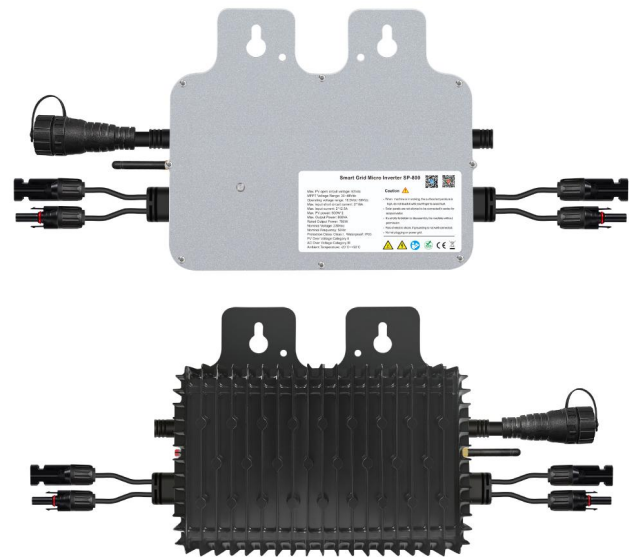
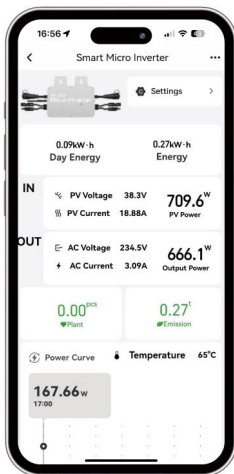
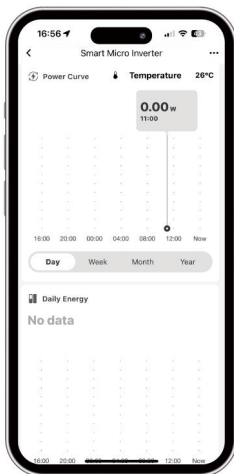
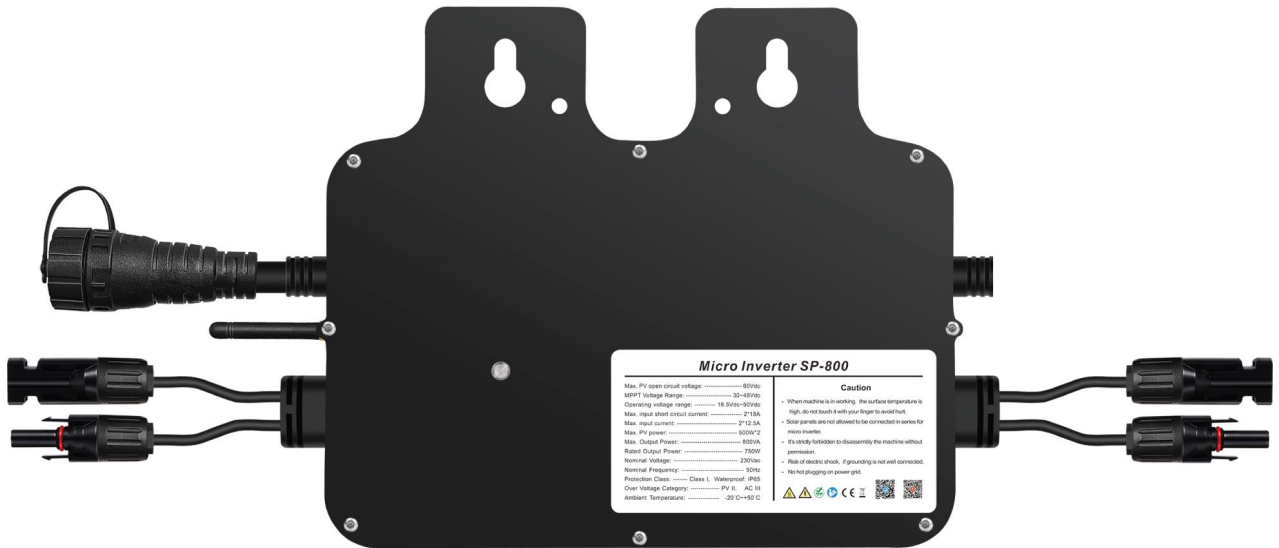


# SP Series Grid Micro Inverter

## Installation and Operation Manual



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# 1 Introduction

## 1.1 About the Micro Inverter

A solar Micro Inverter is a device that converts the constant electrical current (DC) from a single solar Photovoltaic Module (PV) into alternating current (AC) and then feeds the electrical power to the public grid. Such Micro Inverters are designed for 1 PV, for 2 PV and up to 4 PV modules. While delivering an excellent performance the installation of the micro inverter is very simple.

When combining multiple Photovoltaic Modules and accordingly also Micro Inverters, each of those work independently, thus realizing the best possible power generation of each PV module by MPPT (Maximum Power Point Tracking).







## 1.2 About this Manual




This manual contains important instructions for the SP series Micro Inverters, user shall read it carefully before installation and operation. For safety reasons, only qualified personnel who has received the appropriate training shall install this Micro Inverter under the guidance of this manual.

# 2 Important Safety Information

## 2.1 Product Labels


The following symbols appear on the product label and are described here:


Symbols	Explanation
	Danger: Refer to the safety instructions
	Danger: Risk of electrical shock
	Warning: Hot surface
	The Micro Inverter is covered by the EU WEEE directive.
	The CE mark confirms the compliance of the Micro Inverter with the European Low Voltage and EMC Directives
	The RoHS mark confirms the compliance of the Micro Inverter with European directive on “the restriction of the use of certain Hazardous substances in Electrical and Electronic devices”.


	<p>The Micro Inverter complies with the FCC requirements.</p>
	<p>Grounding Protection: prior to operation you must make sure that grounding protection is properly connected.</p>
	<p>Please read the user's manual firstly before installation, operation and maintenance.</p>

## 2.2 Safety and Advisory Symbols

To mitigate the risk of electric shock, and to ensure the safe installation and operation of the SP series Micro Inverter, the following safety symbols appear throughout this document to indicate dangerous conditions and important safety instructions.

	<p><b>Danger</b></p> <p>This indicates a hazardous situation, which if not avoided, will result in death or serious injury.</p>
---	---

	<p><b>Warning!</b></p> <p>This indicates a situation where failure to follow instructions may be a safety hazard or cause equipment malfunction. Use extreme caution and follow instructions carefully.</p>
---	---

	<p><b>Note!</b></p> <p>This indicates information that is very important for optimal system operation. Follow instructions closely.</p>
---	---

## 2.3 General Safety Instructions

Danger:

Risk of electric shock

Risk of fire



- Only use electrical system components approved for wet locations.
- Only qualified personnel should install, troubleshoot, or replace the Micro Inverter.
- Ensure that all AC and DC wiring is correct and that none of the AC or DC wires are pinched, shorted or damaged. Ensure that all AC junction boxes are properly closed.
- Do not exceed the maximum number of microinverters in an AC branch circuit as listed in the manual.

Danger:

Risk of electric shock



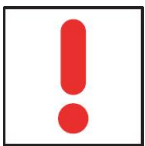
- Do not use the equipment in a manner not specified by the manufacturer. Doing so may cause death or injury to persons, or damage to equipment.
- Be aware that installation of this equipment includes risk of electric shock.
- The DC conductors of this photovoltaic system are ungrounded and may be energized.
- Always de-energize the AC branch circuit before servicing. While connectors are rated for disconnect under load, we do not recommend disconnecting the DC connectors under load.

Warnings:



- Before installing or using the Microinverter, read all instructions and cautionary markings in the technical description, on the equipment and on the photovoltaic (PV) equipment.
- Do not connect the Micro Inverter to the grid or energize the AC circuit(s) until you have completed all of the installation procedures and have received approval from the electrical utility.
- When the PV array is exposed to light, DC voltage is supplied to the power conversion equipment (PCE).
- Risk of equipment damage. Male and female connectors must only be mated with the matching male/female connector.

Notes:



- To ensure optimal reliability and to meet warranty requirements, install the Micro Inverter according to the instructions in this manual.
- The AC and DC connectors on the cabling are rated as a disconnect only when used with an this Micro Inverter.
- Protection against lightning and resulting voltage surge must be in accordance with local standards.
- Perform all electrical installations in accordance with all applicable local electrical codes.

## 2.4 Micro Inverter Safety

Warnings:

Risk of skin burn



- The chassis of the Micro Inverter is the heat sink. Under normal operating conditions, the temperature could be 20° C above ambient, but under extreme conditions the microinverter can reach a temperature of 90° C. To reduce risk of burns, use caution when working with the Micro Inverter.

Danger:

Risk of electric shock

Risk of fire



- Only qualified personnel may connect the Micro Inverter to the utility grid.
- Do not attempt to repair the Micro Inverter; it contains no user-serviceable parts. If it fails, contact your customer service to obtain a return merchandise authorization (RMA) number and start the replacement process. Tampering with or opening the Micro Inverter will void the warranty.

Warnings:

Risk of equipment damage



- Install the Micro Inverter under the PV module to avoid direct exposure to rain, UV, and other harmful weather events. Always install the Micro Inverter bracket side up. Do not mount the Micro Inverter upside down. Do not expose the AC or DC connectors to rain or condensation before the connectors are mated.
- The maximum open circuit voltage of the PV module must not exceed the specified maximum input DC voltage of the Micro Inverter.

Warnings:

Risk of equipment damage



- You must match the DC operating voltage range of the PV module with the allowable input voltage range of the Micro Inverter.
- The Micro Inverter is not protected from damage due to moisture trapped in cabling systems. Never mate Micro Inverters to cables that have been left disconnected and exposed to wet conditions. This voids the warranty.
- The Micro Inverter functions only with a standard, compatible PV module with appropriate fill-factor, voltage, and current ratings. Unsupported devices include smart PV modules, fuel cells, wind or water turbines, DC generators, etc. These devices do not behave like standard PV modules, so operation and compliance are not guaranteed. These devices may also damage the Micro Inverter by exceeding its electrical rating, making the system potentially unsafe.

### **3 SP Grid Micro Inverter**

The SP Grid Micro Inverter maximizes energy production by using a Maximum Power Point Tracking (MPPT) algorithm. Each MPPT individually connects to one PV module. This configuration enables an individual MPPT to control each PV module, ensuring that maximum power available from each PV module is exported to the utility grid regardless of the performance of the other PV modules. While an individual PV module in the array may be affected by shading, soiling, orientation, or PV module mismatch, each SP Grid Micro Inverter ensures top performance for its associated PV module.

#### **3.1 Detailed Description**

Figure 1, 2, and 3 provide a detailed view of the SP Grid Micro Inverter, including the different connections and component, also with the dimensions in Figure 3.



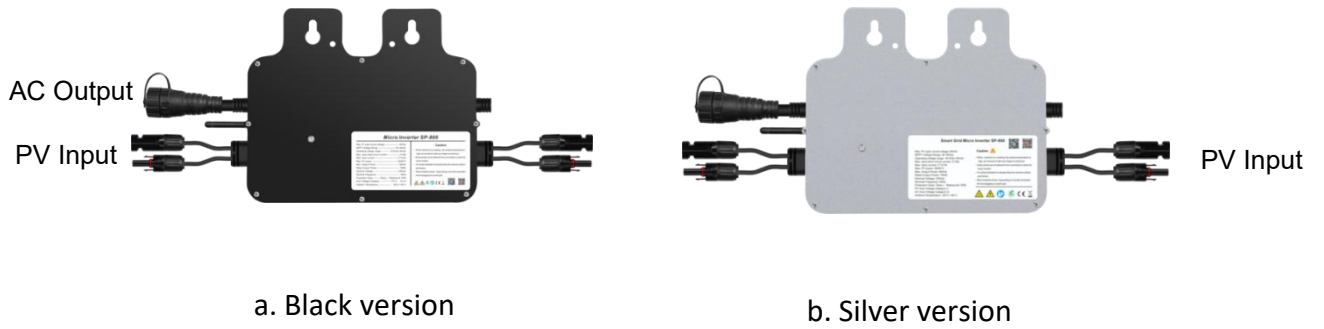


Figure 1: Front view of the SP Grid Micro Inverter

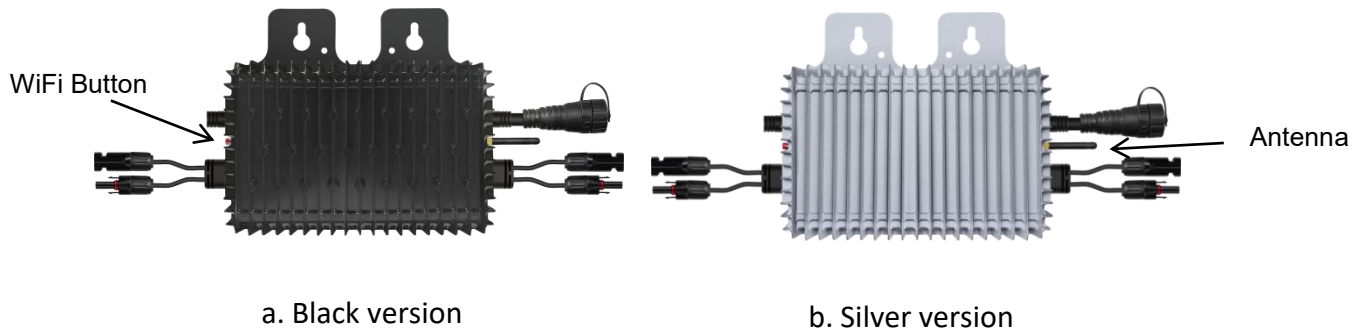


Figure 2: Rear view of the SP Grid Micro Inverter

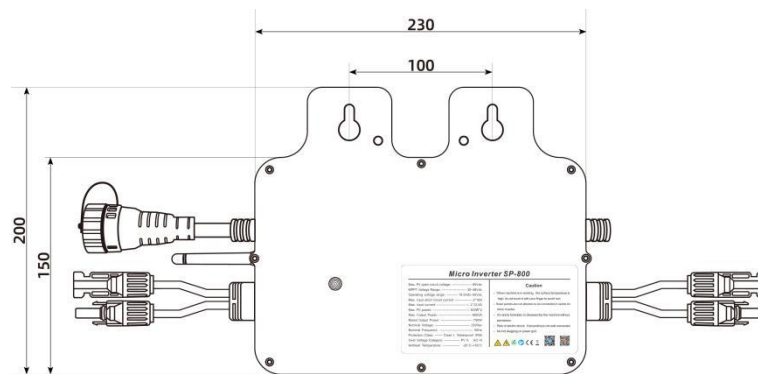


Figure 3: Dimensions of the SP Grid Micro Inverter

!

**Note!**

Metal shell grounding is connected with AC output grounding together through inside conductor in machine

### 3.2 System Monitoring

After installing the Micro Inverter and providing an internet connection through a broadband router or a modem, the Micro Inverter can report performance parameters to the “Smart Life” App and thus allows the user to monitor the system status by using the respective Smartphone-App. Paragraph 7 provides further details.

### 3.3 Optimal Reliability

Microinverter systems are inherently more reliable than traditional inverters. The distributed nature of a microinverter system ensures that there is no single point of system failure in the PV system. The SP grid micro inverter is designed to operate at ambient temperature as high as 50 °C.

### 3.4 Ease of Design

PV systems using the SP Grid Micro Inverter are very simple to design and install. You will not need string calculations or cumbersome traditional inverters. You can install individual PV modules in any combination of PV module quantity, type, age and orientation. Each microinverter quickly mounts on the PV racking, directly beneath each PV module. Low voltage DC wires connect from the PV module directly to the co-located microinverter, eliminating the risk of personnel exposure to dangerously high DC voltage.

#### Note!



Depending on your local regulation you need to register your PV system upfront with your utilities provider.

We strongly recommend to consult your utilities provider / relevant authorities upfront.

### 3.5 Power Derating

During operation the Micro Inverter will create some heat which shall be dissipated via the housing as a heat sink. The heat generated is directly proportional to the AC output, i.e. during times of high power input from the PV modules and high ambient temperatures the Micro Inverter might reach temperatures which might become harmful for the longevity of the Micro Inverter.

The SP Grid Micro Inverter is equipped with a mechanism which continuously monitors the temperature of the device and reduces the AC output power to a level which prevents the device from overheating. The SP Grid Micro Inverter automatically switches back to a full AC power output as soon as the temperature of the device is within the given limits.

## 4 Planning for the Micro Inverter Installation

The SP Grid Micro Inverter supports PV modules with 60 or 72 Cells and installs quickly and easily. The microinverter housing is designed for outdoor installation and complies with the IP65 environmental enclosure rating standard

IP65 rating definition



Indoor or outdoor use primarily to provide a degree of protection against water projected from a nozzle, the entry of water during occasional temporary submersion at a limited depth, and damage from external ice formation.

IP65 rated as "dust tight".

### 4.1 Compatibility

The SP Grid Micro Inverter is electrically compatible with PV modules equipped with MC-4 connectors. For detailed specifications, see Technical Data on paragraph 9 of this manual. To ensure mechanical compatibility, be sure to order the correct connector type for both microinverter and PV module from your vendor.

### 4.2 Grounding Considerations

Independent from your local regulation on establishing a protective grounding for your PV system we recommend sufficient grounding.

## 5 Parts and Tools Required

Below recommended tools and auxiliary tools may be used on site

- 6mm Allen key
- Cable ties
- Tools and fixtures needed to mount the Micro Inverter on the dedicated support (e.g. PV modules, ...)
- Personal protective equipment

## 6 Micro Inverter Installation

Installing the SP Grid Micro Inverter involves below steps. Each step listed here is detailed in the following pages. Before starting with the installation you shall check the correct and complete shipment of your Micro Inverter, prepare the installation as such and have all additional required parts and tools available.

## 6.1 The installation steps are as follows:

- Step 1: Mount the Micro Inverter
- Step 2: Attach WiFi Antenna
- Step 3: AC Cable Connection
- Step 4: Connect PV Modules
- Step 5: Energize the System

## 6.2 Package list

The packaging includes the following items:

1. Micro inverter
2. AC output cable
3. Screw kit
4. Installation and Operation manual
5. WiFi-antenna

You might require additional material and components for installation, Pls contact your local vendor for details.

## 6.3 Preparation

- Before installation, please check the package for any kind of damages during transportation and if any of the components as listed in 6.1 are missing. Please contact your vendor immediately, any such claims cannot be considered if raised at a later point.
- Before installation, please read the Installation and Operation Manual carefully.
- Depending on your requirements you might need to prepare a suitable length of the AC cable and connect it to a suitable and approved connector. You shall make sure that this is done by a sufficiently qualified person.

## 6.4 Position and Space Requirement

- The SP Grid Micro Inverter must be installed at a dry location according to its IP65 rating and ensure to avoid any exposure to rainfall.
- As the Micro Inverter generates heat during operation and the casing acts as a heat sink with natural convection, position the Micro Inverter at a place without any direct exposure to sunlight.
- Allow a minimum of 2 cm of free space on either front- and backside of the Micro Inverter and hereby ensure free convection.
- The SP Grid Micro Inverter is sufficiently protected against dust, weather, etc. and doesn't require any additional protection via an additional casing or housing which will in return limit the cooling through natural convection.

## 6.5 Step 1: Mount the Micro Inverter



We recommend to use a rail system for installing your PV system which ensures the correct installation of your PV Modules, provides a common access for grounding protection and also acts as a fixture for your Micro Inverter.

Pls contact your vendor for suitable installation material for your PV system.



Warning:

Install the Micro Inverter under the PV Module to avoid direct exposure to rain, UV and other harmful weather events.

Do not mount the microinverter upside down.

Ensure enough free space (> 2 cm) around the Micro Inverter for a sufficient natural convection.

Mount the Micro Inverter on the rail as shown in Figure 5.

1. Determine the position of the Micro Inverter on the rail
2. Fasten the screws loosely to the rail
3. Hang the Micro Inverter onto the screw and make sure that there's still a sufficient distance in between the Micro Inverter and the Solar Module. Also make sure that you can see the working status LED.
4. Tighten the screws

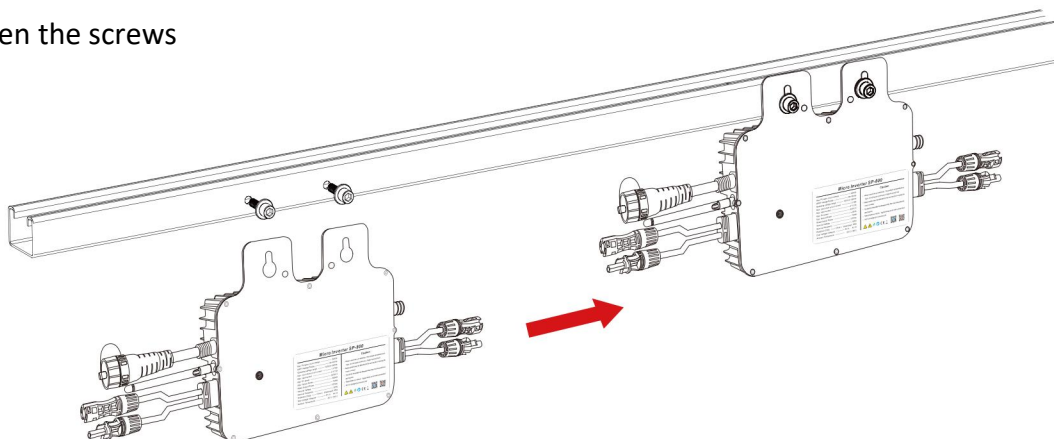


Figure 5: Mounting of the Micro Inverter on the rail of the PV System

## 6.6 Step 2: Attach WiFi Antenna

Screw on the WiFi-Antenna even if you don't intend to connect the SP Micro Inverter to your network.

## 6.7 Step 3: AC Cable Connection

In this paragraph we describe firstly the installation of a single Micro Inverter and thereafter provide guidance on installing multiple Micro Inverters from a larger PV system.

### 6.7.1 Single Micro Inverter

For the electrical installation of a single Micro Inverter you shall use the AC output cable as supplied in the package. Figure 6 shows an example for an AC output cable, the connector on the grid side might vary depending on the local version of the SP Grid Micro Inverter.

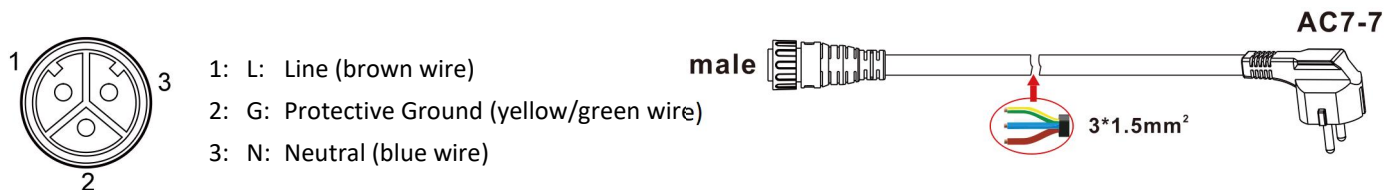


Figure 6: AC output cable for the grid connection of a single Micro Inverter and wiring of

Use the AC output cable and directly connect the cable with your socket in your home for grid connection as shown in Figure 7.

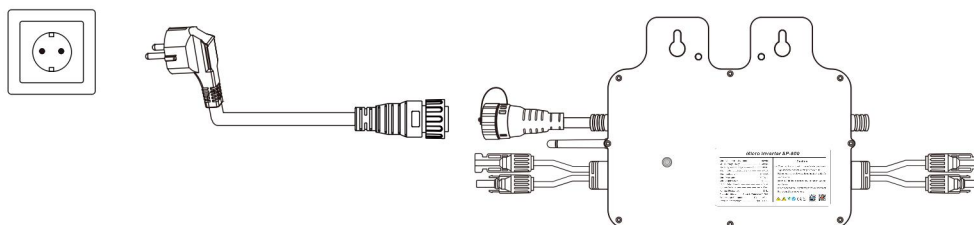


Figure 7: Direct AC connection of a single Micro Inverter to the grid.

### 6.7.2 Multiple Micro Inverters

Warning:

Before installing multiple Micro Inverters in your home you must check the local regulations.



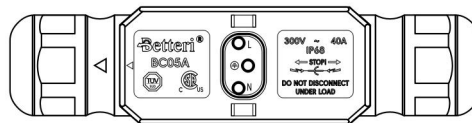
In certain legislations electrical installations exceeding a certain power threshold require the execution from a qualified and certified specialist.

In certain legislations larger PV systems require the prior approval from your grid authorities and you shall verify this upfront.

For multiple Micro Inverters connection, below parts are needed, pls refer to Figure 8 and contact your vendor for the available parts for your installation



Particular trunk AC cable

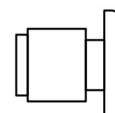


AC bus connector

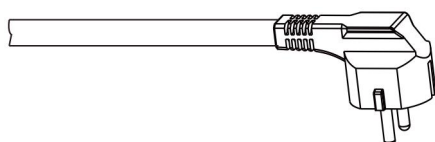


AC main cable

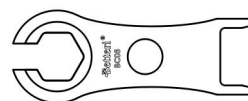
- N: Neutral (blue wire)
- G: Protective Ground (yellow/green wire)
- L: Line (brown wire)



AC bus connector end cap



AC grid cable with plug



Tool

Figure 8: Parts for multiple Micro Inverters connection

In the first step you shall connect the individual Micro Inverters with the AC Particular trunk cables as shown in Figure 9.

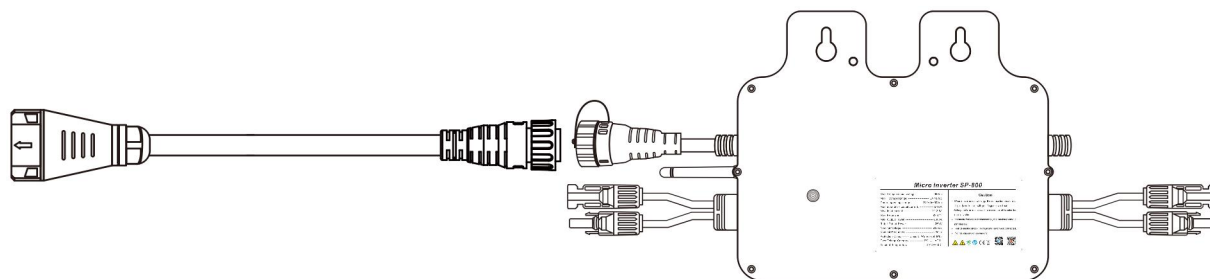
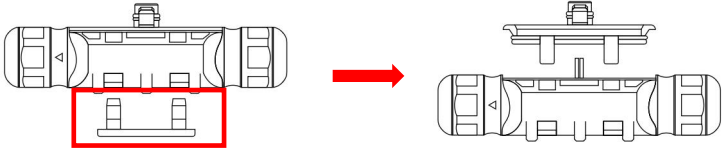
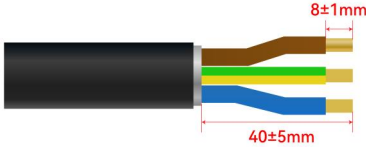
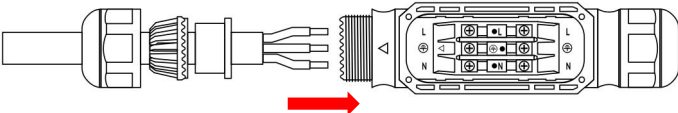
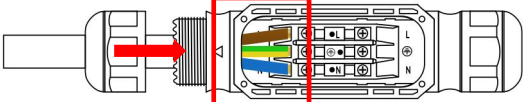
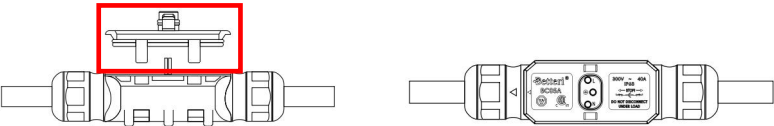
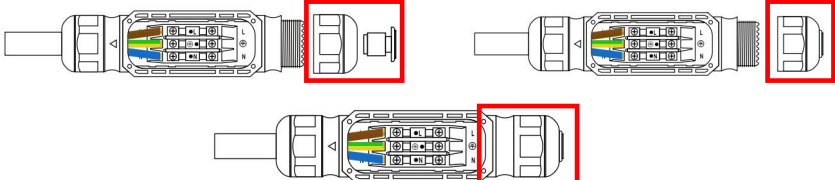


Figure 9: Connecting the Micro Inverters with the AC Particular trunk cable

Base on the distance between the micro inverters for multiple connections to cut the AC main cable for suitable length, then connect the AC main cable to AC bus connectors, the steps are as following:

1) Disassemble the AC Bus Connector for AC main cable assemble.

<p>Unlock the connector's upper cover with AC Bus Connector Unlock Tool.</p>	
<p>Use prepared AC main cable, strip the wire according right drawing</p>	
<p>Insert the cable into the cap in a way that the L, N and PE are in corresponding slots.</p>	
<p>Tighten the screws, and then tighten the cap back to the port.</p>	
<p>Plug the upper cover back to the Bus connector.</p>	
<p>For last AC bus connector, a AC Bus End cap should be insert into AC Bus connector and screw the cap back to port, then tighten the cap.</p>	

2) Repeat 1) to connect more AC Bus connector based on your demand, then according Fig.9 to build up your branch circuit.

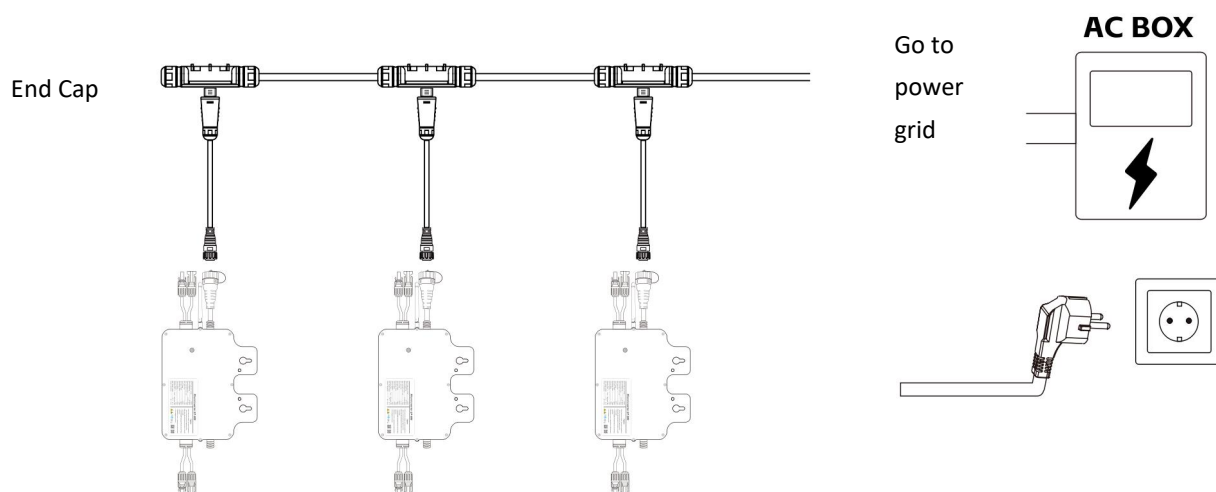


Figure 10: Multiple micro inverter connections





Use AC grid cable with plug to plug the home socket to power grid, maximum branch parallel unit is 5 pcs for 230Vac and 3 pcs for 120Vac .

Use AC main cable to connect distribution box to power grid, maximum branch parallel unit is 10 pcs for 230Vac and 5 pcs for 120Vac .

## 6.8 Step 4: Connect PV Modules

Before connecting the PV Modules to the Micro Inverter(s) you must ensure a robust assembly of the PV Modules according to the installation manual of your PV Modules. As already highlighted in paragraph 6.4 we recommend to mount the PV Modules on top of the Micro Inverter.



Warning:

Electric shock hazard.

The DC conductors of your PV System might be energized already due to exposure of your PV Modules to sunlight.

Connect the DC output of your PV Modules with the respective DC input of the Micro Inverter and ensure to connect them according to the wiring diagram in Figure 12.

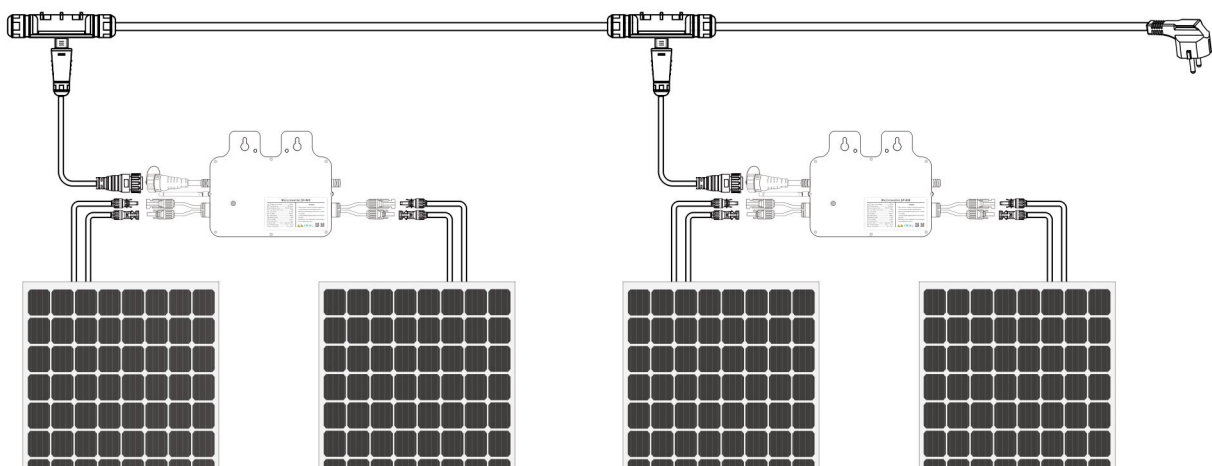


Figure 12: Connecting the PV Modules with the Micro Inverter

Caution:

Make sure that the open circuit voltage (VOC) and the working voltage (VMP) of your PV Modules meet the requirements as laid out in paragraph 9.

It is prohibited to connect multiple PV Modules in a series connection with one DC input of the Micro Inverter. The DC input voltage will be too high and will probably damage the Micro Inverter.



The parallel connection of two or more PV Modules with one DC input of the Micro Inverter is prohibited. The DC current will be too high and will probably damage the Micro Inverter.

For protective grounding you must connect the designated marks on your PV modules and your Micro Inverter with a suitable Protective Ground.

## 6.9 Step 5: Energize the System

Connect your SP Grid Micro Inverter with the AC grid, either by plugging in the connector as shown as a reference in Figure 6 or by turning on the respective circuit breaker in case of a fixed installation of multiple Micro Inverters as described in paragraph 6.7.2

After about 30 sec your SP Grid Micro Inverter will begin to start working and provide electricity to the grid, provided a DC input from your PV Modules.

The status light is located at the front of the Micro Inverter and provides information about the operating status of your Micro Inverter.

The SP Grid Micro Inverter will only work when connected to the electricity grid. If not connected to the grid the conversion of the DC output from the PV Modules is not active.



No hot plugging on power grid, if you want to remove the micro inverter, please first turn off the respective circuit breaker.

As a consequence of the DC to AC conversion the Micro Inverter generates heat which needs to be dissipated via the casing as the heat sink. The Micro Inverter will automatically reduce its output when the temperature reaches the pre set temperature limit.

## 6.10 Status Lights

Aside of the monitoring of the SP Grid Micro Inverter as described in the following paragraph 7 the Micro Inverter also provides information on its current working mode via the status light. Depending on this information you might need to check also paragraph 8 for some basic help.

Colour	Meaning
Red flashing	Micro Inverter is in the startup mode and the two MPPTs are searching on the DC input for power provided by the PV Modules
Red constant	Failure in the machine
Blue flashing	Micro Inverter re-initiated the MPPT searching mode because of changes on the DC input power
Blue constant	MPPT is locked at the maximum power
Blue slow flashing	Increasing fine-tuning of the MPPTs
Red slow flashing	Decreasing fine-tuning of the MPPTs
Blue and Red slow flashing	Output power adjustment (see also paragraph 3.5)

## 7 Smartphone APP

### 7.1 Installation on your Smartphone

Scan the QR code in Figure 13 or search for the APP “Smart life” or “Tuya smart” in Google Play or the Apple AppStore, download the APP on your Smartphone and complete the installation by creating and confirming your own user account.



Figure 13: Scan the QR code as above and install the APP on your Smartphone

## 7.2 Connect your SP Grid Micro Inverter to your Local Network

In order to connect your SP Grid Micro Inverter to your local network you need to establish first a connection in between the SP Grid Micro Inverter and your Smartphone, see picture 14 for reference.

1. Firstly to make sure PV is connect to micro inverter, and machine is in working status.
2. Turn on the Bluetooth function of your Smartphone (Android systems need to have their positioning function activated as well).
3. Check the quality of your local wireless network with your Smartphone:
  - a. Locate your Smartphone close to your SP Grid Micro Inverter
  - b. Select the 2.4 GHz WiFi signal as the only option on your Smartphone
  - c. Check the quality of your WiFi signal

In case the signal of your local wireless network is not sufficient we recommend to relocate your wireless network router or to add a device which helps to improve the signal quality.

4. Open the selected APP on your Smartphone

The SP Grid Micro inverter automatically enters into network connection mode when switching on for the first startup.

In case you need to connect the Micro Inverter via a different router to the Internet you need to delete first the previous connection and thereafter establish a new connection.

Likewise the previous connection needs to be deleted if a different user wants to get connected in order to release the access rights to others.

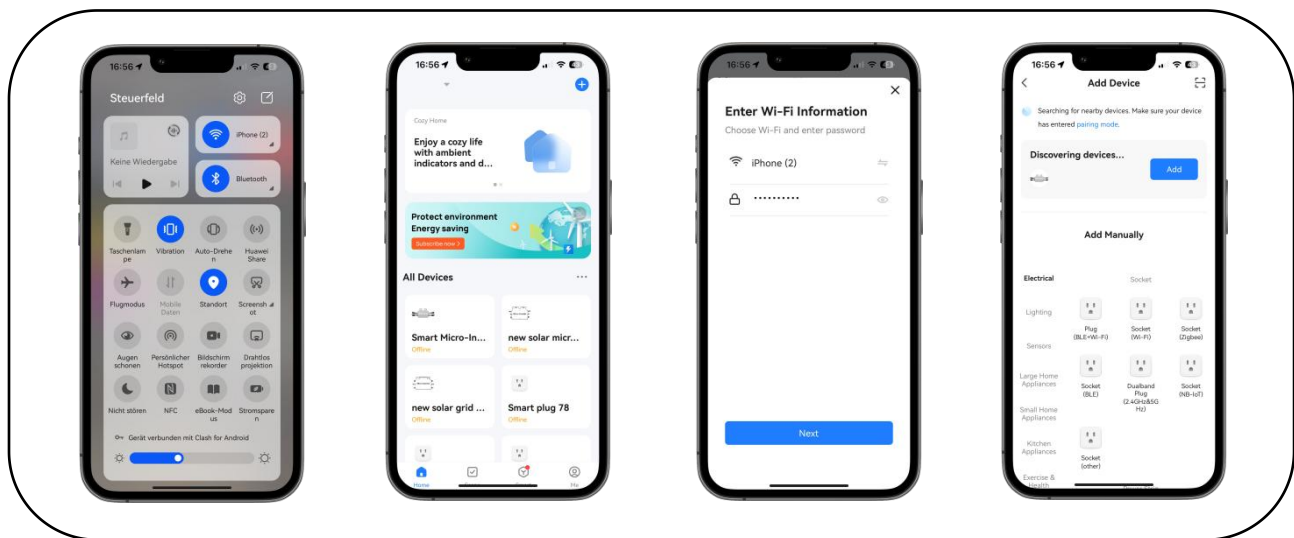


Figure 14: Establishing a connection with the SP Grid Micro Inverter to the local network (illustration for the Tuya Smart APP).

### 7.3 WiFi button

After the SP Grid Micro Inverter is connected to the network you can release this connection and reset the Micro Inverter by pushing the WiFi button for 3-5 seconds.

After pushing the WiFi button the device automatically enters into the network connection mode and you can establish a new connection as described above.

### 7.4 System monitoring with the Smartphone App

With the Smartphone you can monitor the following system parameters (see also Figure 15):

- Input power from your PV modules (voltage and current)
- Output power to the AC grid (voltage and current)
- Electrical energy generated
- SP Grid Micro Inverter rated output power adjustment
- Remote main switch

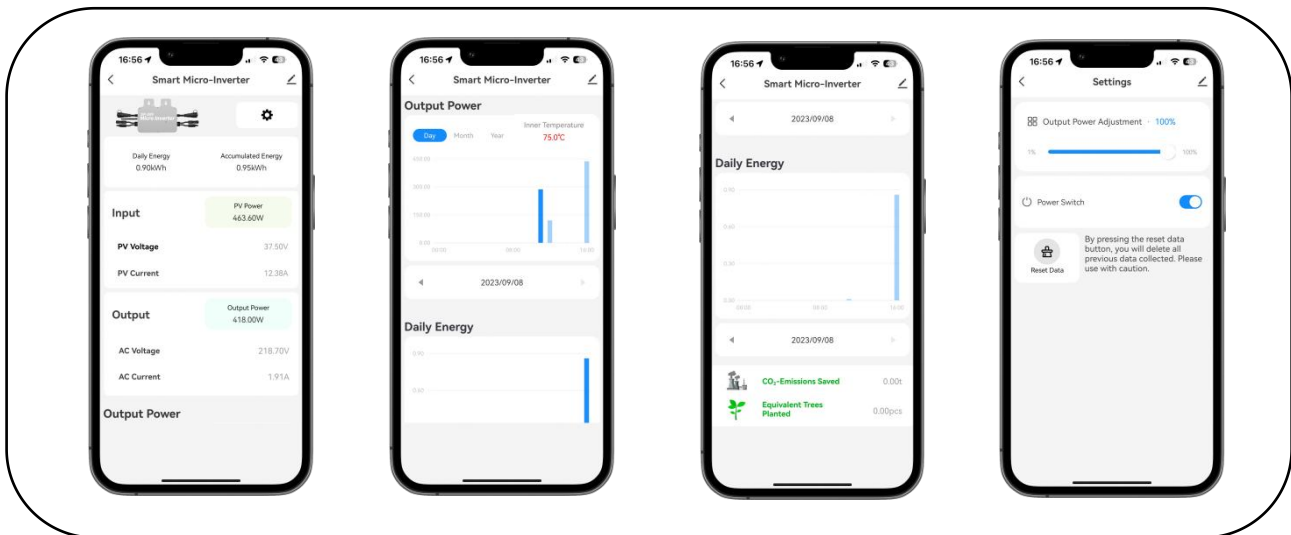


Figure 15: System Monitoring via the Smartphone App

### 7.5 Check the history data when micro inverter is offline

When micro inverter is offline, it's history data is also can be checked through APP, that is just follow below steps as figure 16 by pushing the place with red circle marking.

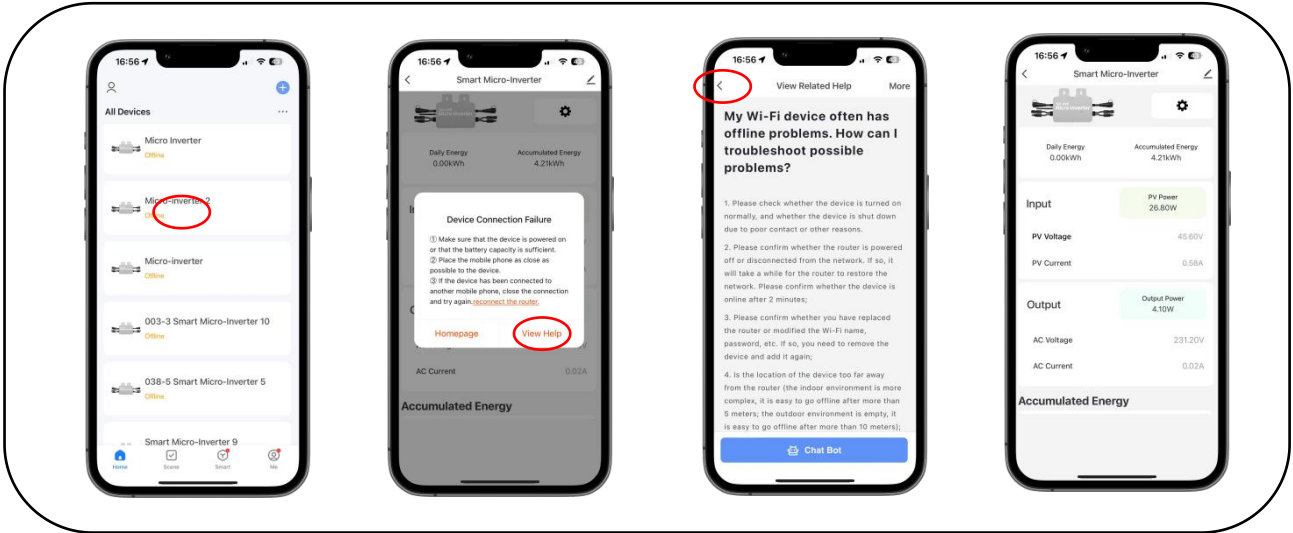


Figure 16 Micro inverter offline history data checking

## 7.6 APP Upgrade

During APP application, if a new message “new updates” pop out on the smartphone screen, that means a new APP version is coming, and you need manually operate to update APP, see figure 16 for reference.

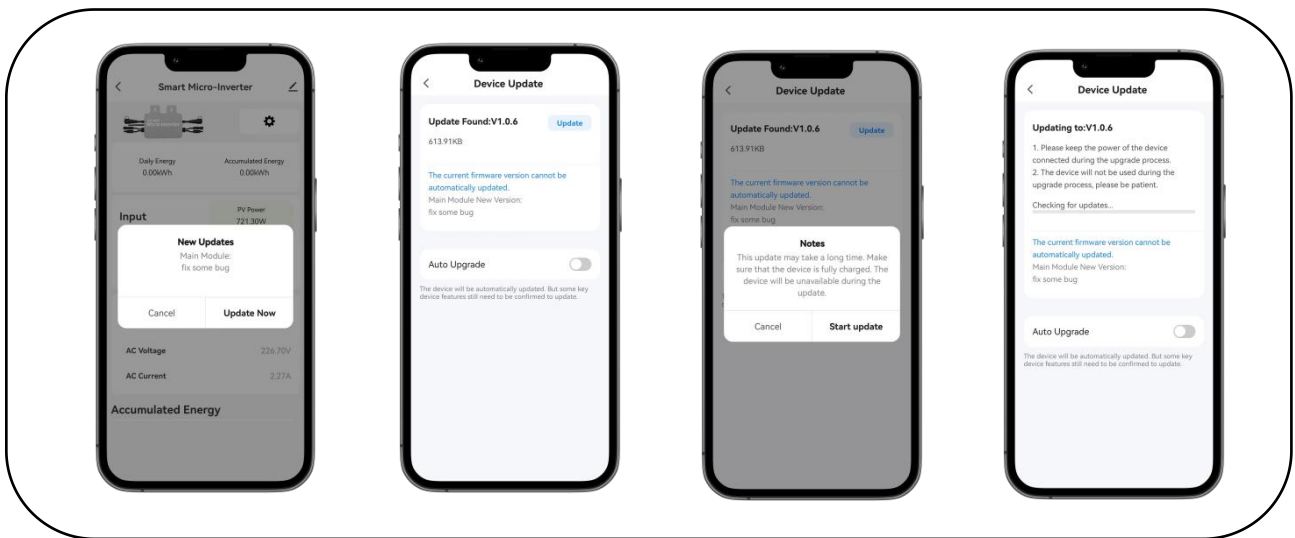


Figure 17: App Upgrade

## 8 Troubleshooting

In case of difficulties with the SP Grid Micro Inverters we recommend to follow firstly the following steps for troubleshooting:

1. Confirm that the grid voltage is within the range as provided in the Technical Data (paragraph 9)
2. Confirm the grid connection of the SP Grid Micro Inverter and in case of a plug make sure that the plug is securely fitted.
3. In case of multiple Micro Inverters connected in a branch circuit layout (see paragraph 6.5.2) check the AC branch connection in between all Micro Inverters and verify that each of the Micro Inverters receives power from the AC grid.
4. Ensure that all respective AC safety breakers and RCDs are working properly and switched on.
5. Check the DC connections between the PV modules and the Micro Inverter.
6. Verify that the DC voltage provided by the PV modules is within the allowable range as provided in the Technical Data (see paragraph 9).
7. Ensure that the Micro Inverter didn't get switched off through the Smartphone App accidentally.
8. Check if the Micro Inverter derated its power output (see paragraph 3.5) because of a high system temperature. Ensure a free natural convection to effectively cool down the Micro Inverter. After cooling down the SP Grid Micro Inverter will increase its power output again accordingly.
9. If the problem still persists, please contact the Technical Support via your local vendor.

Warning:

Do not attempt to repair the Micro Inverter by yourself



Any opening of the housing will void all warranty claims.

If the troubleshoot advices as listed in paragraph 8 fail please contact the Technical Service via your local vendor.

Any faulty device must be disconnected from the mains immediately.

## 9 Technical Data

Model	SP-600	SP-700	SP-800
<b>Input (DC)</b>			
Recommended Max. PV (STC)	375W*2	435W*2	500W*2
Number of input ports	MC4*2		
Max. PV open circuit voltage	60Vdc		
MPPT voltage Range	30Vdc-48Vdc		
Operating voltage range	18.5Vdc-50Vdc		
Start-up voltage	20.5Vdc		
Maximum input current	2*11.5A	2*11.5A	2*12.5A
Maximum input short circuit current	2*18A		
<b>Output(AC)</b>			
Rated output power	550W	650W	750W
Maximum output power	600VA	700VA	800VA
Nominal output voltage	120Vac/230Vac, automatic adjustment		
Nominal output frequency	60Hz/50Hz, automatic fit grid		
Output voltage range	90Vac-160Vac	190Vac-270Vac	
Output frequency range	58.9-61.9Hz	47.5-51.5Hz	
Rated AC current (at 120V)	5A	5.9A	6.6A
Rated AC current (at 230V)	2.6A	3.1A	3.5A
THD	<5% (input 30Vdc~48Vdc)		
Power factor	>0.98 (input 30Vdc~48Vdc)		
Maximum units per branch	3 at 120Vac, 5 at 230Vac		
<b>Efficiency</b>			
Peak conversion efficiency	93%		
CEC efficiency	92%		
MPPT efficiency	99.5%		
Night losses	<0.3W		
<b>Protection</b>			
Anti-islanding protection	Yes		
Output Over/under voltage protection	Yes		
Over temperature protection	Yes, derating		
<b>Mechanical</b>			
Enclosure rating	IP65		
Size(WxHxD)	230x200x48mm		
Weight	IP65	1.7kg	



Package Size(WxHxD)		390x233x98mm
Package weight	IP65	2.5kg
<b>Feature</b>		
Indication lights		Working status LED
Communication		WiFi/2.4G
Monitoring		Smart life (Tuya smart)
Type of isolation		Isolated HF transformer
<b>Environment</b>		
Ambient temperature range		-20℃ ~ +50℃
Storage temperature		-40℃ ~ +85℃
Humidity		≤95%
Altitude		≤2000m
Over voltage category		PV: II AC: III
Location		Indoor, outdoor ( Shelter from rain )
Cooling method		Natural cooling (no fan)
Warranty		5 years
<b>Compliance</b>		
Safety standard		EN62109-1/-2, UL1741, IEC62477,IEEE 1547
EMC		EN61000-3-2/-3, EN61000-6-1/-2/-3/-4, EN301489-3/-17
Grid connection		VDE4105, VDE0124, VDE0126, EN50549-1/-2, CEI021, OVE E8001
Restricted substance		RoHS2.0

# 10 Wiring Diagram

## 10.1 Single Phase Wiring Diagram

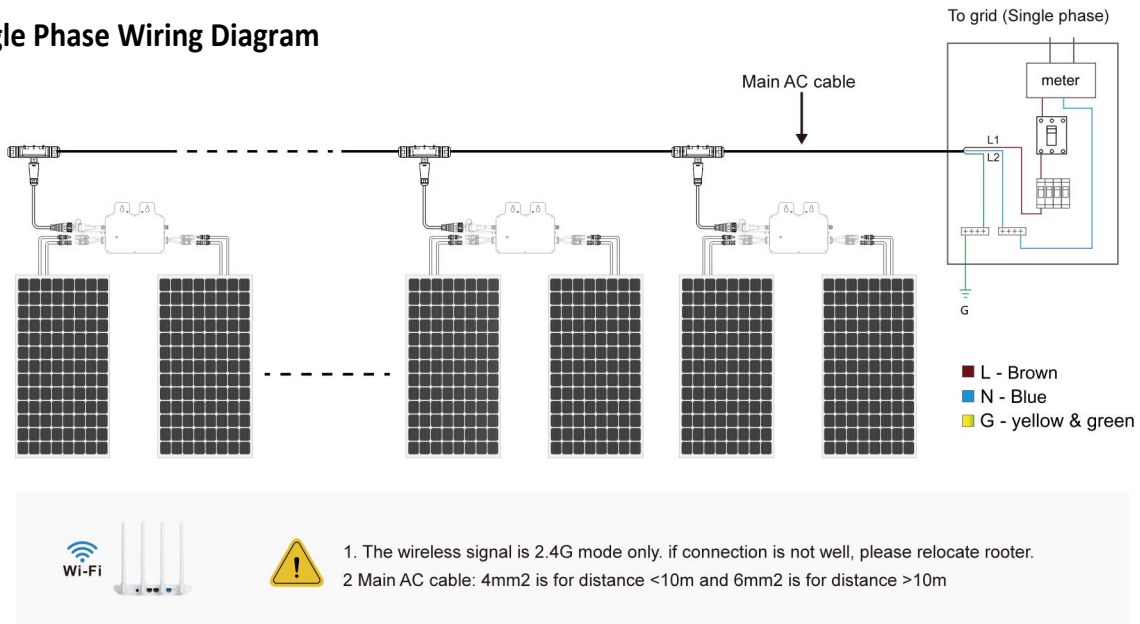


Figure 18: Wiring Diagram for a single phase installation of multiple Micro Inverters.

## 10.2 Three Phase Wiring Diagram

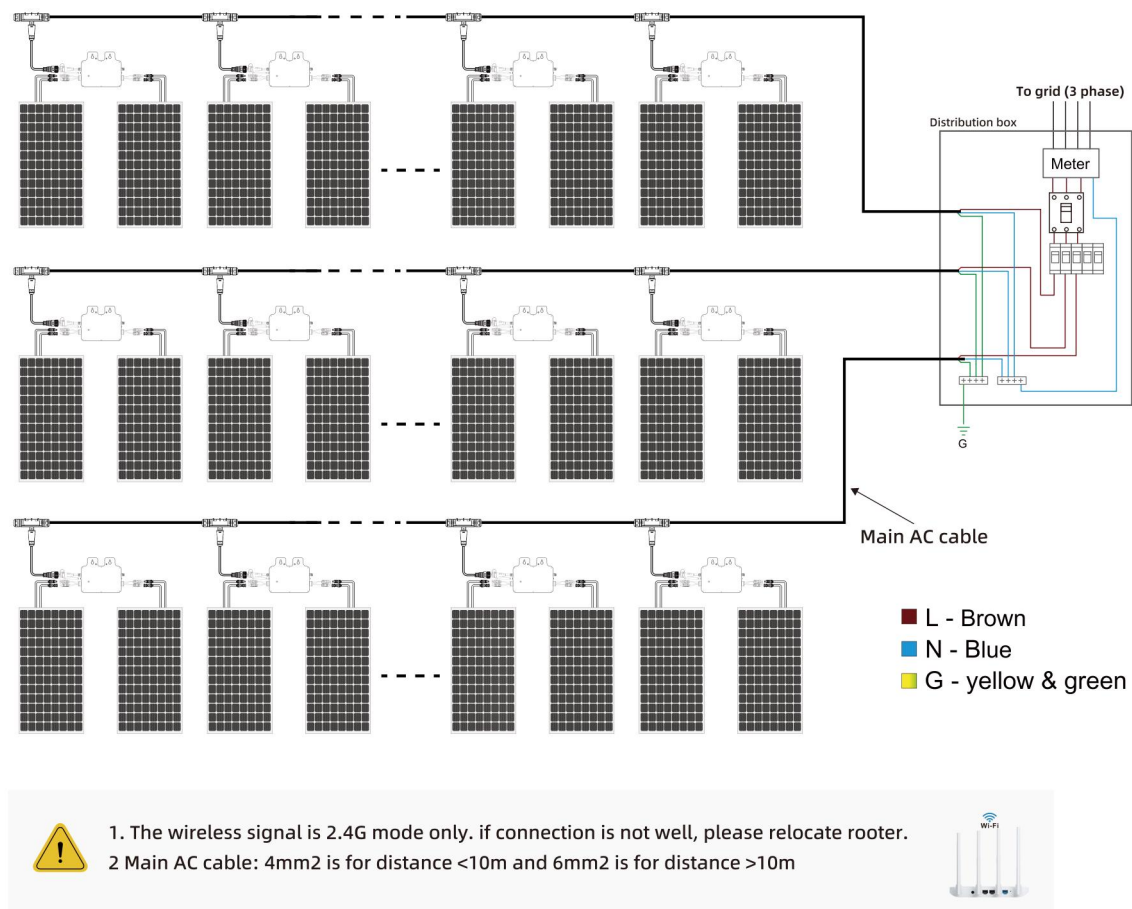


Figure 19: Wiring Diagram for a three phase installation of multiple Micro Inverters.