

M-Relay

MR100-T User Manual



About This Document

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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 MC100-T combiner.

Revision History

	Date	Version	Description
1	2025-01-06	Rev. 1.0.0	1. First Release

Contents

About This Document	I
Corporate Contact Information	I
Disclaimer	I
Applicable Scope	I
Revision History	II
Contents	III
Safety Information	1
1.1 Statement	1
1.2 Safety Labels	1
1.3 Personal Safety Instructions	2
1.4 M-Relay Safety Instructions	3
1.5 Cable Safety Instructions	4
1.6 Environment Instructions	5
Product Information	6
2.1 Overview	6
2.2 Product Structure	6
2.3 Product Labels	7
Storage Requirements	9
Installation	10
3.1 Preparations	10
3.2 Install the DIN rail	14
3.3 Mount the M-Relay	14
3.4 Connect power cables	15
3.5 Connect RS485 cables	15
Troubleshooting	16
4.1 MR100 LED Indicator	16

4.2 MR100 Self-Test Button	17
4.3 MR100 Issue Troubleshooting	18
4.4 Check the Alert Codes	19
4.5 Alarm Codes List	20
Maintenance	23
5.1 Remove MR100-T	23
5.2 Replace MR100-T	24
Technical Data	25
6.1 MR100-T Data Sheet	25
Appendix 1: Wire Diagram	27
Appendix 2: Terms and Abbreviations	28

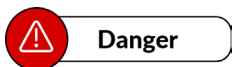
Safety Information

1.1 Statement

- Before installing or using the Atmoce M-Relay 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.



Danger

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



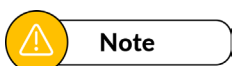
Warning

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



Caution

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



Note

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-Relay Safety Instructions



Danger

- Do not attempt to repair the M-Relay without authorization, as it does not contain any user repairable components. Unauthorized disassembly, repair, or destruction of the M-Relay and its internal components will void the warranty. In case of malfunction of the M-Relay, please contact Atmoce for technical assistance (web link).
- Do not use the M-Relay 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.
- Do not operate the M-Relay if the appearance is damaged.



Warning

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



Note

- When installing the M-Relay, 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.
- 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.

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 wiring is correct and that none of the cables are pinched, shorted, or damaged.
- All cables must be firmly connected, well insulated, and of appropriate specifications.



Note

- Cable selection and routing must follow local laws, regulations and norms.

1.6 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.



Warning

- Do not attempt to install the equipment in adverse weather conditions.
- 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.

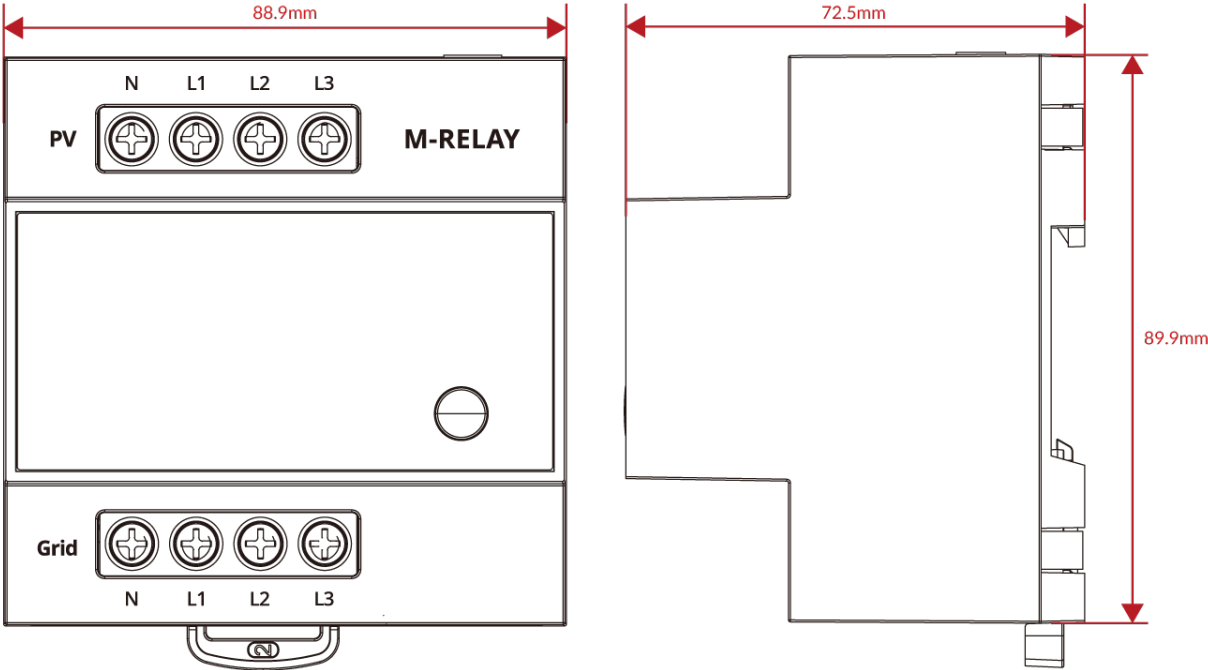
Product Information

2.1 Overview

M-Relay functions as a physical disconnection device for both single-phase and three-phase grid systems. It ensures secure and reliable isolation, providing a critical layer of safety and compliance in energy distribution and management systems.

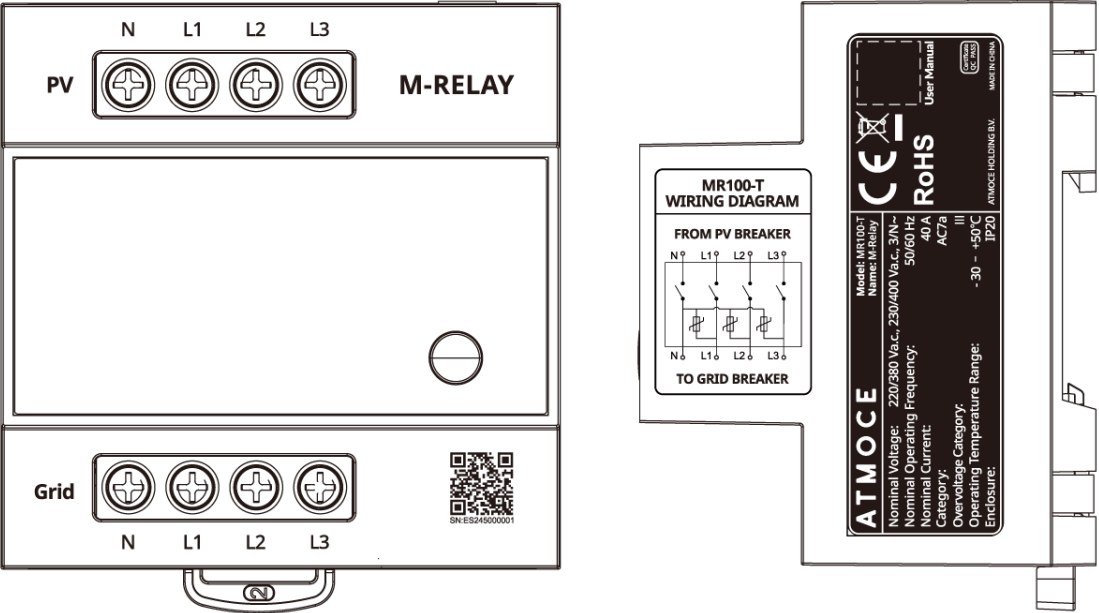
2.2 Product Structure

Section A. MR100-T Dimensions






2.3 Product Labels

Section A. Nameplate Label Symbols



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.
RoHS	Restriction of Hazardous Substances. The product has passed RoHS certification.

Storage Requirements

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

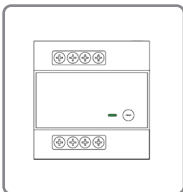


- Do not remove the outer packaging of the product.
- The storage temperature should be maintained within $-40\text{ }^{\circ}\text{C}$ to $+70\text{ }^{\circ}\text{C}$.
- The relative humidity should be maintained between 5% RH to 95% RH.
- Store the product in a clean and dry place, away from dust 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

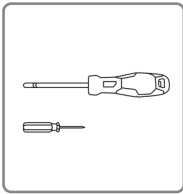
4.1 Preparations

4.1.1 Check the Items in the Package

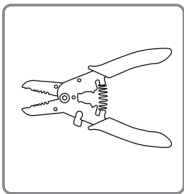
Please make sure that the following items are included in the package before installation.

Item	Catelog	Model	Description
	M-Relay	MR100-T	Device
	Quick installation guide	/	Guide on-site installation
	Inspection Report	/	Ensure products meet quality standards

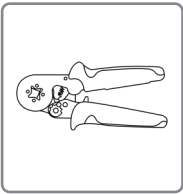
4.1.2 Prepare the Tools and Material



Screwdriver (M5)



Wire stripper



Communication line crimper

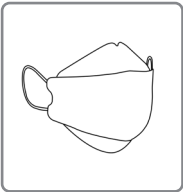
4.1.3 Prepare the Safety Equipment



Safety helmet



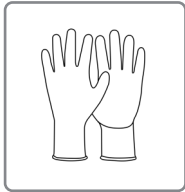
Protective goggles



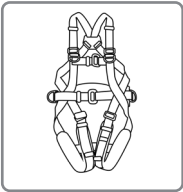
Mask



Safety clothing



Safety gloves



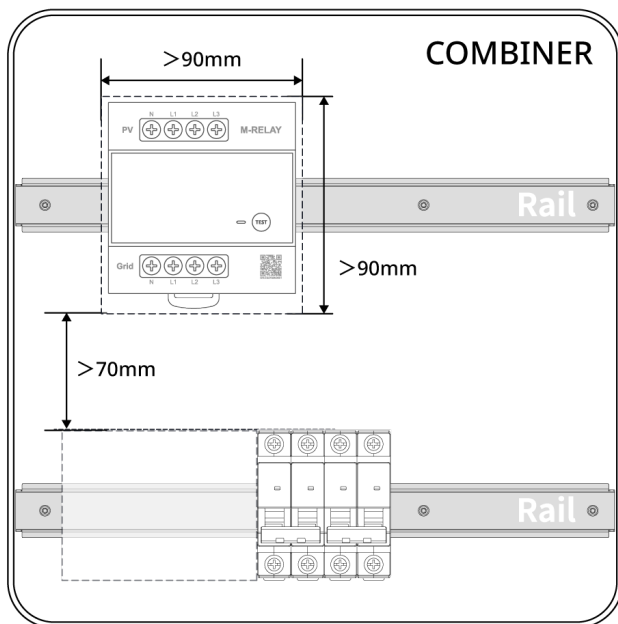
Safety belt



Safety shoes

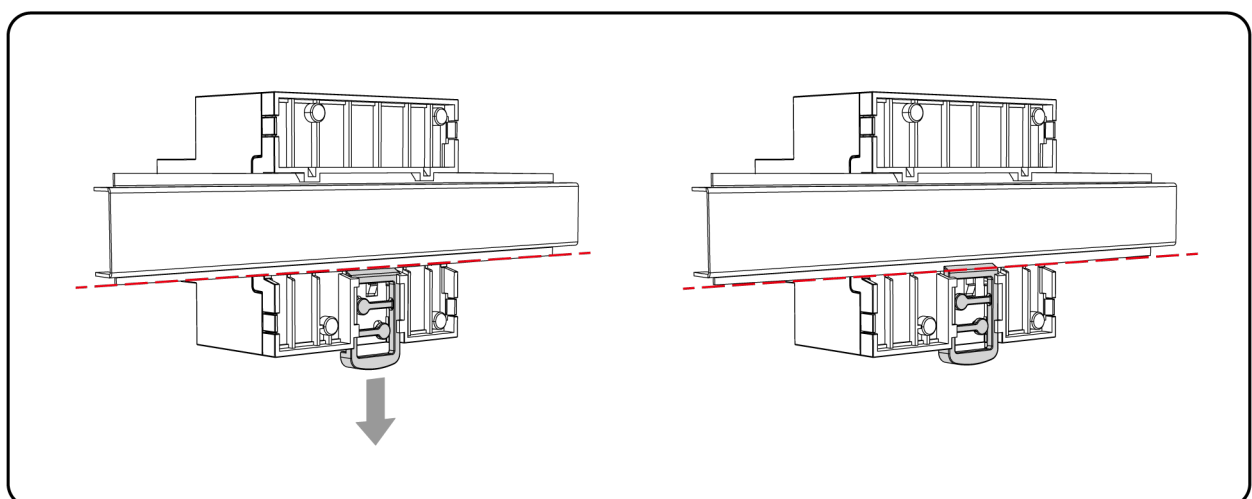
4.2 Install the DIN rail

- Ensure the space meets the M-Relay installation requirements as shown in the figure on the right.
- Ensure there is at least 70mm of clearance between the bottom of the M-Relay and other devices.



4.3 Mount the M-Relay

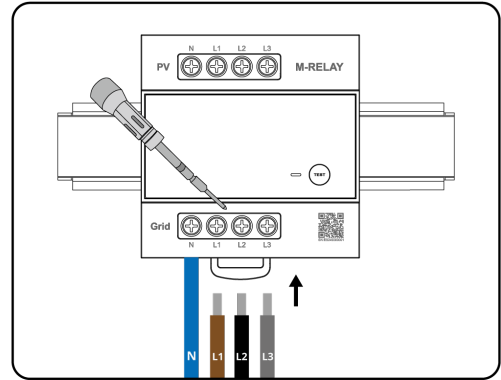
- Pull up the securing clip on the M-Relay.
- Align the relay with the DIN rail inside the combiner until it securely locks into place.
- Release the securing clip.



4.4 Connect power cables

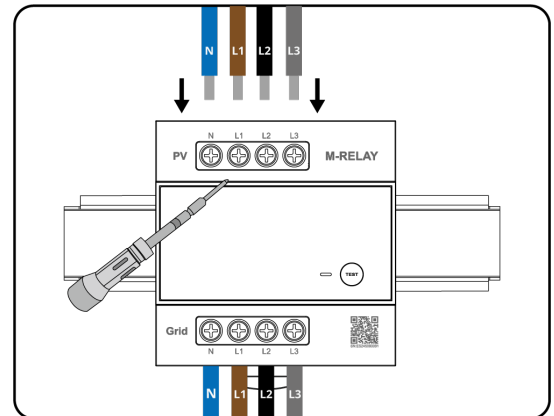
4.4.1 Wire to PV

- Use 2.5–6.0 mm² cables to connect the power wire (N, L1, L2, L3) from the PV system to the terminal (N, L1, L2, L3) on the PV side of the M-Relay.



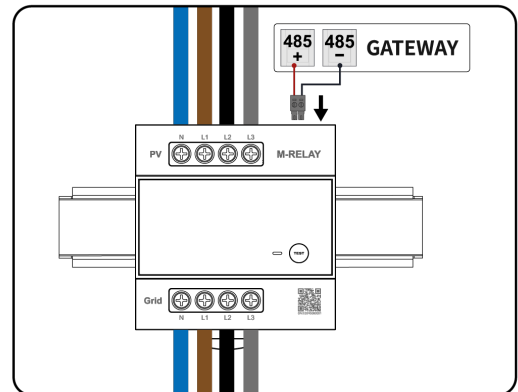
4.4.2 Wire to Grid

- Use 2.5–6.0 mm² cables to connect the power wire (N, L1, L2, L3) from the Grid side to the bus bar.



4.5 Connect RS485 cables

- Connect the cables from M-Relay to the M-Gateway following the figure bellow.
- Red line must be connected to the M-Gateway 485+, black line must be connected to the M-Gateway 485-.



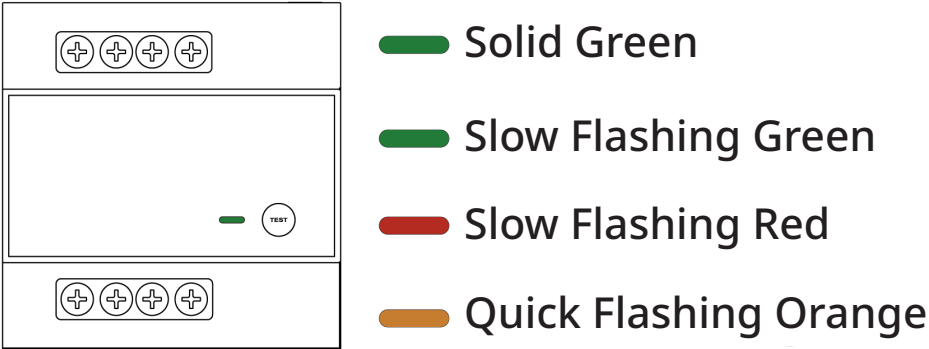
NOTE:

- Ensure the connections are correct and secure.
- Tighten the screw by using a screwdriver with a torque of 1.2 N·m wires to prevent the cables from falling off.

Troubleshooting

5.1 MR100 LED Indicator

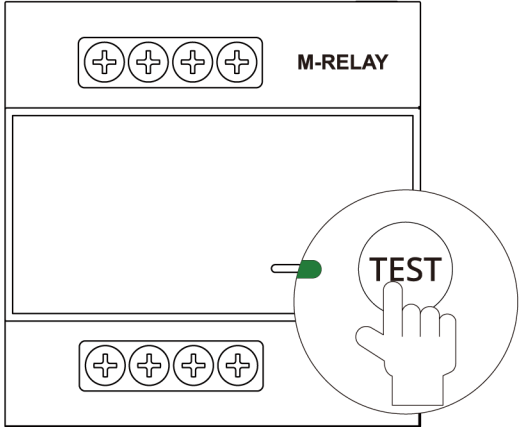
LED indicator can provide critical information on the operational status of devices. The status of LED indicator helps to solve related problems during on-site installation, configuration and troubleshooting. The M-Relay MR100 has one LED indicator, which is described as follows:



Purpose	Colour	Description
1 Status	Solid Green	The M-Relay is working normally.
	Slow Flash Green	The M-Relay is waiting for upgrade or is being upgraded.
	Quick Flash Orange	The M-Relay is self-testing.
	Slow Flash Red	The M-Relay is in a faulty state.

5.2 MR100 Self-Test Button

The M-Relay has a self-test button. The location of the button and the reset operation are shown as below.



	Purpose	Colour	Description
1	Self-Test	Flash Orange 	Press twice within 3 seconds until the indicator flashes orange.

5.3 MR100 Issue Troubleshooting

When an on-site problem occurs, the LED indicator on the MR100 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>).

5.3.1 If the LED status LED is flashing red.

- Issue 1: The AC grid is abnormal.
 - a. Check the alert code in the Atmozen app and obtain the solution. The alert codes can be found in the "Alert Code List" section below.

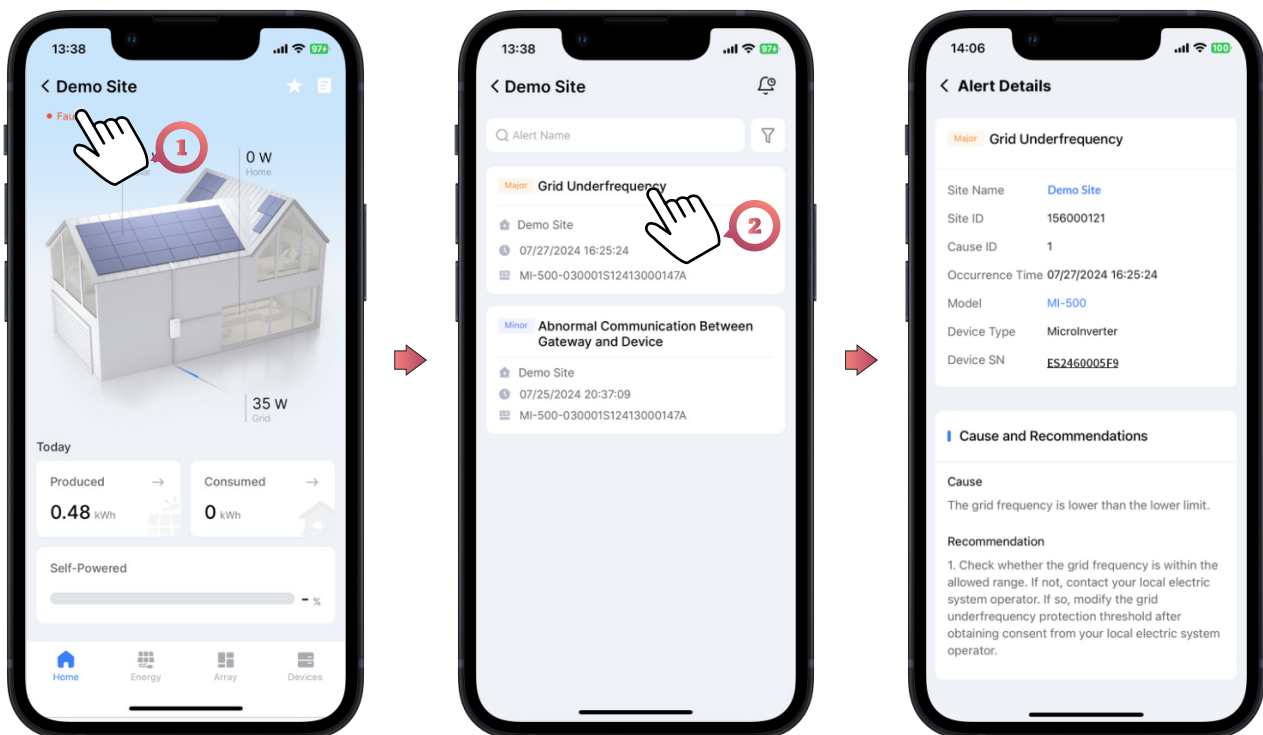
- Issue 2: The internal circuit of the M-Relay failed.
 - a. Check the alert code in the Atmozen app and obtain the solution. The alert codes can be found in the "Alert Code List" section below.
 - b. Power off and then power on the generation system by using the breaker inside the Combiner. If the fault persists, contact your Distributor or Customer Service.

- Issue 3: The M-Relay is disconnected from the gateway.
 - a. Check the alert code in the Atmozen app and obtain the solution. The alert codes can be found in the "Alert Code List" section below.
 - b. Check whether the indicator of the M-Relay flashes in red or is off. If so, contact your Distributor or Customer Service.
 - c. Power off and then power on the gateway by using the grid breaker inside the Combiner. If the fault persists, contact your Distributor or Customer Service.

5.4 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'.

5.5 Alarm Codes List

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

Code	Issue	Reason	Solution
2	Grid Power Outage	Grid power outage occurred.	<ul style="list-style-type: none"> • Check whether the grid is normally powered. • Check whether the alternating current cable or switch is disconnected.
3	Grid Undervoltage	The grid voltage is lower than the lower limit.	<ul style="list-style-type: none"> • 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. • If the fault persists, check whether the alternating current switch and cable are connected properly.
4	Grid Overvoltage	The grid voltage is higher than the upper limit.	<ul style="list-style-type: none"> • 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. • If the fault persists, check whether the alternating current breaker and cable are connected properly, or whether the cable complies with the recommended specifications.
5	Grid Underfrequency	The grid frequency is lower than the lower limit.	<ul style="list-style-type: none"> • 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.
6	Grid Overfrequency	The grid frequency is higher than the upper limit.	<ul style="list-style-type: none"> • 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.

Code	Issue	Reason	Solution
7	High Output Direct Current Component	The output direct current component is higher than the upper limit.	<ul style="list-style-type: none"> The device automatically manages external working conditions in real time and returns to normal after the fault is resolved. If the fault occurs frequently, contact your Distributor or Customer Service.
9	Internal Device Error	<p>The internal circuit of the M-Relay failed.</p> <p>The M-Relay is disconnected from the gateway.</p>	<ul style="list-style-type: none"> Power off and then repower the generation system by using the breaker inside the M-Combiner. If the fault persists, contact your Distributor or Customer Service. Check whether the indicator of the M-Relay flashes in red or is off. If so, contact your Distributor or Customer Service. 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.

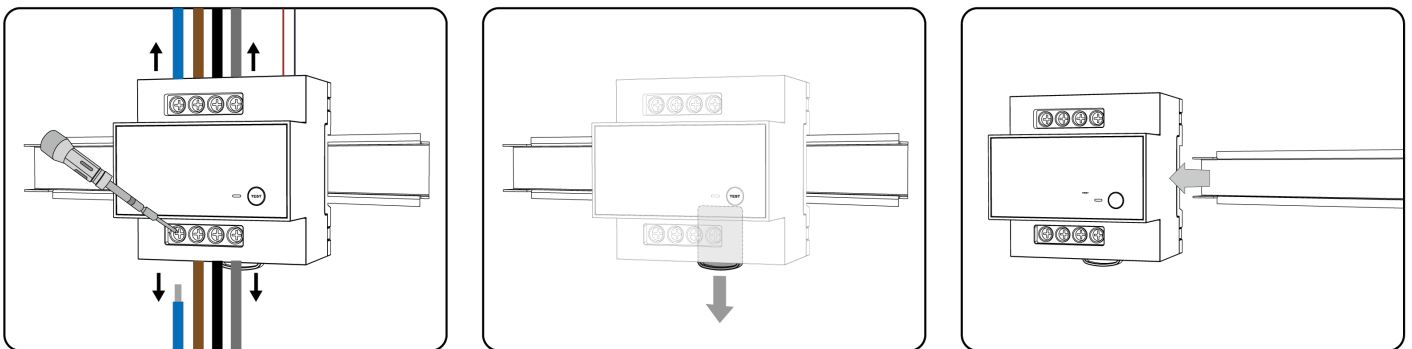
Maintenance

6.1 Remove MR100-T

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

The removal procedure is as follows:

- a. Disconnect the main circuit breaker in the distribution panel.
- b. Remove the power and communication cables in the M-Relay.
- c. Remove the M-Relay from the combiner.

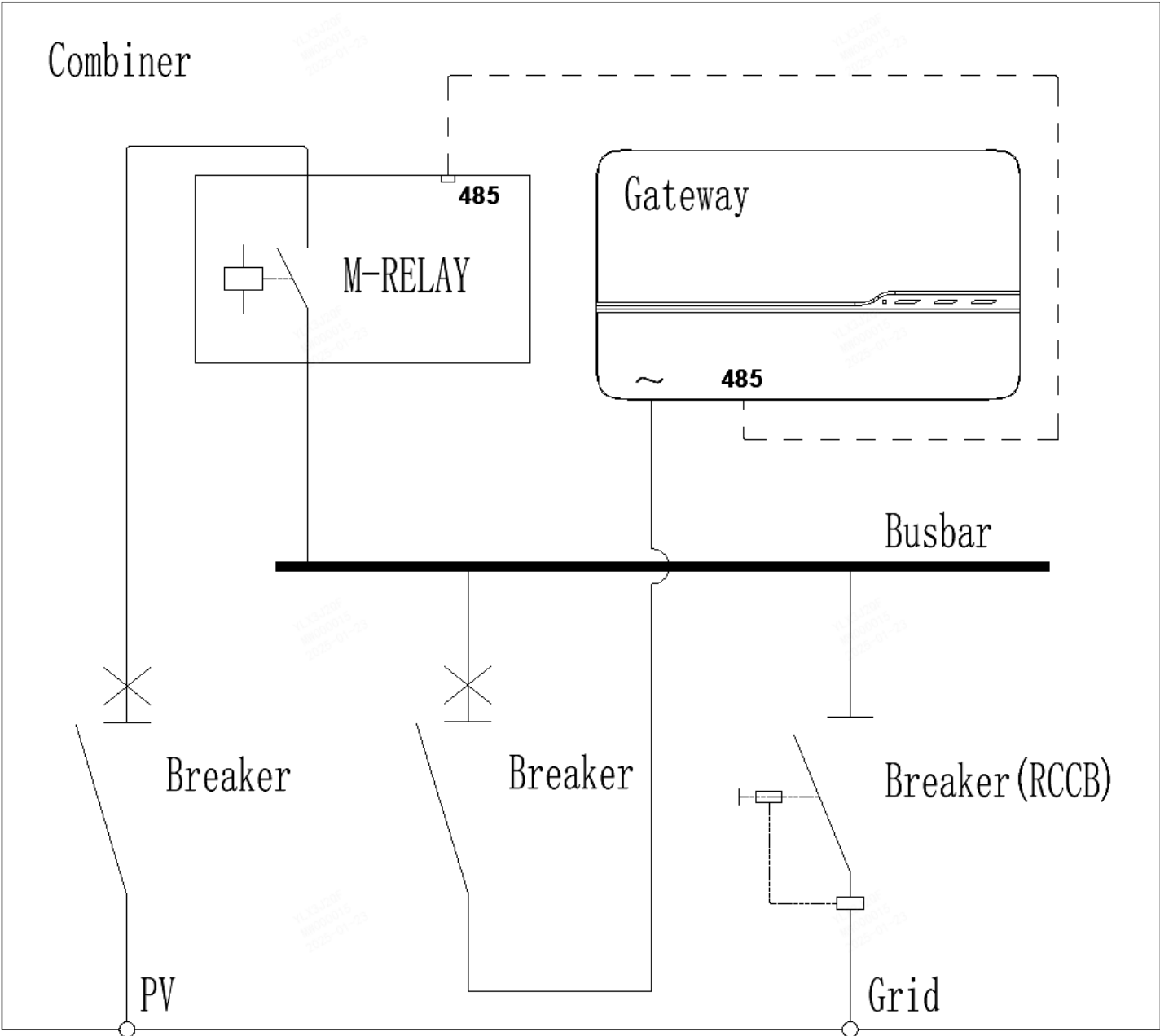


Technical Data

7.1 MR100-T Data Sheet

Items	Unit	MR100-T
Electrical parameters		
Grid setup		Three-phase
Nominal voltage	V	220/380 Va.c., 230/400 Va.c., 3/N~
Operating voltage range (L to N)	V	184 to 276
Nominal frequency	Hz	50/60
Extended frequency range	Hz	45 to 65
Nominal current	A	40/phase
Max. current	A	50/phase
Night power consumption	W	< 1
Overtoltage category		III
AC surge protection		TYPE II
Mechanical parameters		
Dimensions (W x H x D)	mm	89 × 97 × 72.5
Weight	kg	0.4
Ambient temperature range	°C	-30 to 50
Cooling		Air cooling
Enclosure environmental rating		IP20
Noise	dB	<35
Altitude	m	3000
Protection class		II
Pollution degree		II
Communication interfaces		
Communication		RS485
Indicator		1 × LED
Compliance		
Safety		IEC 61010 EN 61010-1
EMC		IEC 61000-6-1/-2/-3/-4

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

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