

2 Installation

This chapter describes the installation and wiring of the Hybrid Inverter. Please strictly follow the instructions in this chapter to install and wire connection.

2.1 Safety regulations

The Hybrid Inverter has high voltage and large current inside. To ensure personal safety, the following regulations should be observed at all times. The Hybrid Inverter can only be installed by personnel who have received training in the Hybrid Inverter and have a good knowledge of the Hybrid Inverter. During the installation process, always observe the safety precautions and local safety regulations before the catalogue of this manual.

Do not operate or maintain the inside of the system during thunderstorms or wet weather to prevent electric shock. If operating inside the Hybrid Inverter, make sure the system is not powered. If hybrid inverter is equipped with anti-theft lock, please be sure of key in safekeeping.

2.2 Installation preparation

2.2.1 Unpacking inspection

Only when the goods arrive at the installation site can the unpacking box be allowed to be inspected. The inspection is completed by the customer's representative and the supplier's representative. Unpack the package, review the check list.

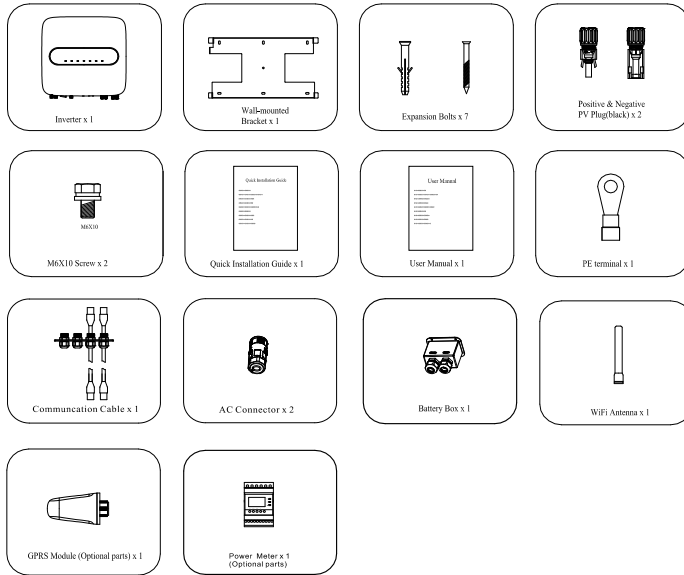


Figure2.1 Packing list

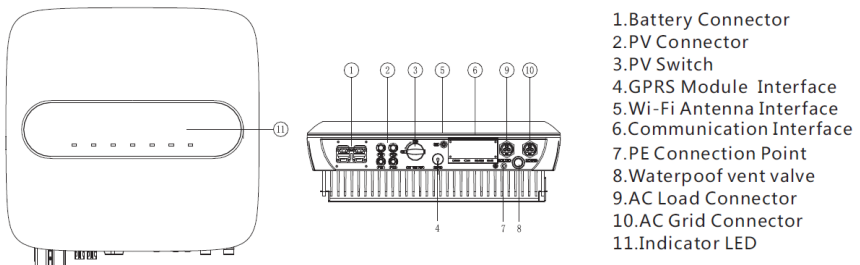


Figure2.2 The Hybrid Inverter Overview

1. Battery Connector
2. PV Connector
3. PV Switch
4. GPRS Module Interface
5. Wi-Fi Antenna Interface
6. Communication Interface
7. PE Connection Point
8. Waterproof vent valve
9. AC Load Connector
10. AC Grid Connector
11. Indicator LED



Installation

2.2.2 Cable and Air switch preparation

Serial	Cable Name	Recommended model	cross-sectional area (mm ²)	Color of cable	Cable OD (mm)
1	PV side DC positive and negative input	UL1015 12AWG	3.31	Red, Black	4.00±0.15
2	Battery side DC positive and negative input	UL10269 4AWG	16~25	Red, Black	10.00±0.30
3	AC output	UL1015 10AWG	4~6	Red, Black Yellow-Green	4.60±0.20

Note: Be sure of all cables' withstand voltage、 temperature-resistance equaling to or better than the recommended model, and complying with relevant regulation of electrical industry.

Selection of switch

Table 2-2

Recommended DC switch		
	PV(option)	Battery(option)
Rated voltage	≥580V DC	≥58V DC
Rated current	11A	125A

Table 2-3

Recommended AC switch		
	AC Load	AC Grid
Rated voltage	≥250V AC	≥250V AC
Rated current	25A	25A

2.2.3 Installation Kit

1. Electric drill (drilling bit: φ 8mm)
2. Screwdriver (Phillips screwdriver: M3、 M6; Flat head screwdriver: M3)
3. Wire stripper(4~6mm²)
4. Wire crimper 1 (Model: H4TC0001; Manufacturer: Amphenol)
5. Wire crimper 2(OT terminal, 4~6 mm²)
6. Open-end wrench (Model: H4TW0001; manufacturer: Amphenol)
7. Multimeter

2.2.4 Installation requirements

1. Wall bracket Installation

- 1) It is necessary to ensure that the installation position is flat and the thickness of the whole wall exceeds 100mm.
- 2) Ensure the installation wall is vertical to the ground. If it is sloping, tilt angle is only allowed to be less than 15° .
- 3) Ensure installation wall is solid enough to meet the requirements of load bearing for hybrid inverter.
- 4) The mounting position is supposed to avoid direct sunlight.

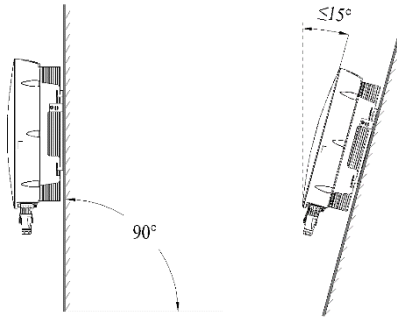


Figure 2-3 Perpendicularity requirement

2. Installation space requirements

Product installation position, leave 300 mm of space for maintenance and heat dissipation left, right and front

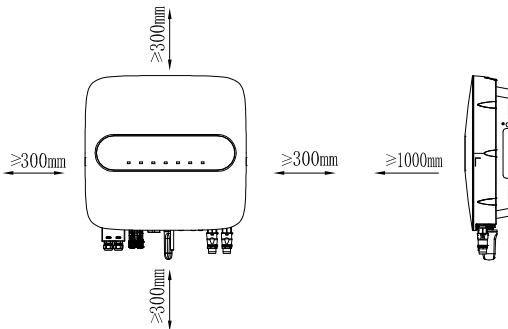


Figure 2-4 Mounting distance

2.3 Installation

2.3.1 Mounting

STEP 1: Mark mounting hole on the wall Drill hole with 8mm diameter of bit. Ensure a depth of 80mm.

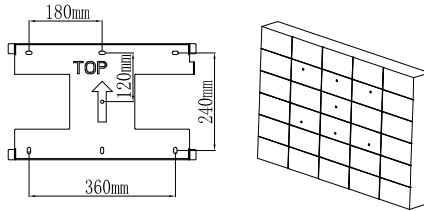


Figure 2-5

STEP 2: Hammer expansion tube into the wall Mount bracket on the wall, keep aligned with the holes.

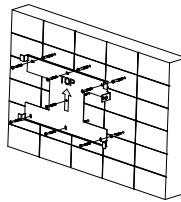


Figure 2-6

STEP 3: Mount the Sermatec hybrid inverter on the bracket.

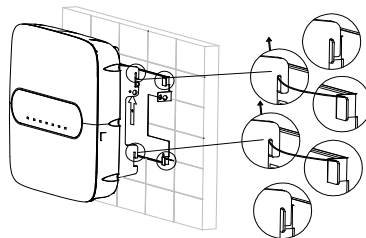


Figure 2-7

Installation



STEP 4: Secure the inverters with M6 screw on the right side.

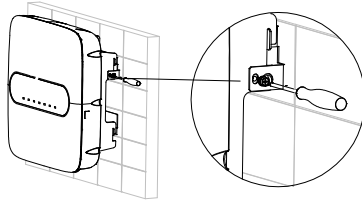


Figure 2-8

STEP 5: Install anti-theft lock if necessary (Option, equipped by user).

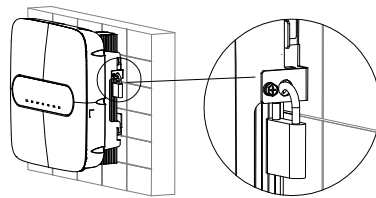


Figure 2-9

2.3.2 Electrical Connection

Hybrid Inverter System connection Diagram

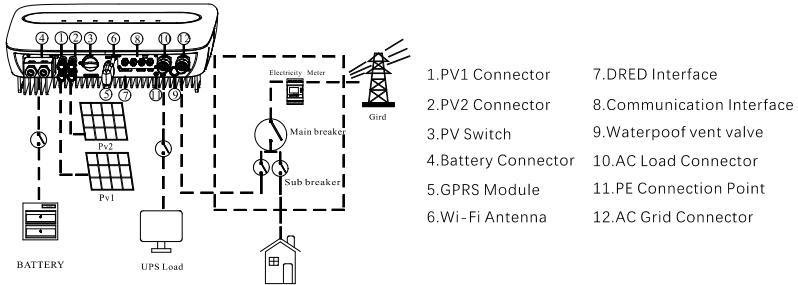


Figure 2-10 Hybrid Inverter System connection Diagram

For AU/EN:

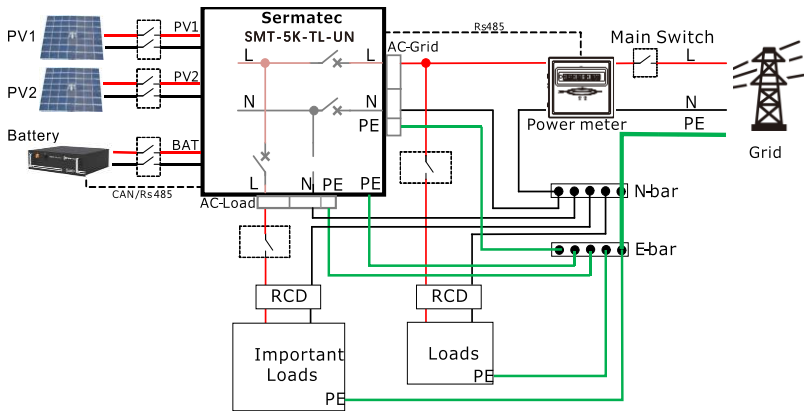


Figure 2-11

Installation



For Other Countries :

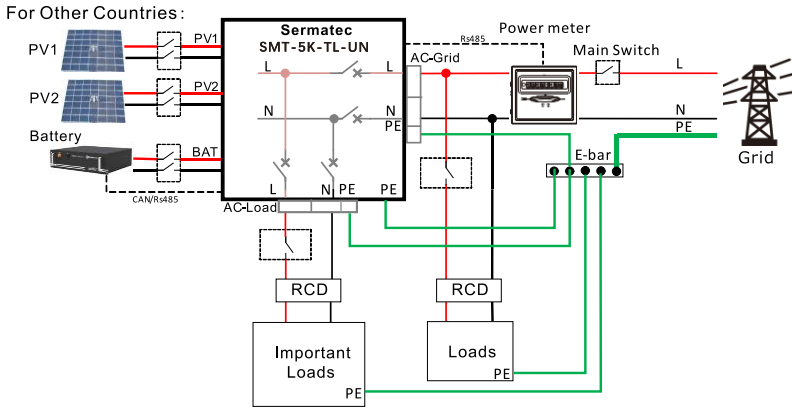


Figure 2-12

Power Meter connection diagram:

Recommended DC Switch		
	PV (option)	Battery (option)
Rated Voltage	$\geq 580\text{VDC}$	$\geq 58\text{VDC}$
Rated Current	11A	125A
Recommended AC Switch		
	AC Load	AC Grid
Rated Voltage	$\geq 250\text{VAC}$	$\geq 250\text{VAC}$
Rated Current	25A	25A

The Power Meter connection diagram:

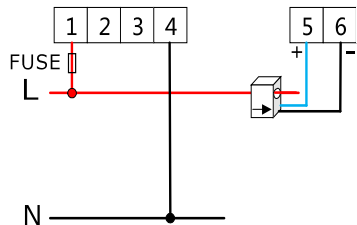


Figure 2-13 (Acrel Single phase Meter)



Dangerous

- 1) Make sure all switches are at closed position before electrical connection.
 - 2) Only qualified installation person can implement installation of AC and DC input cable.
-

1. Connect PV cable



Attention

It is strictly prohibited to connect positive pole (PV1+, PV2+, BAT+) and negative (PV1-, PV2-, BAT+) reversely or incorrectly. Otherwise it would affect normal operation, or even cause damage and other serious consequence.

The length of external cable to PV side and battery side is suggested to be less than 30m.

PV array should not be connected to the grounding conductor.

The minimum insulation resistance to ground of PV panels must exceed 40k, there is a risk of shock hazard if the requirement of minimum resistance is not met.

STEP 1: Check and verify PV rotary switch is at OFF position.

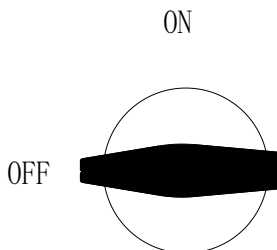


Figure 2-14

STEP 2: Follow the requirement to cramp and connect H4 connector to cable which you can find from installation kits.

Installation



Crimp the H4 connector to the cable as required.

PV Connectionsteps:

PV cable size: 4~6mm²

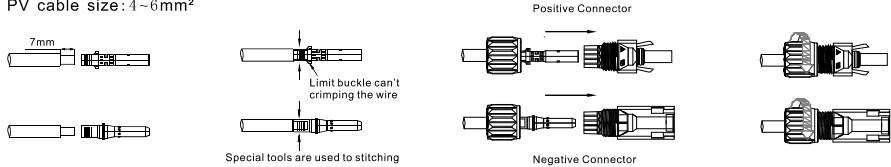


Figure 2-15

STEP 3: Use multimeter to measure PV side voltage and verify correct polarity, ensure open-circuit voltage is less than 580V.

Hybrid Inverter System connection Diagram

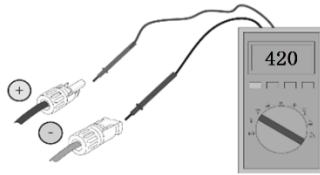


Figure 2-16 PV Polarity check

STEP 4: Use multimeter to measure Battery side voltage and verify correct polarity, ensure open-circuit voltage is less than 60V.

2. Connect BAT cable



Attention

Make sure that the installation location meets the following conditions:

The area is completely water proof.

The floor is flat and level.

Batteries should not be connected to the grounding conductor.

The ambient temperature is within the range from 0° C to 50° C.

The temperature and humidity is maintained at a constant level.

There is minimal dust and dirt in the area.

Installation

Batteries need to comply with local regulations.

Suggestion: If the battery is to be installed indoor for details please refer to battery Manufacture' s user manual.

Suggestion: Batteries must be installed with a distance to each other, details please refer to battery manufacture' s user manual.

As for the number of cells used, it will be decided by customer' s choice, the choice must comply with the followed requirement: the voltage is 40-60V.

STEP 1: Connect positive and negative terminals to the corresponding interfaces

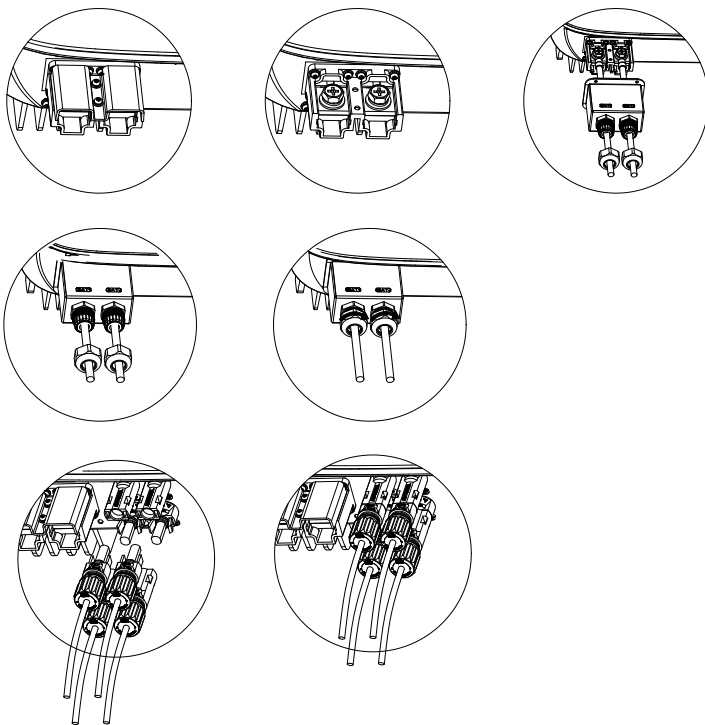


Figure 2-17 DC terminals connection

Installation



STEP 2: Use multimeter to measure Battery side voltage and verify correct polarity, ensure open-circuit voltage is less than 60V.

3. AC output cable connection



Attention

PE cable should be connected properly and reliably, otherwise it would affect normal operation, even cause product damage and serious consequences.

Both PE ground terminal in the connector and ground point on enclosure can be earthed simultaneously.

Don't reversely connect PV input cable and battery input cable to interfaces! Otherwise it will affect normal operation.

Don't reversely connect AC load connector and AC Grid connector, AC load cable and AC Grid cable! Otherwise it will affect normal operation.

STEP 1: The connector and cable are required to be reliably connected as shown below.

Order of connection is L (Red), N (Black), PE

Cable sectional area 6 mm², stripping length 6mm

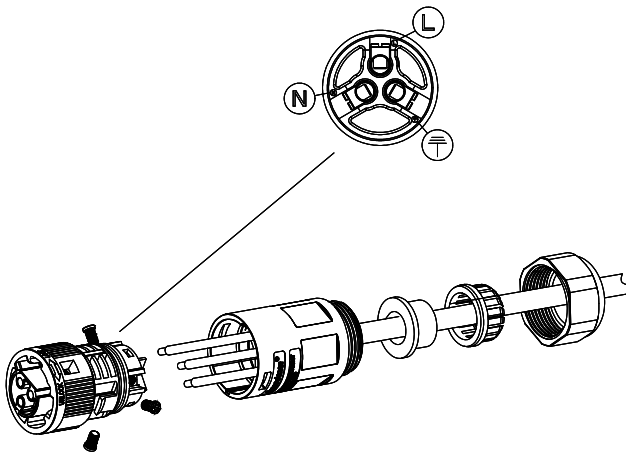


Figure 2-19

Installation

STEP 2: Measure grid voltage by multimeter, ensure grid voltage is less than high limit of voltage required by all national grid standard.

STEP 3: Connect connector to AC Load interface and grid interface, rotate and lock them.

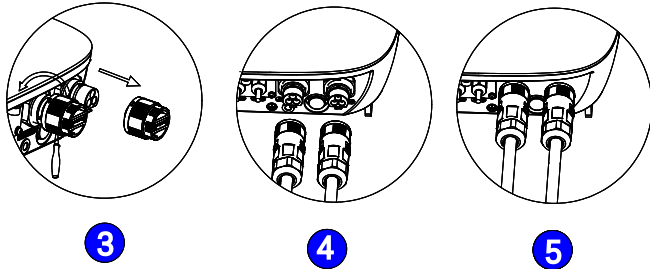


Figure 2-20

Note: Do not connect reverse the load side connector and the grid side connector.

STEP 4: PE Installation

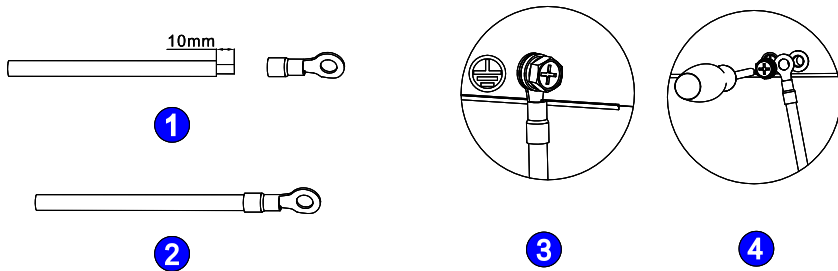


Figure 2-21

4. Communication cable connection

STEP 1: Remove the waterproof cover plate that comes with the Hybrid Inverter

STEP 2: Plug the wire connector of the waterproof cover plate in the accessory into the corresponding interface of the Hybrid Inverter.

STEP 3: Fix firmly by screw.

STEP 4: Screw up water-proof cylinder, connect the cable from “RS485” interface to the interface of Power Meter, connect the cable from “To battery” interface to BMS interface in battery (default length of cable is 3m)

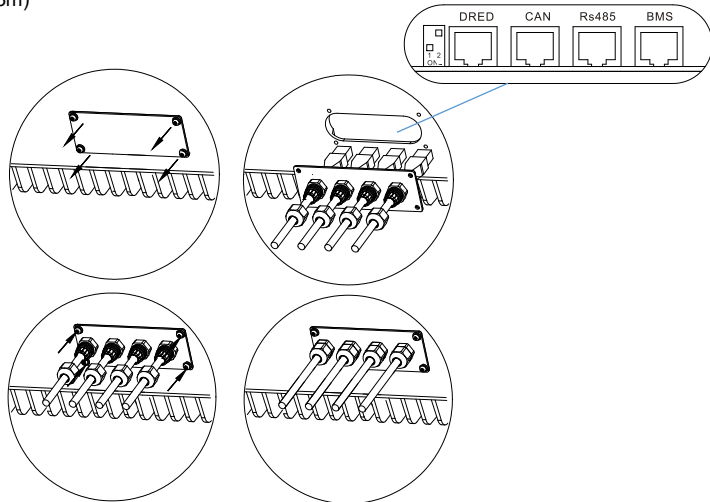


Figure 2-22 Communication cable connection diagram

DRED, Power Meter and BMS Connection:

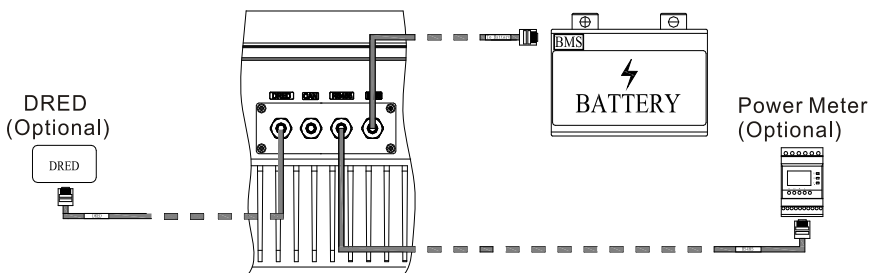
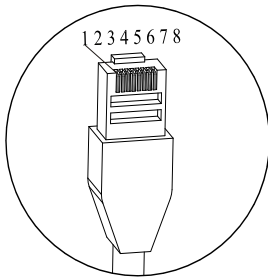


Figure 2-23

Installation

The RJ45 socket pin assignments for DRED, Power Meter and BMS as follows:





DRED		
PIN	Signal Name	Cable Color
1	DRM 1/5	Orange-white
2	DRM 2/6	Orange
3	DRM 3/7	Green-white
4	DRM 4/8	Blue
5	RefGen	Blue-white
6	Com/DRM0	Green
7	N/A	Brown-white
8	N/A	Brown

RS485		
PIN	Signal Name	Cable Color
1	NC	Orange-white
2	NC	Orange
3	485B_B	Green-white
4	COM	Blue
5	COM	Blue-white
6	485B_A	Green
7	485B_B	Brown-white
8	485B_A	Brown

BMS		
PIN	Signal Name	Cable Color
1	485A_B	Orange-white
2	485A_A	Orange
3	COM	Green-white
4	CAN_H	Blue
5	CAN_L	Blue-white
6	COM	Green
7	485A_A	Brown-white
8	485A_B	Brown

Figure 2-24

If you need to use DRED function, please put the left dip switch to the upper position.

The State of dip switch	Function
	DRED Enable
	DRED Disable

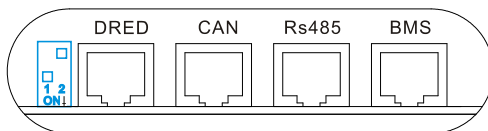


Figure 2-25

The inverter shall detect and initiate a response to all supported demand response commands, demand response modes are described as follows:

Table 2-4

Mode	Requirement
DRM 0	Operate the disconnection device
DRM 1	Do not consume power
DRM 2	Do not consume at more than 50% of rated power
DRM 3	Do not consume at more than 75% of rated power AND Source reactive power if capable
DRM 4	Increase power consumption(subject to constraints from other active DRMs)
DRM 5	Do not generate power
DRM 6	Do not generate at more than 50% of rated power
DRM 7	Do not generate at more than 75% of rated power AND Sink reactive power if capable.
DRM 8	Increase power generation(subject to constraints from other active DRMs)

5. GPRS Module (Optional) and Wi- Fi Antenna Connection

If the user selects the GPRS module, remove the dust cover plate of the GPRS module interface and install the GPRS module.

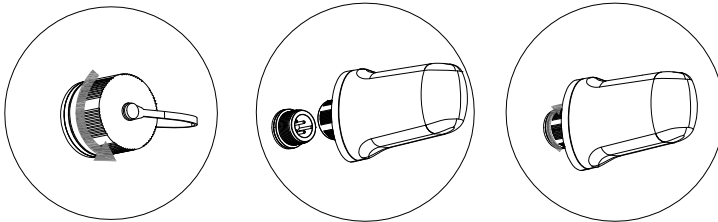


Figure 2-26

The GPRS socket pin assignments as follows:

PIN	Signal Name
1	VCC
2	GND
3	485A
4	485B

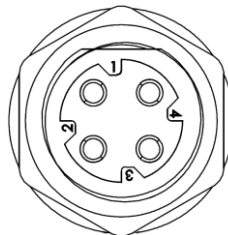


Figure 2-27

Install the antenna to the antenna interface

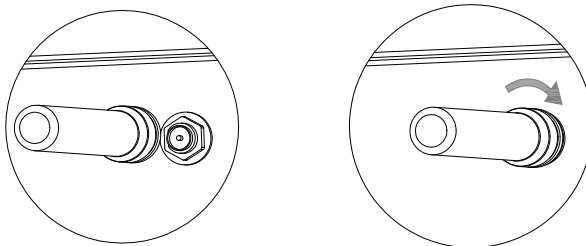


Figure 2-28 Wi-Fi antenna diagram

2.4 Installation check

After the Hybrid Inverter is installed, be sure to check the installation according to the following table!

Table 2-5 Installation checking list

Check item	Series	Check content
Installation	1	Check whether the Hybrid Inverter installation is vertical and stable.
	2	Check that all bolts are tight (especially pay attention to the electrical connection), whether the flat washers and spring washers are complete, and whether they are installed in reverse.
	3	Check whether the reserved distance below the Hybrid Inverter meets the requirements.
	4	Check whether the accessories are complete and the cable is intact and not damaged.
Electrical connection	1	Check PV cable polarity, ensure they are connected properly.
	2	Ensure PV rotating switch is at OFF position
	3	Check load connector \ grid connector whether are connected properly.
	4	Check if ground point on enclosure is earthed reliably.
	5	Check the AC and DC connectors whether are reliably connected.
	6	Check that the model specifications of the incoming and outgoing cable are correct.
	7	Check that all cable connections are secure and reliable
	8	Check whether or not the color of AC cables are standardized, with complete security identity.
	9	Check that the cables are neat and that the cable ties are in compliance with the process specifications.