set correctly.

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

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

2.3 Symbols on the label

Beware of a danger zone

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

Beware of high voltage and operating current

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

Beware of hot surfaces

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

WEEE designation

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

CE marking

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

Certification mark

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

RCM Mark

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

Capacitor discharge

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

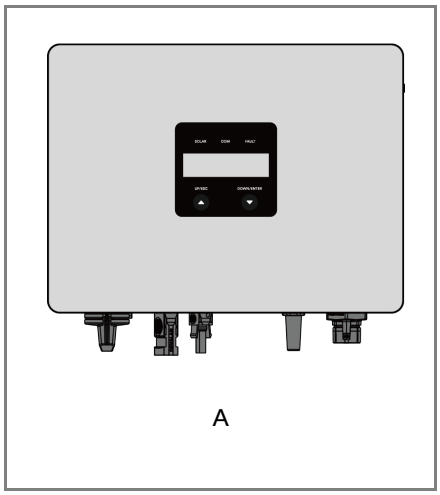
Observe the documentation

Observe all documentation supplied with the product.

3 Unpacking and storage

3.1 Scope of delivery

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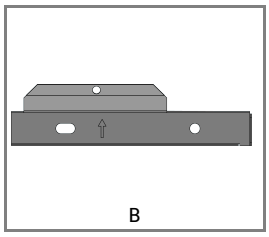
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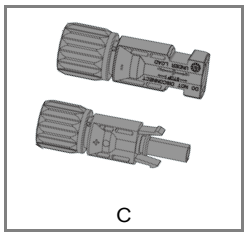
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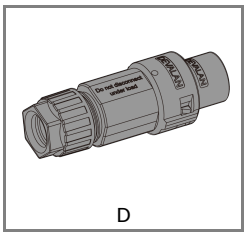
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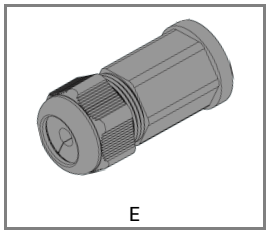
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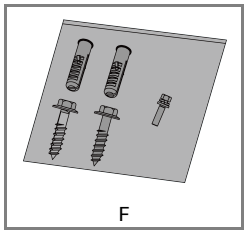
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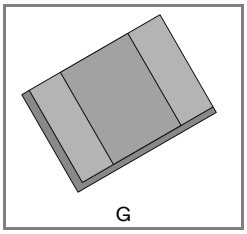

G

NO.	Name	Quantity
A	Inverter	1
B	Mounting bracket	1
C	DC connector	1+1
D	AC connector	1
E	RJ45 Connection waterproof housing	1
F	Screw accessory	1
G	Document package	1

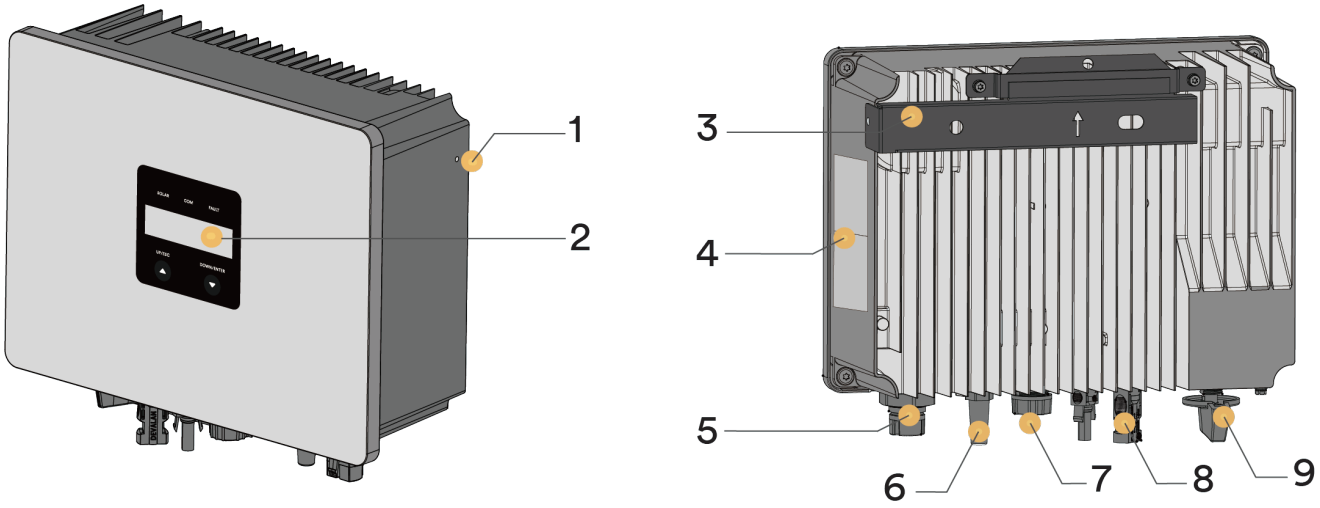
3.2 Product storage

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

- Store the inverter in the original package.
- The storage temperature must be between -25°C to +60°C, and the storage relative humidity must be between 0 and 100%, non-condensing.
- The packing with the inverter shall not be tilted or inverted.
- The product must be fully inspected and tested by professionals before it can be put into operation, if it has been stored for six months or more.

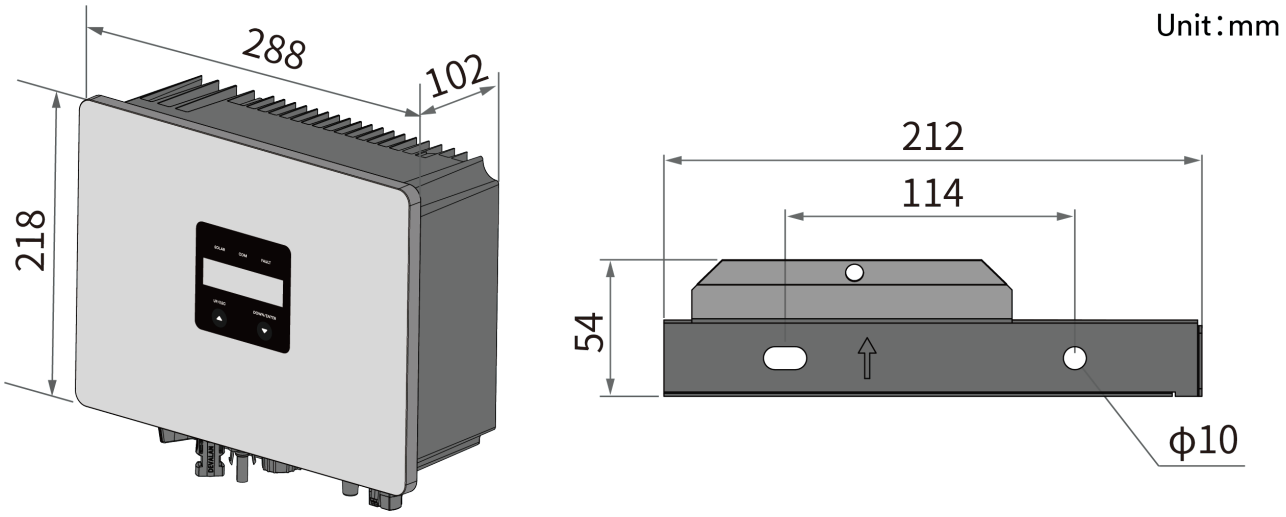
4 Inverter overview

4.1 Product description



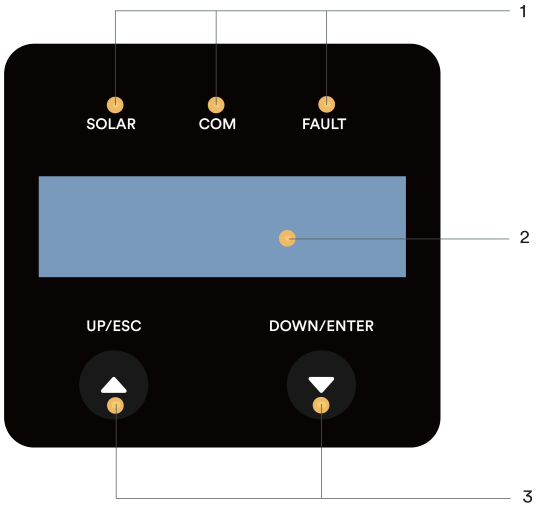
NO.	Name	Description
1	Inverter fixed point	Used for the fixed connection between the inverter and the mounting-bracket. Fixed point on the right side of the inverter.
2	LCD panel	The display and two buttons can be used to access current operating data or change inverter settings.
3	Mounting bracket	Used to hang the inverter to the wall-mounting bracket.
4	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.
5	AC terminal	To feed power into the utility grid
6	Wi-Fi antenna	Used for sending and receiving Wi-Fi signals.
7	Com. terminal	Can be connected to smart meter.
8	PV terminals	Interface to connect PV module strings.
9	DC switch	Used to isolate the inverter from a DC input source e.g. PV array.

4.2 Dimensions



4.3 LCD Panel

The LCD panel with a screen, an indicator and two buttons is on the front of the inverter.



NO.	Name	Description
1	Indicator	White / red. User can observe the colour and blinking frequency to get the current working state of the inverter. For detailed definition, refer to section 4.4.
2	LCD screen	Display and access current operating data or change inverter settings.
3	Buttons	View or set parameters via the buttons. For detailed functions, refer to section 8.

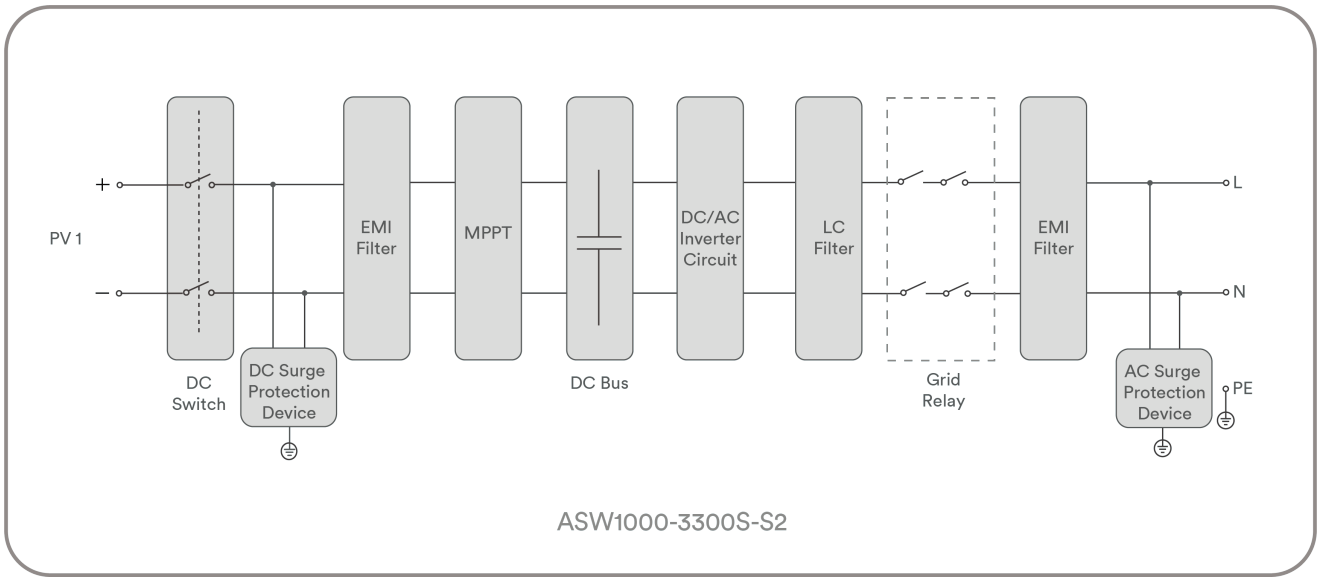
4.4 LED indicator

LED indicator	LED state	Description
SOLAR (White)	Solid ON	The white LED is solid ON when the product is operating normally and feeding into the utility grid.

	Blinking	The white LED is blinking when the product is self-checking automatically e.g., during synchronisation to the utility grid.
	OFF	The white LED is off when the product is not feeding into the utility grid.
COM (White)	Blinking	The white LED is blinking when the product is communicating with other devices e.g., Ai-dongle/ Wi-Fi stick. Depending on the data transfer speed, the white LED may blink either fast or slow.
	OFF	When the communication is abnormal or there is no data transmission, the white LED is off.
FAULT (Red)	Solid ON	When the product stops feeding into the utility grid due to a fault, the red LED is solid ON.
	OFF	When there are no faults, the red LED is off.

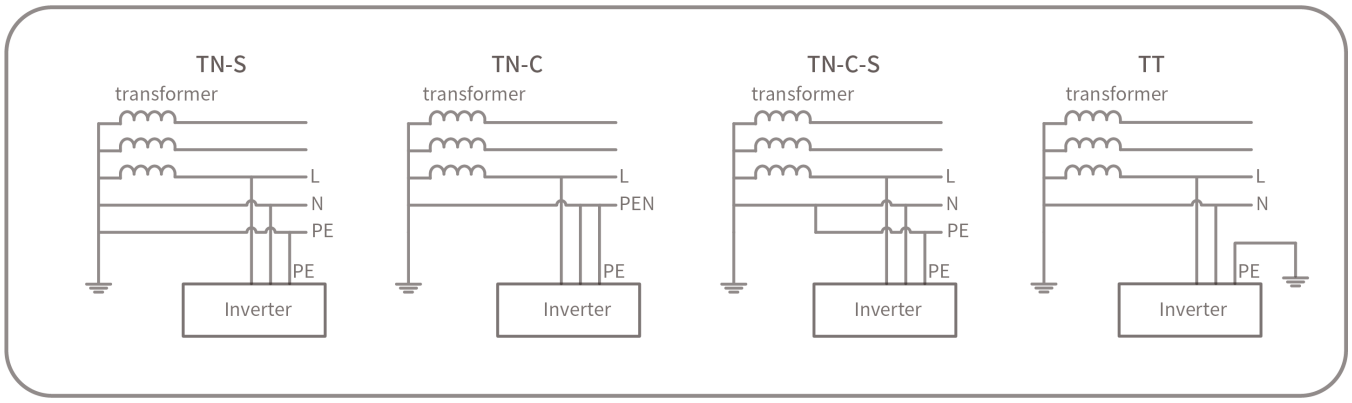
4.5 Circuit diagram

The circuit diagram of the ASW1000-3300S-S2 is as follows:



4.6 Supported grid types

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



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

4.7 Interfaces and functions

The product is equipped with the following interfaces and functions:

Wi-Fi

The product is equipped with a communication device as standard.

When the communication device is used, the inverter will generate a wireless access point (WAP). A direct connection between the inverter and a mobile smart device can be established via the WAP.

RS485 Interface

The inverter is equipped with an RS485 interface. The inverter can communicate with Solplanet communication products or third-party devices via the RS485 interface. For more information regarding third party devices, please contact the local Solplanet service department.

Modbus RTU and Modbus Sunspec

The inverter contains Modbus RTU and Modbus Sunspec protocols. The Modbus of the supported Solplanet products is designed for industrial use and allows:

- Remote query of measured values
- Remote setting of operating parameters
- Setpoint specifications for system control

Export active power control

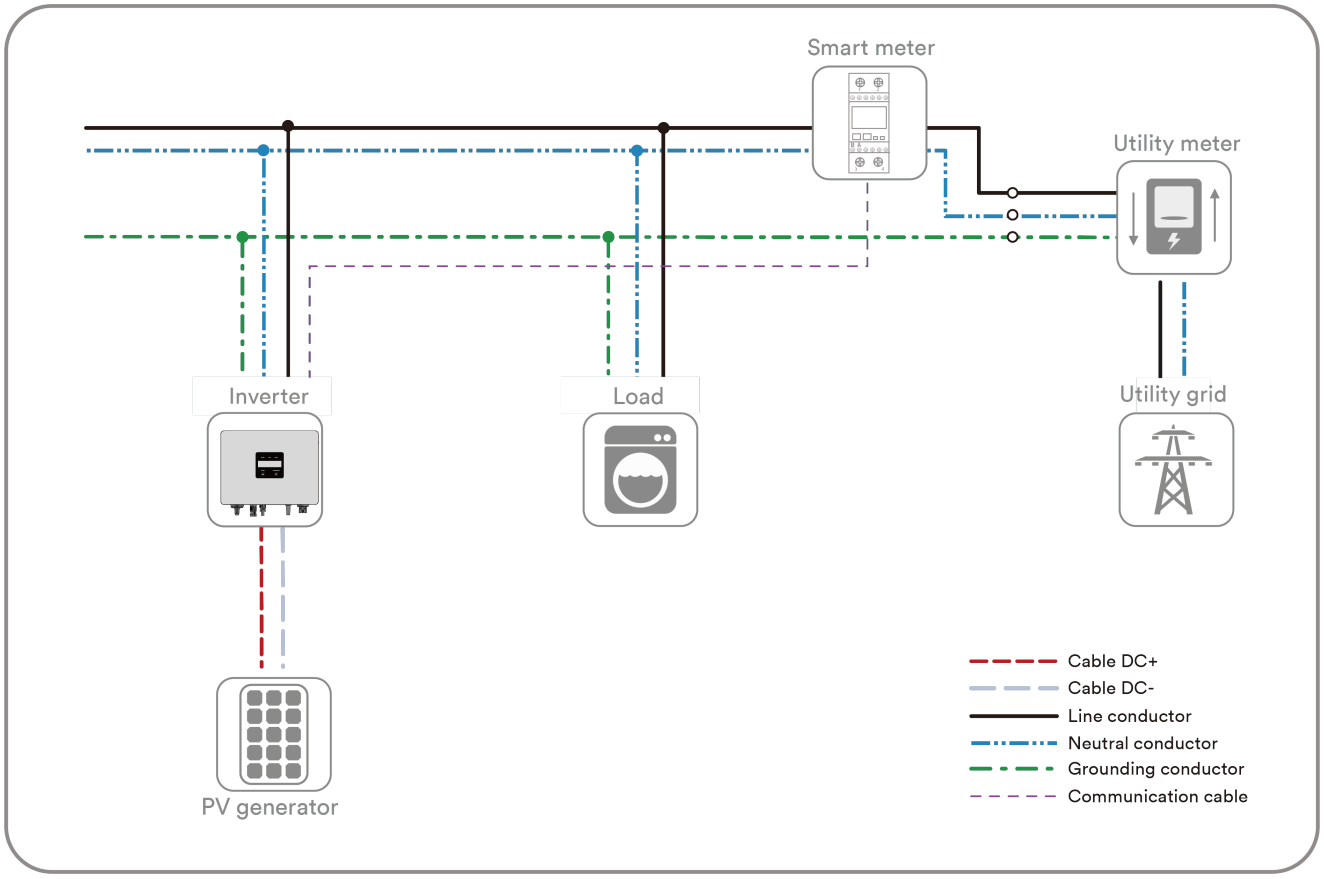
The product is equipped with the export active power limit function, so as to meet the requirements of some national standards or grid standards for limiting the output power at the grid connection point.

The export active power control solution measures the active power at the point where the customer's PV plant is connected to the distribution system (point of grid connection) and then uses this information to control the inverter's active power output in order to prevent the export active power, to the grid, from exceeding the agreed export power limit.

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

If you want to implement the function dynamically, you need to install the Smart-Meter. The communication unit is only compatible with the Eastron Smart meter (SDM230 is available via our customer service).

The Smart meter must support the MODBUS protocol and communicates with baud rate 9600, parity "None", Stop-Bits "1", and address set. "1".

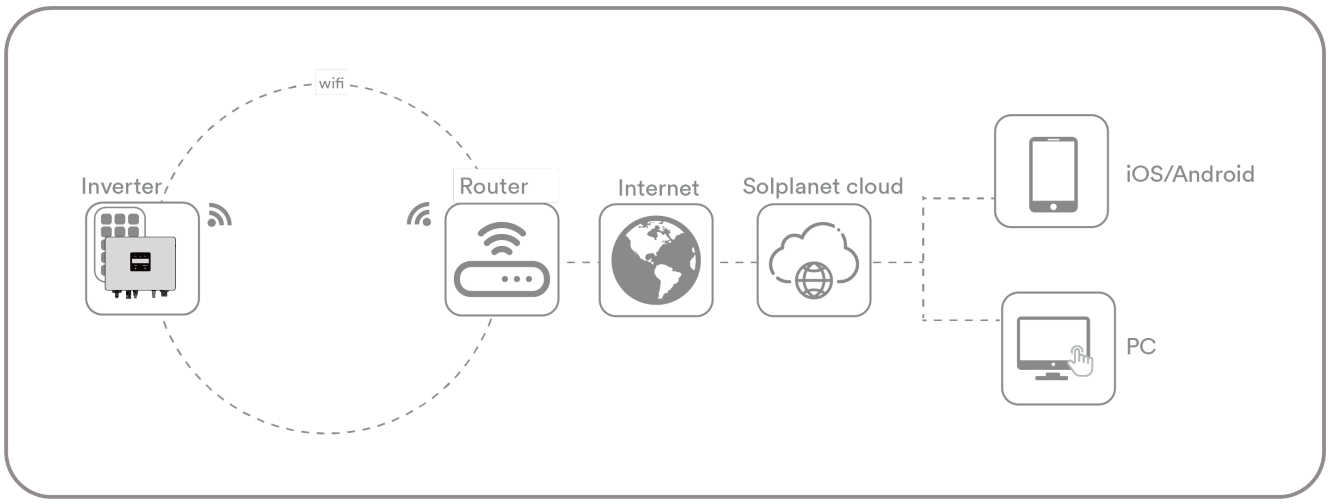


Earth fault alarm

This product complies with IEC 62109-2 clause 13.9 for earth fault alarm monitoring. If an Earth Fault Alarm occurs, the red colour LED indicator will illuminate. At the same time, the error code 38 will be sent to the Solplanet Cloud. (This function is only available in Australia and New Zealand).

4.8 Communication overview

The communication overview with a communication device.



5 Mounting

5.1 Requirements for mounting

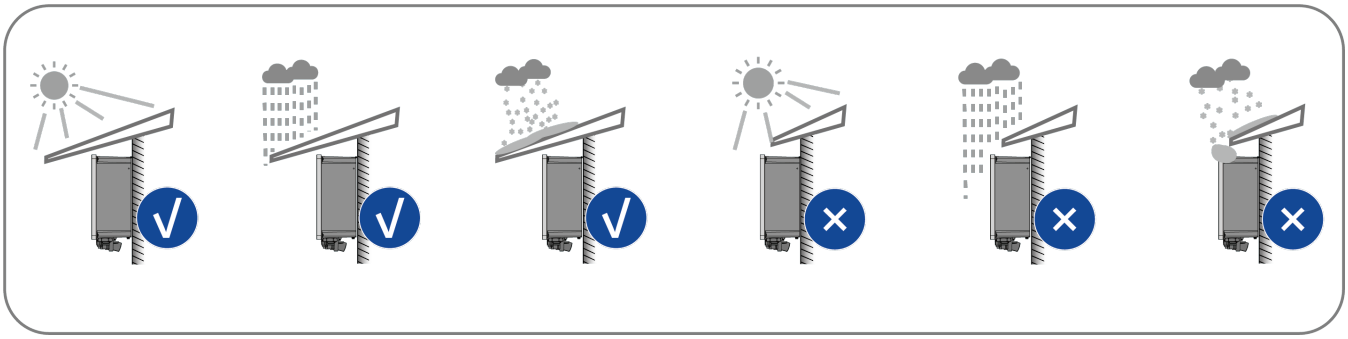
⚠ DANGER

Danger to life due to fire or explosion!

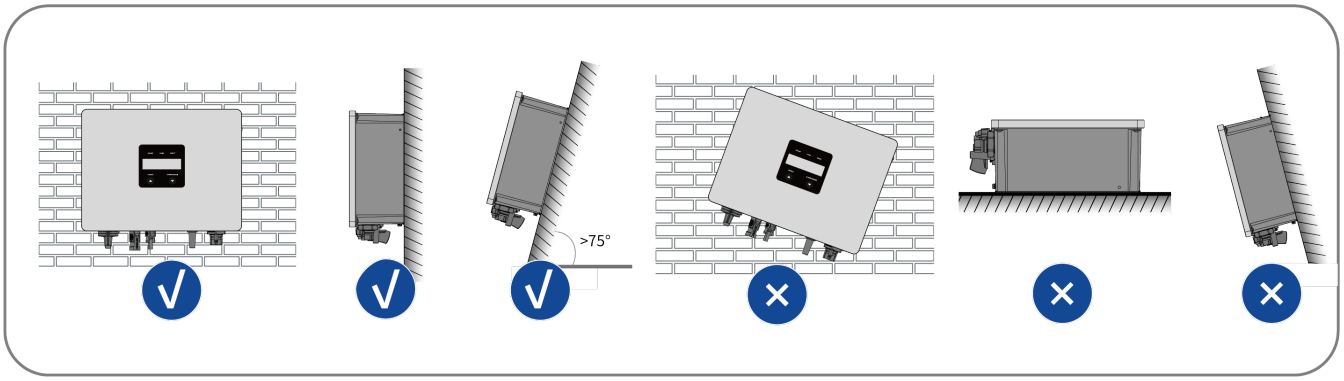
Despite careful construction, electrical devices can cause fires. This can result in death or serious injury.

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

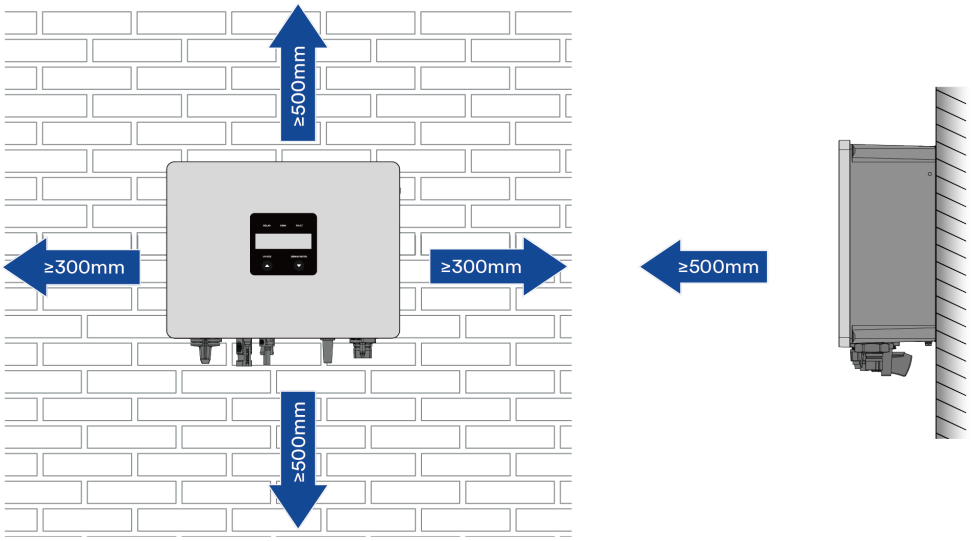
- The ambient temperature recommended to be below 45°C to ensure optimal operation.
- A solid support surface must be available (e.g. concrete or masonry). Ensure that the installation surface is solid enough to bear four times the weight of the inverter. When mounted on drywall or similar materials, the inverter may emit 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-fulfilment of these criteria may restrict operation and maintenance activities.
- The mounting location must not be exposed to direct solar irradiation. If the product is exposed to direct solar irradiation, the exterior components may age prematurely, and overheating might occur. When becoming too hot, the product reduces its power output to avoid overheating.



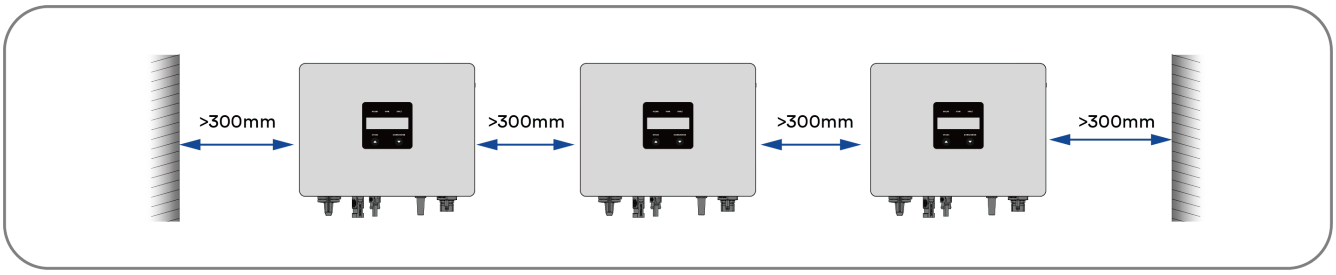
- Never install the inverter horizontally, or with a forward / backward tilt exceeding what is shown in the image below, or even upside down. The horizontal installation can result in damage to the inverter.



- Maintain the recommended clearances to other inverters or objects.



- In case of multiple inverters, ensure the appropriate clearance between the inverters.



- The product should be mounted such that the LED indicators can be viewed without difficulty.
- The DC switch of the product must always be readily accessible.

5.2 Mounting

⚠ CAUTION

Risk of injury due to the weight of the product!

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

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

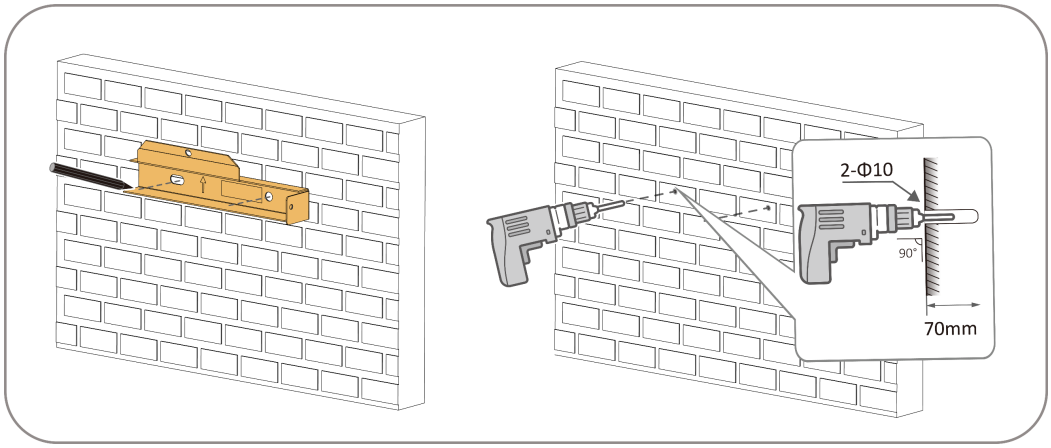
⚠ CAUTION

Damage to cable lines can cause personal injury!

The walls may be covered with power cords or other lines (for example, gas or water).

- Make sure that no cables on the wall or inside the wall cavity are damaged when drilling.

Step 1: Align the wall mounting bracket horizontally on the wall with the arrows pointing upwards. Mark the position of the drill holes. Set the wall mounting bracket aside and drill the marked holes with a diameter of 10 mm. The depth of the holes should be about 70 mm. Maintain the hammer drill bit perpendicular to the wall to avoid drilling at an inclined angle.



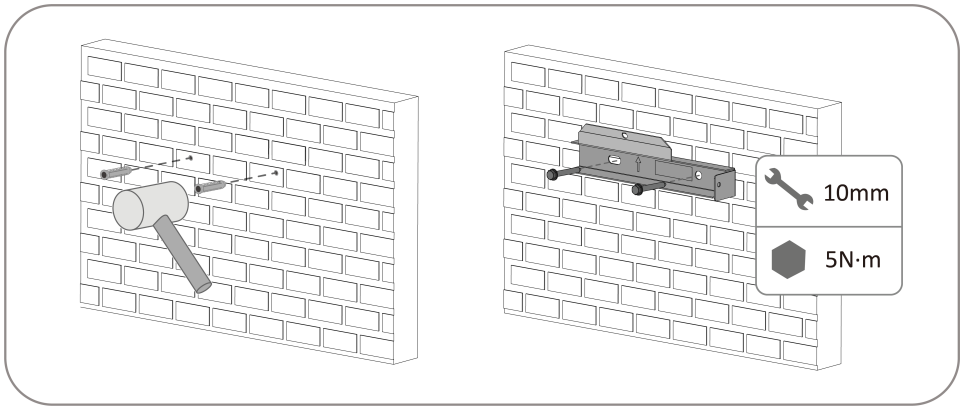
⚠ CAUTION

Danger of personal injury due to falling inverter!

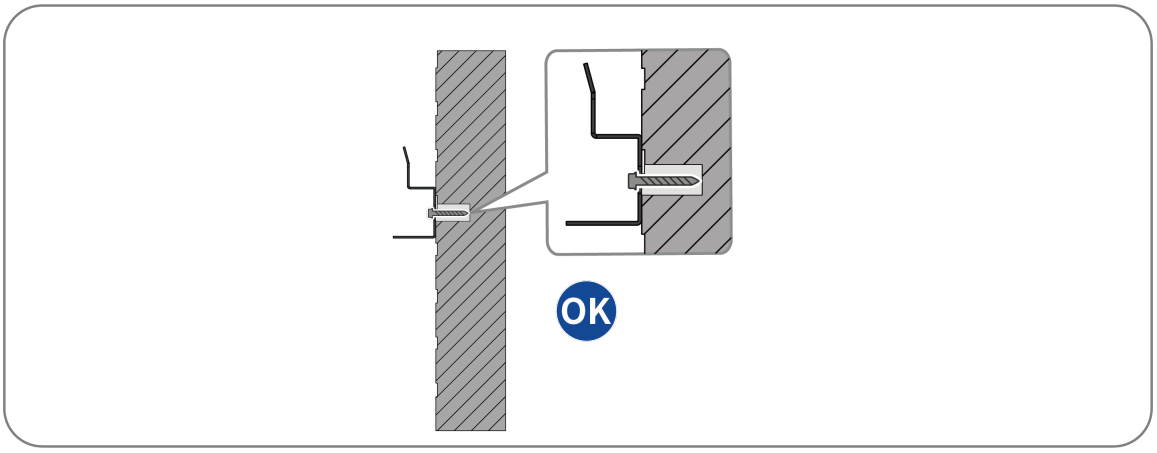
If the hole depth and distance are not correct, the inverter may fall off the wall.

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

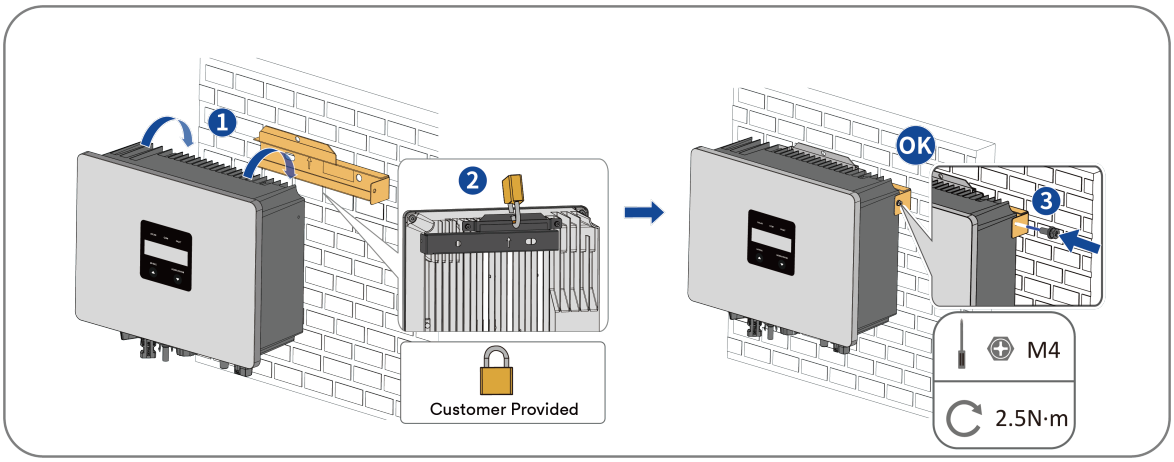
Step 2: Remove any dust from the hole, insert two expansion bolts into the hole, gently tap them into the hole with a rubber hammer.



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. Secure the inverter to the mounting bracket with the screws provided.



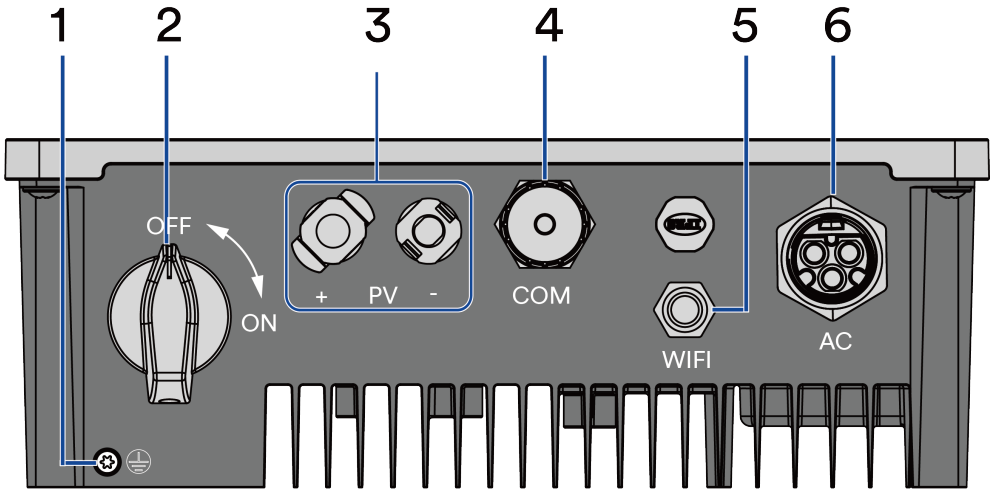
Ensure that the fixing points fit securely in the groove.

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

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

6 Electrical connection

6.1 Overview of the connection area



No.	Name
1	Additional grounding screw
2	DC-switch
3	DC input port
4	COM: Smart meter communication port
5	Wi-Fi antenna
6	AC output port

6.2 Connecting additional grounding

The inverter is equipped with a grounding fault monitoring device. The grounding fault monitoring device will disconnect the inverter from utility grid when it detects there is no ground conductor connected. Hence the product does not require additional grounding or equipotential bonding when operating.

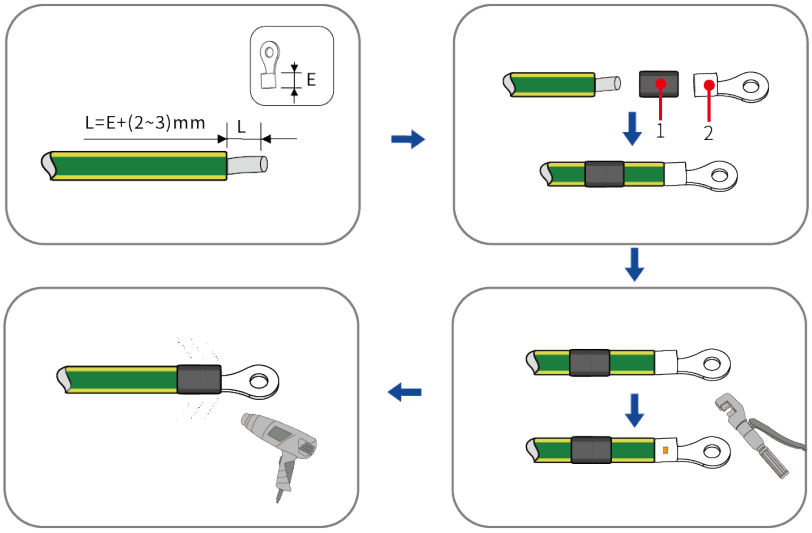
If the ground fault monitoring function is deactivated or the additional grounding is required by local installation standards, then additional grounding can be connected to the inverter.

Requirements for secondary protection ground cable:

Item	Description	Note
1	Screw	Specifications M4, supplied
2	OT/DT terminal	Specifications M4, provided by the customer
3	Yellow and green ground cable	4-16mm²

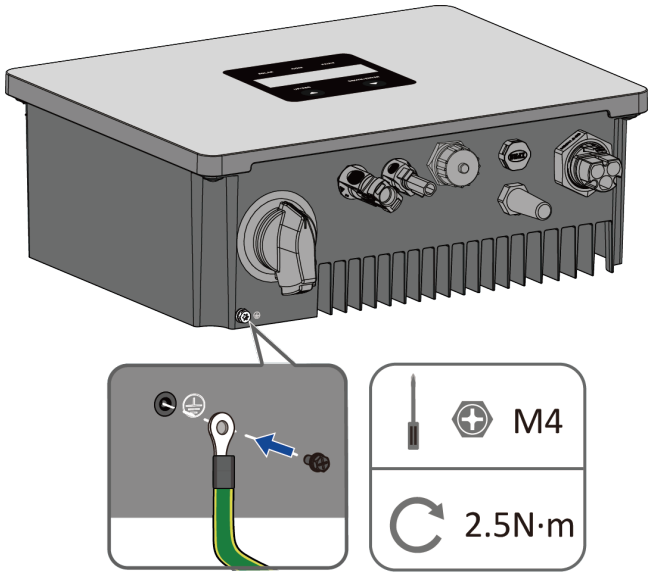
Procedure:

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



1: Heat shrink tubing 2: OT/DT terminal (M4)

Step 2: Remove the screw on the ground terminal, insert the screw through the OT/DT terminal, and tighten the screw. Apply paint to the grounding terminal to ensure corrosion resistance.



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

6.3 AC connection

6.3.1 Requirements for the AC connection

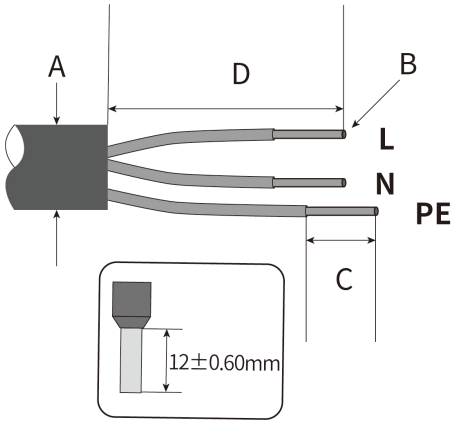
Cable Requirements

The cable must be dimensioned in accordance with the local and national directives for the dimensioning of cables. The requirements for the minimum wire size derive from these directives.

Examples of factors influencing cable dimensioning are: nominal AC current, type of cable, routing method, cable bundling, ambient temperature and maximum desired line losses.

The grid connection is established using three conductors (L, N, and PE).

We recommend the following specifications for stranded copper wire.



Item	Description	Value
A	External diameter of outer sheath	10~14 mm
B	Copper cable conductor cross-section	4~8 mm²
C	Insulation stripping length	≈13 mm
D	Sheath stripping length	53 mm

The PE conductor must be 2 mm longer than the L and N conductors.

Larger cross-sections should be used for longer cables.

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 when operating.

If local regulations require the use of a residual-current device, please install a type A residual-current protection device with a protection limit of no less than 300mA.

Overvoltage category

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

AC circuit breaker

In PV systems with multiple inverters, a separate AC circuit breaker is required for each inverter. This will prevent voltage from being present at the corresponding connection point after disconnection.

No consumer load should be connected between AC circuit breaker and the inverter.

The selection of the AC circuit breaker rating depends on the wiring design (wire cross-section area), cable type, wiring method, ambient temperature, inverter current rating, etc. Derating of the AC circuit breaker rating may result 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 11 “Technical data”.

Ground fault monitoring

The inverter is equipped with a ground fault monitoring device. This device will disconnect the inverter from utility grid when it detects there is no ground fault connected. Depending on the installation site and grid configuration, it may be advisable to deactivate the ground fault monitoring. This is necessary, for example, in an IT electrical 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 ground fault monitoring is deactivated.
In order to guarantee safety in accordance with IEC 62109 when ground fault monitoring is deactivated, carry out the following measure:

- Connect an 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 a damaged AC cable failing.

6.3.2 AC cable connection

⚠ WARNING

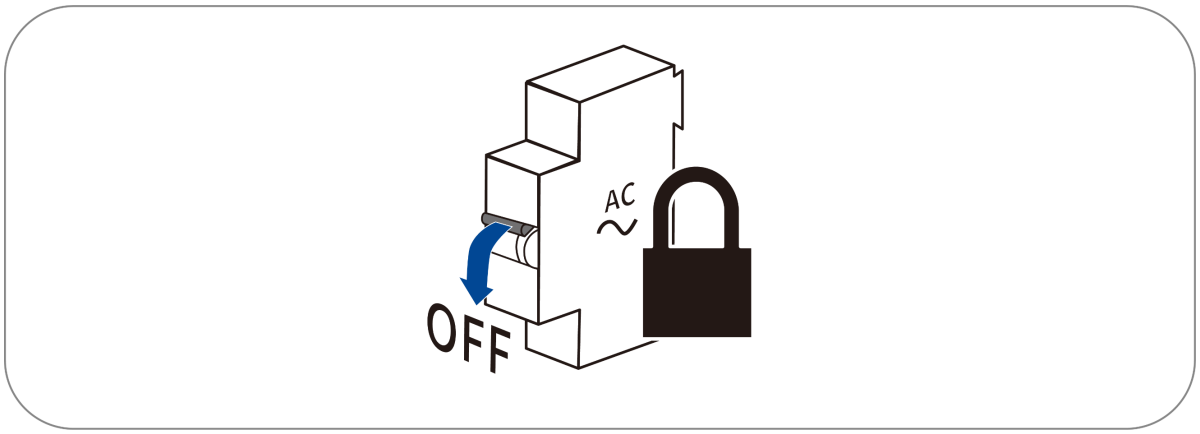
Risk of injury due to electric shock by high leakage current.

If the ground wire is disconnected , touching the product may result in death or lethal injuries due to high leakage current.

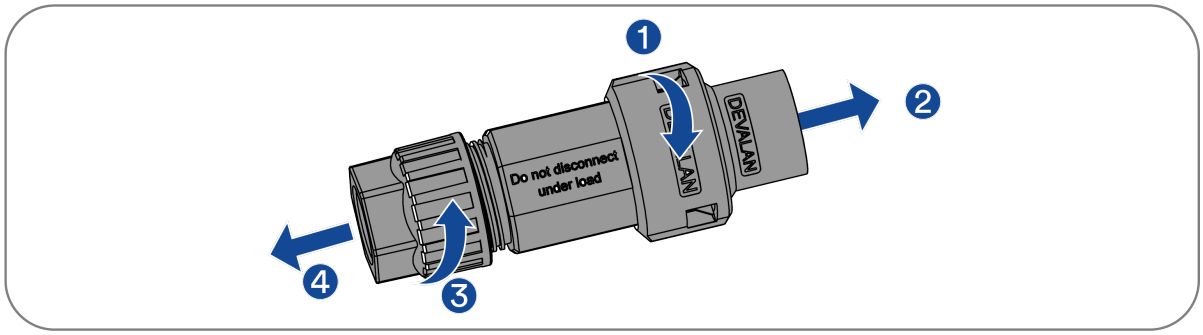
- The product must be grounded correctly in order to protect property and personal safety.

Procedure:

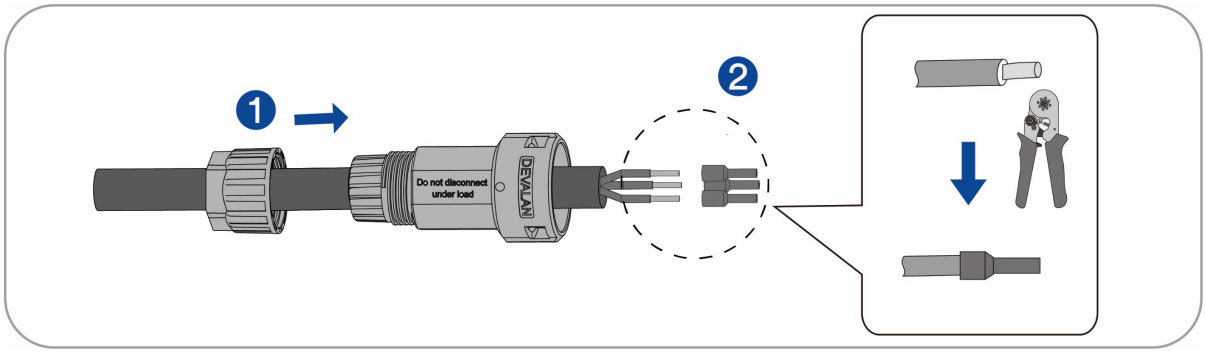
Step 1: Switch off the circuit breaker protecting the inverter circuit and and switch off and isolator all energy sources up stream and down stream of the circuit breaker and secure it against inadvertent switch on. Using an appropriately rated multimeter to ensure there is no AC voltage present on each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



Step 2: Remove the AC Connector from the accessory pack and separate it.



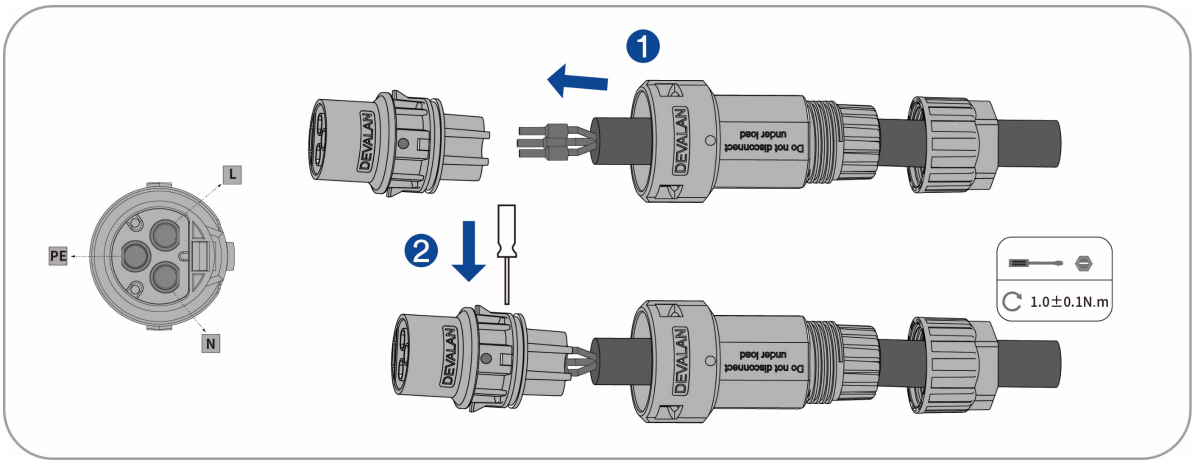
Step 3: Insert the conductor into a suitable ferrule acc. to DIN 46228-4 and crimp the terminals with crimping pliers.



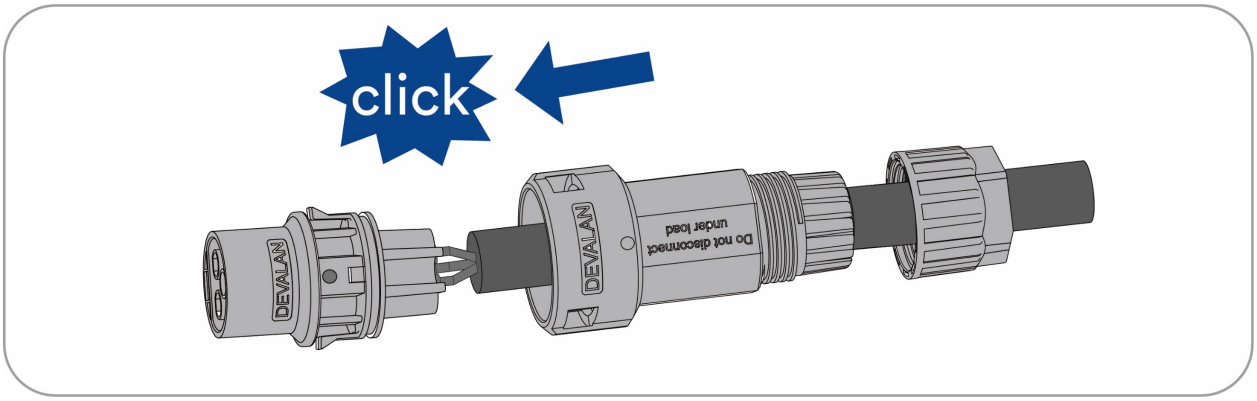
If the L line was connected to PE terminal, the inverter will not function properly.

- Please ensure that the type of the conductors matches the signs of the terminals on the socket element.

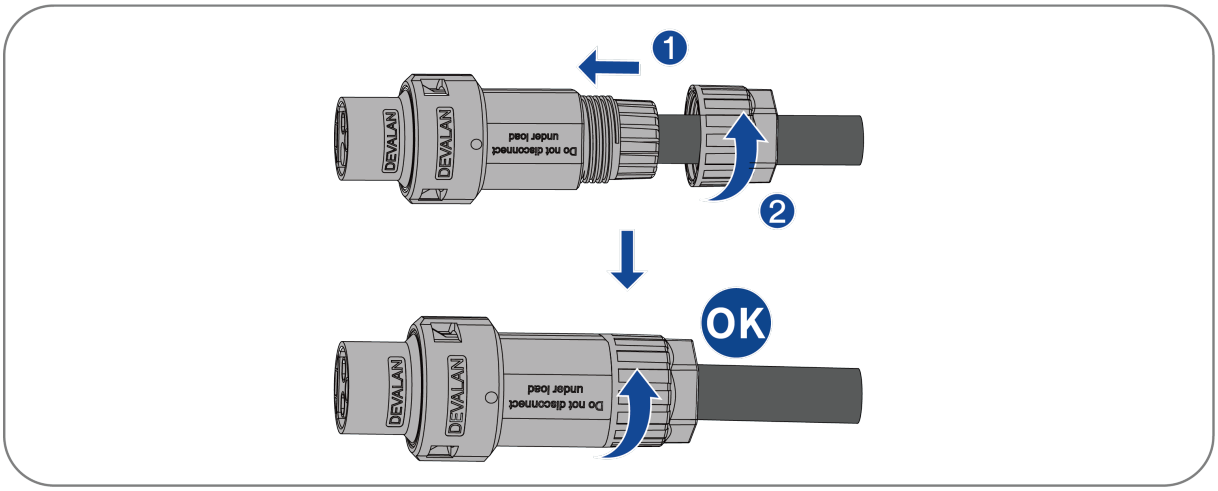
Step 4: Set the parts on the cable, insert the terminal holes in sequence. Crimp the wire with a straight screwdriver and screw the torque 1.0+/-0.1 N·m.



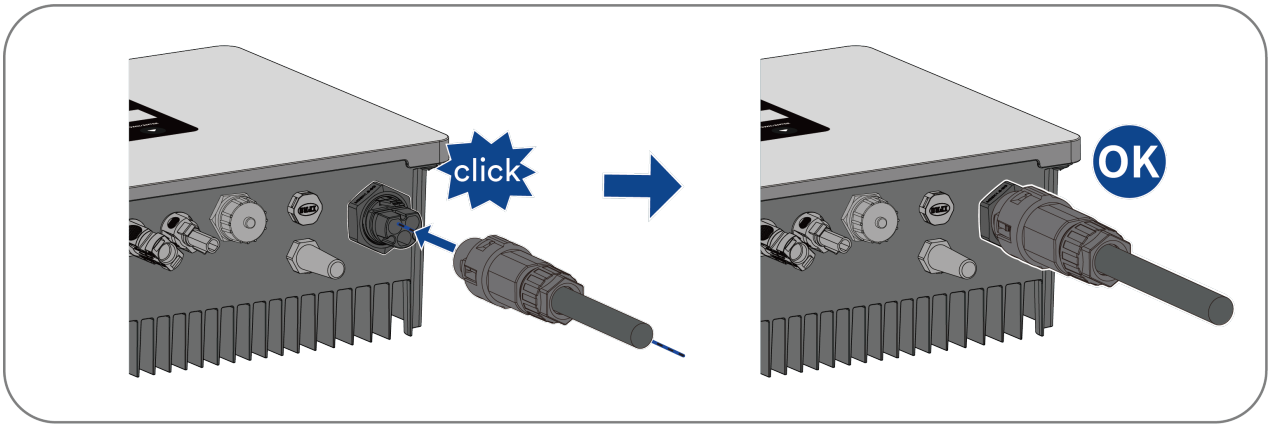
Step 5: Insert the main body into the rubber core and hear the "click" sound.



Step 6: Tighten the nut with an open-ended wrench (torque 2.5±0.5 N·m).



Step 7: Insert the AC connector into the AC connection jack and tighten when you hear the “click” sound.



6.4 DC connection

6.4.1 Requirements for the DC connection

Requirements for the PV modules per input:

- All PV modules should be of the same type.
- 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' through-fault 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.

6.4.2 Assembling the DC connectors

⚠ DANGER

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

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

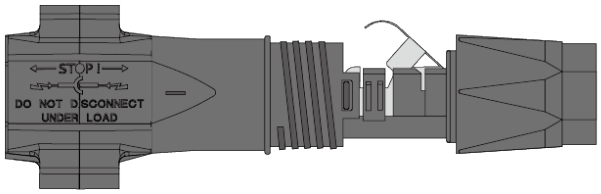
- Do not touch non-insulated parts or cables.
- Disconnect the product from voltage sources and ensure it cannot be reconnected before working on the device.

For connection to the inverter, all PV module cables must be fitted with the DC connectors provided. There may be two different type of DC connector shipped. Assemble the DC connectors as described in the following section.

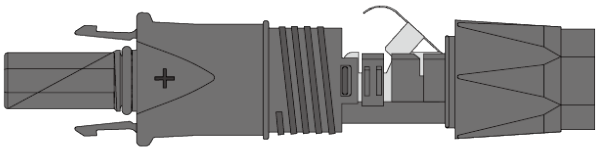
Type 1 DC connector "Phoenix Contact Sunclix"

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

A



B

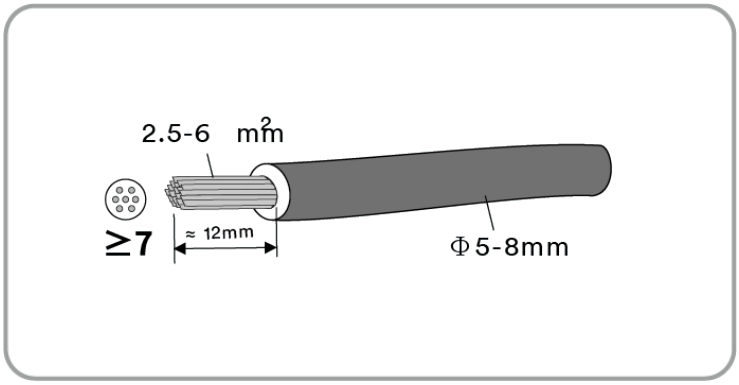


Cable requirements:

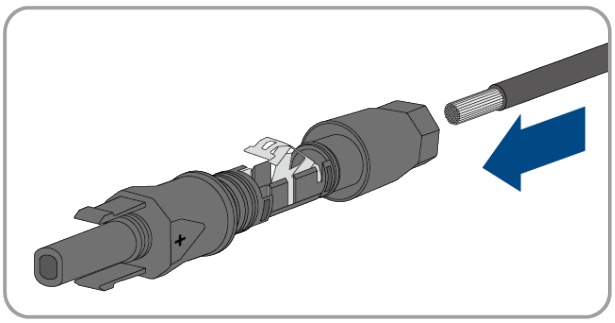
Item	Description	Value
1	Cable type	PV cable
2	External diameter	5-8 mm
3	Conductor cross-section	2.5-6 mm²
4	Number of copper strands	At least 7
5	The rated voltage	≥500 V

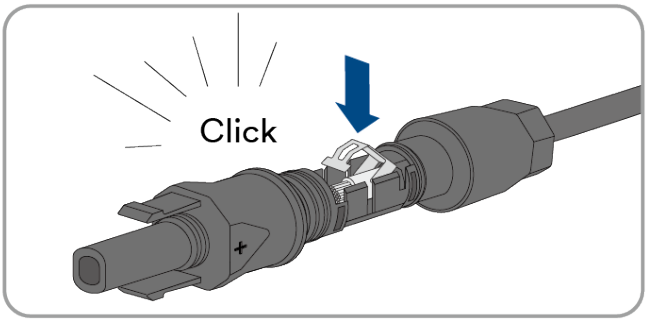
Procedure:

Step 1: Strip 12 mm off the cable insulation.

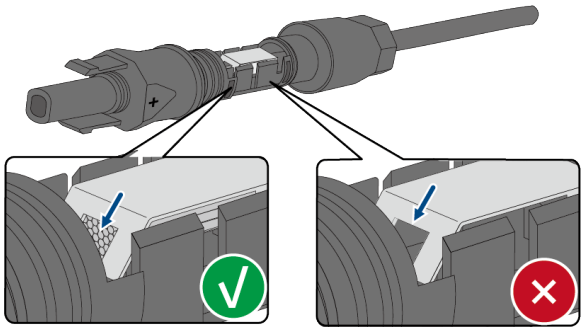


Step 2: Insert the stripped section into the DC connector. Push the clamping bracket down until it audibly snaps into place.

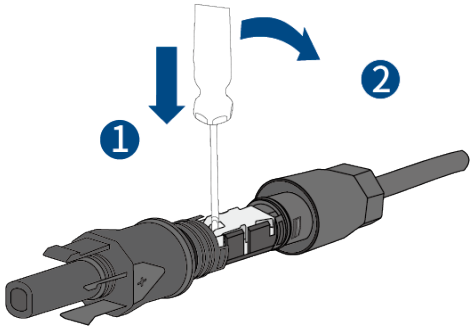




If the wire strands are not visible in the chamber, the cable is not correctly inserted, and the connector must be reassembled. To do this, the cable must be removed from the connector.

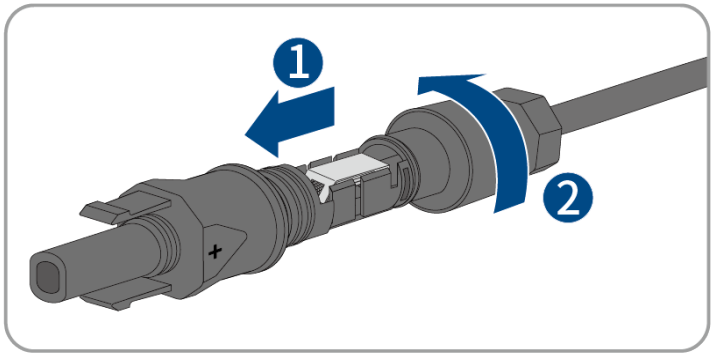


Release the clamping bracket by inserting a screwdriver (blade width: 3.5 mm) into the clamping bracket and pry the clamping bracket open.



Remove the cable and return to Step 2.

Step 1: Push the nut up to the thread and tighten the nut. (SW15, Torque: 2.0Nm).



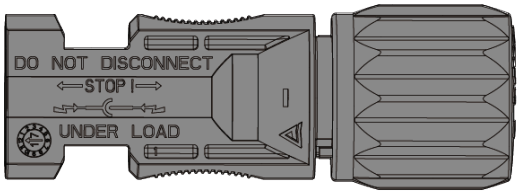
Type 2 DC connector:

Assemble the DC connectors as described in the following section.

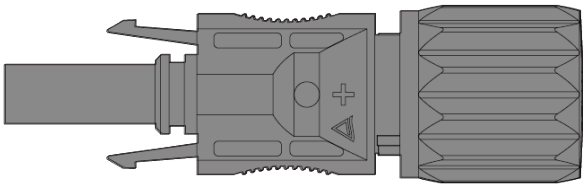
Assemble the DC connectors as described below. Be sure to observe the correct polarity.

The DC connectors are marked with the symbols “+” and “– ”.

A



B

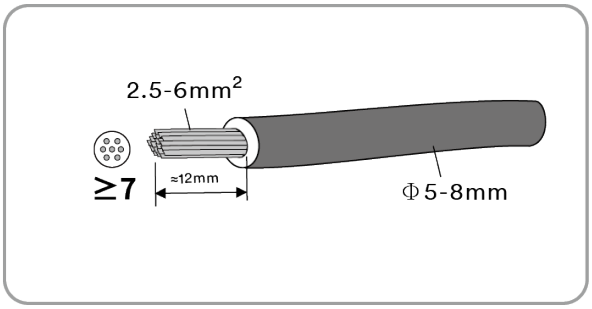


Cable requirements:

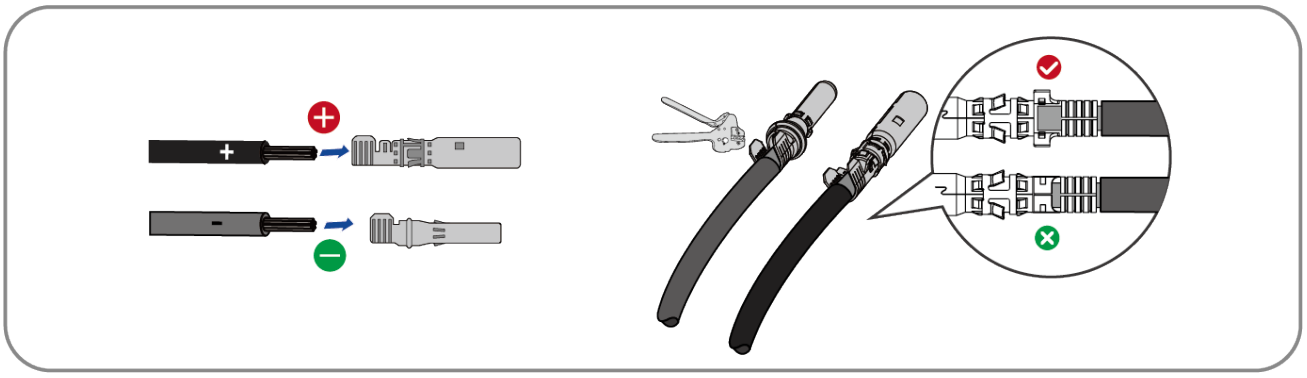
Item	Description	Value
1	Cable type	PV1-F，UL-ZKLA or USE2
2	External diameter	5-8 mm
3	Conductor cross-section	2.5-6 mm²
4	Number of copper strands	At least 7
5	The rated voltage	≥500 V

Proceed as follows to assemble each DC connector.

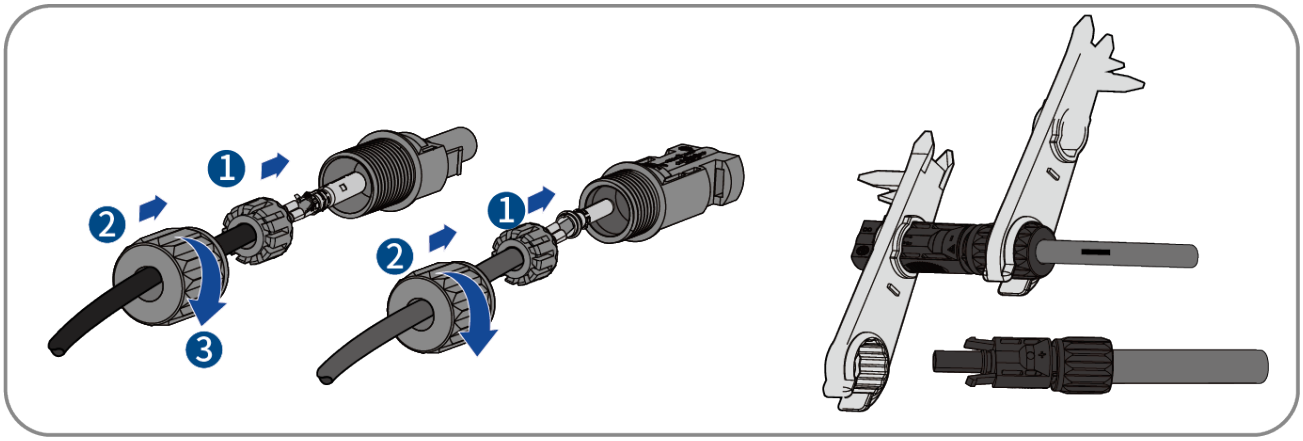
Step 1: Strip 12 mm off the cable insulation.



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



Step 3: Insert the cable through cable gland and insert into the housing until it snaps into place. Gently pull the cable backward to ensure firm connection. Tighten the cable gland and onto the housing (Torque 2.5-3Nm).



Step 4: Ensure that the cable is correctly positioned.

6.4.3 Connecting the PV array

⚠ 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 may result 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 turned on.
- Do not disconnect the DC connectors under load.

NOTE

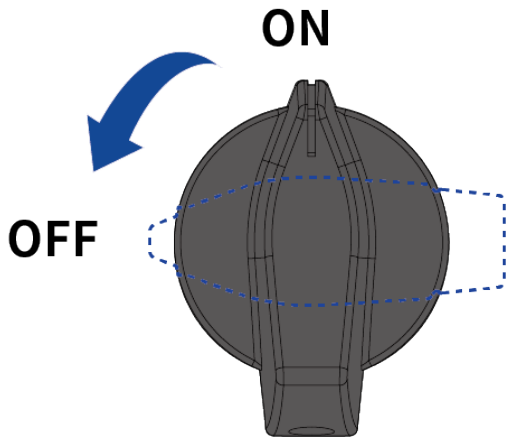
The inverter can be destroyed by overvoltage.

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

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

Step 1: Ensure that the inverter AC circuit breaker is switched off and ensure that it cannot be accidentally turned on.

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



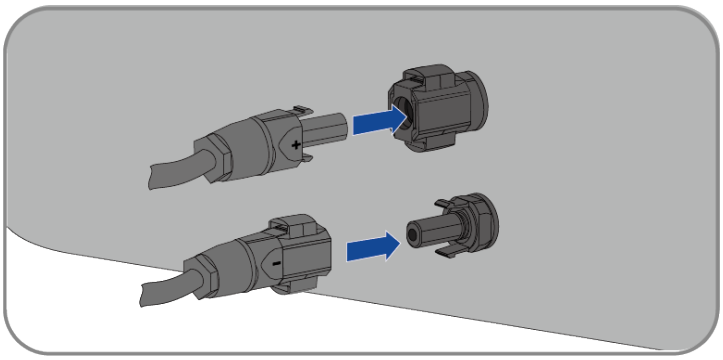
Step 3: Ensure that there is no ground fault in the PV array.

Step 4: Check whether the DC connector has the correct polarity. If the DC connector is equipped with a DC cable having the wrong polarity, the DC connector must be reassembled. The DC cable must always have the same polarity as the DC connector.

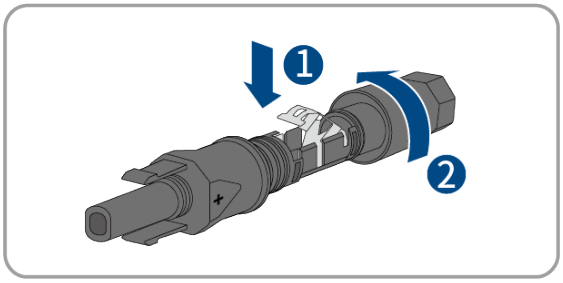
Step 5: Ensure that the open-circuit voltage of the PV array does not exceed the maximum DC input voltage of the inverter. Connect the assembled DC connectors to the inverter until they audibly snap into place.

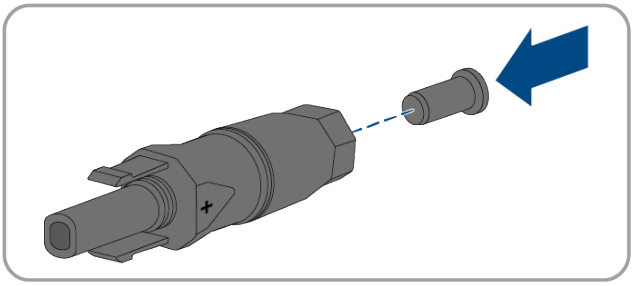
Type 1 DC connector "Phoenix Contact Sunclix":

- Connect the assembled DC connectors to the inverter.

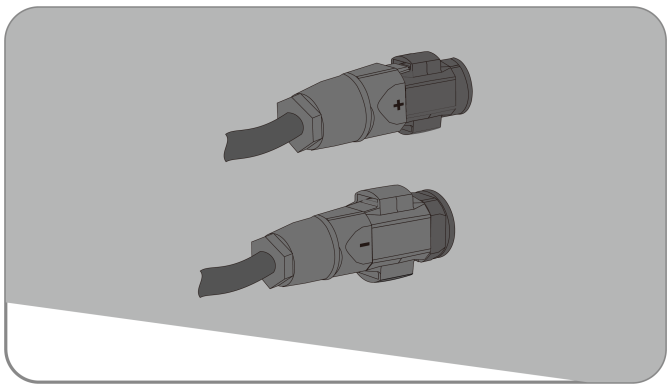


- For unused DC connectors, push down the clamping bracket and push the swivel nut up to the thread. Insert the DC connectors with sealing plugs into the corresponding DC inputs on the inverter.



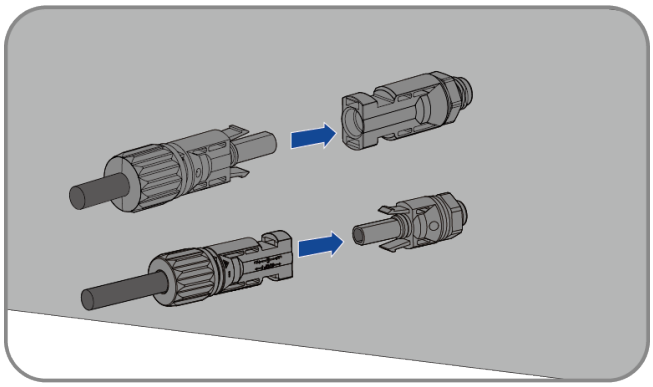


- Insert the DC connectors with sealing plugs into the corresponding DC inputs on the inverter.

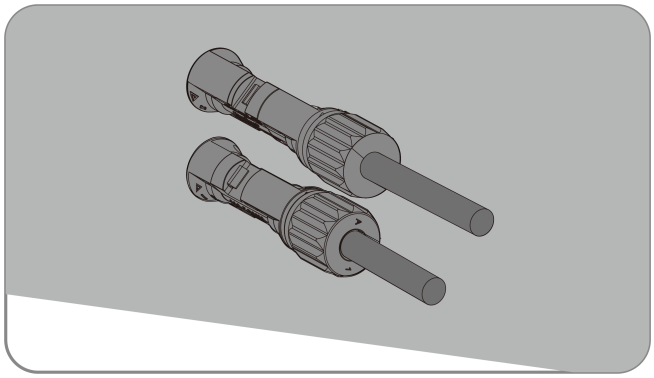


Type 2 DC connector:

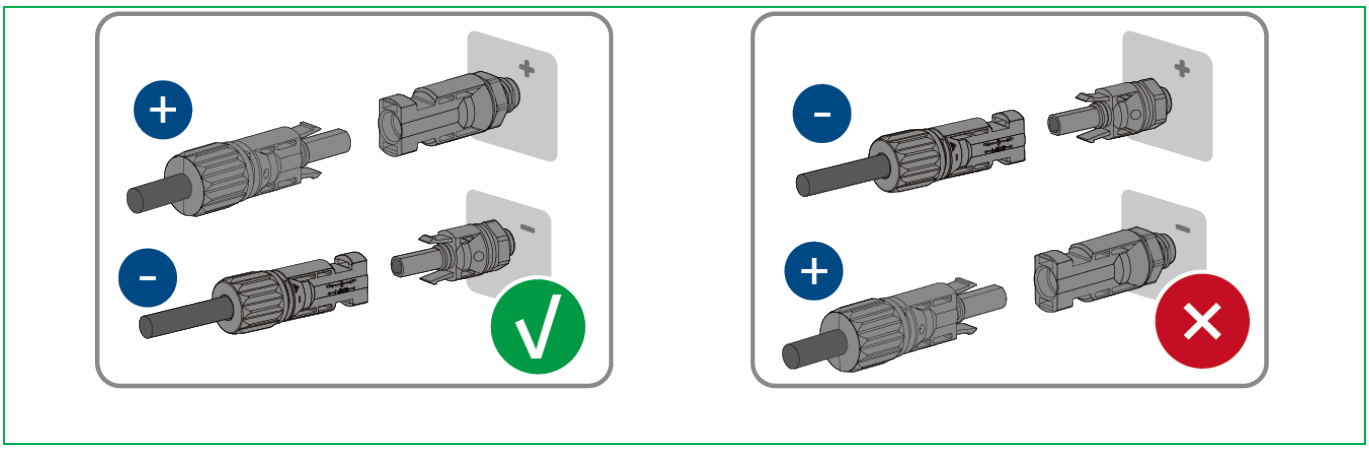
- Connect the assembled DC connectors to the inverter.



- Do not pull out the protective caps from unused DC input connectors.



Check the positive and negative polarity of the PV strings and connect the PV connectors to corresponding terminals only after ensuring polarity correctness. (The image below uses the type 2 connector as an example only.)



Step 6: Ensure that all DC connectors and the DC connectors with sealing plugs are securely in place.

6.5 COM: Smart meter communication port connection

NOTE

Damage to the inverter due to electrostatic discharge.

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

- Ground yourself before touching any component.

NOTE

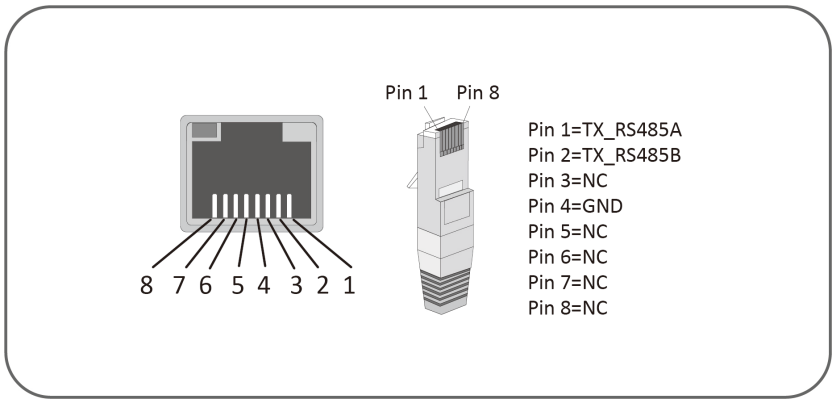
The inverter can be destroyed by wrong communication wiring.

- Internal components of the inverter can be irreparably damaged due to incorrect wiring between the power wire and signal wire. All the warranty claim will be invalid.
- Please check the wiring of the RJ45 connector before crimping the contact.

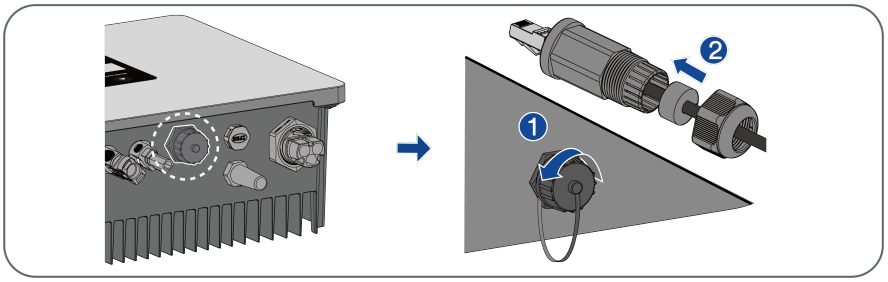
NOTE

If several inverters connect to one ripple control receiver, One of the RJ45 communication port of the first inverter connect to the ripple control receiver, the rest RJ45 communication port connect to the next inverter. The other inverters connect one by one through the straight through network cable.

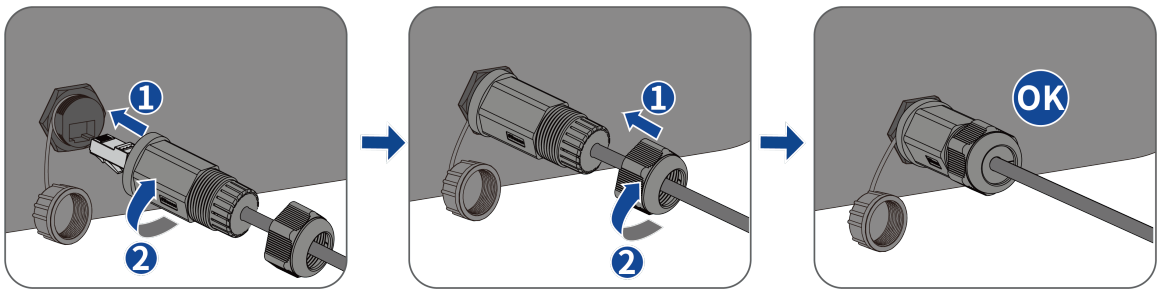
Step 1: RJ45 cable pin assignment as below, Strip the insulation from the wire and crimp it into the corresponding terminal.



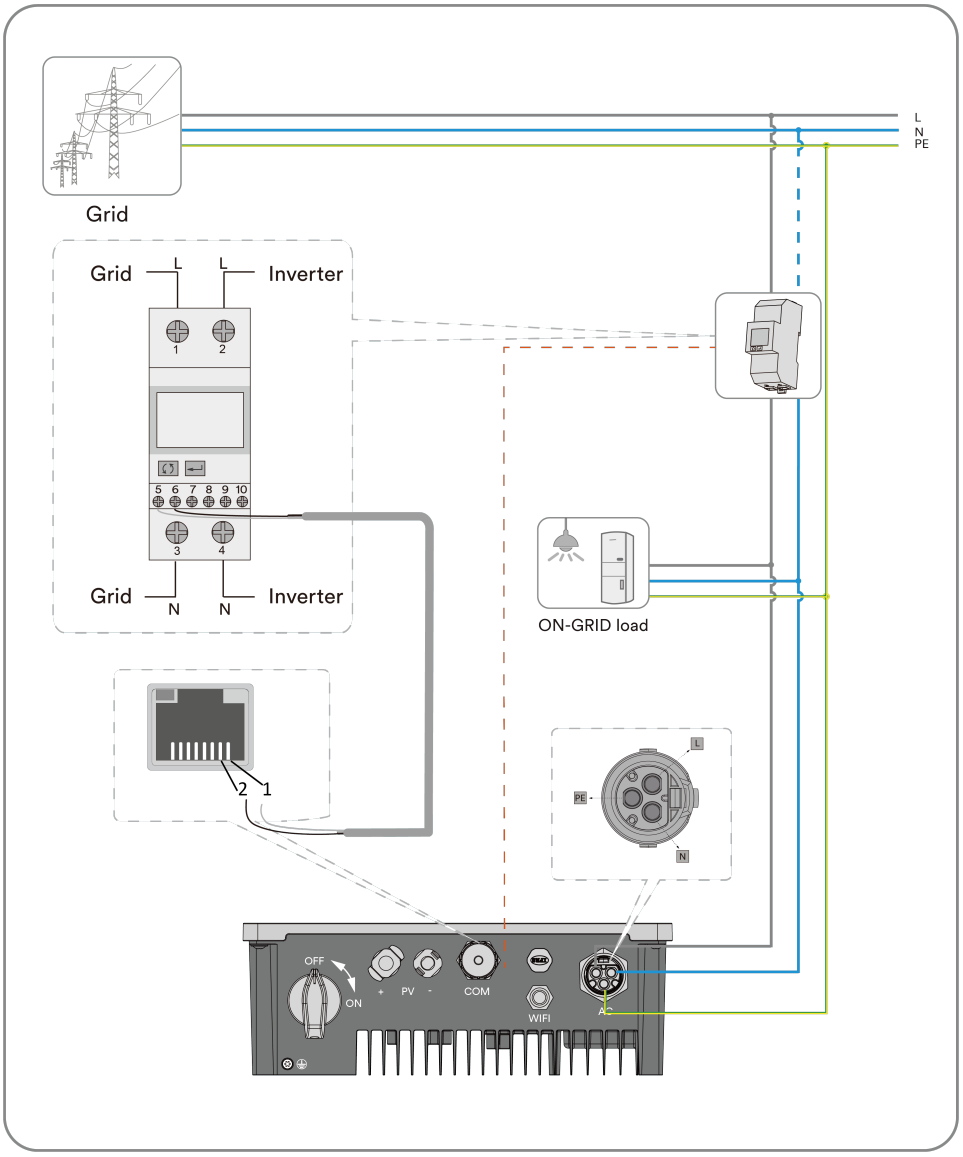
Step 2: Unscrew the communication port cover cap in the following arrow sequence and insert the network cable into the RJ45 communication client attached.



Step 3: Insert the network cable into the corresponding communication terminal of the machine according to the arrow sequence, tighten the thread sleeve, and then tighten the forcing nut at the tail.



Step 4: Insert the other end cable conductors into the slots of smart meter and tighten them. Screwdriver type: PH0, torque: 0.7Nm.



Ensure that individual wires at the terminal contact off the Smart meter are attached with the correct torque and can not work loose. Attach protective cover if fitted.

7 Commissioning

7.1 Inspection before commissioning

⚠ WARNING

Danger to life due to high voltages on DC conductors!

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

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

Check the following items before starting the inverter:

- Ensure the inverter DC switch inverter AC circuit breaker are OFF.
- Ensure the inverter has been correctly mounted onto the mounting bracket.
- Ensure there are no objects lying on top of the inverter.
- Ensure the communication cable and AC connector have been correctly wired and tightened.
- Ensure the inverter's exposed metal surface has a ground connection.
- Ensure the DC voltage of the strings does not exceed the permitted limits of the inverter.
- Ensure the DC voltage has the correct polarity.
- Ensure that the insulation resistance to ground is greater than the insulation resistance protection value.
- Ensure the grid voltage at the point of connection of the inverter complies with the permitted value of the inverter.
- Ensure 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.

1. Turn the DC switch of the inverter to the "ON" position.
2. Set initial protection parameters via the Solplanet App. For details, please refer to Solplanet App user manual.
3. Switch on the AC circuit breaker. If the irradiation and grid conditions meet the minimum thresholds, the inverter will operate normally.
4. The LCD screen will be activated 5 seconds.
5. Later observe the LED indicator to ensure that the inverter operates normally.(Refer to section 4.4 LED indicator).

8 LCD Operation

8.1 Button Function

The inverter offers two buttons. Please refer to the following table before any operation of the inverter.

Buttton	Description
UP/ESC 	Short touch < UP/ESC >button to switch the display of information, long touch <UP/ESC >button to exit the current interface function.
DOWN/ENTER 	Short touch < DOWN/ENTER > button to switch the display of information, long touch <DOWN/ENTER>button to confirm and change parameters.

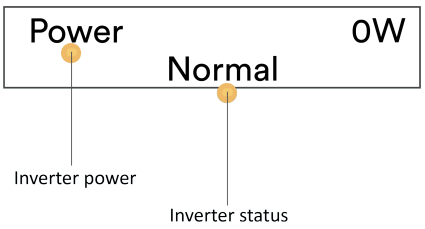
⚠ WARNING

Risk of burns due to hot components!

Do not touch any hot parts (such as heat sinks) during operation. Only the LCD panel and the DC switch can be safely be touched at any time.

8.2 Main Screen

The LCD Main Screen.



- If there is no key operation within 10s, the LCD backlight will turn off automatically.

Status Description

State	Description
Normal	Successful grid connection and normal operation of the inverter.
Waiting	Waiting for grid connection.
Checking	Inverter self-test in progress.
Error xxx	Inverter malfunction, refer to the error code.

NOTE

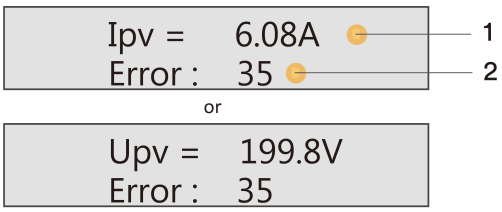
If the device is in standby mode for more than 10 minutes, please check:

- Whether the insolation is sufficient and the PV connection is correct.
- If no anomaly is found, disconnect and reconnect the DC switch and the main switch to restart.
- If it still does not work, contact us.

Viewing the Active Error

No.	Description
1	Displays the current operation information of the inverter, refreshed once in 1s Press <UP/ESC>or<DOWN/ENTER> and release to toggle information including (Vbus, Vpv, Ipv, Vac, Iac, Frep, Pac, Q, Etoday, Etotal, SafetyType, Software Version, Wifi, Cloud status).
2	Error code

Only one error can be displayed on this screen. For solutions, please refer to “12 Troubleshooting”.



8.3 Reset the communication stick

Please follow these steps

In the Wifi display interface, touch <DOWN/ENTER>, holding for 3 seconds→Reset communication stick, Press <ESC> to exit the stick reset result page.

Within five minutes and during the reset process of the communication dongle, if you long press Enter again in the Wifi display interface, you can check whether the dongle has been successfully reset. (The communication stick, allows one reset attempt every one minutes.)

8.4 Select Safety Type

Please follow these steps

In the Safety display interface →Touch <DOWN/ENTER>, holding for 3 seconds →Enter the safety selection page→Touch <UP/ESC> →Switch Safety Display Information.

Step1：Press and hold <UP/ESC> for 3s to exit the selection.

Step2：Press <DOWN/ENTER> for 3s to confirm the safety regulations and exit.

9 Solplanet app

9.1 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

9.2 Hevision 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	2025.01

10 Decommissioning the product

10.1 Disconnecting the inverter from voltage sources

Prior to performing any work on the product, always isolate it from all voltage 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 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 DC input voltage range of 500 Vdc or higher.

Procedure:

Step 1: Turn OFF the AC circuit breaker connected downstream of the AC output of the inverter and lock and secure it to avoid inadvertent reconnection.

Step 2: Turn OFF the DC switch and lock and secure it to avoid inadvertent reconnection.

Step 3: Wait until the LEDs are OFF.

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

⚠ DANGER

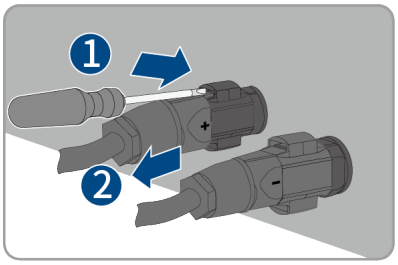
Danger to life due to electric shock when touching exposed DC conductors or DC plug contacts if the DC connectors are damaged or loose!

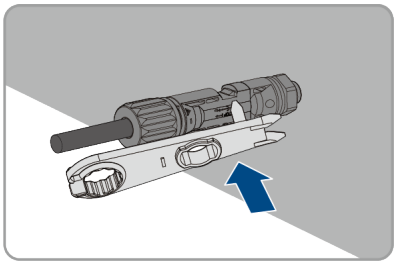
The DC connectors can break or become damaged, become free of the DC cables, or no longer be connected correctly if the DC connectors are released and disconnected incorrectly. This can result in the DC conductors or DC plug contacts being exposed. Touching exposed live DC conductors or DC plug connectors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

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

Step 5: Ensure that no voltage is present between the positive terminal and negative terminal at the DC inputs using a suitable measuring device.

Type 1 DC connector “Sunclix”	Type 2 DC connector
Release and remove the DC connectors. To do so, insert a flat-blade screwdriver or an angled screwdriver (blade width: 3.5 mm) into one of the side slots and pull the DC connectors out.	To remove DC plug connectors, insert the appropriate tool into the slots and press the tool with an appropriate force.





Step 6: Open the AC/COM cover junction box and use a mustimeter to ensure that the AC wiring terminals isolated from an AC power source.

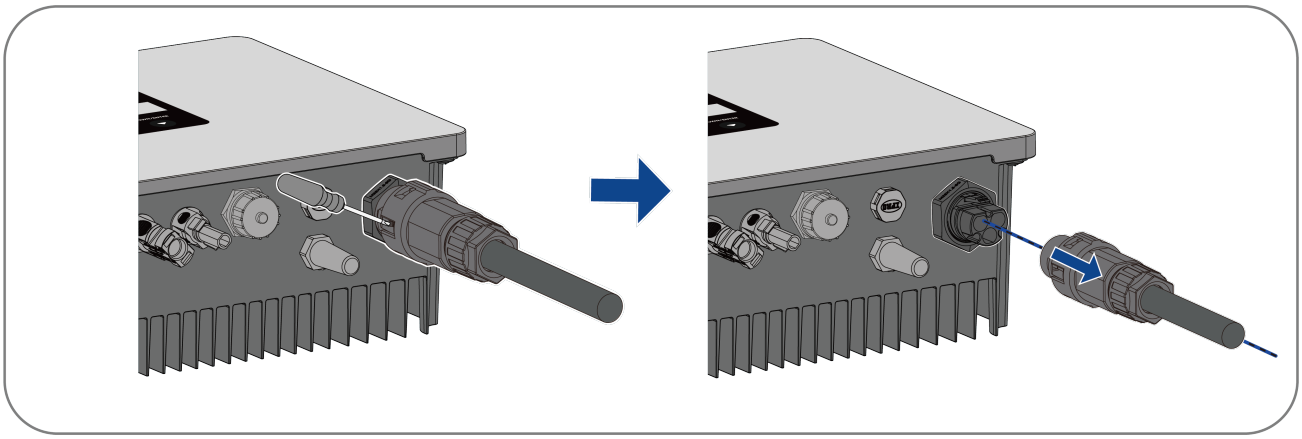
DANGER

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

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

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

Step 7: Remove the AC connector from the jack. Use a suitable measuring device to check that no voltage is present at the AC connector between L and N and L and PE.



Step 8: Hold down the buckle on the side of the RJ45 terminal and pull out the RJ45 terminal.

10.2 Dismantling the inverter

After disconnecting all electrical connections as described in Section 10.1, the inverter can be removed as follows.

Procedure:

Step 1: Dismantle the inverter referring to “5.2 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 Product storage”.

11 Technical data

11.1 AC/DC

DC Input			
Type	ASW1000S-S2	ASW1500S-S2	ASW2000S-S2
Maximum power of PV array	2000 Wp	3000 Wp	4000 Wp
Maximum input voltage	500 V		
MPP voltage range	50-450 V		
MPP voltage range at P_{nom}	65-400 V		
Rated input voltage	360 V		
Minimum input voltage	50 V		
Initial input voltage	60 V		
Max. operating input current per MPP	16 A		
Max. short circuit current per MPP	20 A		
Maximum reverse current into the PV modules	0A		
Number of independent MPP inputs	1		
Strings per MPP input	1		
Overvoltage category in accordance with ICE 60664-1	II		
AC output	**ASW1000S-S2**	**ASW1500S-S2**	**ASW2000S-S2**
Rated power at 230V	1000 W	1500 W	2000 W
Rated apparent power at cosφ = 1	1100 VA	1650 VA	2200 VA
Maximum apparent power at cos φ = 1	1100 VA	1650 VA	2200 VA
Nominal grid voltage	220/230/240 L/N/PE		
Grid voltage range[1]	180-290 V		
Nominal grid frequency	50Hz/60 Hz/		
Grid frequency range[2]	45-55Hz/55-65Hz		
Rated current at 230V	4.5 A	6.8 A	9.1 A
Maximum output current	5 A	7.5 A	10 A
Inrush current	<20% of nominal AC current for a maximum of 10ms		
Recommended rated current of AC circuit Breaker	10 A	10 A	16 A
Total harmonic distortion of the output current with total harmonic distortion of the AC voltage <2%, and AC power >50% of the rated power	<3%		
Power factor at rated power	1		
Adjustable displacement power factor	0.8 inductive.... 0.8 capacitive		
Feed-in phase	1		
Connection phase	1		
Overvoltage category in accordance with IEC 60664-1	III		
Efficiency	**ASW1000S-S2**	**ASW1500S-S2**	**ASW2000S-S2**
Maximum efficiency	97.8 %		
European weighted efficiency	97.2 %		

DC Input	

Type	ASW2500S-S2	ASW3000S-S2	ASW3300S-S2
Maximum power of PV array	5000 Wp	6000 Wp	6000 Wp
Maximum input voltage	500 V		
MPP voltage range	50-450 V		
MPP voltage range at Pnom	65-400 V		
Rated input voltage	360 V		
Minimum input voltage	50 V		
Initial input voltage	60 V		
Max. operating input current per MPP	16 A		
Max. short circuit current per MPP	20 A		
Maximum reverse current into the PV modules	0A		
Number of independent MPP inputs	1		
Strings per MPP input	1		
Overvoltage category in accordance with ICE 60664-1	II		
AC output	**ASW2500S-S2**	**ASW3000S-S2**	**ASW3300S-S2**
Rated power at 230V	2500 W	3000 W	3300 W
Rated apparent power at cosφ = 1	2750 VA	3000 VA	3000 VA
Maximum apparent power at cos φ = 1	2750 VA	3300 VA	3300 VA
Nominal grid voltage	220/230/240 L/N/PE		
Grid voltage range[1]	180-290 V		
Nominal grid frequency	50Hz/60 Hz/		
Grid frequency range[2]	45-55Hz/55-65Hz		
Rated current at 230V	11.4 A	13.6 A	15 A
Maximum output current	12.5 A	15 A	15 A
Inrush current	<20% of nominal AC current for a maximum of 10ms		
Recommended rated current of AC circuit Breaker	16 A	20 A	20 A
Total harmonic distortion of the output current with total harmonic distortion of the AC voltage <2%, and AC power >50% of the rated power	<3%		
Power factor at rated power	1		
Adjustable displacement power factor	0.8 inductive.... 0.8 capacitive		
Feed-in phase	1		
Connection phase	1		
Overvoltage category in accordance with IEC 60664-1	III		
Efficiency	**ASW2500S-S2**	**ASW3000S-S2**	**ASW3300S-S2**
Maximum efficiency	97.8 %		
European weighted efficiency	97.2 %		

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.

11.2 General data

General data	ASW1000-3300S-S2
Width × height × depth	288 mm × 218 mm ×102 mm
Weight	＜5 Kg
Topology	Non-isolated
Operating temperature range	-25℃...+60℃
Allowable relative humidity range (non-condensing)	0% ... 100%
Degree of protection for electronics in accordance with IEC 60529	IP66
Climatic category in accordance with IEC 60721-3-4	4K4H
Protection class (according to IEC 62103)	I
Pollution degree outside the enclosure	3
Pollution degree inside the enclosure	2
Maximum operating altitude above mean sea level	3000 m
Self-consumption (night)	<1 W
Cooling method	Natural convection
Typical noise emission	< 35 dB(A)
Display	LCD indicator, App
Export active power output	Via connecting Smart meter
Earth Fault Alarm	Audible (AU)
Communication interface	Wi-Fi / RS485/4G/LAN (Optional)
Communication	Modbus RTU
Mounting information	Wall mounting bracket
DC connection technology	Plug-in connector
AC connection technology	Plug-in connector
Radio technology	WLAN 802.11 b/g/n
Radio spectrum	2.4 GHz
Maximum transmission power	100 mW
Support smart meter type	EASTRON SDM230/ Chint DDSU666

11.3 Protective device

Protective devices	ASW1000-3300S-S2
DC reverse polarity protection	Integrated
DC isolator	Integrated
Ground fault monitoring	Integrated
AC short-circuit current capability	Integrated
All-pole sensitive residual current monitoring unit	Integrated
Active anti-islanding protection	Integrated
PV string current monitoring	Integrated
DC current injection monitoring	Integrated
Low voltage ride through	Integrated
High voltage ride through	Integrated
Overvoltage protection	DC Type II / AC Type III

12 Troubleshooting

When the PV system does not operate normally, we recommend the following solutions for quick troubleshooting. If an error occurs, the red LED will turn solid ON. The error code can be read from the Solplanet APP.

Error code	Message	Corrective measures
1,3-5 8-10	Self-diagnosis fault	• Disconnect the inverter from the utility grid and the PV array and reconnect it after LED's turn off. If this fault is still being displayed, contact Solplanet service.
32	ROCOF fault	• Check the grid frequency and observe how often major fluctuations occur. • If this fault is caused by frequent fluctuations, try to modify the operating parameters after informing the grid operator first.
33	Grid frequency fault	• Check the grid frequency and observe how often major fluctuations occur. • 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 and the cable connections at the inverter. • Check the grid voltage at the point of connection. • 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, contact Solplanet service.
35	Grid loss	• Check whether any AC circuit breakers downstream of the inverter AC output have switched off. • Check the grid voltage to ensure that it is within the permitted values of the grid code. • Check the AC cable and the cable connection at the inverter. • If this fault is still being shown, contact Solplanet service.
36 56-58	GFCI fault	• Ensure the grounding connection of the inverter is reliable. • Conduct a visual inspection of all PV cables and modules. • If this fault is still shown, contact Solplanet 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, contact Solplanet service.
38	Isolation fault	• Check the PV array's insulation to ground and ensure that the insulation resistance to ground is greater than 1 MOhm. Otherwise, conduct a visual inspection of all PV cables and modules. • Ensure the grounding connection of the inverter is reliable. • If this fault occurs often, contact Solplanet 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.
46	Bus Voltage High 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 is within the permitted range and the fault still occurs, it might be that the internal circuit has been damaged. Contact Solplanet service.

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, contact Solplanet service.
61,62	DRMs device fault	• Check the DRED device communication or operation
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.

Contact Solplanet service if you encounter errors not listed in the table above.

13 Maintenance

13.1 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, an electric arc may occur causing electric shock and burns. Wear appropriately insulated gloves and use appropriately insulated tools when working on the DC connectors.

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

⚠ DANGER

Danger to life due to high voltages in the inverter.

Do not touchlive parts for 5 minutes after disconnection from the power sources.

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

Procedure:

Step 1: Turn OFF the AC circuit breaker downstream of the inverter AC output and lock and secure it to avoid inadvertent reconnection.

Step 2: Rotate the DC switch handle from the ON" position to the "OFF" position and repeat five times.

14 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.

15 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.

16 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 provide 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.

17 Contact

EMEA

Service email: service.EMEA@solplanet.net

APAC

Service email: service.APAC@solplanet.net

LATAM

Service email: service.LATAM@solplanet.net

AISWEI Technology Co., Ltd

Hotline: +86 400 801 9996

Add.: No. 18, Alley 600, Nanchezhan Road, Huangpu District, Shanghai, China

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

Scan QR code: Android

Scan QR code: iOS

AISWEI Technology CO., Ltd