

# Single-phase M-Combiner Lite

## MC100L User Manual



**ATMOCE**

## About This Document

### Corporate Contact Information

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### Disclaimer

- Product information is subject to change without prior notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.
- For optimum reliability and to meet warranty requirements, this product must be installed in accordance with the instructions in this manual.
- For warranty text, please refer to <https://www.atmoce.com/warranty>.

### Applicable Scope

- This manual is intended for professional installation and maintenance personnel only.
- This manual mainly introduces the assembly, installation, configuration, maintenance and troubleshooting methods of the the MC100L combiner.

Revision History

	Date	Version	Description
1	2024-10-30	Rev. 1.0.2	1. Add the SPD-related information. 2. Adjust grid-side and battery-side cable parameters.
2	2024-09-30	Rev. 1.0.1	1. Add the RCD-related information.
3	2024-06-30	Rev. 1.0.0	1. For testing purposes only

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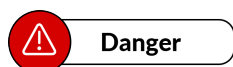
## Safety Information

### 1.1 Statement

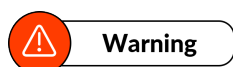
- Before installing or using the Atmoce M-Combiner, please carefully read the user manual, all instructions and safety labels on the product, and any safety manuals available. Not following these safety instructions may result in personal injury, damage to the equipment, or invalidation of the warranty.
- DANGER, WARNING, CAUTION, and NOTE in this manual imply that they must be observed. You must also comply with relevant international, national or regional standards and industry practices. Atmoce assumes no responsibility for any violation of safe operation requirements or of safety standards for the design, manufacture and use of the equipment.
- This equipment should be used in an environment that meets the design specifications; otherwise, the equipment failure, abnormal equipment function or damage to components that arises shall not be covered by the warranty.
- All operations such as transport, storage, installation, operation, use, maintenance, etc. should comply with applicable laws, regulations, standards and specifications.

### 1.2 Safety Labels

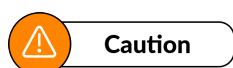
To reduce the risk of electric shock and to ensure the safe installation and operation of the microinverter system, the following safety symbols are used throughout this manual to indicate hazardous conditions and important safety instructions.



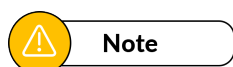
A label indicates a hazard with a high level of risk. If not avoided, it may result in serious personal injury or death.



A label indicates a hazard with a medium level of risk. If not avoided, it may result in serious personal injury or death.



A label indicates a hazard with a low level of risk. If not avoided, it may result in serious personal injury or death.



A label indicates a safety hazard and risk of device damage. If not avoided, it may result in equipment damage, data loss, reduced performance, and other consequences, but does not involve personal injury.

## 1.3 Personal Safety Instructions



### **Danger**

- The installation process is strictly prohibited to operate with electricity. It is prohibited to install or remove cables with electricity. The moment the cable core touches the conductor, it will generate electric arc or electric spark, which can lead to fire or personal injury.
- When equipment is energised, unregulated and incorrect operation may produce a fire, electric shock or explosion, resulting in injury, death or property damage.
- Do not work alone. When using or working near electrical equipment, someone should be within earshot or close enough to help you. Remove rings, bracelets, necklaces, watches, etc. when operating PV modules, microinverters, M-Combiners and other electrical equipment.



### **Warning**

- Specialised protective equipment must be used during operations, such as protective clothing, insulated shoes, goggles, helmets and insulated gloves.
- Do not ignore warnings, cautions and precautions in manuals and on equipment.
- During operation of the equipment, if a malfunction is detected that could result in personal injury or equipment damage, immediately terminate the operation, report it to the person in charge, and take effective protective measures.
- Do not apply power to the equipment before installation is completed or without confirmation from a qualified person.



### **Note**

- Do not install by untrained personnel. Atmoce shall not be liable for any loss or damage caused by improper use, installation, or misuse of the product.
- Personnel responsible for installing and maintaining the equipment must first be trained in the correct methods of operation and be aware of the various safety precautions and relevant standards in their country/region.
- Personnel in special scenarios such as electrical operation, work at heights, and operation of special equipment must have special operating qualifications required by the local country/region.

## 1.4 M-Combiner Safety Instructions



### Danger

- Do not attempt to repair the combiner without authorization, as it does not contain any user repairable components. Unauthorized disassembly, repair, or destruction of the combiner and its internal components will void the warranty. In case of malfunction of the combiner, please contact Atmoce for technical assistance (web link).
- Do not use the combiner in any way other than as specified by Atmoce as unauthorized use may result in personal injury or damage to the equipment.
- Do not use accessories that have not been approved by Atmoce as this may result in equipment damage or personal injury.
- Since the combiner is powered by multiple sources, please confirm that all the circuit breakers are in the Off position before any installation, maintenance or cleaning.
- Do not operate the Atmoce combiner if the appearance is damaged.



### Warning

- Check that the cables and connectors to ensure that they are in good condition. Do not operate the combiner with damaged or unqualified cables or connectors.
- Do not disassemble the enclosure and protective panel of the combiner except for necessary maintenance.
- Use the circuit-breakers in the Atmoce combiner in accordance with their markings and do not change their purpose without authorisation.



### Note

- When installing the Atmoce combiner, comply with the installation regulations and/or local electrical regulations.
- The combiner is suitable for use in environments with a maximum ambient temperature of 50°C.
- When installing the Atmoce combiner, use copper wires with a temperature resistance of 90°C or higher. Please take full account of local regulations.
- Please select cables that meet safety requirements based on the parameters of the circuit breaker, check the cables and connectors to ensure that they are in good condition and in rated condition.
- Do not connect the combiner to the grid or connect the AC circuit before completing all installation procedures and obtaining approval from the utility company.
- Provide cable supports at least every 1 meter.

## 1.5 Cable Safety Instructions



### Danger

- Do not attempt to install cables unless the circuit is disconnected.
- Take care not to damage the copper conductor of the cable when stripping the cable sheath. If the exposed wires are damaged, the system may not function properly.



### Warning

- Ensure that all AC and DC wiring is correct and that none of the AC or DC cables are pinched, shorted, or damaged. Ensure that all AC junction boxes are properly closed.
- Do not leave the connectors on the cable uncovered for long periods of time. Unused AC connectors must be covered with caps because they are energised when the system is powered on.
- All cables must be firmly connected, well insulated, and of appropriate specifications.
- If it is necessary to remove the sealing caps or connectors, use the disconnection tool supplied by Atmoce.



### Note

- Cable selection and routing must follow local laws, regulations and norms.
- When routing cables, make sure that the minimum bending radius of cables is 8xOD (8 times the cable's outer diameter) or r55mm.
- In the process of laying power cables, if the length of the power cable is found to be insufficient, the power cable must be replaced, and it is strictly prohibited to make joints or welding points in the power cable.
- Do not expose terminals or cable connectors to continuous tension and avoid pulling or bending the cable at the connection.
- Avoid routing cables with overly tight cable clamps.
- Cable crossing holes should be free of sharp edges to avoid damage to the cables by sharp edges, burrs, and so on.
- Ensure that the cable connector is kept free from dirt or debris and prevent dirt or debris from entering the connector.

## 1.6 CT Safety Instructions



### Danger

- To avoid the risk of electric shock, always disconnect the circuit from the distribution system (the distribution panel) before installing or repairing the current transformers (CTs).
- Do not install CTs when the sensing circuit is energised. Before turning on the sensing circuit, the CT signal cable must be installed in the terminal.
- Only qualified personnel should troubleshoot, install or replace CTs.
- Mount the CTs and cables so that they do not come into direct contact with live terminals.



### Warning

- Failure to follow these instructions may result in damage to the equipment.
- Please observe national and local electrical regulations for all electrical installations.

## 1.7 Environment Instructions



### Danger

- Do not place the equipment in an environment where flammable or explosive gases or fumes are present, and it is forbidden to carry out any operation in such an operation.
- Do not install or use the equipment in a potentially explosive environment.
- Do not place the equipment near sources of heat or ignition, such as fireworks, candles, heaters or other heat generating devices, as heat from the equipment may result in damage to the equipment or cause a fire.
- Do not expose terminals or connectors to direct sunlight.



### Warning

- Do not attempt to install the equipment in adverse weather conditions.
- Do not expose terminals or connectors to directed pressurized liquids (such as water jets).
- Do not immerse the terminals or connectors in liquid.
- Do not install the equipment in an environment with volatile gases, corrosive gases or organic solvents.
- Do not install the equipment in an area with strong vibration, strong noise sources, and strong electromagnetic field interference.
- When installing the equipment, make sure that the mounting surface is sturdy and meets the equipment load-bearing requirements.
- After installing the equipment, remove empty packing materials, such as cardboard boxes, foam, plastic, cable ties, etc., from the equipment area.

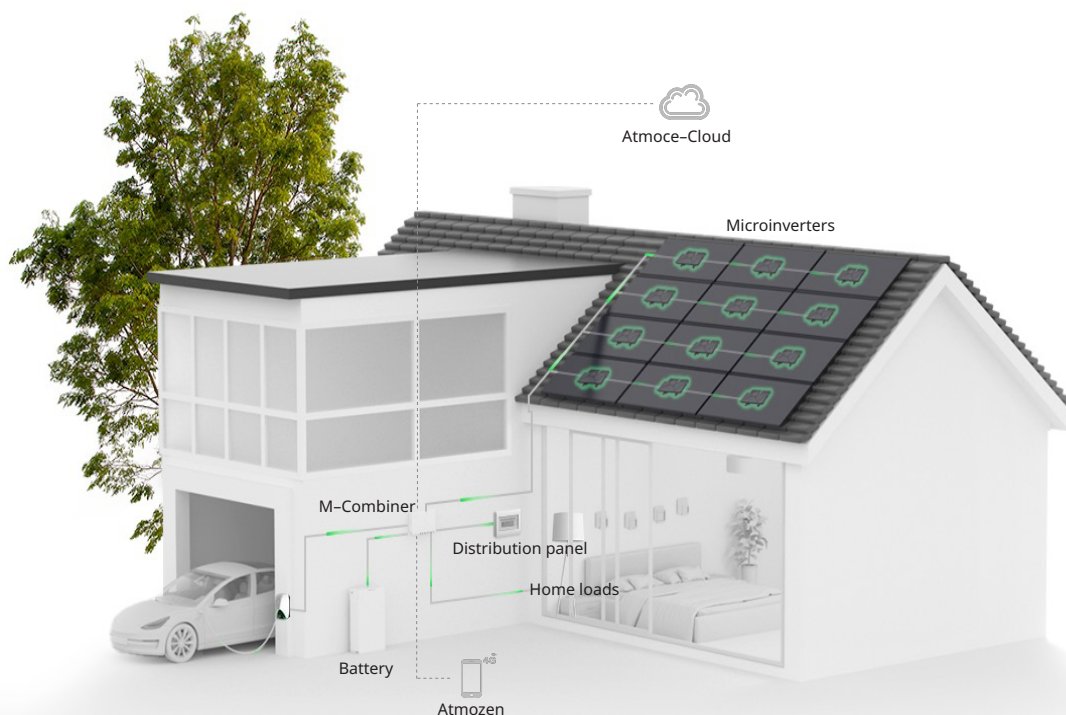
## Product Information

### 2.1 Atmoce System

#### 2.1.1 Overview

The system includes the following components:

- **Microinverter:** MI-400/MI-425/MI-450/MI-500, etc. Atmoce microinverters are compact and efficient devices for home distribution systems. The grid-connected microinverter converts the DC output of a PV module into grid-compliant AC power.
- **M-Combiner:** MC100/MC100L/MC100L, etc. The M-Combiner is an energy management equipment that ensures the proper connection of microinverters, batteries and loads, and enables grid connection.
- **Atmoce-Cloud:** A web-based energy management portal. Users can use it to view detailed operational data, manage multiple energy systems, and resolve system issues remotely. For more information, please visit <https://www.atmocecloud.com>.
- **Atmozen app:** A mobile application suitable for iOS and Android devices with the following main functions: remote module level management, home energy management, etc.
- **Battery.**
- **AC EV charger, heat pump or other residential loads.**



## 2.1.2 Functional characteristics

- **Safety**

Atmoce system eliminates any potential hazards associated with high-voltage direct current (DC), ensuring that homeowners and installers are not exposed to dangerous electrical environments. In addition, the system is resistant to extreme weather conditions and can operate reliably even in harsh environments.

- **Flexibility & Intelligence**

The Atmoce system's AC-coupled architecture provides the flexibility to expand the system as needed. This feature allows users to easily add new PV modules. In addition, the system incorporates digital real-time management to accurately measure and manage the power generation status.

- **Excellent Compatibility**

The system offers excellent compatibility, based on the grid-forming design, which ensures seamless integration with the grid. In addition, the system supports multi-energy access, such as solar energy, the grid, and even wind energy. This versatility ensures that the system can adapt to changing energy demands and sources, providing a reliable and sustainable energy solution for the future.



## 2.2 MC100L

### 2.2.1 Overview

The single-phase M-Combiner Lite (MC100L) is an integrated management and power equipment that ensures the proper connection of microinverters, batteries and loads, and achieves grid-connection with the distribution panel. The MC100L integrates an M-Gateway Lite to manage the system performance and the devices above. The combiner communicates with the Atmoce-Cloud and Atmozen app, allowing users to learn about the energy production and consumption in their homes.

### 2.2.2 Functional Characteristics

- **Stable, Continuous, Uninterrupted Power Supply**

The core of the system is an M-Gateway lite that intelligently manages and optimises energy flows to ensure a stable and reliable power supply for your home. In addition, the system offers the flexibility to utilise a variety of energy sources, including renewable energy, grid power and energy storage systems.

- **Safety Priority with IP65 and Insulation Materials**

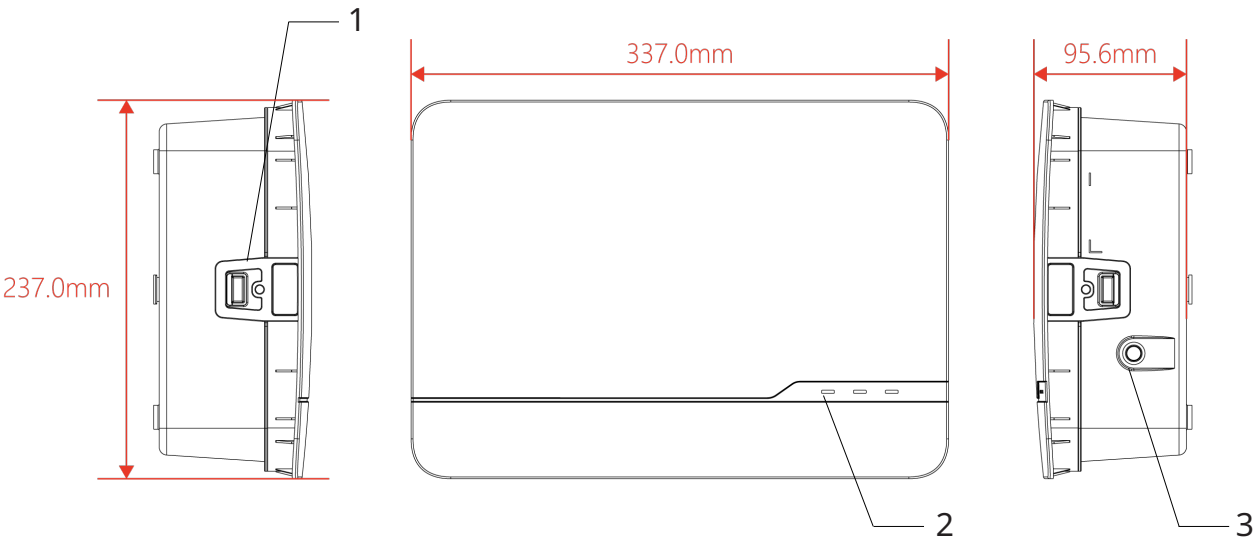
The system is IP65-rated and double-insulated to protect against dust, water and other environmental hazards. This rugged design allows for easy outdoor installation and ensures that our systems can provide power regardless of the weather condition.

- **Easy Installation**

Atmoce systems feature fast, trouble-free installation, eliminating the need for complex, time-consuming reassembly of an in-house power distribution system. Our Atmozen app guides you through each step, ensuring that your system is installed correctly and operates efficiently.

2.2.3 Product Structure

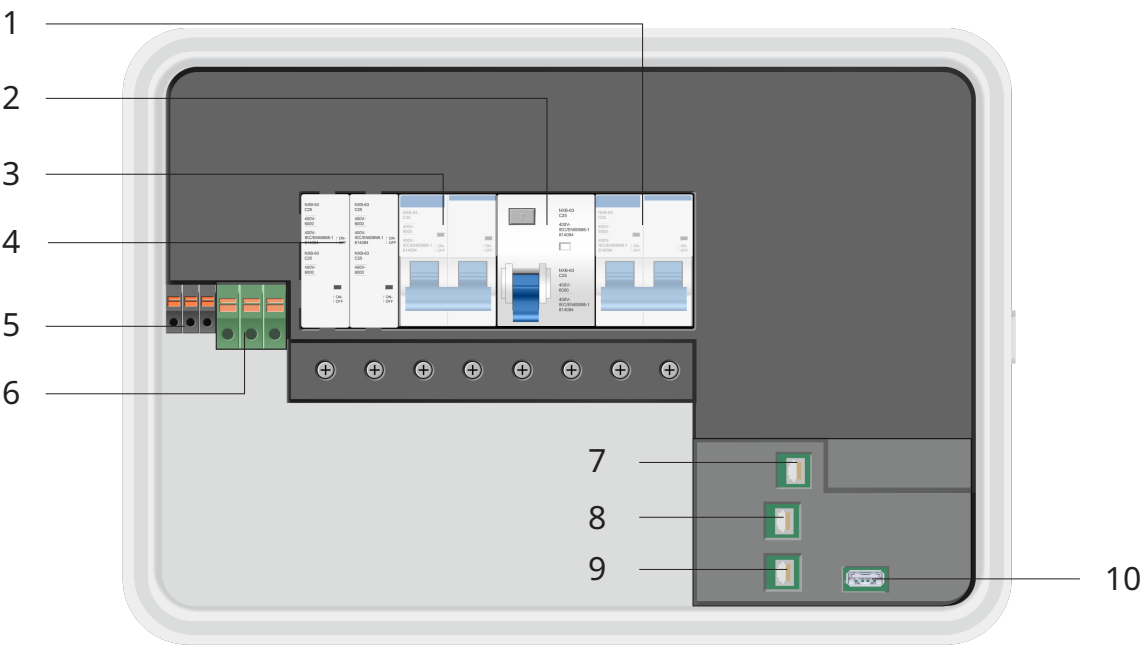
Section A. MC100L Dimensions



- 1. Snap fasteners
- 2. LED indicator
- 3. Reset button

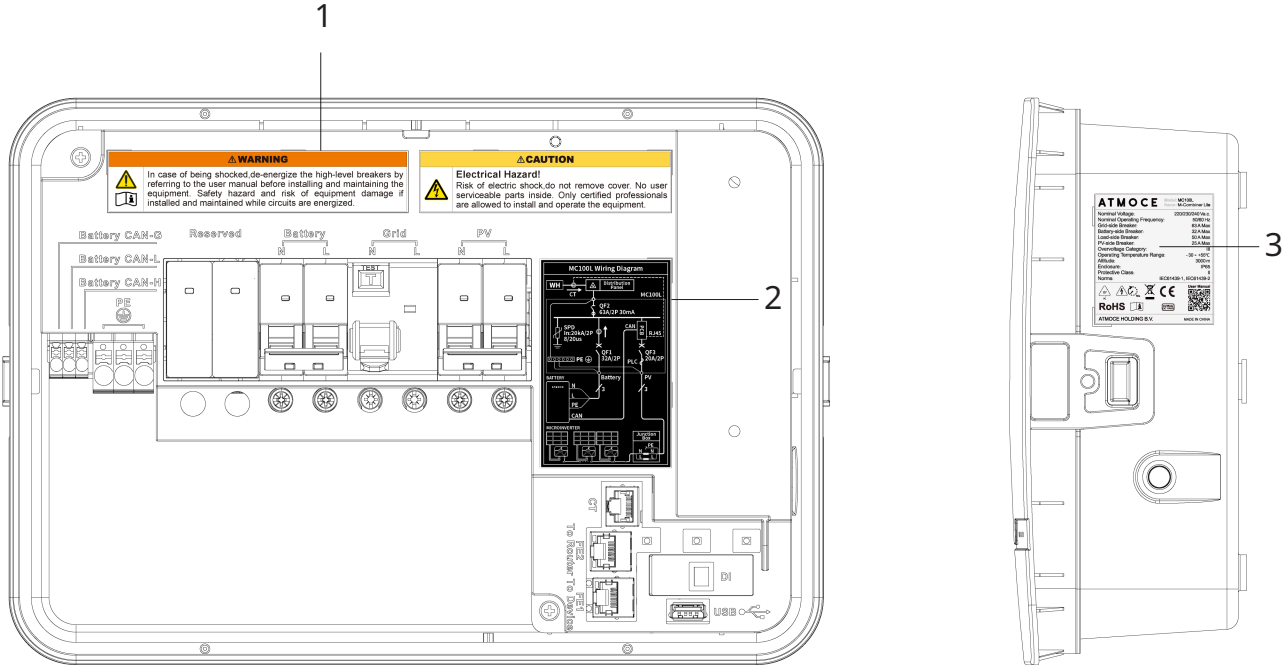
Section B. Items inside the MC100L

Open the door of the MC100L and refer to the following figure and table for pre-installed components in the MC100L.





	Catalog	Model	Description
1	PV breaker	NXB-63 C20 2P	2-pole, 20A, 230V, 6kA
2	Grid breaker	NL1-63 63A 2P 30mA	2-pole, 63A, 230V
3	Battery breaker	NXB-63 D32 2P	2-pole, 32A, 230V, 6kA
4	SPD	NXU-II G	2-pole, In: 20kA
5	CAN terminal block	RPV2.5	Used to connect to the battery
6	PE terminal block	RPV6-PE	Used to connect to the ground
7	Consumption CT interface	/	Used to connect to the consumption CT
8	ETH interface 1	/	Used to connect to the home router
9	ETH interface 2	/	Used to connect to the home load
10	USB interface	/	Reserved interface

2.2.4 Product Labels




Section A. MC100L Safety Instructions

The following safety instructions appear on the protective panel:



**⚠ WARNING**

In case of being shocked, de-energize the high-level breakers by referring to the user manual before installing and maintaining the equipment. Safety hazard and risk of equipment damage if installed and maintained while circuits are energized.









**⚠ CAUTION**

**Electrical Hazard!**  
Risk of electric shock,do not remove cover. No user serviceable parts inside.Only certified professionals are allowed to install and operate the equipment.

Section B. Nameplate Label Symbols

The following symbols appear on the nameplate label:

Symbol	Description
	Made of PC material. Do not heat or expose to direct sunlight.
	The product has passed CE related certification.
	Waste of electrical and electronic equipment. This product cannot be treated as household waste. Please dispose of it in accordance with local regulations or return it to Atmoce.
	Restriction of Hazardous Substances. The product has passed RoHS certification.
	Delayed discharge. After the device is powered off, please wait 60 seconds for the unit to fully discharge.
	Please read the user manual before using the equipment.

## Storage Requirements

If the product is not to be used and installed immediately, it must be stored in accordance with the following requirements:

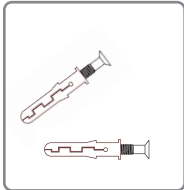


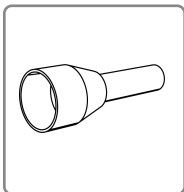
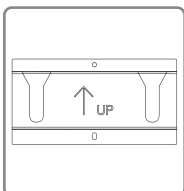

- Do not remove the outer packaging of the product.
- The storage temperature should be maintained within  $-40\text{ }^{\circ}\text{C}$  to  $+70\text{ }^{\circ}\text{C}$ .
- The relative humidity should be maintained between 40% RH and 60% RH.
- Store the product in a clean and dry place, away from dust and moisture.
- Stack no more than 8 layers high. When stacking, please be careful when placing the packaging box to avoid personal injury or equipment damage caused by equipment tipping over.
- Regular inspections are required during storage (once every three months recommended). If the product has been placed in storage for two years or longer, it must be inspected and tested by qualified personnel before use.

## Installation

### 4.1 Prepare for Installation

#### 4.1.1 Check the Items in the Package

Please make sure that the following items are included in the package before installation.

Item	Catelog	Model	Description
	Wall anchors and screws	M6	Mount the combiner on the wall
	Waterproof glands	HQCF-M32-AD34.5 HQCF-M25-AD28.5	Rain-tight fittings on the holes
	Consumption CT	SK9016	Measure electricity consumption in the home
	Cold-press terminals	/	Cover the cable ends
	Mounting tab	/	Mount the combiner on the wall
	Quick installation guide	/	Guide on-site installation

4.1.2 Check the Grid Voltage

Atmoce system should connect to a single-phase grid. Measure AC line voltages at the point of connection to confirm that they are within the ranges.

Grid setup		Voltage range	
Single-phase		L to N	184 to 276 Vac

4.1.3 Plan the Number of Microinverters on each PV AC Branch

The number of microinverters on each PV AC branch shall not exceed the following limits respectively:

Model	Max microinverters/20A branch <sup>a</sup>	Max microinverters/25A branch <sup>b</sup>
MI-400	9	11
MI-425	8	10
MI-450	8	10
MI-500	7	9

a. Output overcurrent protection is provided by a type C circuit breaker inside the M-Combiner, rated at 20A for MI-400/MI-425/MI-450/MI-500.

b. You can replace the PV breaker with one rated at 25A and select the cables that meet the local electrical code requirements.



4.1.4 Prepare the Cables

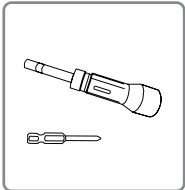
To properly set up the system, it is necessary to select the appropriate cables. The table below shows the recommended cable requirements. You can replace and select the cables that meet the local electrical code requirements.

Connection	Recommended cable size		Terminal requirement
Microinverter	Power cable	2.5 to 4 mm <sup>2</sup> , 2-core	Cold-pressed Terminal
Grid	Power cable	6 to 16 mm <sup>2</sup> , 3-core	Cold-pressed Terminal
	Consumption CT signal cable	Provided by Atmoce	/
Battery	Power cable	4 to 6 mm <sup>2</sup> , 3-core	Cold-pressed Terminal
	CAN cable	0.25 to 0.75 mm <sup>2</sup> , 3-core	Cold-pressed Terminal
Load	ETH cable	802.3, Cat 6 UTP ethernet cable	RJ45
Router	ETH cable	802.3, Cat 6 UTP ethernet cable	RJ45

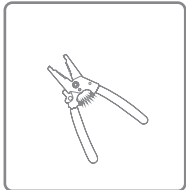
NOTE:

- When connecting the cables to the M-Combiner, you must cover the cable ends by using the cold-press terminal provided in the package.
- When stripping the cable, remove approximately 12–15 mm of the insulation layer from the power cable and 8 mm of the insulation layer from the communication cable.

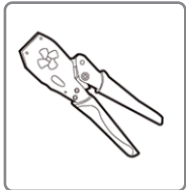
4.1.5 Prepare the Tools and Materials



Screwdriver  
(M6)



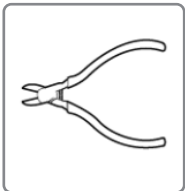
Wire stripper



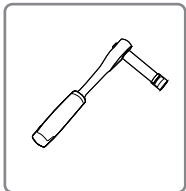
Power line crimper



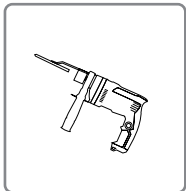
Communication line  
crimper



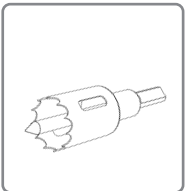
Diagonal cutter



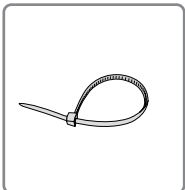
Torque wrench



Drill  
(Φ8 mm)



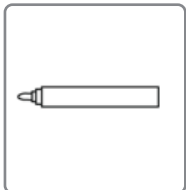
Hole cutter with pilot  
(Φ32 mm and Φ25  
mm)



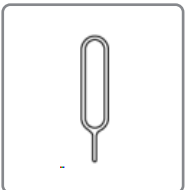
Tie wrap



Multimeter



Marking pen



Needle



Tape measure



Spirit level

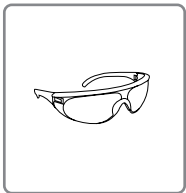


Corrugated protective  
pipe

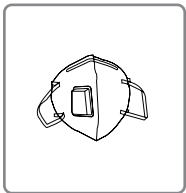
4.1.6 Prepare the Safety Equipment



Safety helmet



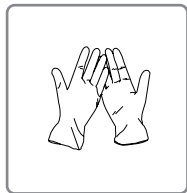
Protective goggles



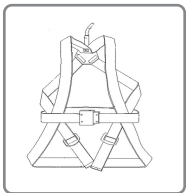
Mask



Safety clothing



Safety gloves



Safety belt



Safety shoes

#### 4.1.7 Download the Atmozen App

Download the latest version of the Atmozen app. Open and log in to your account. You can track the progress of system installation with this app.



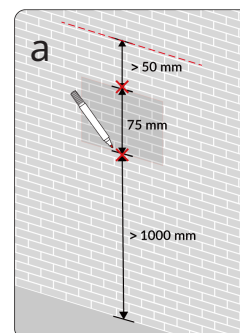
#### 4.1.8 Select How the Device Connects to the Internet

There are two methods: Wi-Fi, and Ethernet.

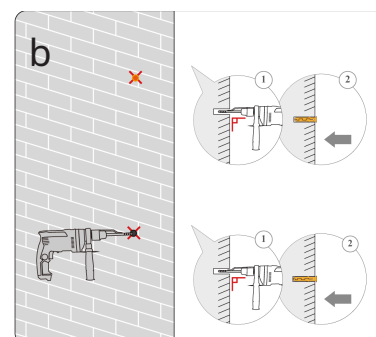
- For Ethernet connection, use 802.3-compliant Cat 6 UTP Ethernet cables.
- For Wi-Fi connection, install the M-Combiner within a 10-m radius from the home router to ensure strong Wi-Fi signals.

## 4.2 Mount the M-Combiner

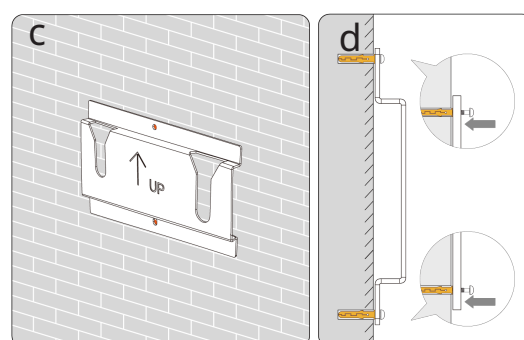
- a. Use a tape measure and make a mark on the wall at least 1,000 mm vertically from the ground. Measure approximately 75 mm above the mark and make another mark.



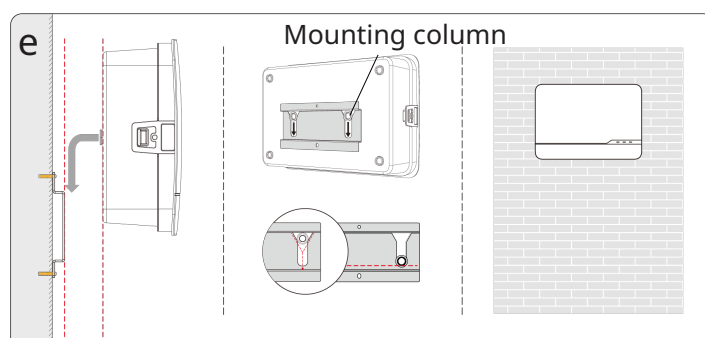
- b. Drill along these marks by using an electric drill with an bit ( $\Phi 8$ ) and insert the wall anchors (provided in the package) into the holes.



- c. Take out the mounting tab in the package and align the screw holes of the mounting tab with the wall anchors.
- d. Insert and tighten the M6 screws by using a Phillips #2 screwdriver with a torque of 3 N·m.



- e. Insert the two mounting columns at the bottom of the MC100L into the sliding rail and slide them to the end.

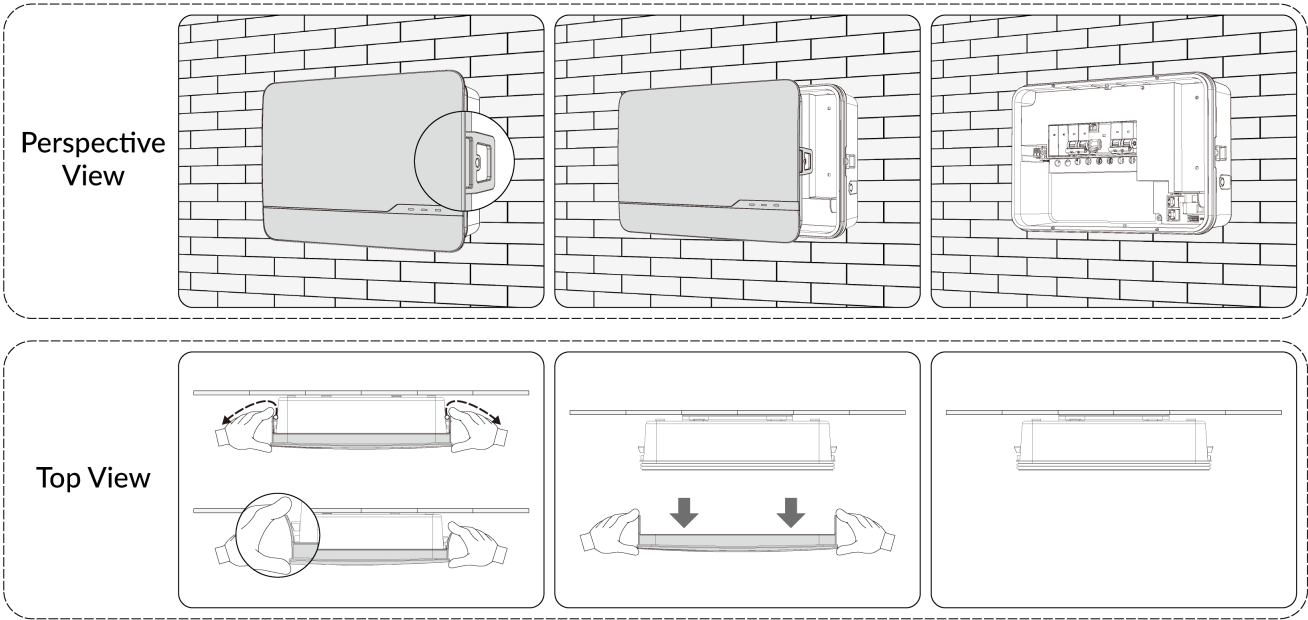


### NOTE:

- Do not install the M-Combiner in an environment with direct sunlight exposure, unless with a sunshade installed
- Install the M-Combiner close to the distribution panel because the signal line of the consumption metering CT is only 5 meters long.

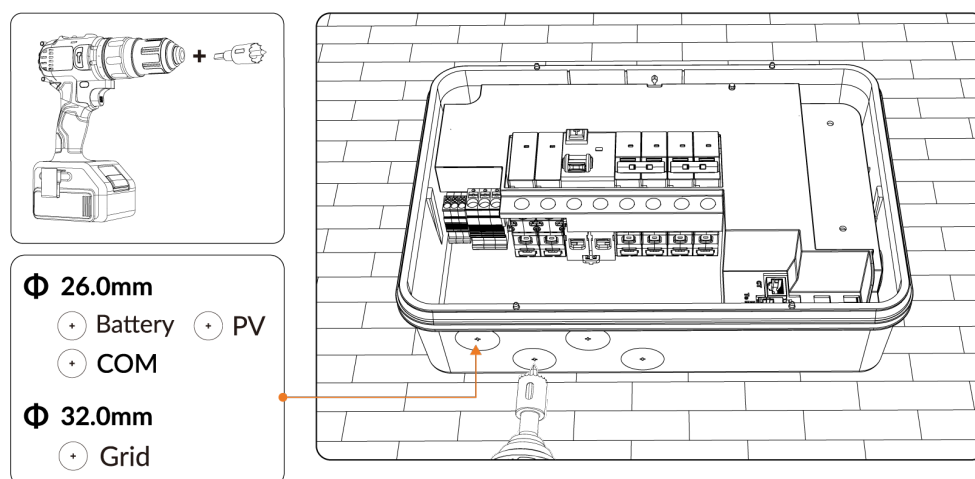
4.3 Remove the Cover

- a. There are two snap fasteners on both sides of the MC100L. Remove the cover by pulling the two snap fasteners outward at the same time and then pulling the cover toward you.



## 4.4 Drill on the MC100L

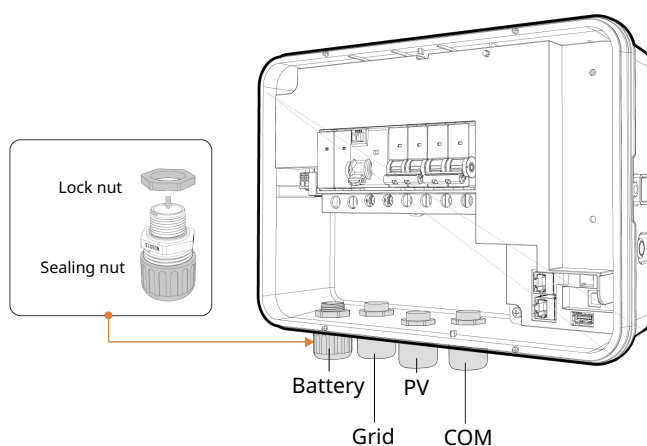
- a. Use the electrical hole cutter with a pilot drill bit to drill holes. The drilling areas and recommended purposes are indicated at the bottom of the M-Combiner.



### NOTE:

- Make sure that the edges of the holes do not exceed the indicated circles.

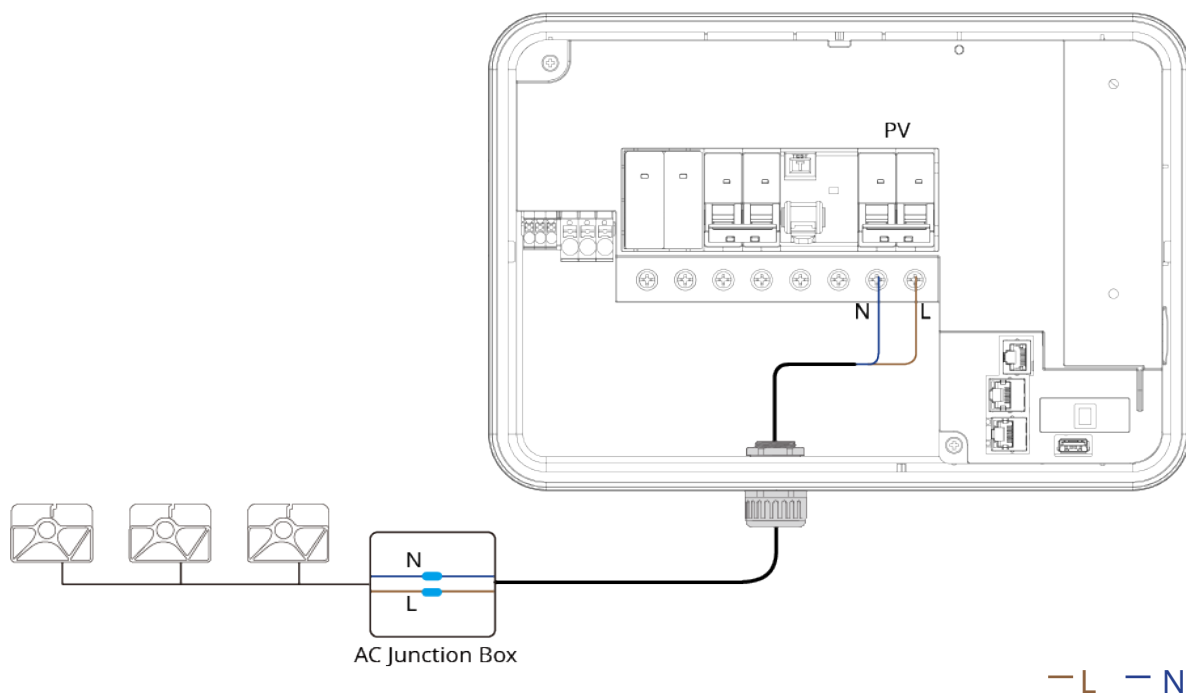
- b. Install the rain-tight fittings to the holes. Several waterproof glands can be found in the package.
- c. Tighten the lock nuts of the glands with a torque of 4-5 N·m and the sealing nuts with a torque of 7-7.5 N·m.



## 4.5 Wire to the M-Combiner

### 4.5.1 Wire from the PV Branch (Microinverter)

- Bring in the cables from the PV branch circuit through the PV hole of the combiner.
- Connect the cables (N and L) to the PV breaker.
- Tighten the screws by using a Phillips #2 screwdriver with a torque of 2-2.5 N·m.
- Optional: Wire the ground cable from the PV rack system to the AC junction box and connect this cable to the PE terminal block in MC100L.





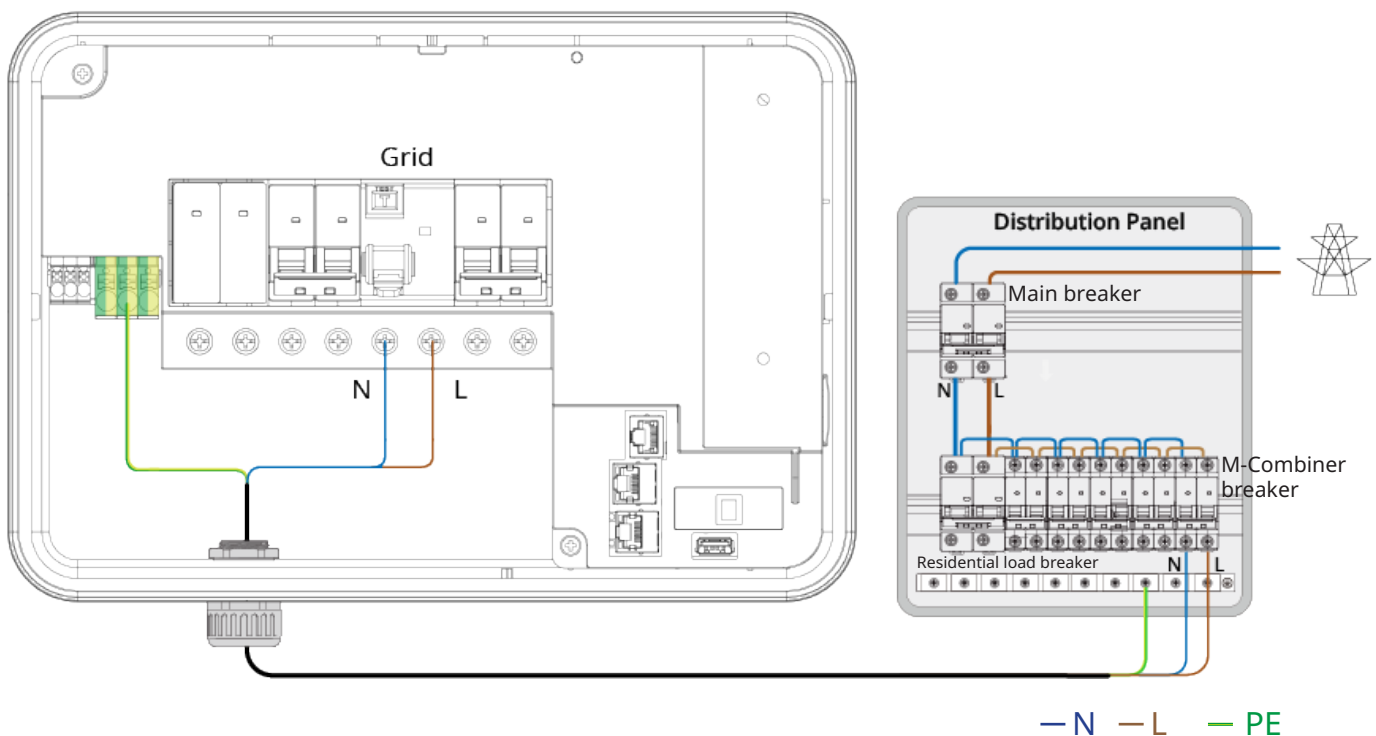
### 4.5.2 Wire from the Distribution Panel (Grid)

#### Section A. Wire the power cables

- Bring in the cables from the distribution panel through the grid hole of the combiner.
- Connect the cables (N and L) to the grid breaker and connect the ground cable to the PE terminal block as shown.
- Tighten the screws by using a Phillips #2 screwdriver with a torque of 2-2.5 N·m.

#### NOTE:

- Ensure that the N cable of the terminal block is connected to the grid neutral line to avoid damaging the devices and voiding the warranty.
- Ensure that the cable sequences (N and L) of the power terminal block, M-Combiner breaker and main breaker are consistent.



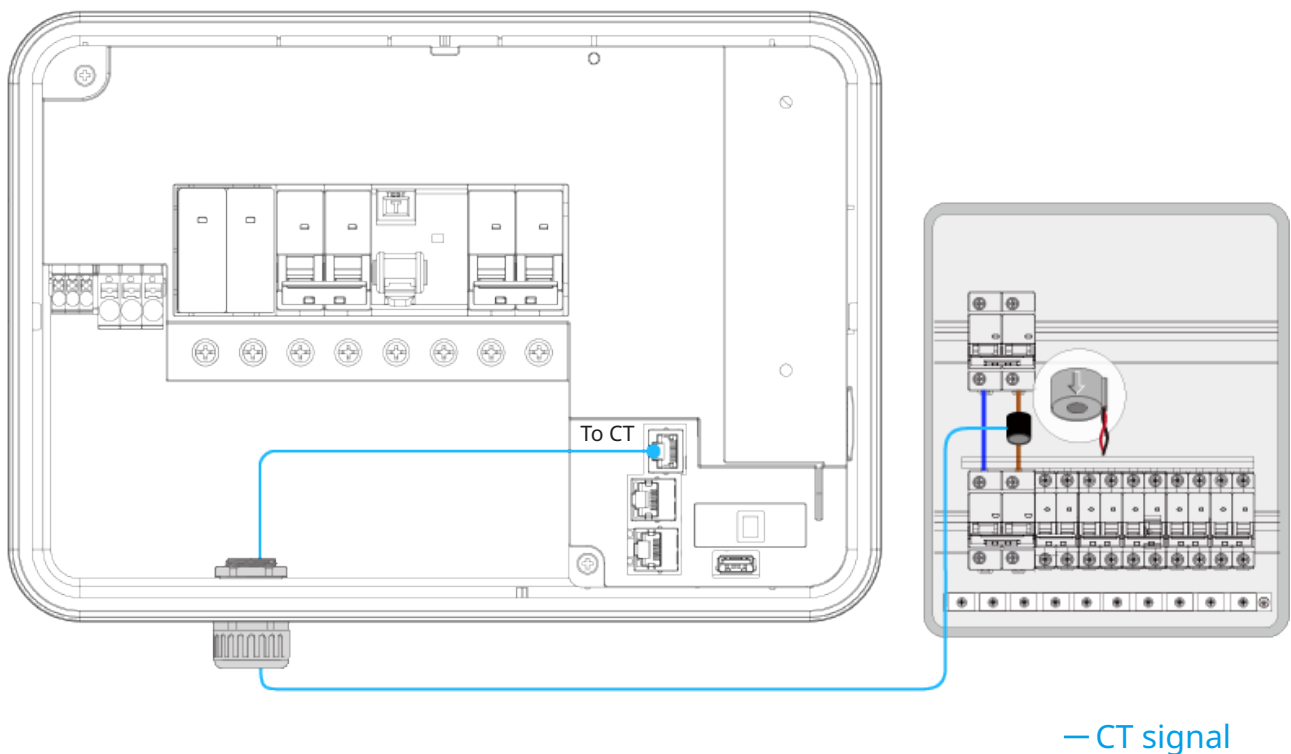
## Section B. Wire the consumption CT

- a. Install the consumption CT for electricity metering. You can find the CT in the combiner.
- b. To install the CT, perform the following steps:
  - Connect the CT signal cable to the terminal of MC100L as shown above.
  - Remove the L cable of the main breaker in the distribution panel.
  - Locate the arrow on the CT's label and thread the L cable into the CT with 'L' lable. The CT's arrow must point away from the grid.
  - Reconnect the L cable to the main breaker and tighten the screws.

### NOTE:

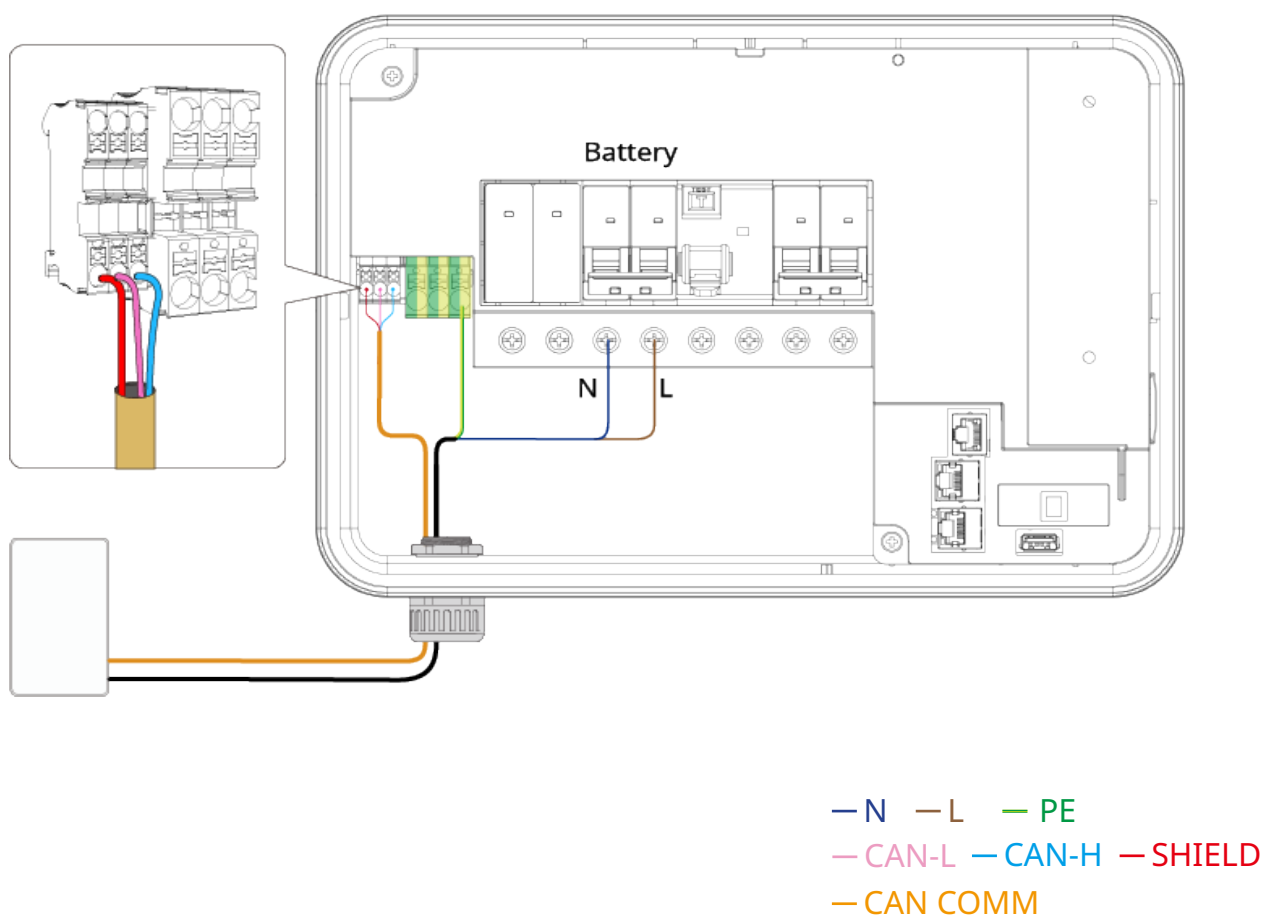
To guarantee the correct measurement of electricity consumption, observe the following rules:

- The CT's arrow must point away from the grid.
- Ensure that the CT with 'L' lable is installed on the same power line as the L cable of the grid breaker in the M-combiner.



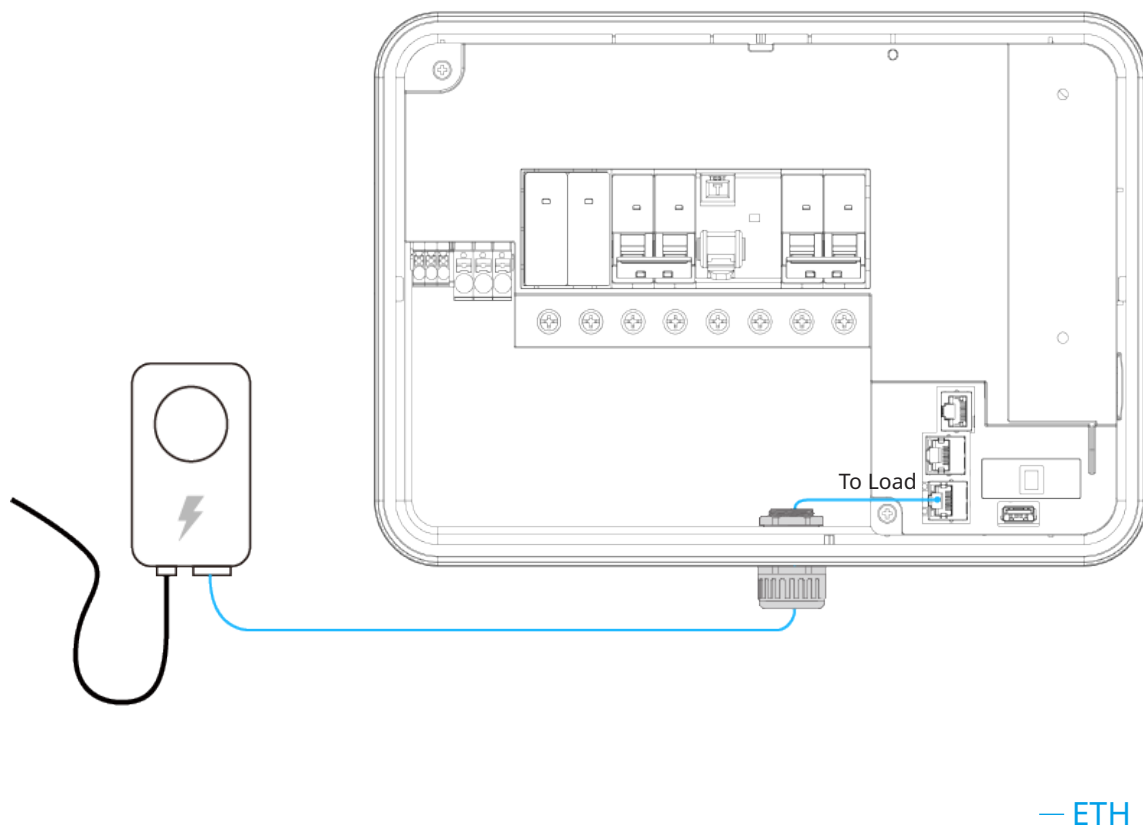
### 4.5.3 (Optional) Wire from the Battery

- Bring in the power cables from the battery through the battery hole of the combiner.
- Connect the cables (N and L) to the battery breaker and connect the ground cable to the PE terminal block as shown.
- Tighten the screws by using a Phillips #2 screwdriver with a torque of 2-2.5 N·m.
- Bring in and connect the CAN cable to the terminal block as shown in the figure.



#### 4.5.4 (Optional) Wire from Loads

- Bring in the cables from the load through the COM hole of the combiner.
- The MC100L supports ETH communication with loads. Connect the cables from the load to the communication interface as shown in the right figure.

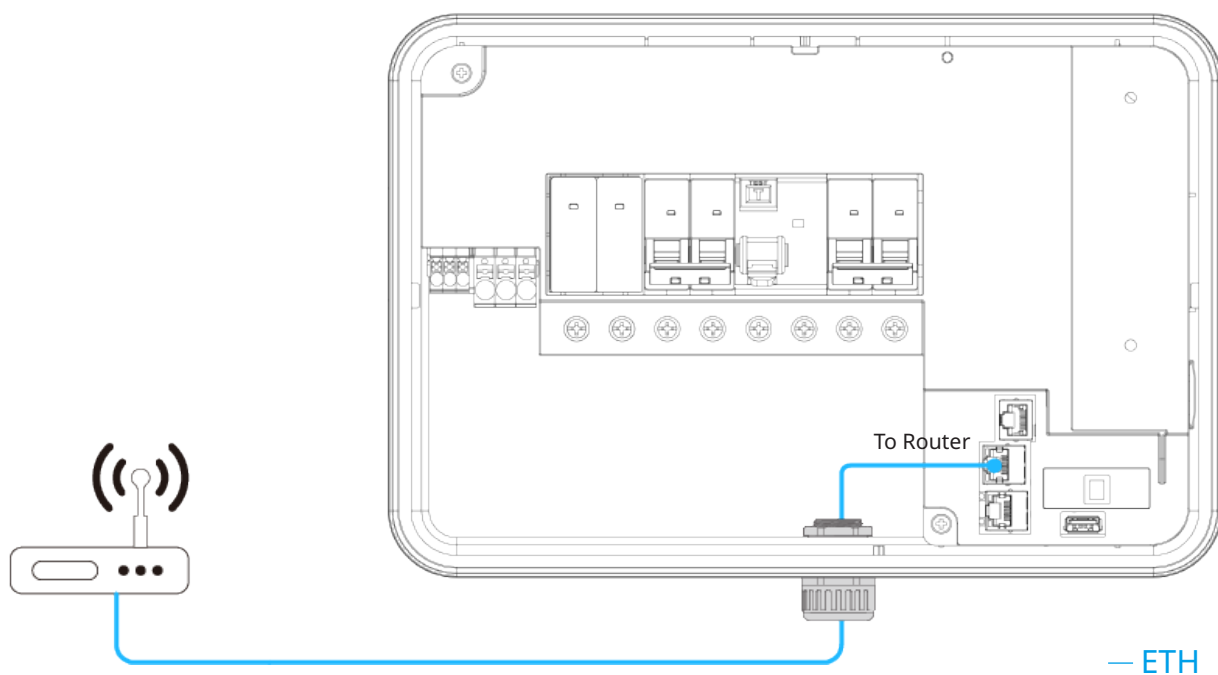


#### 4.5.5 (Optional) Wire from the Router

- When you use ETH to connect to Atmoce-Cloud, bring in the wire from the home broadband router through the COM hole of the combiner.
- Connect the 802.3 Cat 6 UTP ethernet cable to the RJ45 terminal in the combiner as shown in the figure.

#### NOTE:

- This interface is used only for communication with home routers.

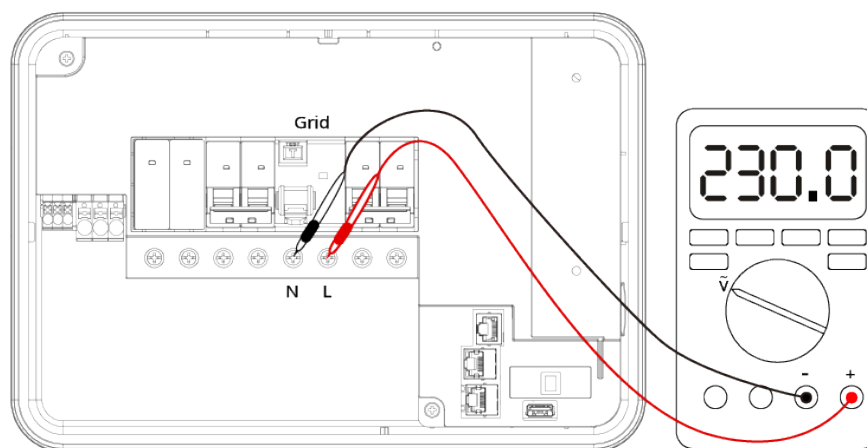


## 4.6 Power on the System

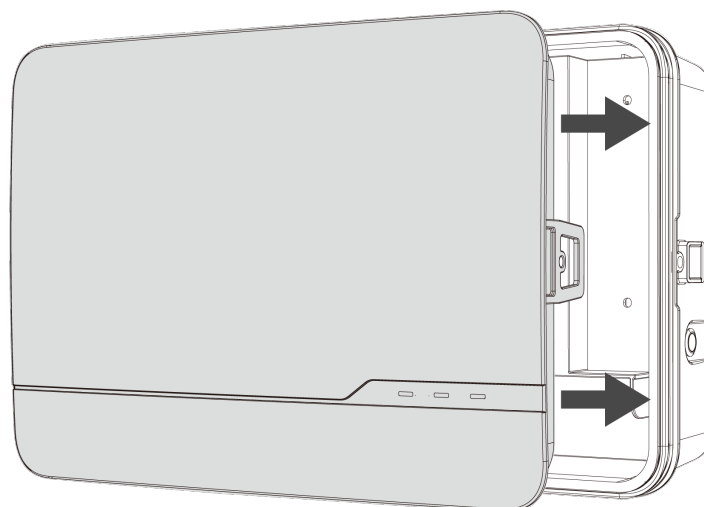
- Turn on the main breaker and M-Combiner breaker in the distribution panel.
- Use the multimeter to measure the voltage between the N pole and L pole of the grid breaker as shown in the figure.

### NOTE:

- If the voltage value is beyond the range (184 to 276 V), do not switch on the grid breaker inside the combiner. Check the cable connection to avoid damaging the device and voiding the warranty.



- If the voltage value is approximately the nominal phase voltage, e.g. 220 V, 230 V and 240 V, turn on the grid and other breakers in the combiner and the LEDs will be on.
- Re-install the cover to close the combiner.



## 4.7 Activate the System

- a. Log in to the Atmozen app on your mobile phone and follow the deployment guide in the app to activate the system. Details of the deployment guide can be found in the following section.
- b. After the system is activated, all LEDs will be solid green.

## Deployment Guide

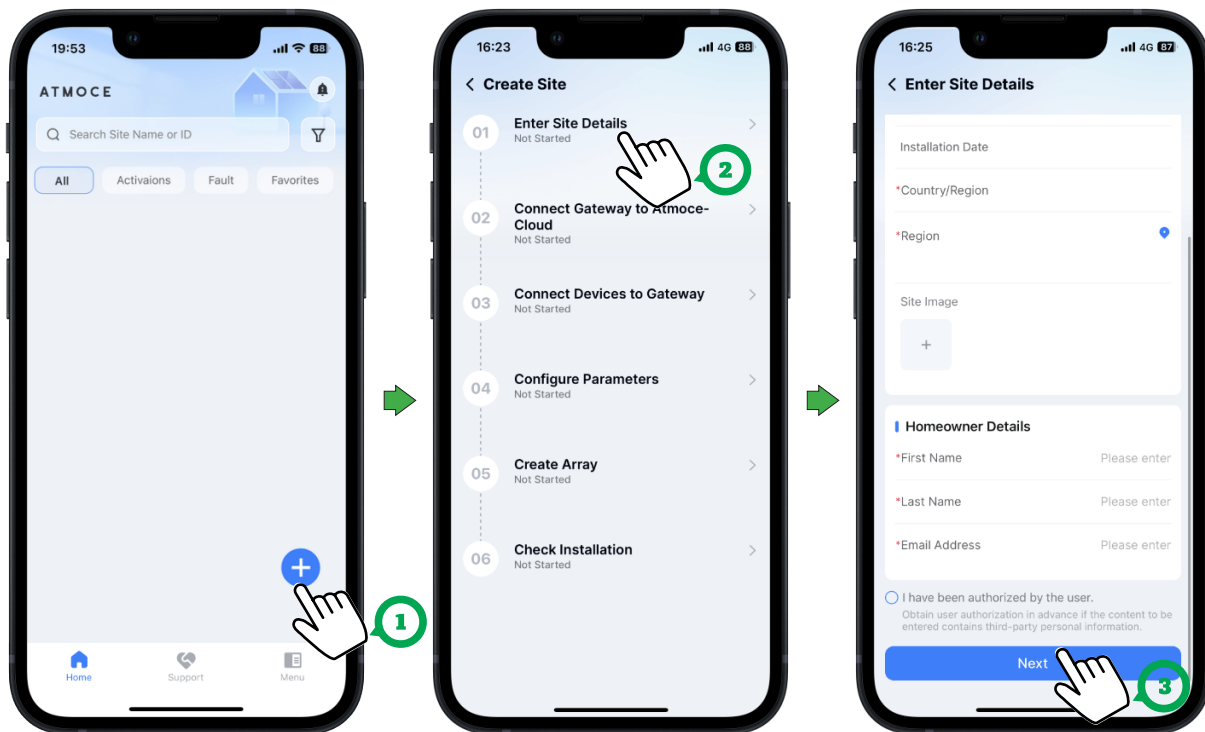
**Note**

- Ensure that your phone's operating system meets the following requirements: iOS 16.3.1 or later, or Android 11 or later.
- Complete the creation of the installer role following the registration process on the app.
- Before the configuration, confirm that all microinverters, gateways, batteries, and other loads have been installed and powered on.



## 5.1 Enter Site Details

- a. Log in to your installer account and tap + to create a site.
- b. Specify site details. Parameters marked with \* are required

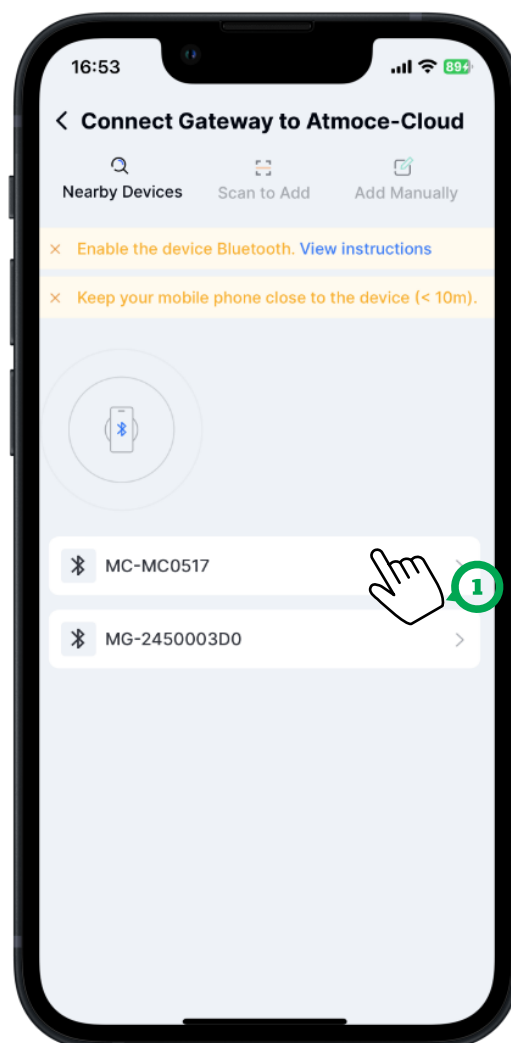


### NOTE:

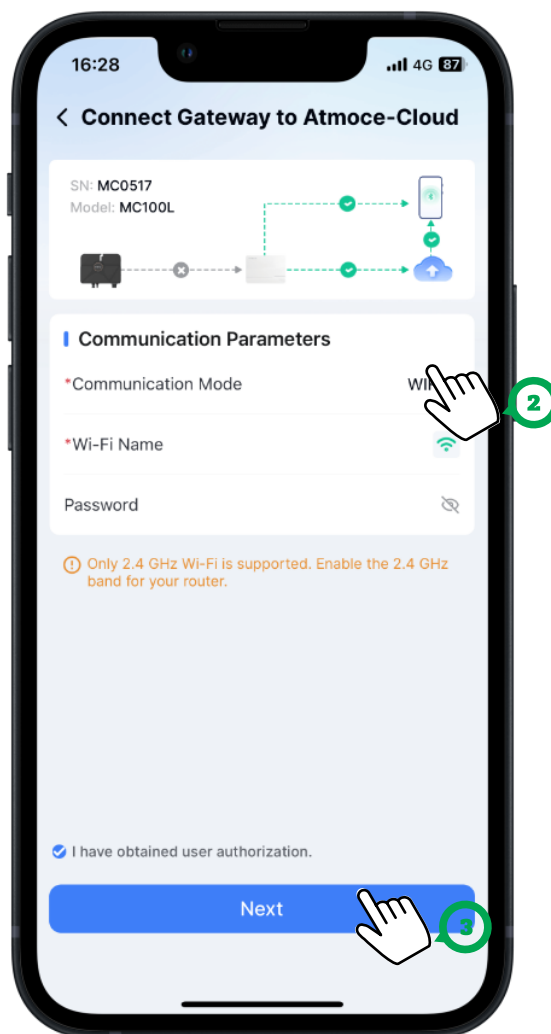
- Help the homeowner complete the registration process on the app, and specify the homeowner details based on the registered information.

## 5.2 Connect the Gateway to Atmoce-Cloud

- a. Enable Bluetooth on your phone, and keep your mobile phone close to the M-Gateway (<10 m).
- b. There are three methods to create a Bluetooth link:
  - Nearby Device: the default method. Check the Bluetooth device list, and select the SN number of the M-Gateway, whose name usually starts with "M".
  - Scan to Add: Scan the device serial number (QR code) on the M-Gateway.
  - Add Manually: Enter the device serial number of the M-Gateway.



- c. Configure a home network for your device and ensure proper network connection. There are two methods to create a connection:
- Wi-Fi: select Wi-Fi Name and input Password.
  - Ethernet: connect the router to the combiner through a Cat 6 UTP ethernet cable. For more information, see Section 4.5.5 "(Optional) Wire from the Router."

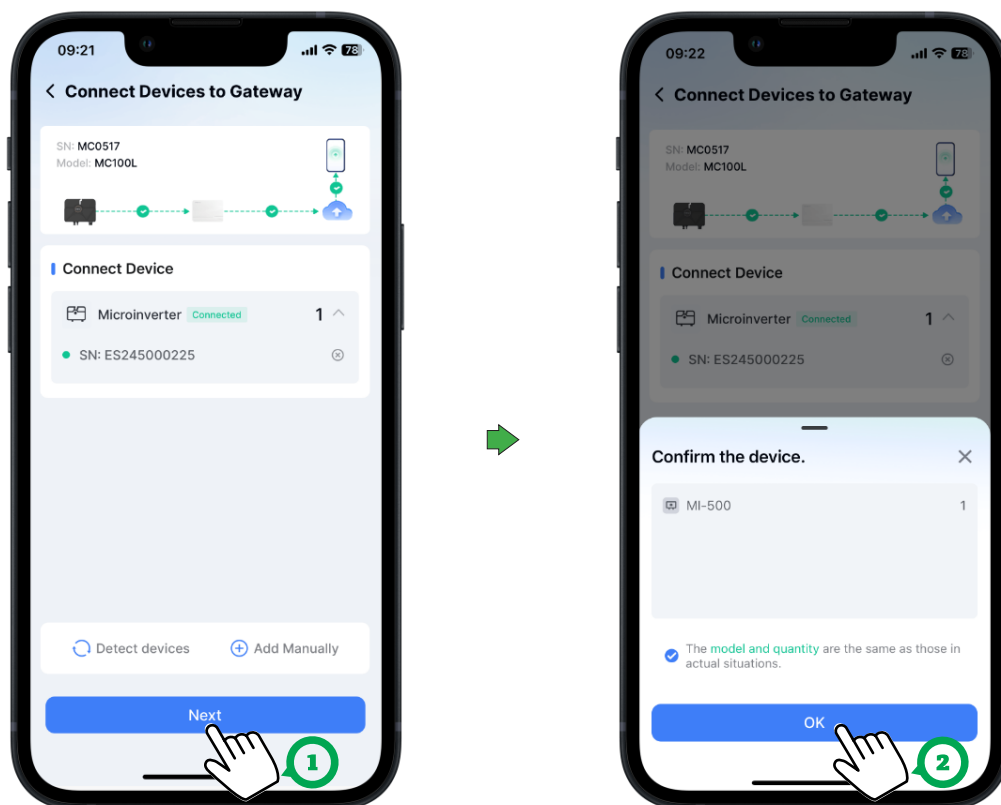


## NOTE:

- The M-Gateway integrated Wi-Fi operates at 2.4 GHz and supports IPv4 and a number of wireless security protocols, including WPA-PSK and WPA2-PSK.
- The M-Gateway does not support Wi-Fi WPS.

## 5.3 Connect Devices to the Gateway

- a. The M-Gateway automatically searches for microinverters that are installed.
- b. Check the serial numbers of microinverters listed on the app against the installation map. If you find that not all devices are connected, you can tap **Detect Devices** to initiate a search again or tap **Add Manually** to add devices.

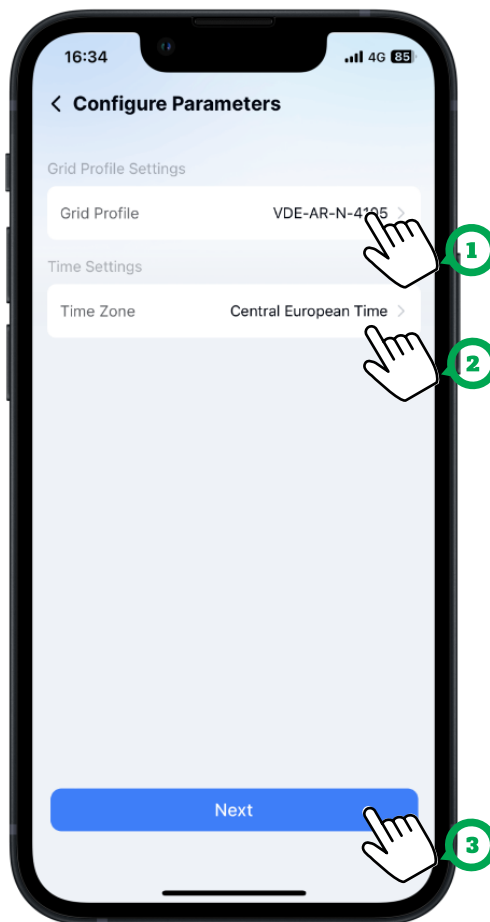


### NOTE:

- If a device is deleted by mistake, it can be added again only by clicking **Add Manually**.

## 5.4 Configure Parameters

- a. a. Ensure that the settings of Grid Profile and Time Zone match the country or region where the site is located.

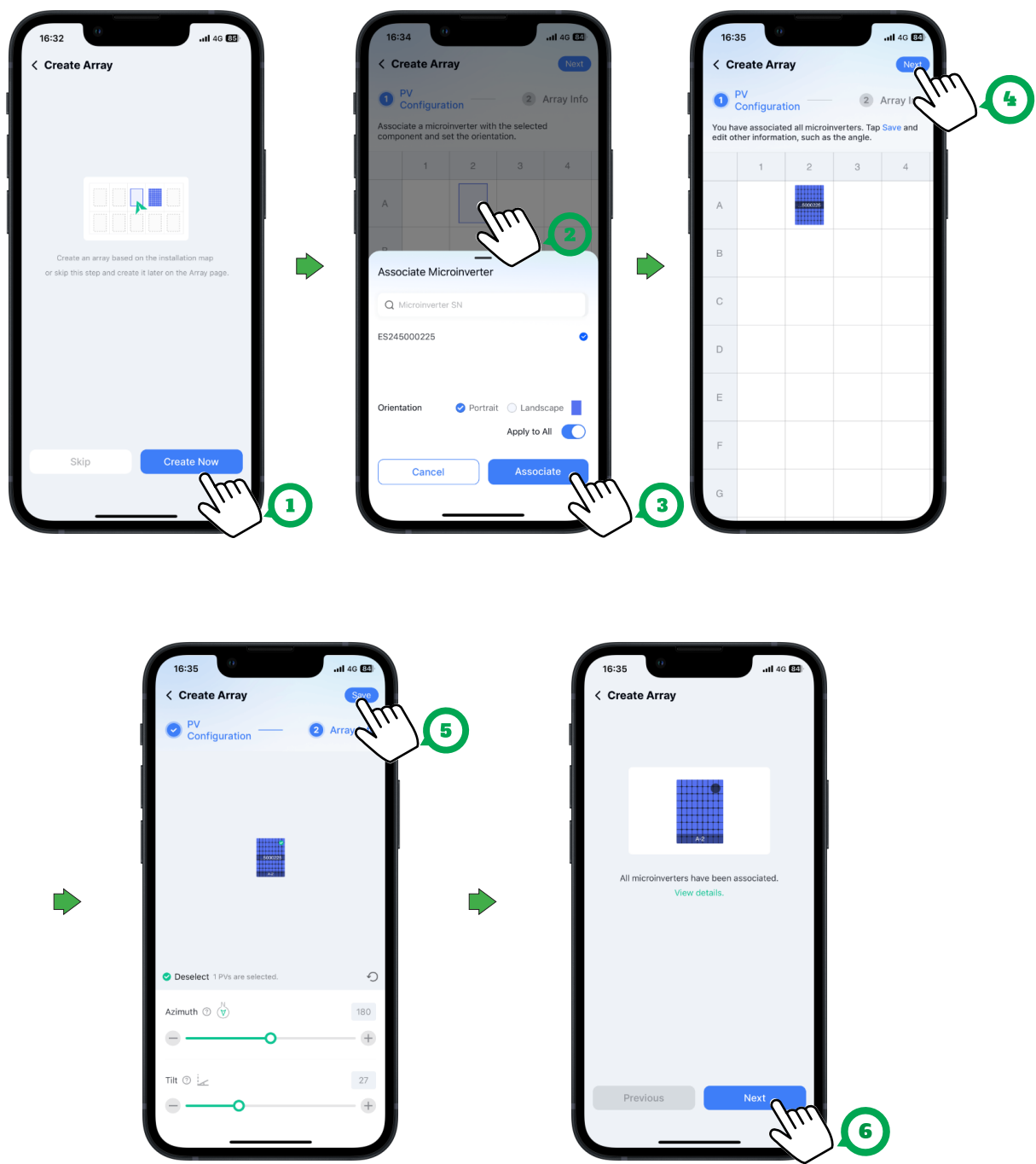


### NOTE:

- If there is no grid profile that meets the local electricity authority requirements, please contact Atmoce Technical Support and request a new grid profile.

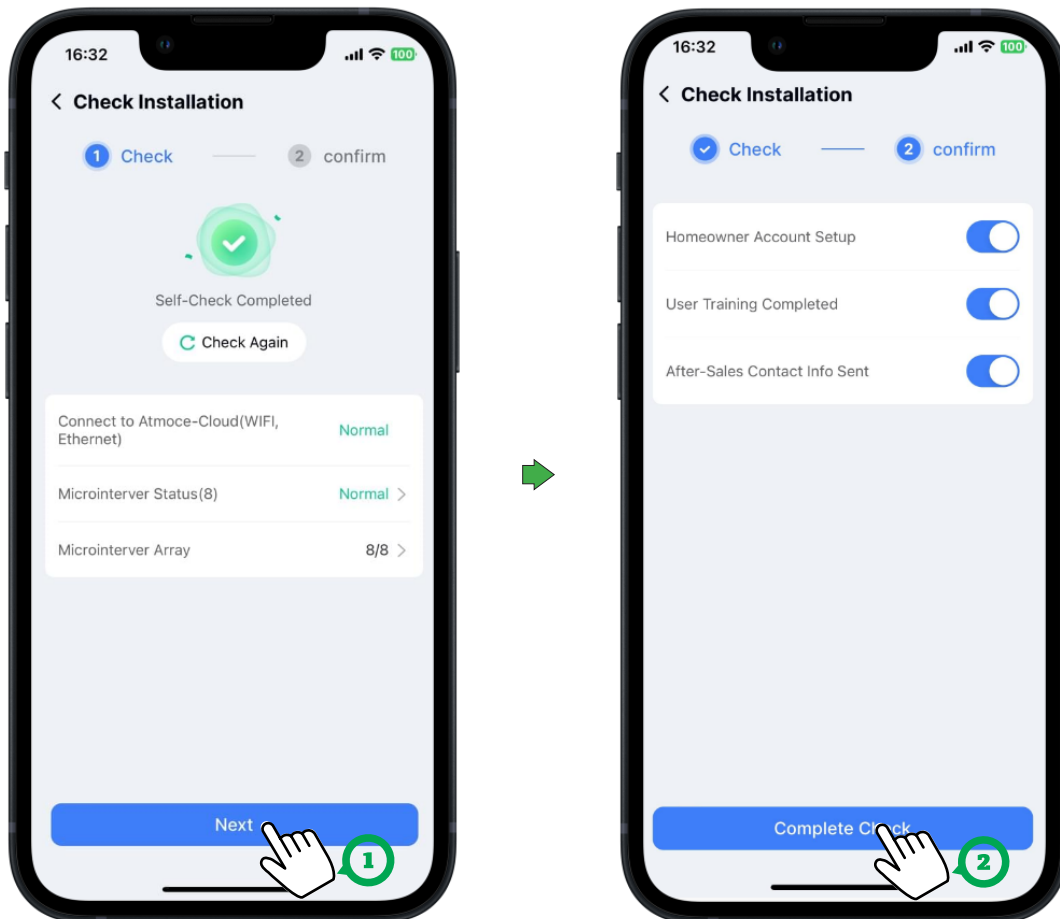
5.5 Create an Array

- a. Create the array diagram for module-level management.
- b. Please follow the steps shown below to complete the deployment of the array and the setting of the azimuth and tilt angle.



## 5.6 Check the Installation

- a. The system status is automatically diagnosed to ensure proper site runing. Ensure that all devices are in a normal state
- b. Tap Complete Check to finish the activation.



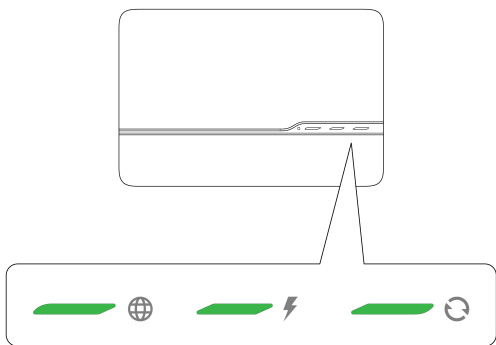
### NOTE:

- Once the M-Gateway is connected to the Atmoce-Cloud, the network service is activated. The Atmoce-Cloud will support updates and upgrades for all connected devices in the future.

## Troubleshooting

### 6.1 MC100L LED Indicator Description

- a. LED indicators can provide critical information on the operational status of devices. The status of LED indicators helps to solve related problems during on-site installation, configuration and troubleshooting.
- b. MC100L has three LED indicators, which are described as follows:



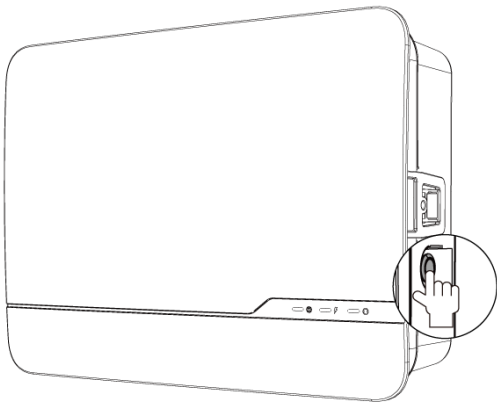
- Solid ON
- Quick flash: 0.2s ON, 0.2s OFF
- Slow flash: 1s ON, 1s OFF
- Dimmed










LED indicator		Colour		Description
	Network Status	Solid Green		Connecting to Atmoce-cloud.
		Quick Flash Green		Connecting to Atmozen app via Bluetooth.
		Slow Flash Red		No network available.
	Microinverter Power Status	Solid Green		All communicating microinverters are generating power.
		Slow Flash Orange		At least one microinverter is not generating power.
		Dimmed		All microinverters are not generating power.
	Microinverter Communication Status	Solid Green		All microinverters are in communication normally.
		Quick Flash Green		The MG100 is detecting microinverters.
		Slow Flash Orange		At least one microinverter is not in communication.
		Slow Flash Red		None of the microinverters are in communication (not due to low light or night time).
ALL		Dimmed		None of the microinverters are in communication (due to low light or night time).
		Slow Flash Green		Software update is in progress.



6.2 MC100L Reset Button

- a. The MC100L has a reset button. The location of the button and the reset operation are shown as below.



	Function	Operation	Duration
1	Turn On Bluetooth	  	Press until the network indicator quickly flashes orange three times. 3s < Press < 10s
2	Turn Off Bluetooth	  	Press until the network indicator slowly flashes orange three times. 3s < Press < 10s
3	Restart the MG100	  	Step1: Press until all indicators are solid orange. Step2: Release the button. Step3: Press until all indicators are dimmed. 10s < Press < 20s 0s < Wait < 5s 10s < Press < 20s

### 6.3 MC100L Issue Troubleshooting

When an on-site problem occurs, the LED indicators on the MG100 can provide troubleshooting guidance. The following content will introduce common on-site problems and their solutions.

If you have any questions about the fault diagnosis, please contact Atmoce Technical Support (<https://www.atmoce.com/contact-us>).

#### 6.3.1 If the network status LED is flashing red.

- Issue 1: The Wi-Fi communication is disconnected.

Reason		Solution
1	The Wi-Fi name or password is incorrect.	<ul style="list-style-type: none"><li>• Reconfigure the Wi-Fi name and password through the Wi-Fi settings on the mobile app.</li></ul>
2	The Wi-Fi band is not 2.4GHz.	<ul style="list-style-type: none"><li>• Please contact your network service provider or check the router user manual for assistance.</li><li>• Use a broadband router that supports the 2.4 GHz band.</li></ul>
3	The M-Combiner is outside the Wi-Fi coverage range	<ul style="list-style-type: none"><li>• Place the M-Combiner nearer to the router or add a wireless repeater to expand the Wi-Fi coverage range.</li></ul>
4	DHCP server issues.	<ul style="list-style-type: none"><li>• If the Dynamic Host Configuration Protocol (DHCP) server is disabled, enable it.</li><li>• Confirm that you are using a broadband router, not a switch or hub. Many hubs and switches cannot provide a DHCP server and may not allow devices to connect to Ethernet or wireless networks.</li></ul>
5	Broadband router issues.	<ul style="list-style-type: none"><li>• If the SSID is hidden, turn off "Hide SSID".</li><li>• Select "WPA-PSK" or "WPA2-PSK" for "Security Mode".</li><li>• Select "AES" for "Encryption".</li></ul>
6	Unable to connect to the router.	<ul style="list-style-type: none"><li>• Check if other devices connected to the router are communicating properly.</li><li>• Please contact your network service provider or check the router user manual for assistance.</li></ul>
7	The home broadband router has been replaced.	<ul style="list-style-type: none"><li>• Reconfigure the Wi-Fi name and password through the Wi-Fi settings on the mobile app.</li></ul>

- Issue 2: The ETH communication is disconnected.

	Reason	Solution
1	The Ethernet cable connection of the router is incorrect/unplugged.	<ul style="list-style-type: none"><li>• Replug the Ethernet cable.</li><li>• Restart the router and MG100. If the problem persists, please replace the Ethernet cable.</li></ul>
2	DHCP server issues.	<ul style="list-style-type: none"><li>• If the DHCP server of the router is disabled, enable it.</li><li>• Confirm that you are using a broadband router, not a switch or hub. Many hubs and switches cannot provide a DHCP server and may not allow devices to connect to Ethernet or wireless networks.</li></ul>
3	The broadband router has been replaced.	<ul style="list-style-type: none"><li>• Connect the Ethernet cable from the M-Combiner to the new router.</li></ul>

6.3.2 If the microinverter power status LED is dimmed.

- Issue 1: The system does not generate power.

	Reason	Solution
1	A grid error, such as an abnormal grid voltage or grid frequency, leads to system protection.	<ul style="list-style-type: none"><li>• Check the alert type in the app and resolve the alert based on the recommendations.</li></ul>
2	The alternating current cable is abnormal.	<ul style="list-style-type: none"><li>• Check whether the cables are connected properly in the combiner as indicated in the user manual.</li><li>• Check whether the alternating current cables between the combiner and microinverters are connected properly.</li></ul>

3	Device protection is triggered in the combiner.	<ul style="list-style-type: none"><li>• Check whether each circuit breaker in the combiner is closed.</li><li>• If there are some errors inside the device, contact your local installer.</li></ul>
4	A device fault occurred, for example, M-Relay protection in the grid.	<ul style="list-style-type: none"><li>• Check the alert type in the app and resolve the alert based on the recommendations.</li></ul>
5	Poor sunlight	<ul style="list-style-type: none"><li>• Wait until there is sufficient sunlight.</li></ul>

6.3.3 If the microinverter power status LED is flashing orange.

- Issue 1: One or more microinverters in the system do not generate power.

Reason		Solution
1	The alternating current cable is abnormal.	<ul style="list-style-type: none"><li>• Check whether the cables are connected properly in the combiner as indicated in the user manual.</li><li>• Check whether the alternating current cables between the combiner and microinverters are connected properly.</li></ul>
2	Device protection is triggered in the combiner.	<ul style="list-style-type: none"><li>• Check whether each circuit breaker in the combiner is closed.</li><li>• If there are some errors inside the device, contact your local installer.</li></ul>
3	Active protection inside microverter is triggered due to abnormal solar voltage or grid voltage.	<ul style="list-style-type: none"><li>• Check the fault type in the app and resolve the fault based on the recommendations.</li><li>• Contact your installer to replace the faulty microinverter.</li></ul>

6.3.4 If the microinverter communication status LED is flashing red.

- Issue 1: All microinverters communicates abnormally.

Reason		Solution
1	The alternating current cable is abnormal.	<ul style="list-style-type: none"><li>• Check whether the cables are connected properly in the combiner as indicated in the installation manual.</li><li>• Check whether the alternating current cables between the combiner and microinverters are connected properly.</li></ul>
2	Device protection is triggered in the combiner.	<ul style="list-style-type: none"><li>• Check whether each circuit breaker in the combiner is closed.</li><li>• If there are some errors inside the device, contact your local installer.</li></ul>
3	A device fault occurred, for example, M-Relay protection in the grid.	<ul style="list-style-type: none"><li>• Check the alert type in the app and resolve the alert based on the recommendations.</li></ul>
4	A gateway fault occurred.	<ul style="list-style-type: none"><li>• Try to turn off the grid breaker in the combiner or reset the gateway by referring to Section 6.2 "MG100 Reset Button."</li><li>• If there are some errors inside the device, contact your local installer.</li></ul>

- Issue 2: All microinverters have internal faults.
  - a. Check whether the status of LED indicator on the microinverter is solid red. if so, disconnect the DC inputs from PV modules, wait for 5 to 10 minutes, and then reconnect the DC inputs.
  - b. If the LED indicator is still solid red, please contact Atmoce Technical Support.

6.3.5 If the microinverter communication status LED is flashing orange.

- Issue 1: Only one or scattered microinverters are not communicating.

Reason		Solution
1	A connection fault occurs between the PV modules and the microinverters.	<ul style="list-style-type: none"><li>• Check whether the cables are connected properly in the combiner as indicated in the user manual.</li><li>• Check whether the alternating current cables between the combiner and microinverters are connected properly.</li></ul>
-----		
2	The alternating current cable is abnormal.	<ul style="list-style-type: none"><li>• Check whether each circuit breaker in the combiner is closed.</li><li>• If there are some errors inside the device, contact your local installer.</li></ul>

- Issue 2: The microinverter has an internal fault.
  - a. Check the alerts in the Atmozen app to confirm which microinverter is in the faulty state.
  - b. Disconnect the DC input of the faulty microinverter from the PV module, wait for 5 to 10 minutes, and then reconnect the DC input of the microinverter.
  - c. If the LED indicator is still solid red, please contact Atmoce Technical Support.

6.3.6 If all the LEDs are dim

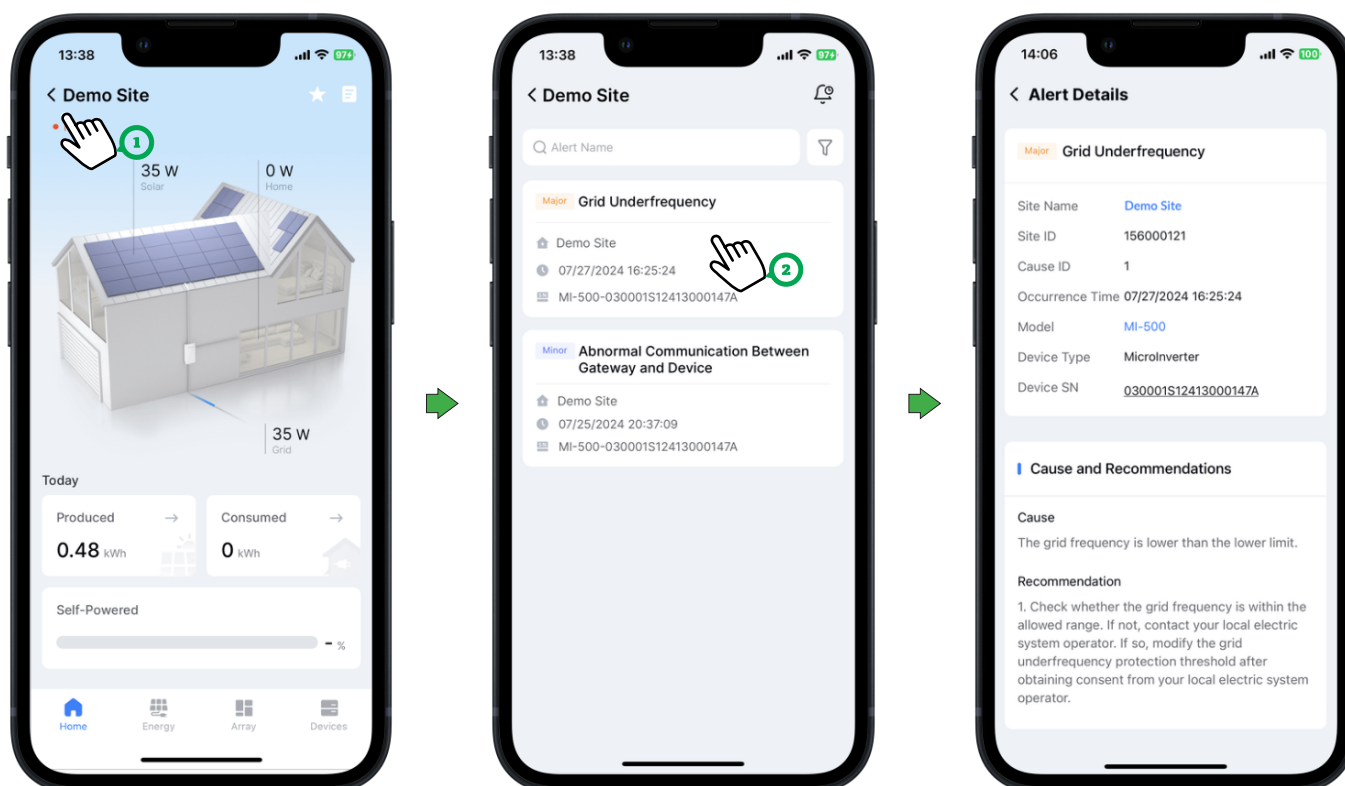
- Issue 1: The MG100 is not powered on.

Reason		Solution
1	The MG100 is not powered on.	<ul style="list-style-type: none"><li>• Check that the grid circuit breaker is "on".</li><li>• Check that the voltage of the L and N lines of the MG100 is within the voltage range (usually 184 Vac to 276 Vac).</li></ul>
-----		
2	Grid power outage occurred.	<ul style="list-style-type: none"><li>• Check whether the system generates power after grid recovery.</li></ul>

## 6.4 Check the Alert Codes

The device error codes can be viewed through the following steps in the Atmozen app:

- Tap Status of the site.
- Select the faulty device to check the details.



### NOTE:

- The alert code check can be performed only after the system has been activated via the Atmozen app.
- Alert codes can be checked only when the site status is 'Faulty' or 'Offline'.

## 6.5 Alarm Codes List

The information about alerted issues of the Atmoce system can be found in the table below:

Code	Issue	Reason	Solution
1	High Direct Current Input Voltage	The open-circuit voltage of the PV module is set to a value higher than the maximum operating voltage of the device.	<ul style="list-style-type: none"> <li>Check whether the open-circuit voltage of the PV module is higher than the maximum input voltage of the device specified in the user manual. If so, configure the PV module according to the user manual to ensure that the open-circuit voltage is within the allowed range. Then, the alert will be automatically cleared.</li> </ul>
2	Grid Power Outage	Grid power outage occurred.	<ul style="list-style-type: none"> <li>Check whether the grid is normally powered.</li> <li>Check whether the alternating current cable or switch is disconnected.</li> </ul>
3	Grid Undervoltage	The grid voltage is lower than the lower limit.	<ul style="list-style-type: none"> <li>Check whether the grid voltage is within the allowed range. If not, contact your local electric system operator. If so, modify the grid undervoltage protection threshold after obtaining consent from your local electric system operator.</li> <li>If the fault persists, check whether the alternating current switch and cable are connected properly.</li> </ul>
4	Grid Overvoltage	The grid voltage is higher than the upper limit.	<ul style="list-style-type: none"> <li>Check whether the grid voltage is within the allowed range. If not, contact your local electric system operator. If so, modify the grid overvoltage protection threshold after obtaining consent from your local electric system operator.</li> <li>If the fault persists, check whether the alternating current breaker and cable are connected properly, or whether the cable complies with the recommended specifications.</li> </ul>
5	Grid Underfrequency	The grid frequency is lower than the lower limit.	<ul style="list-style-type: none"> <li>Check whether the grid frequency is within the allowed range. If not, contact your local electric system operator. If so, modify the grid underfrequency protection threshold after obtaining consent from your local electric system operator.</li> </ul>



Code	Issue	Reason	Solution
6	Grid Overfrequency	The grid frequency is higher than the upper limit.	<ul style="list-style-type: none"> <li>Check whether the grid frequency is within the allowed range. If not, contact your local electric system operator. If so, modify the grid overfrequency protection threshold after obtaining consent from your local electric system operator.</li> </ul>
7	High Output Direct Current Component	The output direct current component is higher than the upper limit.	<ul style="list-style-type: none"> <li>The device automatically manages external working conditions in real time and returns to normal after the fault is resolved.</li> <li>If the fault occurs frequently, contact your Distributor or Customer Service.</li> </ul>
8	Low Direct Current-Side Insulation Resistance	The insulation between the PV module and the ground is poor.	<ul style="list-style-type: none"> <li>Check the insulation between the PV module and the ground. If there is a short circuit or poor insulation, rectify it.</li> </ul>
9	Internal Device Error	<p>The internal circuit of the microinverter failed.</p> <p>The internal circuit of the gateway failed.</p>	<ul style="list-style-type: none"> <li>Wait for the inverter to power on again until the next day. If the fault persists, contact your Distributor or Customer Service.</li> <li>Power off and then repower the gateway by using the grid breaker inside the M-Combiner. If the fault persists, contact your Distributor or Customer Service.</li> </ul>
10	Active Device Protection	The operating environment of the inverter is abnormal.	<ul style="list-style-type: none"> <li>The device automatically checks external working conditions and returns to normal after the fault is resolved.</li> <li>If the alert is reported frequently, contact your Distributor or Customer Service.</li> </ul>
256	Abnormal Communication Between Gateway and Device	The device is shut down. The alternating current cable between the microinverter and gateway is abnormal.	<ul style="list-style-type: none"> <li>Check whether the AC switch is disconnected. If the AC switch is disconnected, close the AC switch.</li> <li>Wait for the inverter to be powered on again the next day and confirm the communication status. If the fault still exists, check whether the AC line is disconnected and whether the AC wiring and mating terminals are abnormal.</li> </ul>

Code	Issue	Reason	Solution
257	Abnormal Communication Between Gateway and Atmoce-Cloud	The gateway is shut down. The gateway network is improperly configured. The network between the gateway and Atmoce-Cloud is abnormal.	<ul style="list-style-type: none"><li>• Observe the indicator of the gateway to check whether it is shut down.</li><li>• Check whether the router is connected to the Internet.</li><li>• If the gateway is connected to the Internet via Wi-Fi:<ul style="list-style-type: none"><li>1. Check whether the Wi-Fi name and password are changed.</li><li>2. Check whether Wi-Fi signals are strong.</li></ul></li><li>• If the gateway is connected to the Internet via a network cable:<ul style="list-style-type: none"><li>1. Check whether the router network and cable are normal.</li><li>2. DHCP mode: Check whether DHCP mode is enabled for the router.</li><li>3. Manual mode: Check whether the IP address, gateway, and DNS are properly configured for the router.</li></ul></li></ul>
258	Upgrade Failure	Microinverter upgrade failed. M-Relay upgrade failed. Gateway upgrade failed.	<ul style="list-style-type: none"><li>• Try to upgrade again. If the fault persists, contact your Distributor or Customer Service.</li></ul>

## Maintenance

### 7.1 Remove MC100L

If, after the above troubleshooting, the M-Combiner still does not operate normally, please contact Atmoce Technical Support. If the warranty conditions are met, the M-Combiner can be removed and replaced.

The removal procedure is as follows:

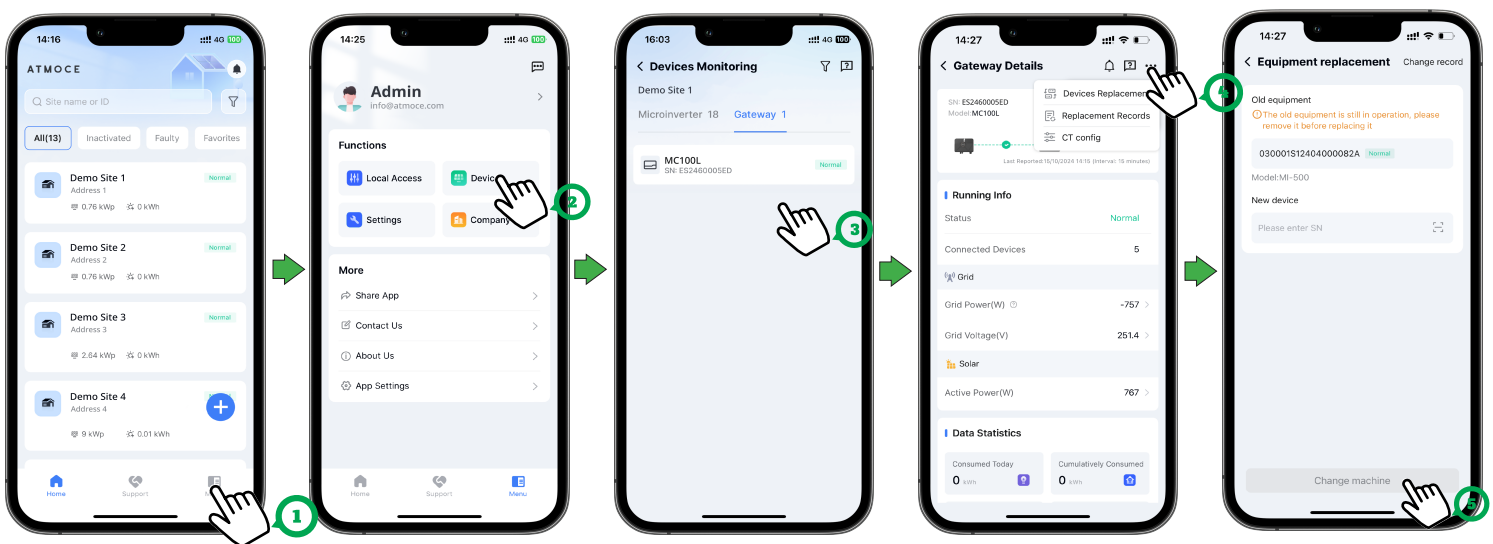
- a. Disconnect the main circuit breaker in the distribution panel.
- b. Remove the cover of the MC100L.
- c. Turn off all the breakers in the combiner.
- d. Remove the power and communication cables from the breakers and terminal blocks in the MC100L.
- e. Reinstall the cover.

## 7.2 Replace MC100L

If, after the above troubleshooting, the M-Combiner still does not operate normally, please contact Atmoce Technical Support. If the warranty conditions are met, the M-Combiner can be removed and replaced.

The replacement procedure is as follows:

- Remove the MC100L (refer to the "Remove MC100L" section).
- Secure the replaced MC100L to the wall (refer to the "Installation" section).
- Turn on the circuit breakers in the distribution panel and MC100L.
- Retrieve the serial number of the removed combiner from the device list in the Atmozen app and replace the device. Specifically, perform the following steps:
  - Tap Menu – Devices.
  - Select the replaced device to check the details.
  - Tap Replacement – Enter the SN of new device.



- Check the operating status and the device information of the device in the Atmozen app to confirm that the new combiner is operating normally.

### NOTE:

- If both the MC100L and the microinverter need to be replaced, the MC100L must be replaced first.

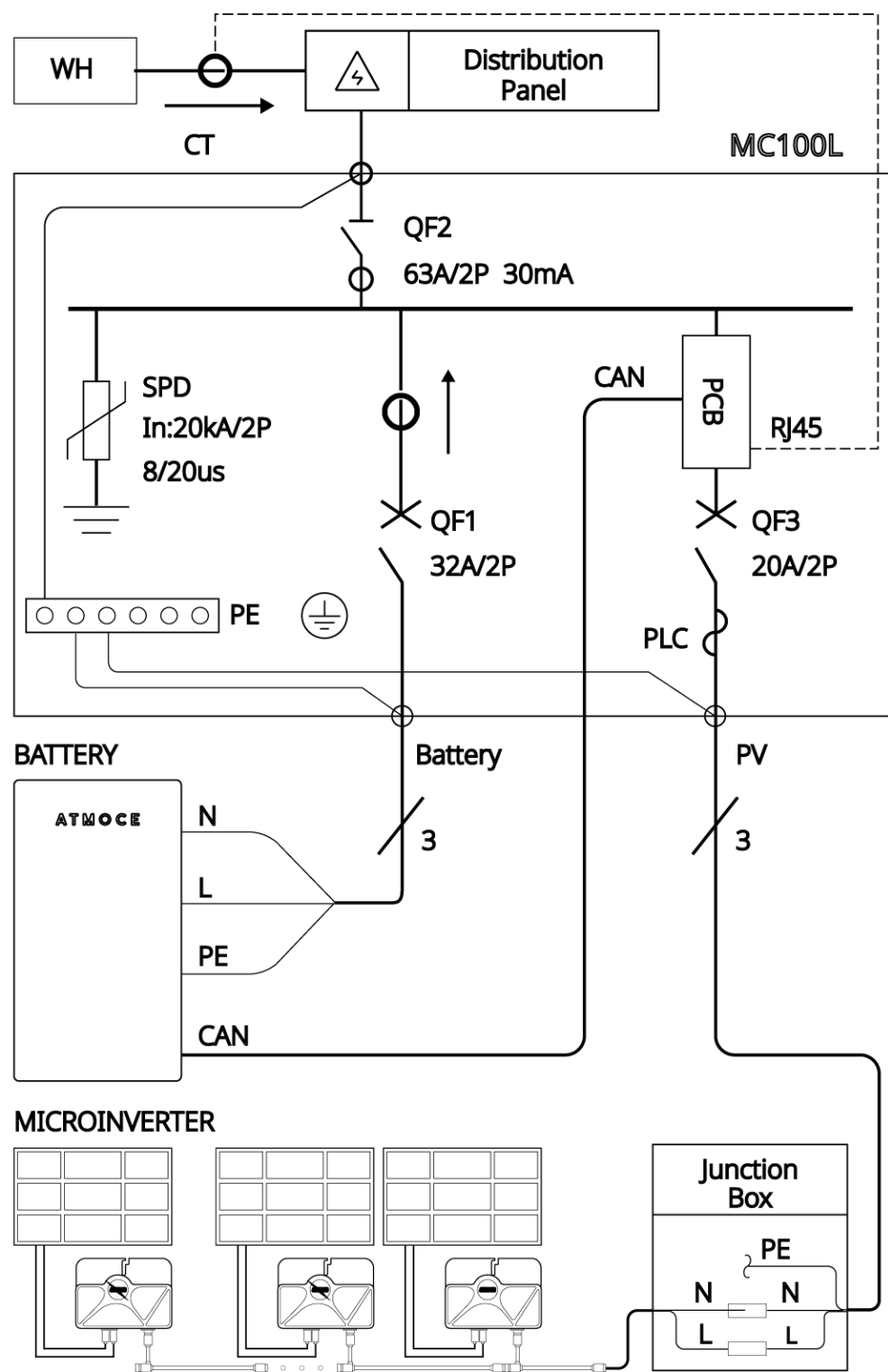
Technical Data

8.1 MC100L Data Sheet

Items	Unit	MC100L
What's in the combiner		
M-Gateway Lite		1 × board
PV-side breaker		1 × unit, 20 A, 2-pole
Grid-side breaker		1 × unit, 63 A, 2-pole, RCD 30mA
Battery-side breaker		1 × unit, 32 A, 2-pole
SPD		1 × unit, In: 20kA, 2-pole
Battery CT		1 × CT, accurate up to 0.1%
Consumption CT interface		1 × CT signal interface, accurate up to 0.1%
Electrical parameters		
Grid setup		Single-phase
Nominal voltage	V	220/230/240
Nominal operating voltage range (L to N)	V	184 to 276
Nominal frequency	Hz	50/60
Extended frequency range	Hz	45 to 65
Max. PV branch		1
Max. PV current/branch	A	25
Max. PV power	kW	5
Max. battery current	A	32
Max. battery capacity	kWh	7
Nominal CT current	A	80
Overvoltage category		III
Mechanical parameters		
Dimensions (W x H x D)	mm	337 × 237 × 99
Weight	kg	2.4
Ambient temperature range	°C	-30 to 50
Cooling		Natural convection
Enclosure environmental rating		Outdoor, IP65
Wire sizes	mm <sup>2</sup>	PV side: 2.5 to 4 Grid side: 10 to 16 Battery side: 4 to 6
Communication		PLC, Wi-Fi, BLE, ETH, CAN
Noise	dB	<25
Altitude	m	3000
Protection class		II
Pollution degree		III

Communication interfaces		
PV side	PLC	Support
Grid side		1 × interface for consumption CT
Battery side	CAN	Support
Load side	ETH	1 × interface, 100 Mb/10 Mb auto-adaptability
Atmoce-Cloud	Wi-Fi	2.4 GHz
	ETH	1 × interface, 100 Mb/10 Mb auto-adaptability
Atmozen app	BLE	2.4 GHz
Indicators		3 × LEDs
Compliance		
Safety		IEC 61439-1/-2
Health		EN IEC 62311
EMC		EN 301 489-1/-17, EN IEC 61000-1/-2/-3/-4
Radio spectrum		EN 300 328
PLC		EN 50065-1/-2

Appendix 1: Wire Diagram



Appendix 2: Terms and Abbreviations

AC	Alternating current
APP	Application
CAT 6	Category 6
DC	Direct current
DI	Digital input
DO	Digital output
EMC	Electromagnetic Compatibility
ETH	Ethernet
MPPT	Maximum power point tracking
PE	Protective earthing
PV	Photovoltaic
RH	Relative humidity
SN	Serial number
WEEE	Waste electrical and electronic equipment



## Contact Us

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