

# Installation/User Manual

SOSSEN-600 SOSSEN-800 SOSSEN-1000

MICROINVERTER



### **About Micro inverter**

This system is composed of a group of Micro inverters that convert direct current (DC) into alternating current (AC) and feeds it into the public power grid. The system is designed for the incorporation of one Micro inverter for two photovoltaic modules. Each Micro inverter works independently that guarantees the maximum power generation of each photovoltaic module. This setup enables user to control the production of a single photovoltaic module directly, consequently improving the flexibility and reliability of the system.

### **About the Manual**

This manual contains important instructions for the SOSSEN-600/SOSSEN-800/SOSSEN-1000 Micro inverter and must be read in its entirety before installing or commissioning the equipment. For safety, only qualified technician, who has received training or has demonstrated skills can install and maintain this Micro inverter under the guide of this document.

### **Other Information**

Product information is subject to change without notice. User manual will be updated aperiodically, please refer to SOSSEN official website at <https://www.sossen-energy.com/> for the latest version.

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# 1.Important Safety Instructions

This manual contains important instructions to follow during installation and of the Photovoltaic Grid-connected Inverter (Micro inverter). To reduce the risk of electrical shock and ensure the safe installation and operation of the Micro inverter, the following symbols appear throughout this document to indicate dangerous conditions and important safety instructions.

Specifications subject to change without notice - please ensure you are using the latest manual found at the manufacturer website.

**WARNING:** This indicates a situation where to follow instructions may cause a serious hardware failure or personnel danger if not applied appropriately. Use extreme caution when performing this task.

***\*Note: This indicates information that is important for optimized micro inverter operation. Follow these instructions strictly.***

## 1.1Safety Instructions

- ✓ DO NOT disconnect the PV module from the Micro inverter without disconnecting the AC power.
- ✓ Only qualified professionals should install and/or replace the Micro inverters.
- ✓ Perform all electrical installations in accordance with local electrical codes.
- ✓ Before installing or using the Micro inverter, please read all instructions and cautionary markings in the technical documents and on the Micro inverter system and the Micro inverter solar-array.
- ✓ Be aware that the body of the Micro inverter is the heat sink and can reach a temperature of 80°C . To reduce risk of burns, do not touch the body of the Micro inverter.



✓ DO NOT attempt to repair the Micro inverter. If it fails, contact technical support to obtain an RMA number and start the replacement process. Damaging or opening the Micro inverter will void the warranty.

✓ Caution!

The external protective earthing conductor is connected to the inverter protective earthing terminal through AC connector.

When connecting, connect the AC connector first to ensure the inverter earthing then the DC connections.

When disconnecting, disconnect the AC by opening the branch circuit breaker first but maintain the protective earthing conductor in the branch circuit breaker connect to the inverter, then disconnect the DC inputs.

✓ In any circumstance, do not connect DC input when AC connector is unplugged.

✓ Please install isolation switching devices on the AC side of the inverter.

## 1.2 Radio Interference Statement

CE EMC Compliance: The equipment can comply with CE EMC, which are designed to protect against harmful interference in a residential installation. The equipment could radiate radio frequency energy and this might cause harmful interference to radio communications if not following the instructions when installing and using the equipment. But there is no guarantee that interference will not occur in a particular installation. If this equipment causes harmful interference to radio or television reception, the following measures might resolve the issues:

A) Relocate the receiving antenna and keep it well away from the equipment.

B) Consult the dealer or an experienced radio / TV technical for help. Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

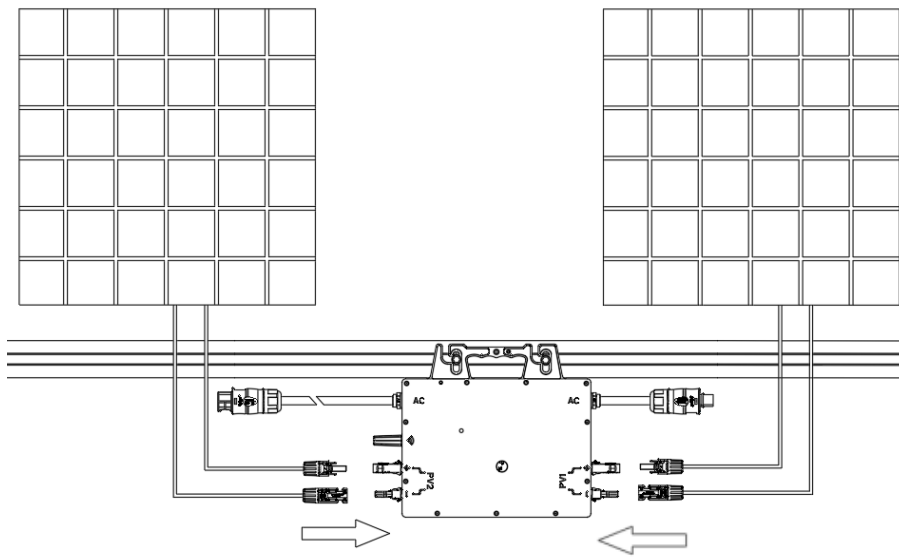
## 1.3 The Meaning of Symbols

| Symbol                                                                              | Usage                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <b>Treatment</b><br>To comply with European Directive 2002/96/EC on waste Electrical and Electronic Equipment and its implementation as national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility. Any device no longer required must be returned to an authorized dealer or approved collection and recycling facility. |
|    | <b>Caution</b><br>Do not come within 8 inches (20cm) of the micro inverter for any length of time while it is in operation.                                                                                                                                                                                                                                                                                        |
|    | <b>Danger of high voltages</b><br>Danger to life due to high voltage in the micro inverter.                                                                                                                                                                                                                                                                                                                        |
|   | <b>Beware of hot surface</b><br>The inverter can become hot during operation. Avoid contact with metal surfaces during operation.                                                                                                                                                                                                                                                                                  |
|  | <b>CE mark</b><br>The inverter complies with the requirements of the Low Voltage Directive for the European Union.                                                                                                                                                                                                                                                                                                 |
|  | <b>Read manual first</b><br>Please read the installation manual first before installation, operation and maintenance.                                                                                                                                                                                                                                                                                              |

## 2. Micro inverter System Introduction

### 2.1 About 2 in 1 Unit

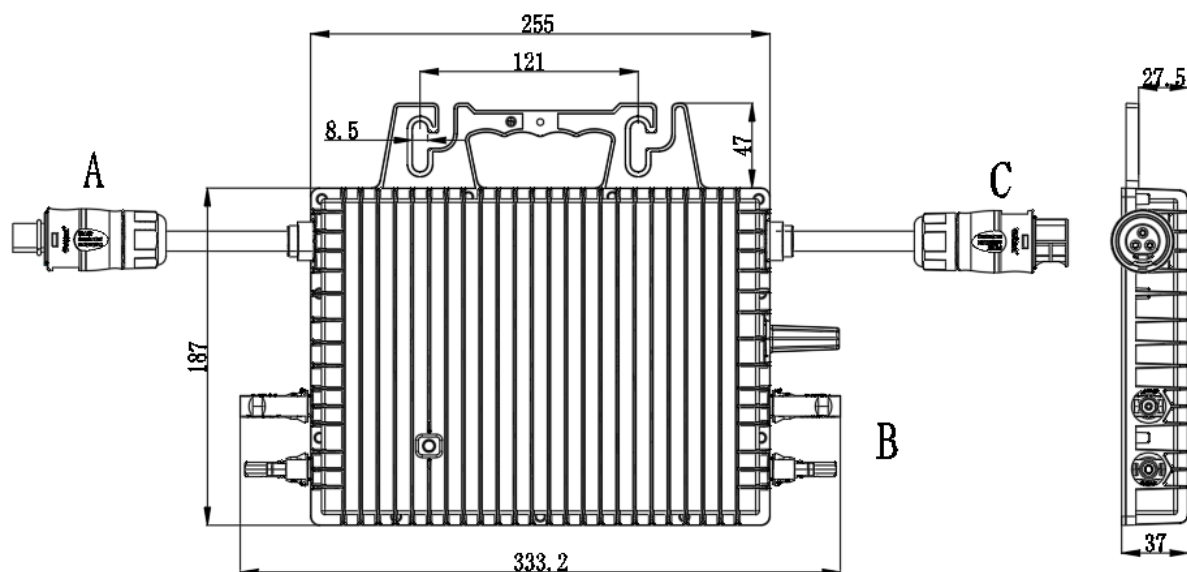
- “2-in-1 Unit Micro inverter ” with ultra-wide DC input operating voltage range (20 V–60 V) and low start-up voltage (22 V only).



### 2.2 Microinverter Highlights

- Maximum output power up to 600W/800W/1000W; Adapted to 60 & 72 cells PV panels.
- CEC weighted efficiency 96.50%.
- MPPT efficiency 99.5%.
- High reliability: NEMA6 (IP67) enclosure; 6000V surge protection.

## 2.3 Terminals Introduction



| Object | Description           |
|--------|-----------------------|
| A      | AC Connector (Male)   |
| B      | DC Connectors         |
| C      | AC Connector (Female) |

## 3.About Function

### 3.1Work Mode

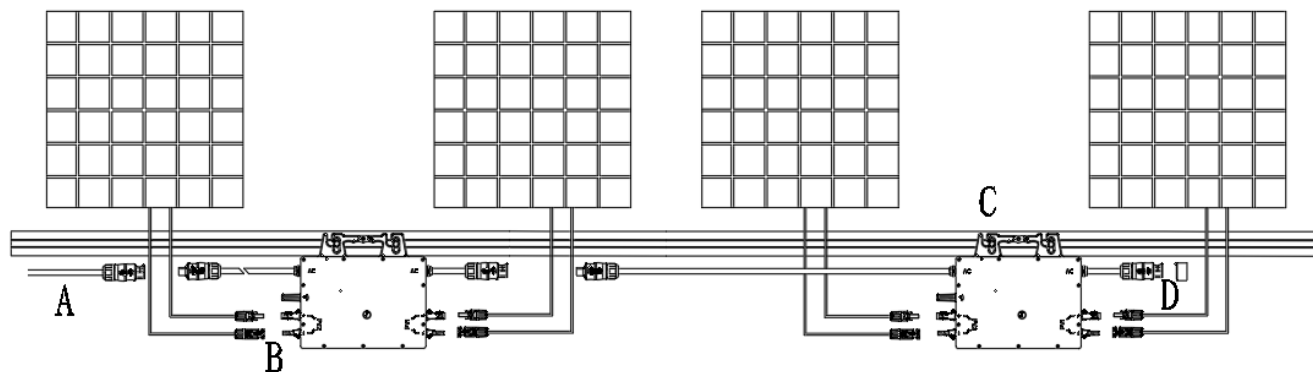
Normal: Under this mode, Micro inverter is operating normally and convert DC power into AC power to support the house loads and feed in to Public Grid.

Standby: There are several circumstances that Micro inverter will stay in Standby mode:

The current condition is contradicted with Micro inverter operating requirement.

## 4.About Installation

### 4.1Accessories



| Object | Description                         |
|--------|-------------------------------------|
| A      | AC End Cable (Male), 2m 12AWG Cable |
| B      | DC Extension Cable, 1m              |
| C      | M8*25 screws                        |
| D      | AC Female End Cap, IP68             |

***\*Note: All accessories above are not included in the package, and need to be purchased separately. Please contact our sales representative for the price. (M8 screws need to be prepared by installer-self.)***

### 4.2Installation Precaution

Please install the Micro inverter and all DC connections under the PV module to avoiding direct sunlight, rain exposure, snow layup, UV etc. Allow a minimum of 2 cm of space around the micro inverter enclosure to ensure ventilation and heat dissipation.

### 4.3Space Distance Required

If the micro inverters are installed on a concrete roof or metal roof, the communication with the WIFI router may be slightly affected. Under such installation conditions, it is better for the micro inverters to be installed 50cm above the roof. Otherwise, more WIFI router may be required to ensure the communication quality between the WIFI router and the micro inverters.

## 4.4 Preparation

- Installation of the equipment is carried out based on the system design and the place in which the equipment is installed.
- The installation must be carried out with the equipment disconnected from the grid (power disconnect switch open) and with the photovoltaic modules shaded or isolated.
- Referring to the Technical Data to make sure the environmental conditions fit the micro inverter's requirement (degree of protection, temperature, humidity, altitude, etc.)
- To avoid power de-rating due to an increase in the micro inverter internal temperature, do not expose it to direct sunlight.
- To avoid overheating, always make sure the airflow around the inverter is not blocked.
- Do not install in places where gasses or flammable substances may be present.
- Avoid electromagnetic interference that can compromise the correct operation of electronic equipment.

When choosing the position of installation, comply with the following conditions:

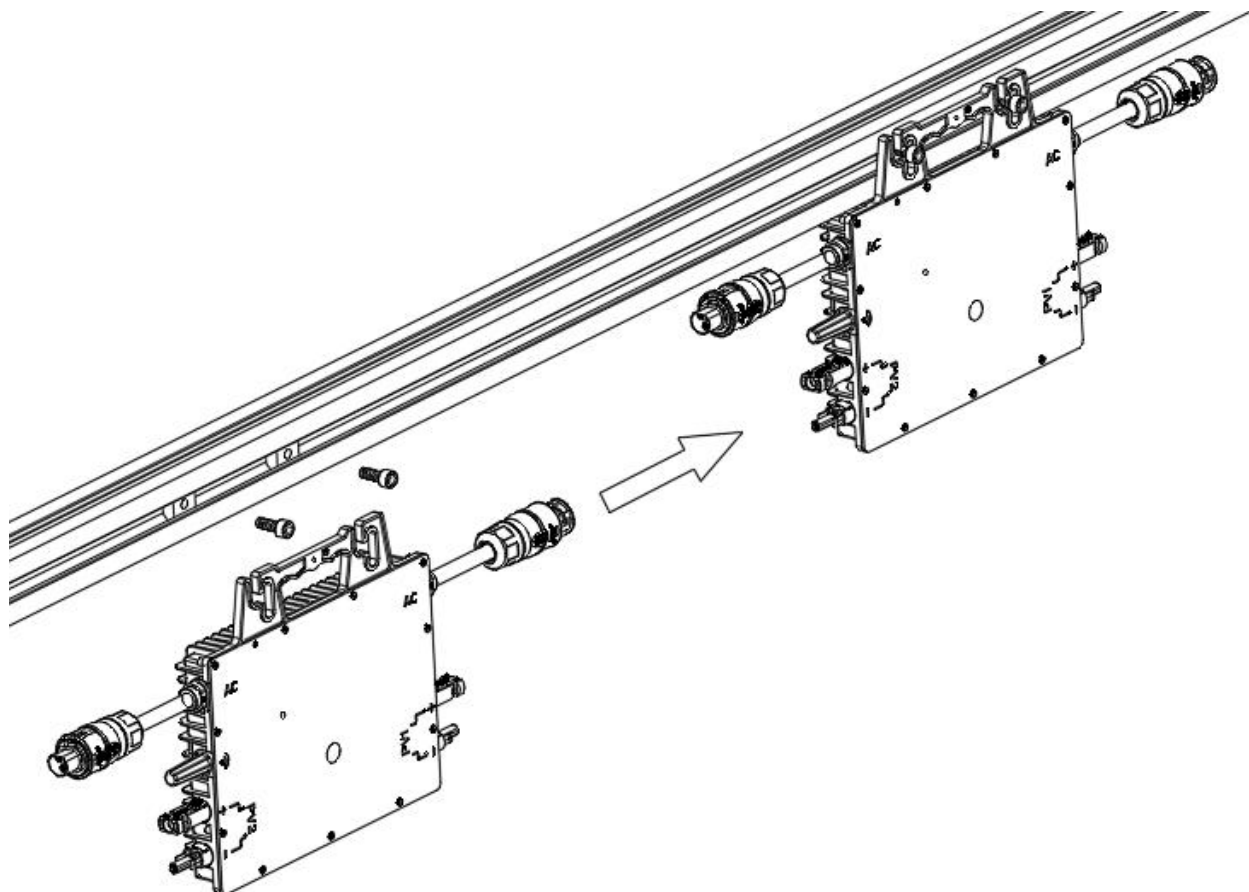
- Install only on structures specifically conceived for photovoltaic modules (supplied by installation technicians).

Install Micro inverter underneath of the photovoltaic modules to make sure it works in the shadow. If this condition cannot be met, might trigger the inverter production de-rating.

## 4.5 Installation Steps

### 4.5.1 Step 1. Attach Micro inverter on Rail.

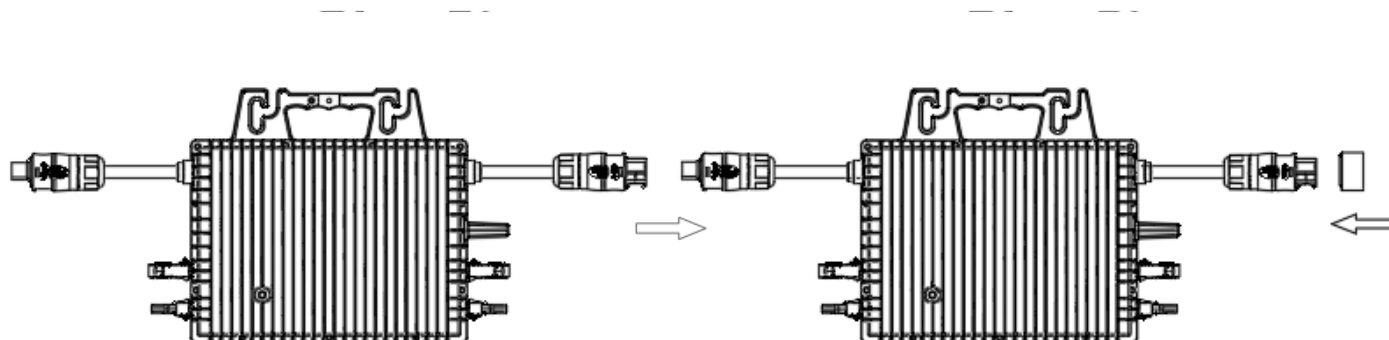
- A) Mark the approximate center of each panel on the frame.
- B) Fix the screw on the rail.
- C) Hang the micro inverter on the screw (as shown in the picture below), and tighten the screw. **The black cover side of the micro inverter should be facing the panel.**



## 4.5.2 Step 2. Connect AC Cables of Micro inverter

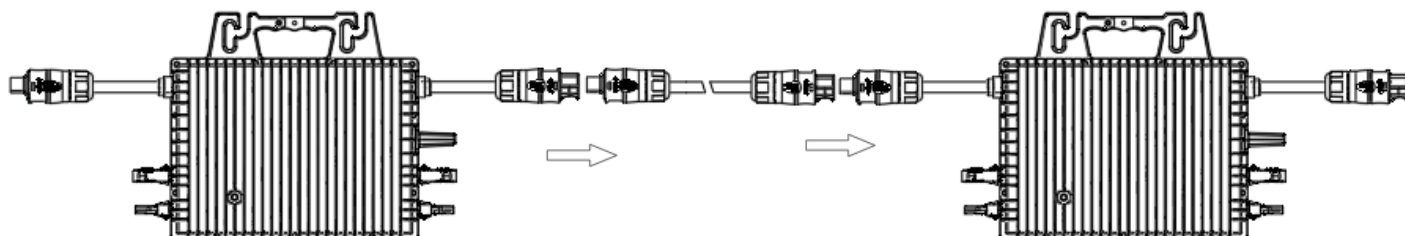
A). Plug the AC connector of the first micro inverter into the connector of the second micro inverter

to form a continuous AC branch circuit.



B). Install the AC end cap on the open AC connector.

*\*Note: The length of AC cable on micro inverters is roughly 2 m, if the distance between two micro inverters is more than 2m, please use an AC extension cable between two micro inverters (as Shown in the picture below).*



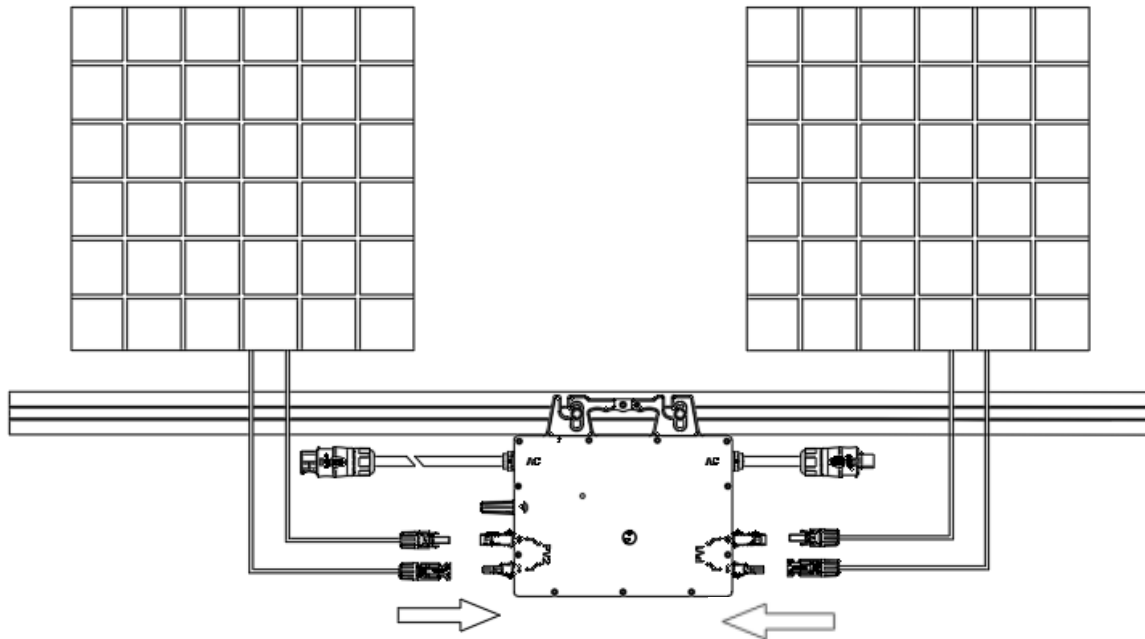
## 4.5.3 Step 3. Create an Installation Map

Affix the serial number label to the respective location on the installation map.

| <div style="display: flex; justify-content: space-between; align-items: center;">  <div>Microinverter Installation Map</div> <div>V1.0</div> </div> |   |   |                                                       |   |   |   |   |                       |   |    |   |    |                    |    |    |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|-------------------------------------------------------|---|---|---|---|-----------------------|---|----|---|----|--------------------|----|----|----|
| Please Make N for<br>North                                                                                                                          |   |   | Panel Type:<br>Azimuth:<br>Tilt:<br>Sheet ___ of ___: |   |   |   |   | Customer Information: |   |    |   |    | DCU Serial Number: |    |    |    |
|                                                                                                                                                                                                                                      | 1 | 2 | 3                                                     | 4 | 5 | 6 | 7 | 8                     | 9 | 10 | 1 | 12 | 13                 | 14 | 15 | 16 |
| A                                                                                                                                                                                                                                    |   |   |                                                       |   |   |   |   |                       |   |    |   |    |                    |    |    |    |
| B                                                                                                                                                                                                                                    |   |   |                                                       |   |   |   |   |                       |   |    |   |    |                    |    |    |    |
| C                                                                                                                                                                                                                                    |   |   |                                                       |   |   |   |   |                       |   |    |   |    |                    |    |    |    |
| D                                                                                                                                                                                                                                    |   |   |                                                       |   |   |   |   |                       |   |    |   |    |                    |    |    |    |
| E                                                                                                                                                                                                                                    |   |   |                                                       |   |   |   |   |                       |   |    |   |    |                    |    |    |    |
| F                                                                                                                                                                                                                                    |   |   |                                                       |   |   |   |   |                       |   |    |   |    |                    |    |    |    |

## 4.5.4 Step 4. Connect PV Modules

- A) Mount the PV modules above the micro inverter.
- B) Connect the PV module's DC cables to the DC input side of the micro inverter



## 4.5.5 Step 5. Energize the System

- A) Turn on the AC breaker of the branch circuit.
- B) Turn on the main AC breaker of the house. Your system will start to generate power after about **two minutes** of waiting time.

## 4.5.6 Step 6. Set Up the Monitoring System

Refer to the **SOSSEN APP User Manual and Quick Installation Guide for SOSSEN Monitoring Platform Online Registration** to install the APP and set up your monitoring system.

## 5. Troubleshooting

### 5.1 Status LED Indicator

The LED flashes at start up. All green flashes indicate normal start up.

#### 1. Start-up Process

- Flashing green : Start-up success
- Flashing Yellow: Grid connect waiting
- Flashing Red : Start-up failure

#### 2.Run Process

- Flashing green (once every 0.5s gap): one input is producing power
- Flashing green (two every 0.5s gap): one input is producing power

#### 3.Operational fault state

- Flashing [red, green] alternately indicates grid failure
- Flashing [red, green, red] alternately indicates device over-temperature alarm
- Flashing [red, green, red, green, red] alternately indicates hardware failure

**\*Note: All the faults are reported to the cloud platform, refer to SOSSEN Monitoring Platform**

**for more information.**

## 5.2 On-site Inspection (For qualified installer only)

To troubleshoot an inoperable micro inverter, follow the steps in the order shown.

1. Verify the utility voltage and frequency are within ranges shown in the in appendix Technical Data of this Micro inverter.
2. Check the connection to the utility grid. Verify utility power is present at the inverter in question by removing AC, then DC power. Never disconnect the DC wires while the micro inverter is producing power. Re-connect the DC module connectors and watch for short LED flashes.
3. Check the AC branch circuit interconnection between all the micro inverters. Verify each inverter is energized by the utility grid as described in the previous step.
4. Make sure that any AC breaker are functioning properly and are closed.
5. Check the DC connections between the micro inverter and the PV module.
6. Verify the PV module DC voltage is within the allowable range shown in appendix Technical Data of this manual.
7. If the problem persists, please call SOSSEN customer support.

***\*Note: Do not try to repair the micro inverter. If the troubleshooting fails, please return it to the factory for replacement***

## 5.3 Routine Maintenance

1. Only authorized personnel are allowed to carry out the maintenance operations and are responsible to report any anomalies.
2. Always use the personal protective equipment provided by the employer when carry out the maintenance operation.
3. During normal operation, check that the environmental and logistic conditions are correct. Make sure that the conditions have not changed over time and that the equipment is not exposed to adverse weather conditions and has not been covered with foreign bodies.
4. DO NOT use the equipment if any problems are found, and restore the normal conditions after the fault removed.
5. Conduct an annual inspection on various components, and clean the equipment with a vacuum cleaner or special brushes.

4. DO NOT use the equipment if any problems are found, and restore the normal conditions after the fault removed.
5. Conduct an annual inspection on various components, and clean the equipment with a vacuum cleaner or special brushes.

## **6.Decommissions**

### **6.1Decommissions**

Disconnect the inverter from DC input and AC output; remove all connection cable from the Microinverter; remove the Micro inverter from the frame.

Please pack the Micro inverter with the original packaging, or use the carton box that can afford 5kg weight and can be fully closed if the original packaging is no longer available.

### **6.2Storage and Transportation**

SOSSEN packages and protects individual components using suitable means to make the transport and subsequent handling easier. Transportation of the equipment, especially by road, must be carried out by suitable ways for protecting the components (in particular, the electronic components) from violent, shocks, humidity, vibration, etc. Please dispose the packaging elements in appropriate ways to avoid unforeseen injury.

It is the customer 's responsibility to examine the condition of the components transported. Once receiving the Micro inverter, it is necessary to check the container for any external damage and verify receipt of all items. Call the delivering carrier immediately if damage or shortage is detected. If inspection reveals damage to the inverter, contact the supplier, or authorized distributor for a repair/return determination and instructions regarding the process.

The micro inverter storage temperature is -40-85°C.

## 6.3 Disposal

If the equipment is not used immediately or is stored for long periods, check that it is correctly packed. The equipment must be stored in well-ventilated indoor areas that do not have characteristics that might damage the components of the equipment.

Take a complete inspection when restarting after a long time or prolonged stop.

Please dispose the equipment properly after scrapping, which are potentially harmful to the environment, in accordance with the regulations in force in the country of installation.

## 7. Technical Data

### 7.1 DC Input

| Model                                   | SOSSEN-600                   | SOSSEN-800                   | SOSSEN-1000                  |
|-----------------------------------------|------------------------------|------------------------------|------------------------------|
| Commonly used module power (W)          | Up to 420+<br>(Single panel) | Up to 540+<br>(Single panel) | Up to 670+<br>(Single panel) |
| Peak power MPPT voltage range (V)       | 20-55                        | 20-55                        | 20-55                        |
| Start-up voltage (V)                    | 22                           | 22                           | 22                           |
| Operating voltage range (V)             | 20~60                        | 20~60                        | 20~60                        |
| Maximum input voltage (V)               | 60                           | 60                           | 60                           |
| Maximum input current (A)               | 2*20                         | 2*20                         | 2*20                         |
| Maximum input short circuit current (A) | 2*25                         | 2*25                         | 2*25                         |

### 7.2 AC Output

| Model                              | SOSSEN-600               | SOSSEN-800  | SOSSEN-1000 |
|------------------------------------|--------------------------|-------------|-------------|
| Rated output power (W)             | 600                      | 800         | 1000        |
| Rated output current (A)           | 2.61                     | 3.48        | 4.35        |
| MAX output current (A)             | 3                        | 4           | 5           |
| MAX Inrush current (A)             | 3                        | 4           | 5           |
| Initial short-circuit current (A)  | 3                        | 4           | 5           |
| Nominal output voltage/range (V)   | 230/198-264              | 230/198-264 | 230/198-264 |
| Nominal frequency/range (Hz)       | 48-52 (under 50Hz @230V) |             |             |
| Power factor                       | >0.99                    |             |             |
| Output current harmonic distortion | <3%                      | <3%         | <3%         |
| Maximum units per branch           | 9                        | 7           | 5           |

### 7.3 Efficiency, Safety and Protection

| Model                             | SOSSEN-600 | SOSSEN-800 | SOSSEN-1000 |
|-----------------------------------|------------|------------|-------------|
| CEC peak efficiency               | 96.50%     | 96.50%     | 96.50%      |
| Nominal MPPT efficiency           | 99.50%     | 99.50%     | 99.50%      |
| Night time power consumption (mW) | <50        | <50        | <50         |

## 7.4 Mechanical Data

| Model                          | SOSSEN-600                   | SOSSEN-800 | SOSSEN-1000 |
|--------------------------------|------------------------------|------------|-------------|
| Ambient temperature range (°C) | -40 ~ +65                    | -40 ~ +65  | -40 ~ +65   |
| Storage temperature range (°C) | -40 ~ +85                    | -40 ~ +85  | -40 ~ +85   |
| Dimensions (W×H×D mm)          | 260*197.5*35.6               |            |             |
| Weight (kg)                    | 3.3                          | 3.3        | 3.3         |
| Enclosure rating               | Outdoor-NEMA (IP67)          |            |             |
| Cooling                        | Natural convection – No fans |            |             |
| Highest altitude               | 3000m                        |            |             |
| Pollution degree               | PD3                          |            |             |
| Protective class               | I                            |            |             |
| Storage and operating humidity | < 95% non-condensing         |            |             |
| Terminal overvoltage class OVC | II                           |            |             |

## 7.5 Features

| Model         | SOSSEN-600                            | SOSSEN-800 | SOSSEN-1000 |
|---------------|---------------------------------------|------------|-------------|
| Communication | Wifi and bluetooth                    |            |             |
| Monitoring    | TUYA APP                              |            |             |
| Warranty      | 12 years standard                     |            |             |
| Compliance    | EN 50549- 1: 2019, VDE-R-N 4105: 2018 |            |             |

**\*Note: Voltage and frequency ranges can be extended beyond nominal if required by the utility.**

## 8. Autonime Micro Reverse Monitoring Platform V1.0 (how to use the “SOSSEN” APP)

### 8.1 User instructions

The “SOSSEN” APP is a mobile application of the micro-inverse autonomous monitoring platform. This APP is used by power plant owners or group companies to query power plant information, monitor power plant equipment operating data in real time, and calculate power generation revenue. Its specific functions include: user registration, power plant creation, binding ownership, visitors, binding equipment, workbench, real-time monitoring, power plant events, power plant logout and other functions. The data created on the mobile device is synchronized in real time with the web-based business system.

The user types and corresponding permissions in the system are as follows:

| serial number | User type           | Information about the power plant | Bind/unbind device | Share power plant | Deregistration from the power plant |
|---------------|---------------------|-----------------------------------|--------------------|-------------------|-------------------------------------|
| 1             | Installers, dealers | Edit delete                       | Bind/Unbind        | yes               | yes                                 |
| 2             | owner               | Edit delete                       | Bind/Unbind        | yes               | yes                                 |
| 3             | Visitors            | read-only                         | read-only          | No                | read-only                           |

### 8.2. „SOSSEN“ APP-Installation

**Android users:** Search “SOSSEN” on Google play to download and install.

**IOS users:** Search for “SOSSEN” in the Appstore to download and install.

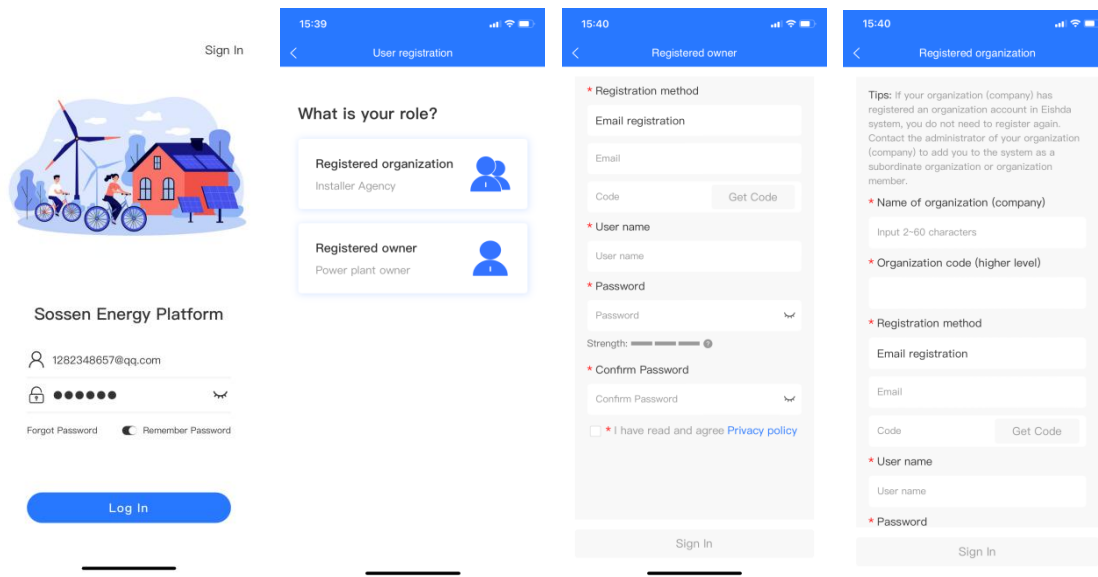
### 8.3. The next step: “SAUSEN” APP registration

1: Click the button at the top right of the page

2: Registered organization or registered owner

*\* Non-users of this system cannot log in.*

*Supports password saving and forgotten password retrieval functions*



## 8.4.Then: additional power plants

- 1: Working platforms
- 2: Click on the word icon in the top right corner
- 3: additional power plants

## 8.5.And: connect to the WiFi

- 1:mein
- 2:WIFI configuration
- 3: Go over to the WiFi interface.
- 4:Turn on the wireless phone of the mobile phone to get the network signal of the module.
- 5:Select a Wi-Fi network that begins with "SOSSEN".
- 6: The next step
- 7:Click "Search"
- 8:After selecting the router to connect to the hotspot, enter the router's Wi-Fi connection password. Other options can be left as default.

## 6.Last: reboot

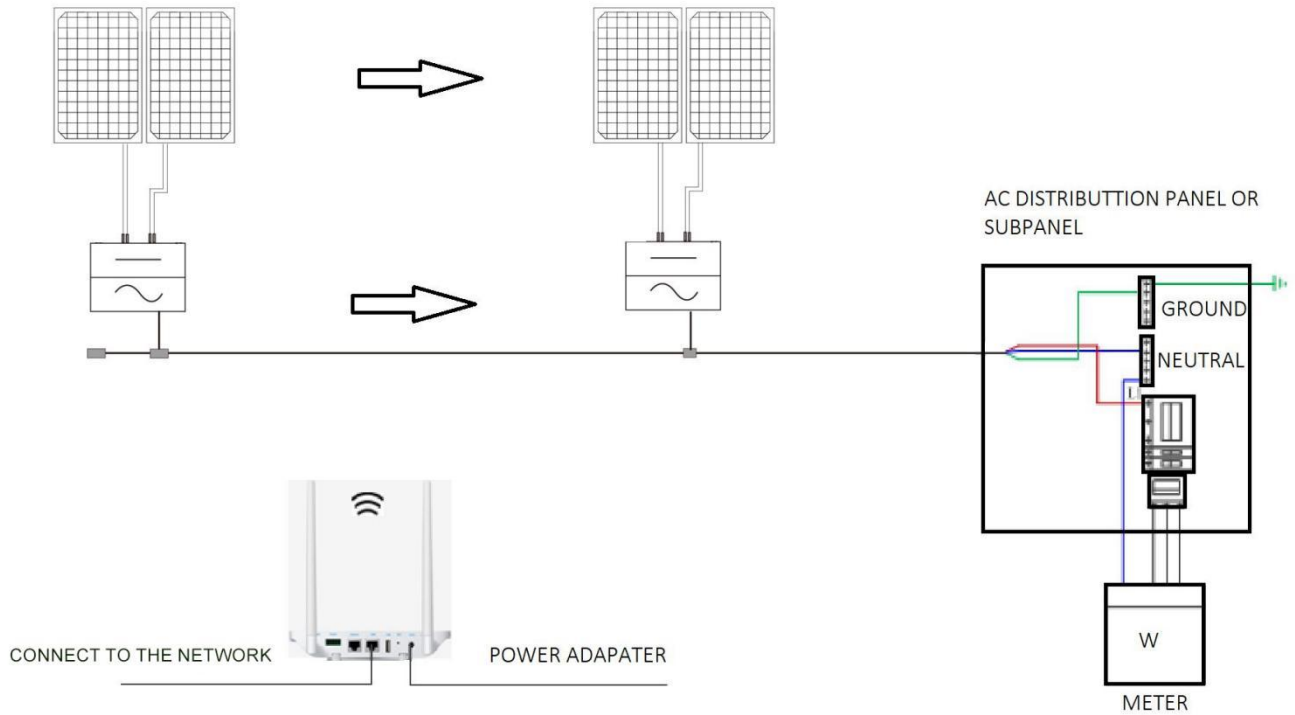
Appendix 1:

Installation Map

|                                                                            |   |   |                                                |   |   |   |   |                       |   |    |    |                    |    |    |    |    |
|----------------------------------------------------------------------------|---|---|------------------------------------------------|---|---|---|---|-----------------------|---|----|----|--------------------|----|----|----|----|
| <div><div>SOSSEN</div><div>Microinverter Installation Map V1.0</div></div> |   |   |                                                |   |   |   |   |                       |   |    |    |                    |    |    |    |    |
| Please Make N for North                                                    |   |   | Panel Type:<br>Azimuth:<br>Tilt:<br>Sheet of : |   |   |   |   | Customer Information: |   |    |    | DCU Serial Number: |    |    |    |    |
|                                                                            | 1 | 2 | 3                                              | 4 | 5 | 6 | 7 | 8                     | 9 | 10 | 11 | 12                 | 13 | 14 | 15 | 16 |
| A                                                                          |   |   |                                                |   |   |   |   |                       |   |    |    |                    |    |    |    |    |
| B                                                                          |   |   |                                                |   |   |   |   |                       |   |    |    |                    |    |    |    |    |
| C                                                                          |   |   |                                                |   |   |   |   |                       |   |    |    |                    |    |    |    |    |
| D                                                                          |   |   |                                                |   |   |   |   |                       |   |    |    |                    |    |    |    |    |
| E                                                                          |   |   |                                                |   |   |   |   |                       |   |    |    |                    |    |    |    |    |
| F                                                                          |   |   |                                                |   |   |   |   |                       |   |    |    |                    |    |    |    |    |

## Appendix 2:

### WIRING DIAGRAM – 230VAC SINGLE PHASE:



## WIRING DIAGRAM –120VAC / 240VAC SPLIT PHASE:

