V1.4-2026-01-30

Grid-Tied PV Inverter

MS Series (7-10kW) G4
User Manual

GOODWE

Copyright Statement

NOTICE

Due to product version upgrades or other reasons, the document content will be updated periodically. Unless otherwise agreed, the document content cannot replace the safety precautions on product labels. All descriptions in the document are for guidance only.

About This Manual

This document primarily introduces the product information, installation wiring, configuration debugging, troubleshooting, and maintenance content of the inverter. Before installing and using this product, please read this manual carefully to understand the product safety information and familiarize yourself with the product's functions and features. The document may be updated periodically; please obtain the latest version and more product information from the official website.

Applicable Model

This document applies to the following inverter models:

model	Nominal output power	Nominal output voltage
GW7K-MS-CN-G40	7kW	220V，L/N/PE
GW8K-MS-CN-G40	8kW	
GW10K-MS-CN-G40	10kW	
GW7.5K-MS-G40	7.5kW	220V/230V/240V，L/N/PE
GW8.5K-MS-G40	8.5kW	
GW9.999K-MS-G40	9.999kW	
GW10K-MS-G40	10kW	
GW7.5K-MS-G41	7.5kW	220V/230V，L/N/PE
GW8K-MS -G40	8kW	

Applicable Personnel

Applicable only to professionals who are familiar with local regulatory standards and

electrical systems, have received professional training, and possess thorough knowledge of this product.

Symbol Definition

To better use this manual, the following symbols are used to highlight relevant important information. Please read the symbols and their descriptions carefully.

DANGER
Indicates a highly hazardous situation which, if not avoided, will result in death or serious injury.
WARNING
Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION
Indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor injury.
NOTICE
Emphasizes and supplements the content, may also provide tips or tricks for optimal product use, and can help you solve a problem or save you time.

Table of Contents

1 Safety Precautions

⚠WARNING

The inverter has been strictly designed and tested in accordance with safety regulations. However, as an electrical device, relevant safety instructions must be followed before performing any operations on the equipment. Improper operation may lead to serious injury or property damage.

1.1 General Safety

NOTICE

- Due to product version upgrades or other reasons, the document content may be updated periodically. Unless otherwise agreed, the document content cannot replace the safety precautions on the product label. All descriptions in the document are for guidance only.
- Please read this document carefully before installing the equipment to understand the product and the precautions.
- All operations on the equipment must be performed by professional and qualified electrical technicians who are familiar with the relevant standards and safety regulations in the project location.
- When operating the equipment, use insulated tools and wear personal protective equipment to ensure personal safety. Contact with electronic components requires wearing anti-static gloves, anti-static wrist straps, anti-static clothing, etc., to protect the equipment from electrostatic damage.
- Unauthorized disassembly or modification may cause equipment damage, and such damage is not covered under warranty.
- Equipment damage or personal injury caused by installation, use, or configuration of the equipment not in accordance with the requirements of this document or the corresponding user manual is beyond the manufacturer's liability. For more product warranty information, please visit the official website: https://en.goodwe.com/warrantyrelated.html.

1.2 DC Side

⚠DANGER

Use the DC connector supplied with the inverter to connect the DC cables. Using other models of DC connectors may lead to serious consequences, and any resulting equipment damage is beyond the manufacturer's liability.

⚠WARNING

- Ensure the module frame and mounting system are properly grounded.
- After connecting the DC cables, ensure the connections are secure and not loose.
- Use a multimeter to measure the PV string. Damage caused by reverse connection, overvoltage, or overcurrent is beyond the manufacturer's liability.
- PV modules connected to the same MPPT must be of the same model. The voltage difference between different MPPTs must be <160V.
- When the input voltage is between 1000V and 1100V, the inverter will enter standby mode. It will resume normal operation when the voltage returns to the MPPT operating voltage range (140V to 1000V).
- It is recommended that the sum of the peak power currents of the strings connected to each MPPT does not exceed the maximum input current of that MPPT on the inverter.
- When the inverter is connected to multiple PV strings, it is recommended to connect at least one string to each MPPT, with no MPPT left unconnected.
- The PV modules used with the inverter must comply with IEC 61730 Class A standard.

1.3 AC Side

⚠WARNING

- Ensure that the voltage and frequency at the grid connection point comply with the inverter's grid-connection specifications.
- It is recommended to add protective devices such as circuit breakers or fuses on the AC side of the inverter. The specifications of the protective devices must be greater than 1.25 times the inverter's maximum output current.
- The protective ground wire of the inverter must be securely connected.
- It is recommended to use copper-core cables for AC output lines. If aluminum wires are to be used, please use copper-aluminum transition terminals for wiring.

1.4 Inverter

DANGER

- During inverter installation, please avoid putting weight on the bottom wiring terminals, otherwise it will cause terminal damage.
- After inverter installation, the labels and warning signs on the enclosure must be clearly visible. Do not obstruct, alter, or damage them.
- Please use the connectors provided with the box to connect inverter cables. Using connectors of other models may lead to serious consequences, and equipment damage caused thereby is not within the responsibility of the equipment manufacturer.
- The warning labels on the inverter enclosure are as follows:

No.	Symbol	Meaning
1		High voltage hazard. The inverter operates at high voltage. Ensure the inverter is powered off before performing any operations.
2		Delayed discharge. After powering off the device, wait for 5 minutes until it is completely discharged.
3		Read the product manual carefully before operating the inverter.
4		Potential hazard exists during device operation. Take necessary precautions during operation.
5		The inverter surface is hot. Do not touch it during operation to avoid burns.
6		Grounding point.
7		CE certification mark.
8		This device must not be disposed of as household waste. Dispose of it according to local regulations or return it to the manufacturer.
9		RCM mark.

1.5 Inverter

⚠DANGER

- During inverter installation, please avoid bearing weight on the bottom terminals, as this may cause terminal damage.
- After inverter installation, the labels and warning signs on the enclosure must be clearly visible; do not cover, alter, or damage them.
- The warning labels on the inverter enclosure are as follows:

No.	Symbol	Meaning
1		Potential hazards exist during equipment operation. Take protective measures when operating the equipment.
2		High voltage hazard. High voltage is present during equipment operation. Ensure the equipment is powered off before performing any operations.
3		The inverter surface is hot. Do not touch during operation to avoid burns.
4		Delayed discharge. After powering off the equipment, wait for 5 minutes until it is fully discharged.
5		Read the product manual carefully before operating the equipment.
6		This equipment must not be disposed of as household waste. Dispose of it according to local laws and regulations, or return it to the manufacturer.
7		Grounding point.
8		CE certification mark.

1.6 EU Declaration of Conformity

1.7 Equipment with Wireless Communication Modules

Equipment with Wireless Communication Modules sold in the European market must comply with the following directives:

- Radio Equipment Directive 2014/53/EU (RED)
- Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

1.8 Devices without wireless communication functions

Devices without wireless communication functions that can be sold in the European market meet the following directive requirements:

- Electromagnetic compatibility Directive 2014/30/EU (EMC)
- Electrical Apparatus Low Voltage Directive 2014/35/EU (LVD)
- Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

1.9 personnel requirements

NOTICE

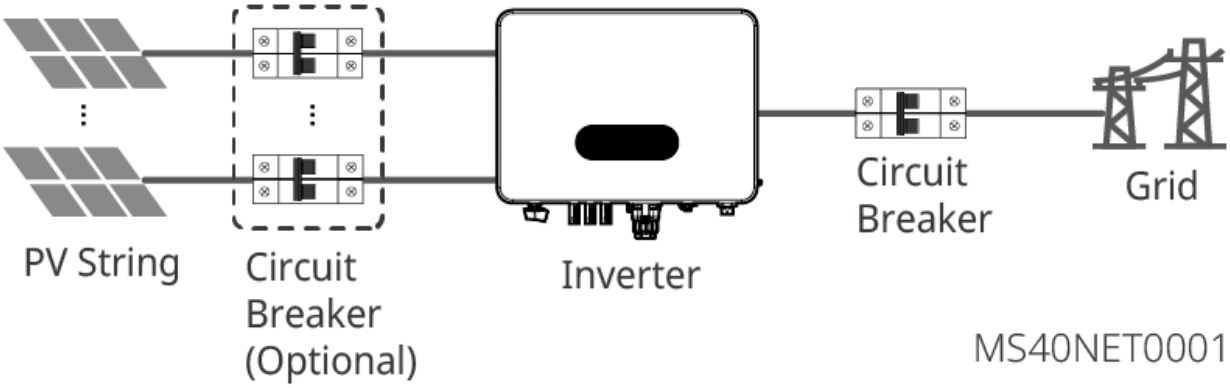
- Personnel responsible for installation and maintenance of equipment must first undergo rigorous training to understand all product safety precautions and master the correct operating methods.
- Installation, operation, maintenance, or replacement of equipment or components is only permitted to be performed by qualified professionals or trained personnel.

2 Product Introduction

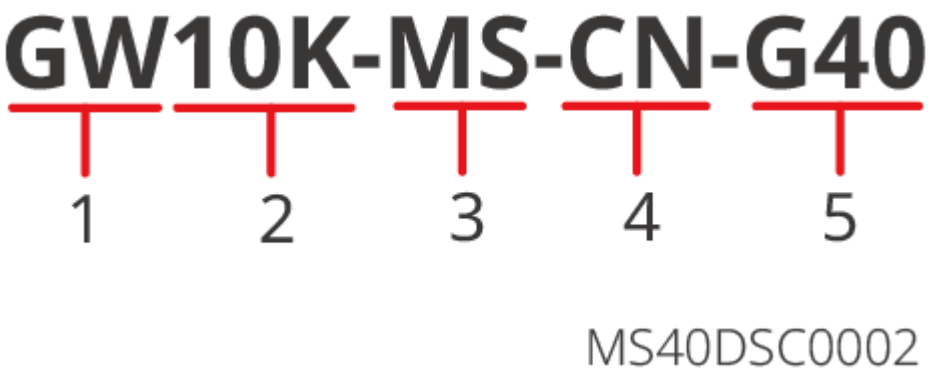
2.1

Introduction

MS series inverters are single-phase string photovoltaic grid-connected inverters. They convert the direct current generated by photovoltaic solar panels into alternating current that meets grid requirements and feed it into the grid. The main application scenarios for the inverters are as follows:

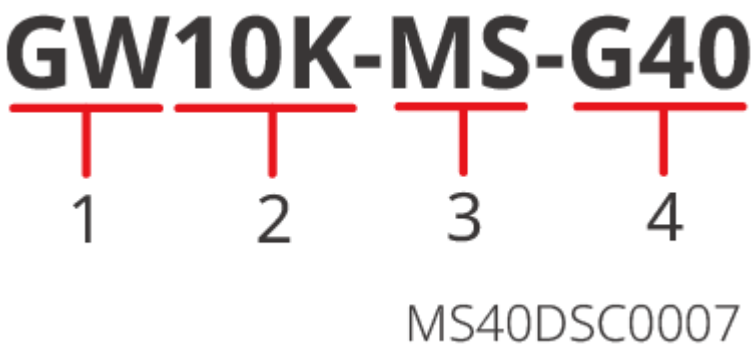


Model Number Meaning



No.	Meaning	Description
1	Brand code	GW: GoodWe

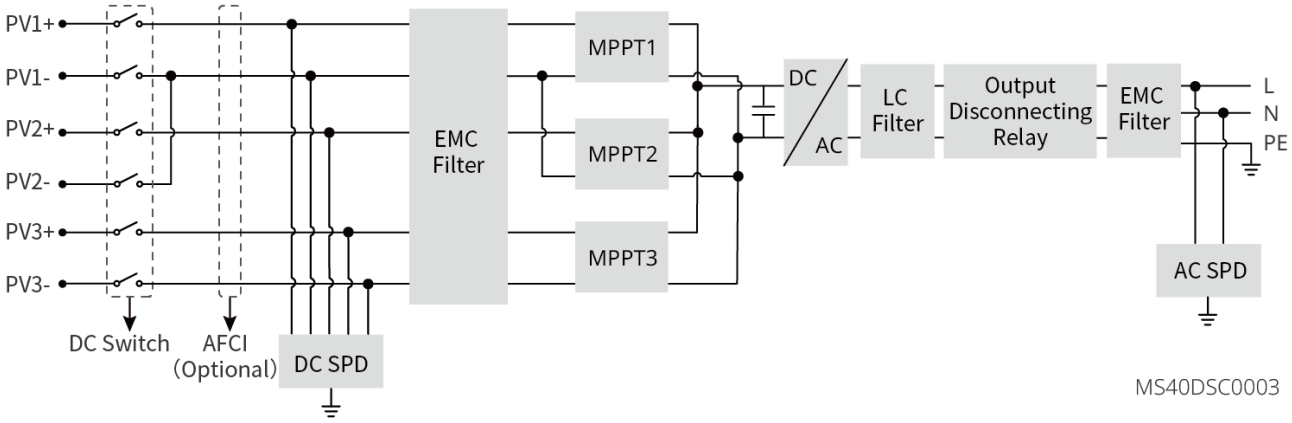
No.	Meaning	Description
2	Nominal power	10K: Nominal power is 10kW 8K: Nominal power is 8kW 7K: Nominal power is 7kW
3	Series code	MS: MS Series
4	Special country code	CN: China version
5	Version code	G40: Fourth-generation product



No.	Meaning	Explanation
1	Brand code	GW: GoodWe
2	Nominal power	10K: Nominal power is 10kW 9.999K: Nominal power is 9.999kW 8.5K: Nominal power is 8.5kW 8K: Nominal power is 8kW 7.5K: Nominal power is 7.5kW
3	Series code	MS: MS Series
4	Version code	G40/G41: Fourth-generation product

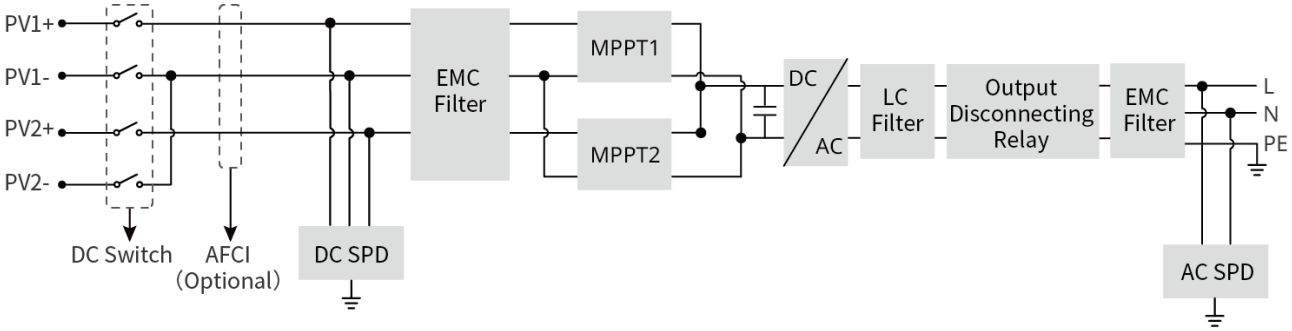
2.2 Circuit Block Diagram

GW7.5K-MS-G40,GW8.5K-MS-G40, GW10K-MS-G40, GW9.999K-MS-G40:



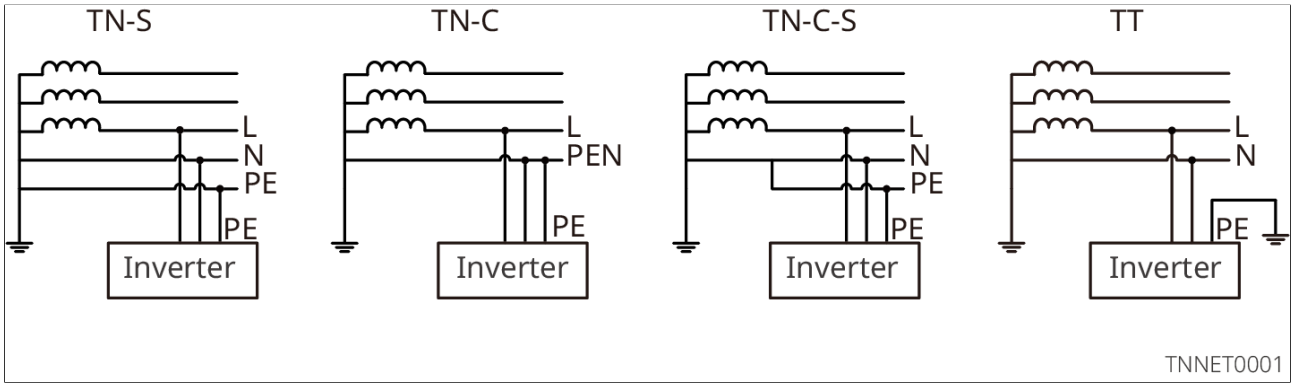
MS40DSC0003

GW7.5K-MS-G41, GW8K-MS-G40, GW7K-MS-CN-G40, GW8K-MS-CN-G40, GW10K-MS-CN-G40:

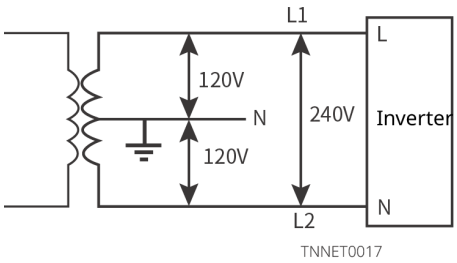


MS40DSC0004

2.3 Supported Grid Types



TNNET0001



2.4 Features

NOTICE
Specific function configurations are subject to the actual model.

AFCI

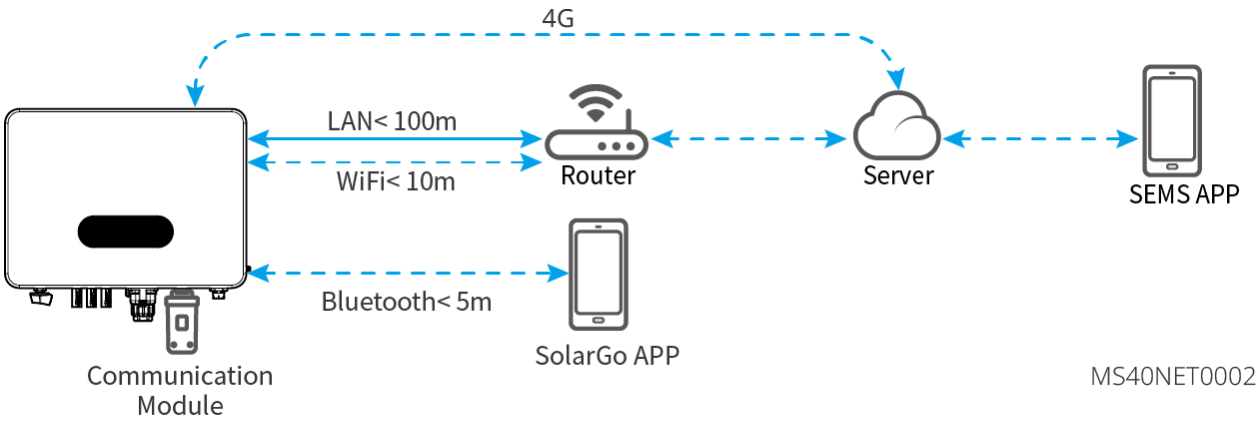
The AFCI function is used to detect arc faults on the DC side of the inverter. When an arc fault occurs, the inverter will automatically protect itself.
Reasons for arc generation:

- DC connectors in the photovoltaic system are damaged or improperly connected.
- Cable connections are incorrect or damaged.
- Connectors and cables are aged.

Communication

The inverter supports parameter settings via Bluetooth locally; it supports connecting to the monitoring platform via WiFi, LAN, or 4G to monitor the inverter operation status, power station operation, etc.

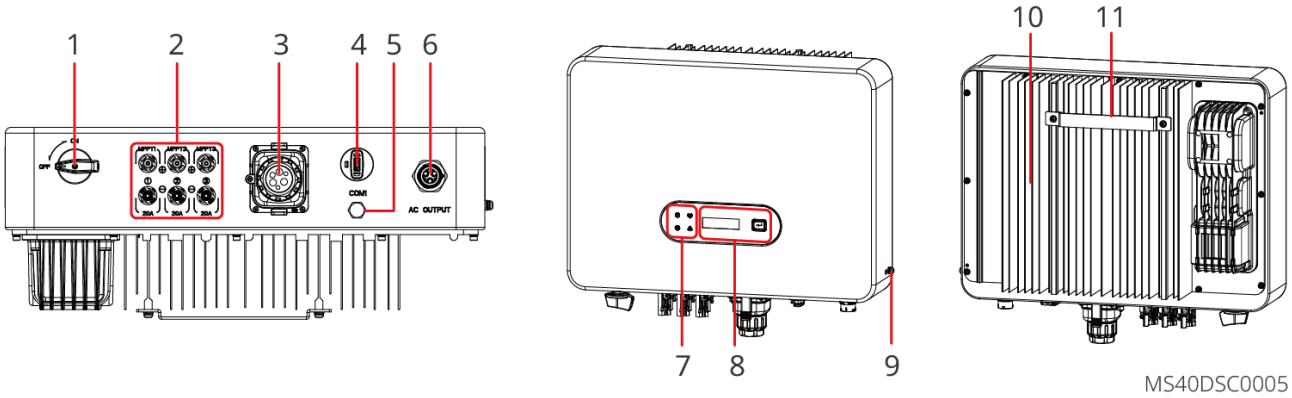
- Bluetooth: Complies with the Bluetooth 5.1 standard.
- WiFi/LAN2.0 (optional): Wireless IEEE 802.11 b/g/n @2.4 GHz; Ethernet 10M/100Mbps adaptive; if a third-party monitoring platform is to be used, this platform must support the ModbusTCP communication protocol.
- 4G (optional): Supports connection to a third-party monitoring platform via the MQTT communication protocol.



2.5 Appearance Description

The color and appearance may vary among different inverter models. Please refer to the actual product.

2.5.1 Component Introduction

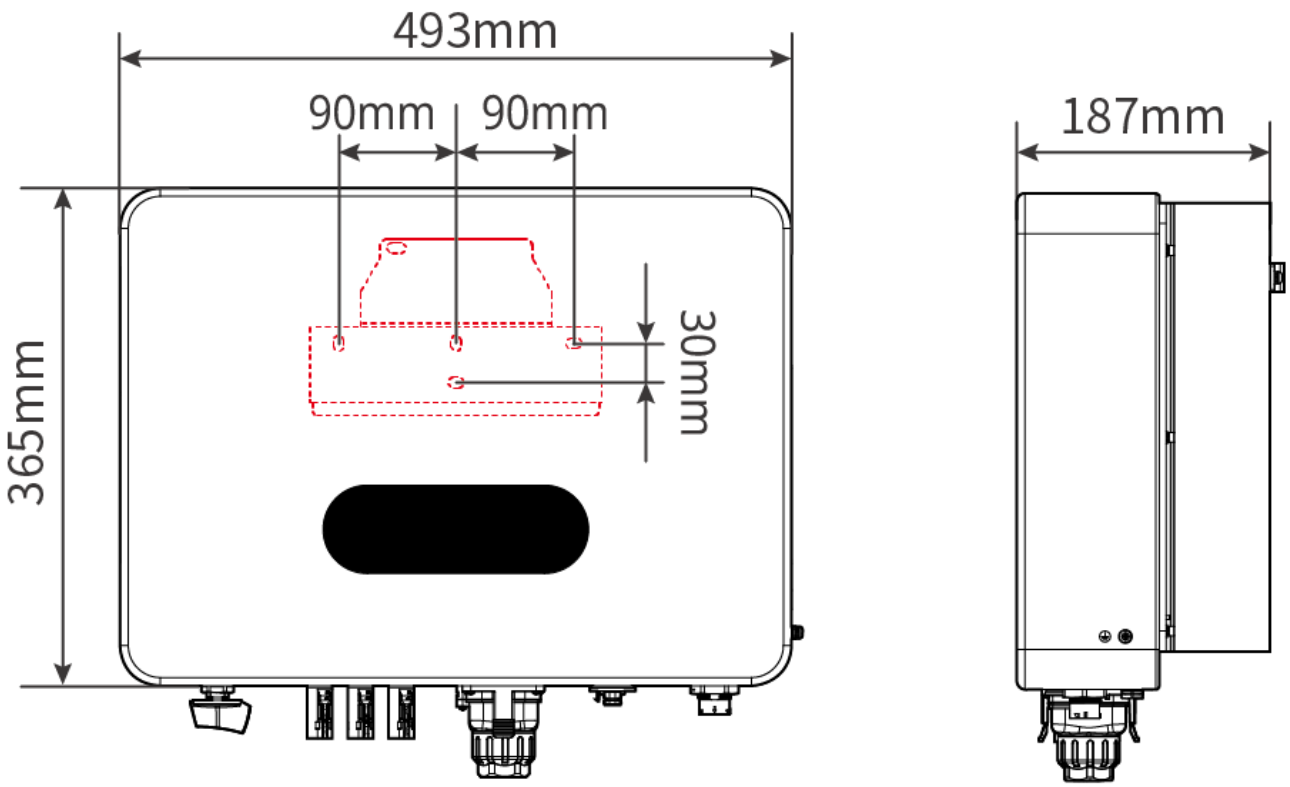


No.	Component/Silk Screen	Description
1	DC switch	Controls the connection or disconnection of DC input.

No.	Component/Silk Screen	Description
2	PV Input Terminals	Can be connected to the DC input cables from PV modules. GW7.5K-MS-G40, GW8.5K-MS-G40, GW10K-MS-G40, GW9.999K-MS-G40: PV+/PV- x 3. GW7.5K-MS-G41, GW8K-MS-G40, GW7K-MS-CN-G40, GW8K-MS-CN-G40, GW10K-MS-CN-G40: PV+/PV- x 2.
3	Communication Port	Can be connected to communication cables for load control, optional CT, RS485 (meter), remote shutdown, DRED (Australia)/RCR (Europe), etc.
4	Communication Module Port	Can be connected to communication modules, such as 4G, WiFi/LAN, etc. Please select the module type based on actual requirements. Supports connection to a U disk for local inverter software version upgrade. For the Brazilian market, can be connected to a USB-RS485 adapter cable.
5	Ventilation valve	-
6	AC Output Cable Connection Terminals	Can be connected to AC output cables to connect the inverter to the grid.
7	indicator	Indicates the working status of the inverter.
8	Display Screen and Buttons	• View inverter-related data. • GW7K-MS-CN-G40, GW8K-MS-CN-G40, GW10K-MS-CN-G40, optional. • GW7.5K-MS-G40, GW8.5K-MS-G40, GW9.999K-MS-G40, GW10K-MS-G40, GW7.5K-MS-G41, GW8K-MS -G40, standard-equipped. • Used to operate the display screen.
9	Grounding terminal	Connecting the PE cable.

No.	Component/Silk Screen	Description
10	heat sink	Inverter heat dissipation.
11	Mounting Bracket	Can be used to mount the inverter.

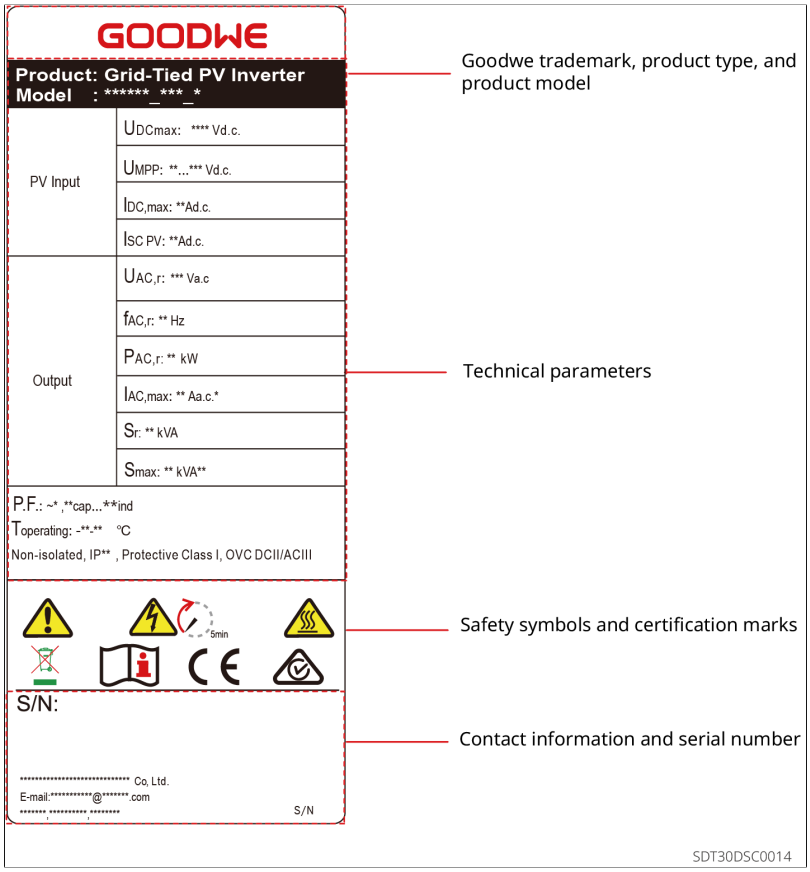
2.5.2 Product Dimensions



MS40DSC0006

2.5.3 Nameplate Instructions

The nameplate is for reference only; please refer to the actual product.



2.5.4 Indicator Light Description

Indicator	Status	Description
Power		Constantly lit: Device powered on
		Off: Device not powered on
Run		Constantly lit: Grid normal, grid connection successful
		Off: Not grid-connected
		Single slow flash: Self-check before grid connection
		Single fast flash: About to connect to grid
		Constantly lit: Wireless monitoring normal
		Single flash: Wireless module reset or reboot

Communication		Two flashes: Not connected to base station or router
		Four flashes: Not connected to monitoring server
		Flashing: RS485 communication normal
		Off: Wireless module restoring factory settings
Fault		Constantly lit: System fault
		Off: No fault

3 Check and Storage

3.1 Check Before Receiving

Before signing for the product, please carefully check the following items:

1. Check the outer packaging for any damage, such as deformation, holes, cracks, or other signs that could indicate damage to the equipment inside the box. If any damage is found, do not open the packaging and contact your distributor.
2. Verify that the inverter model is correct. If it does not match, do not open the packaging and contact your distributor.
3. Check the type and quantity of delivered items for accuracy, and inspect their appearance for any damage. If any damage is found, please contact your distributor.

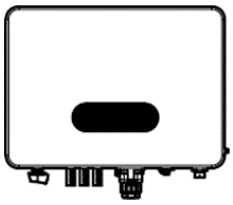
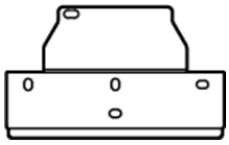
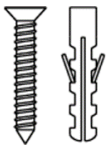
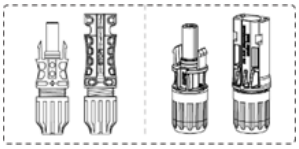
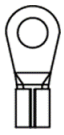
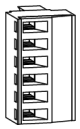
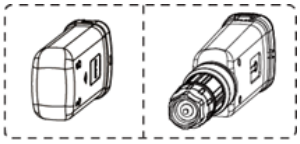
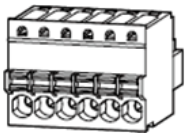
3.2 deliverables

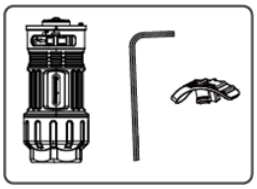
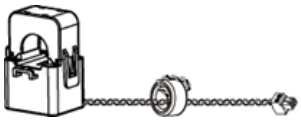
⚠WARNING

When making electrical connections, please use the terminal blocks shipped with the box. Damage to the equipment caused by using incompatible connectors will not be covered under warranty.

NOTICE

[1] The quantity of DC connectors matches the number of inverter DC terminals. Please confirm based on the inverter's DC terminal count.
[2] Communication module types include: WiFi/LAN, 4G, etc. The actual shipping type depends on the selected inverter communication method.
[3] The quantity of communication terminals and tubular terminals matches the selected communication method. Please confirm based on the communication configuration. Depending on the inverter configuration, the quantity of 2PIN communication terminals and DRED/RCR communication terminals included in the box may vary. Please refer to the actual contents.
[4] The protocol converter connecting cable is only shipped to China.
[5] CT is standard in Australia, optional in other regions.
[6] For China region x 0; for other regions x 1.

Part	Description	Part	Description
	Inverter x1		mounting plate x1
	Expansion screw x 4		PV terminal[1] GW7.5K-MS-G40、GW8.5K-MS-G40、GW10K-MS-G40、GW9.999K-MS-G40： x 3 GW7.5K-MS-G41，GW8K-MS-G40，GW7K-MS-CN-G40，GW8K-MS-CN-G40，GW10K-MS-CN-G40： x 2
	Grounding OT terminal x 1		2PIN communication terminal x N[3]
	6PIN 485 communication terminal x 1		PIN terminal x N[3]
	smart dongle x 1[2]		DRED/RCR communication terminal x N[3]

Part	Description	Part	Description
	• AC terminal x 1 • Hex screwdriver x 1 AC terminal release tool x 1		(Optional) CT x 1[5]
	Protocol converter cable (Inverter side) x 1[4]		Protocol converter cable (Protocol converter side) x 1[4]
	Product documentation x 1		PV release tool x N[6]

3.3 Storage

If the device is not put into use immediately, store it according to the following requirements:

1. Ensure the outer packaging box is not removed and the desiccant inside the box is not lost.
2. Ensure the storage environment is clean, with appropriate temperature and humidity ranges, and free from condensation.
3. Ensure the stacking height and orientation of the inverters are arranged according to the instructions on the packaging box label.
4. Ensure there is no risk of the stacked inverters tipping over.
5. If the inverter storage time exceeds two years or the idle time after installation exceeds 6 months, it is recommended to have it inspected and tested by qualified personnel before putting it into use.
6. To ensure the good electrical performance of the internal electronic components of the inverter, it is recommended to power it on once every 6 months during storage. If it has not been powered on for more than 6 months, it is recommended to have it inspected and tested by qualified personnel before putting it into use.

4 Installation

4.1 Installation Requirements

Installation Environment Requirements

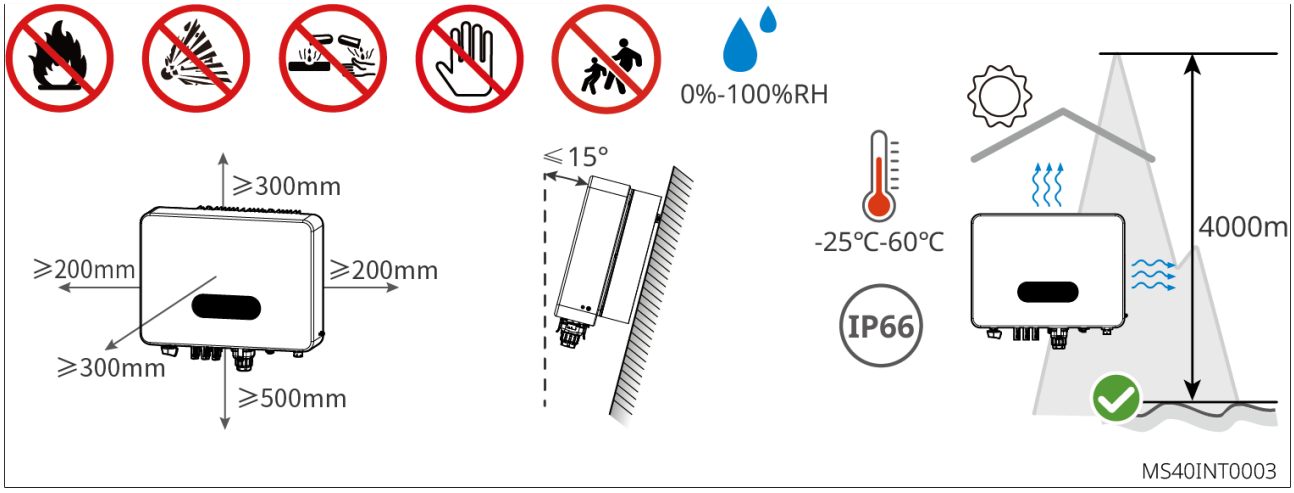
1. The device must not be installed in flammable, explosive, corrosive, or similar environments.
2. The installation carrier must be sturdy and reliable, capable of bearing the weight of the inverter.
3. The installation space must meet the ventilation and heat dissipation requirements of the device, as well as the operational space requirements.
4. The device's protection rating is suitable for indoor and outdoor installation, and the environmental temperature and humidity must be within the appropriate range.
5. The inverter should avoid installation environments with direct sunlight, rain, snow accumulation, etc. It is recommended to install it in a sheltered location, and if necessary, a sunshade can be built.
6. The installation location should be out of reach of children and avoid being placed in easily accessible positions. During operation, the device surface may become hot to prevent burns.
7. The device installation height should facilitate operation and maintenance, ensuring that the device indicators, all labels are easily visible, and the terminal blocks are easy to operate.
8. The inverter installation altitude should be below the maximum operating altitude of 4000m.
9. Inverters installed in salt damage areas may corrode. Salt damage areas refer to regions within 1000m from the coast or affected by sea breeze. The areas affected by sea breeze vary depending on meteorological conditions (e.g., typhoons, seasonal winds) or topography (with embankments, hills).
10. Keep away from strong magnetic field environments to avoid electromagnetic interference. If there are radio stations or wireless communication devices below 30MHz near the installation location, install the device according to the following requirements:
    - Add ferrite cores with multiple turns on the DC input lines or AC output lines of the inverter, or add low-pass EMI filters.
    - The distance between the inverter and the wireless electromagnetic interference device should exceed 30m.

Installation Carrier Requirements

- The installation carrier must not be made of flammable materials and must have fire-resistant properties.
- Ensure that the installation surface is sturdy and that the carrier meets the load-bearing requirements of the device.
- During operation, the device may vibrate. Do not install it on a carrier with poor sound insulation to avoid noise from the device disturbing residents in living areas.

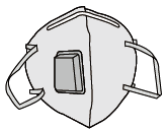
Installation Angle Requirements

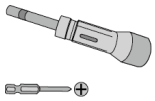
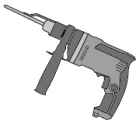
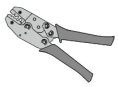
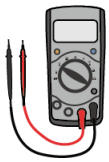
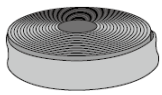
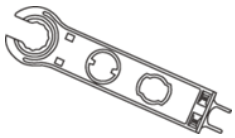
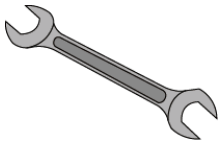
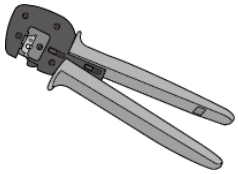
- Recommended inverter installation angle: vertical or tilted back ≤ 15°.
- Do not install the inverter upside down, tilted forward, tilted back beyond the angle, or horizontally.



Installation Tool Requirements

During installation, it is recommended to use the following installation tools. If necessary, other auxiliary tools can be used on site.

Tool Type	Description	Tool Type	Description
	Insulated gloves, protective gloves		Dust mask
	goggle		Safety shoes

Tool Type	Description	Tool Type	Description
	torque wrench M3/M5		hammer drill
	diagonal plier		Heat gun
	wire stripper		Terminal crimping tool
	rubber hammer		Marker pen
	multimeter		Heat shrink tubing
	Vacuum cleaner		Level bar
 or 	DC unlocking tool		Wrench
	crimping tool	-	-

4.2 Installing the Inverter

4.2.1 Portable Inverter

⚠CAUTION

Before installation, the inverter must be transported to the installation site. To avoid personal injury or equipment damage during transportation, please note the following:

1. Ensure an adequate number of personnel based on the equipment weight to prevent it from exceeding the safe lifting capacity and causing injury.
2. Wear safety gloves to prevent injury.
3. Keep the equipment balanced during transportation to avoid dropping it.

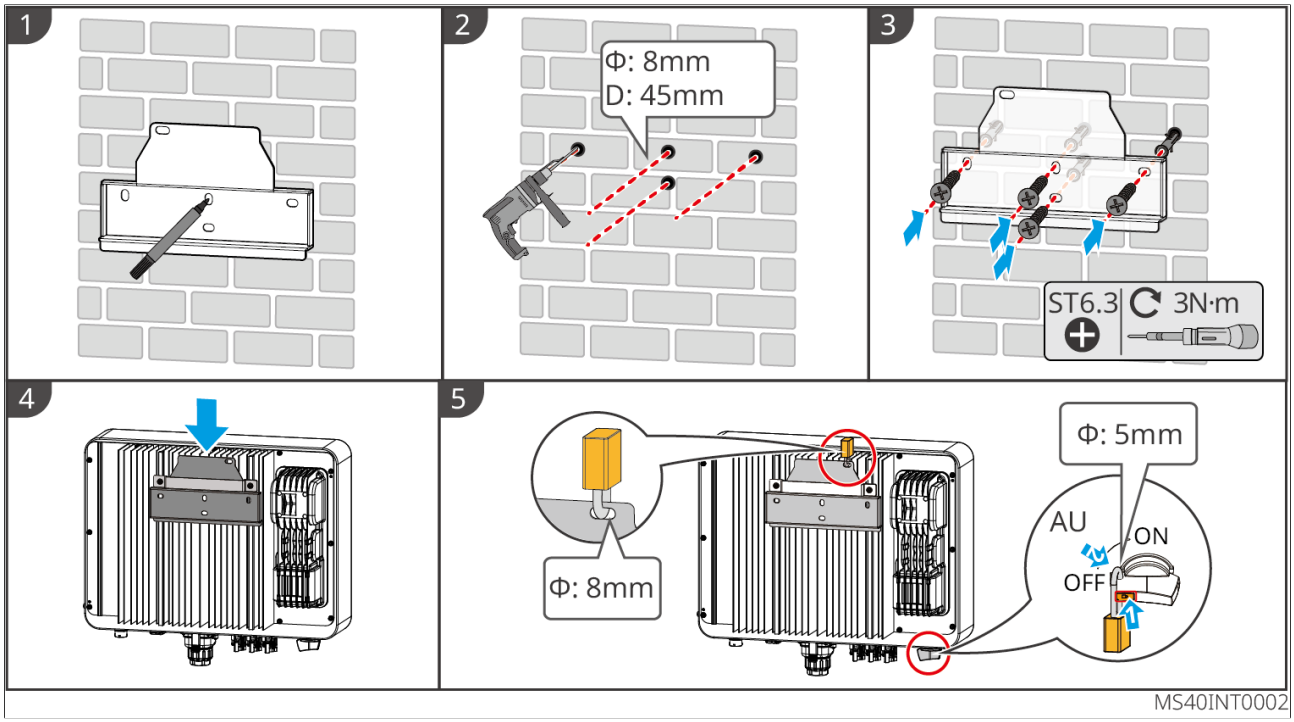
4.2.2 Installing the Inverter

NOTICE

- When drilling holes, ensure the drilling location avoids water pipes, cables, etc., inside the wall to prevent danger.
- When drilling holes, please wear safety goggles and a dust mask to avoid inhaling dust into the respiratory tract or getting it into the eyes.
- The DC switch lock is user-supplied (Australia only).
- The security lock is user-supplied. Please select an appropriate security lock, otherwise installation may not be possible.
- Ensure the inverter is securely installed to prevent it from falling and injuring personnel.

1. Place the backplate horizontally on the wall, and use a marker pen to mark the drilling positions.
2. Use an impact drill with a drill bit diameter of 8mm to drill holes, ensuring the hole depth is approximately 45mm.
3. Use expansion screws to secure the backplate to the wall or bracket.
4. Mount the inverter onto the backplate, and secure the backplate and inverter.
5. Install the anti-theft lock with an aperture of 8mm. Install the DC switch lock (only

in Australia) with an aperture of 5mm.



5 Electrical Connection

5.1 Safety Precautions

DANGER

- Before performing electrical connections, disconnect the DC switch and AC output switch of the inverter to ensure the device is powered off. It is strictly prohibited to operate with power on, otherwise DANGER such as electric shock may occur.
- All operations during electrical connections, as well as the specifications of cables and components used, must comply with local laws and regulations.
- If the cable is subjected to excessive tension, it may lead to poor connections. When wiring, please leave a certain length of cable before connecting it to the inverter's terminal ports.

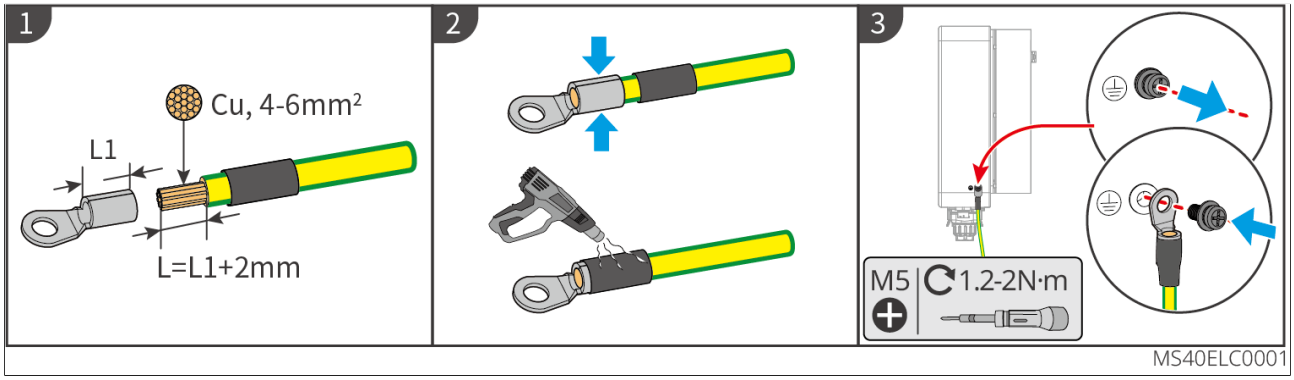
NOTICE

- When performing electrical connections, wear personal protective equipment such as safety shoes, protective gloves, and insulating gloves as required.
- Only qualified personnel are permitted to perform electrical connection operations.
- The cable colors shown in the diagrams in this document are for reference only. Specific cable specifications must comply with local regulations.

5.2 Connecting the PE cable

WARNING

- The protective grounding of the chassis cannot replace the protective earth wire of the AC output port. When wiring, ensure the protective earth wires at both locations are reliably connected.
- When using multiple inverters, ensure all inverter chassis protective grounding points are equipotentially connected.
- To improve the corrosion resistance of the terminals, it is recommended to apply silicone or paint to the exterior of the grounding terminal after the protective earth wire connection installation is complete.
- Please prepare your own protective earth wire. Recommended specifications:
  - Type: Outdoor single-core copper wire
  - Conductor cross-sectional area: 4-6mm^2



5.3 Connecting AC Output Cables

WARNING

- Do not connect loads between the inverter and the AC switch directly connected to the inverter.
- The inverter integrates a Residual Current Monitoring Unit (RCMU). When the inverter detects a leakage current greater than the allowable value, it will quickly disconnect from the grid.

NOTICE

- Each inverter must be equipped with an AC output switch. Multiple inverters cannot be connected to a single AC switch simultaneously.
- If the inverter's AC output terminals are not used, please seal the terminals with waterproof caps, otherwise the equipment's protection rating will be affected.

To ensure that the inverter can safely disconnect from the grid in case of abnormalities, please connect an AC switch on the AC side of the inverter. Please select a suitable AC switch according to local regulations. The following switch specifications are for reference:

Inverter Model	AC Switch Specification
GW7K-MS-CN-G40	50A
GW8K-MS-CN-G40	50A
GW10K-MS-CN-G40	63A
GW7.5K-MS-G40	50A
GW8.5K-MS-G40	63A
GW9.999K-MS-G40	63A
GW10K-MS-G40	63A
GW7.5K-MS-G41	50A
GW8K-MS -G40	50A

Please choose whether to install an RCD device according to local laws and regulations.
The inverter can additionally be connected to an A-type RCD (Residual Current Device) for protection when the DC component of the leakage current exceeds the limit. It is recommended to use an RCD with a specification of 300mA (according to local regulations).

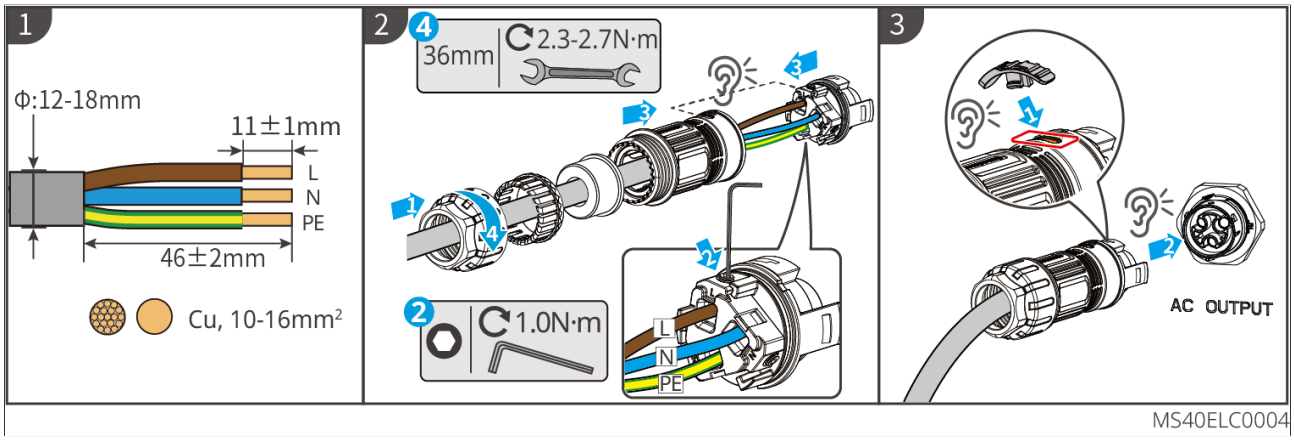
NOTICE

Each inverter must be equipped with an AC output switch. Multiple inverters cannot be connected to a single AC switch simultaneously.

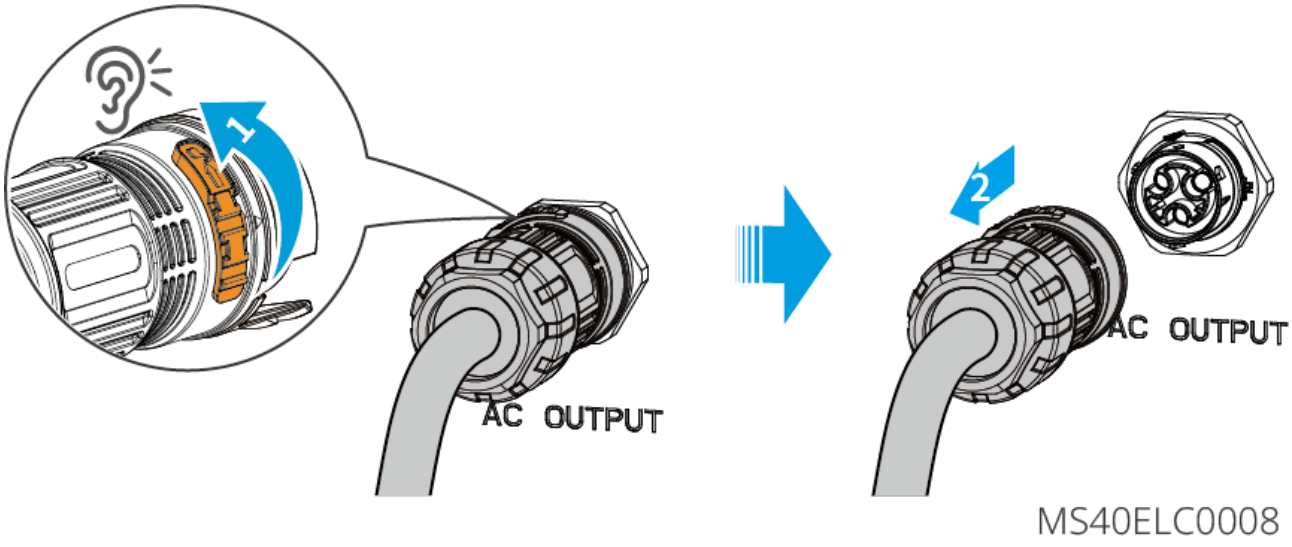
⚠WARNING

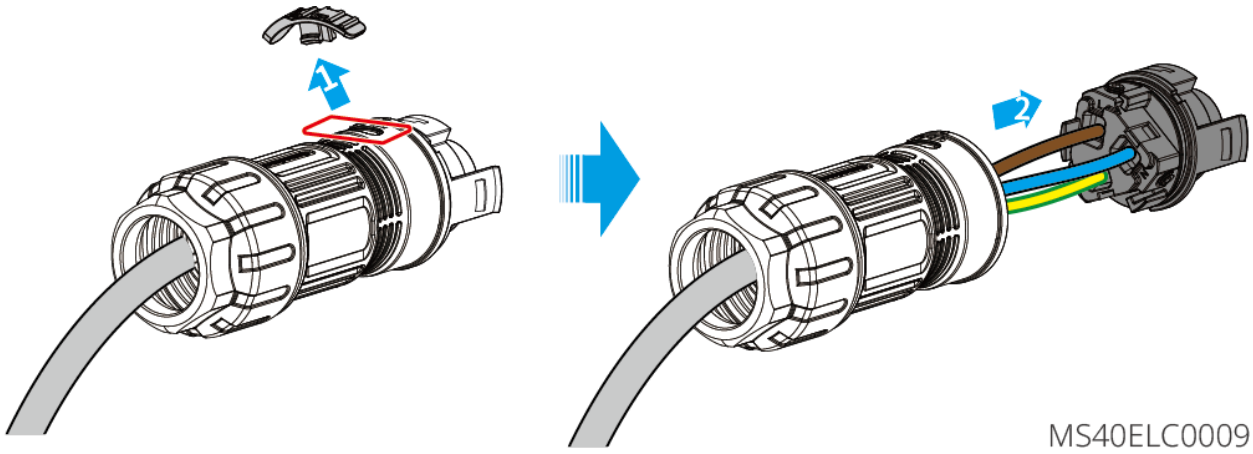
- When wiring, ensure that the AC output wires are exactly matched to the “L”、“N”、“PE” ports of the AC terminal. If the cables are connected incorrectly, it will cause damage to the inverter.
- Please ensure that the wire cores are fully inserted into the AC terminal wiring holes, with no exposure.
- Ensure that the cable connections are tight; otherwise, during equipment operation, it may cause the terminal to overheat and damage the inverter.

1. Make the AC output cables.
2. Disassemble the AC terminal, connect the AC output cables to the AC terminal. Assemble the AC terminal.
3. Connect the AC terminal to the inverter.



DisassembleACterminal





NOTICE

- After completing the wiring connection, please check the correctness and firmness of the wiring, and clean up any construction debris left behind during maintenance.
- The AC output wiring terminals must be sealed to ensure the machine's protection rating.

5.4 Connecting DC Input Cables

⚠DANGER

Before connecting the PV strings to the inverter, please confirm the following information. Otherwise, it may cause permanent damage to the inverter, and in severe cases, may lead to fire resulting in personal injury and property loss.

1. Ensure the maximum short-circuit current and maximum input voltage for each MPPT circuit are within the inverter's allowable range.
2. Ensure the positive pole of the PV string is connected to the inverter's PV+, and the negative pole of the PV string is connected to the inverter's PV-.

⚠WARNING

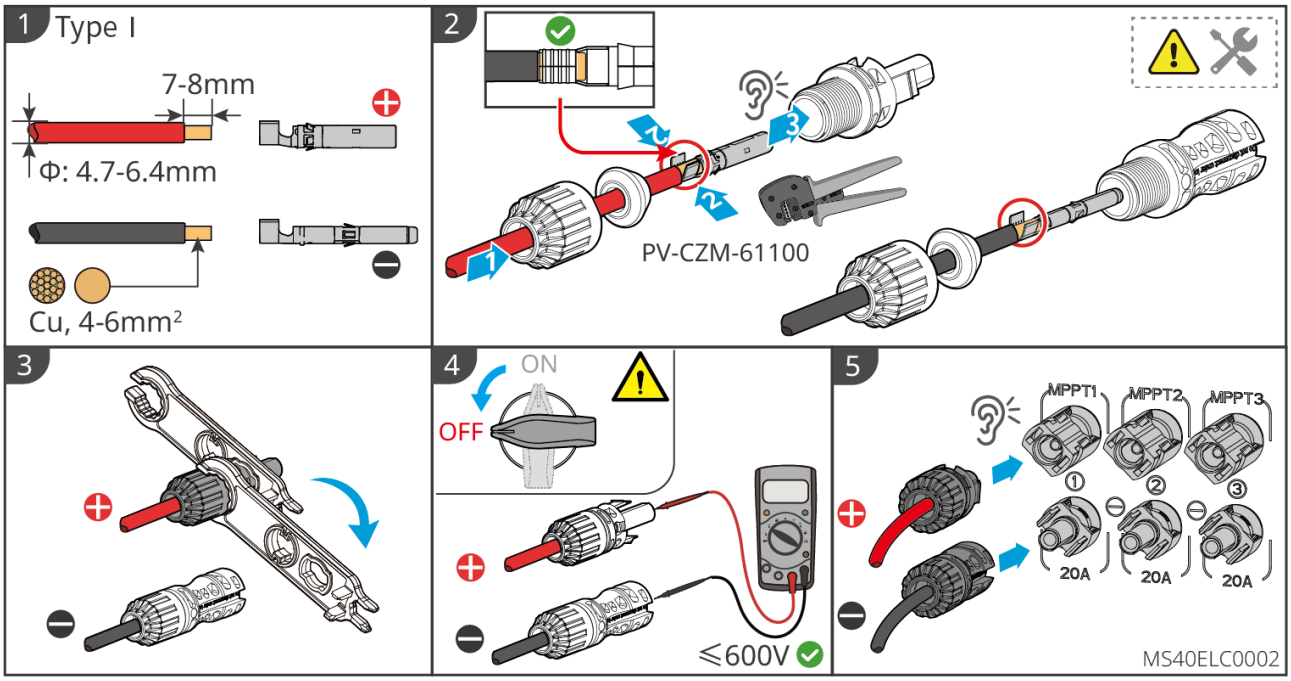
- Mixing PV modules of different brands or models within the same MPPT circuit, or connecting PV modules with different azimuths or tilt angles within the same PV string, will not necessarily damage the inverter but may lead to reduced system performance.
- The maximum DC input voltage of the inverter is 600V. Please ensure the open-circuit voltage of the PV string connected to each MPPT does not exceed 600V. When the input voltage is between 560V-600V, the inverter will enter standby mode. The inverter will resume normal operation when the voltage returns to the MPPT operating voltage range of 40V-560V.
- It is recommended that the voltage difference between different MPPT circuits does not exceed 150V.
- The sum of the peak power currents of the strings connected to each MPPT must not exceed the Max. AC Current From Utility Grid of the inverter per MPPT circuit.
- When the inverter is connected to multiple PV strings, it is recommended to maximize the number of MPPT connections.
- PV string output does not support grounding. Before connecting the PV string to the inverter, please ensure the minimum insulation resistance to ground of the PV string meets the minimum insulation impedance requirement.
- Please prepare your own DC input cables.

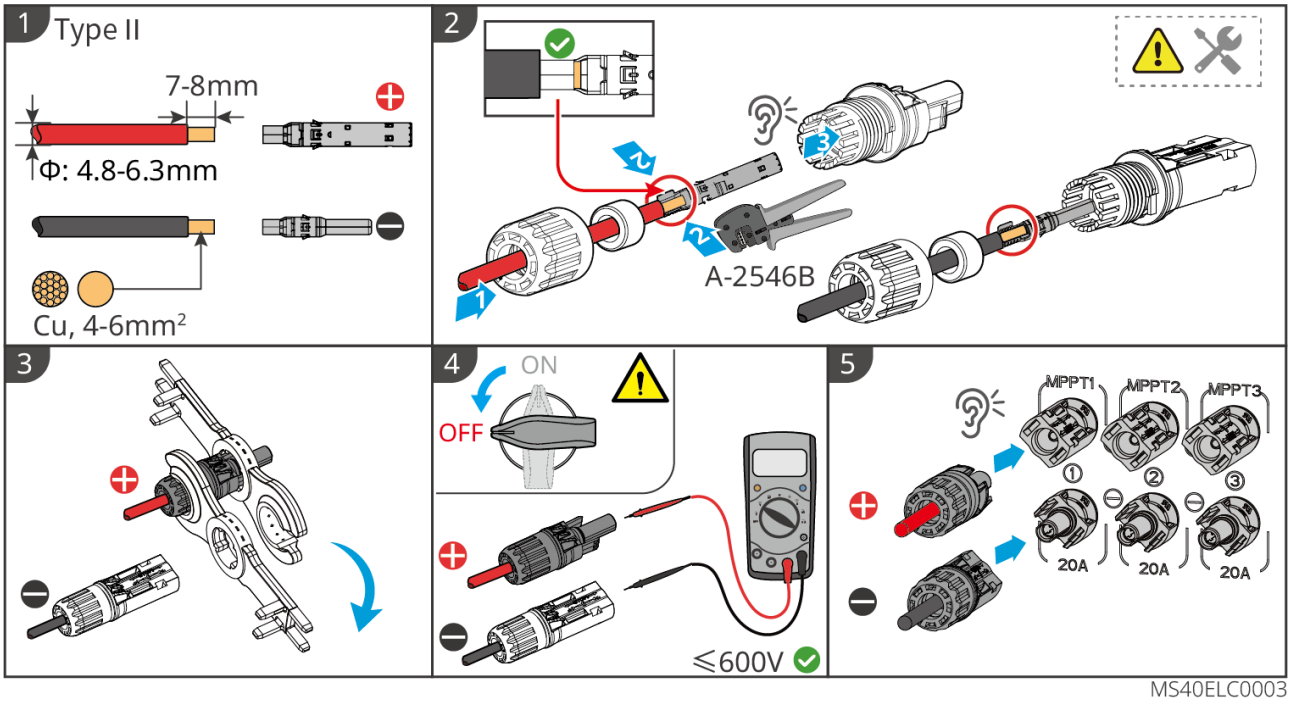
NOTICE

If the inverter's DC input terminals do not need to be connected to a PV string, please use waterproof covers to seal the terminals; otherwise, the equipment protection rating will be affected.

Connecting DC Input Cables

1. Prepare DC cables.
2. Crimp DC input terminals and assemble DC connectors.
3. Tighten the DC connectors.
4. Check the DC input voltage.
5. Connect the DC connectors to the inverter DC terminals.





5.5 Communication Connection

NOTICE

- For specific product function configurations, please refer to the actual model of the inverter in your region.
- Due to product version upgrades or other reasons, the document content will be updated periodically. For the compatibility between inverters and IoT products, please refer to: https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_Compatibility-list-of-GoodWe-inverters-and-IoT-products-EN.pdf

5.5.1 Communication Networking Introduction

Power Limitation Networking Solution

NOTICE

- Connecting the inverter to a smart meter or CT enables output power limiting and load monitoring functions.
- Please enable the "Export power limit" function via the SolarGo APP.

The photovoltaic power station generates electricity for self-consumption. When the electrical equipment cannot consume all the generated power and surplus power feeds back into the grid, the inverter can monitor the grid-connected power data in real-time via a smart meter and adjust the output power to prevent excess electricity from feeding into the grid.

WARNING

1. For single-unit networking, during initial installation, there is no need to pay attention to the CT sampling current direction; during later replacement or maintenance of the CT, please use the meter/CT auxiliary detection function on the SolarGo APP to allow the inverter to re-adapt to the CT sampling current direction.
2. For multi-unit networking, the CT installation position should be close to the grid connection point, with the correct installation direction. The "-->" symbol on the CT indicates the direction of inverter current flowing towards the grid. If installed in reverse, the inverter will trigger an alarm and the output limitation function

cannot be achieved.

3. The aperture of the CT must be larger than the outer diameter of the AC power line to ensure the AC power line can pass through the CT.
4. The CT must be clamped onto the L cable, do not clamp it onto the N cable.
5. Specifications for the CT shipped with the inverter: Sampling range: 90A; Ratio: 1000:1; Cable length: 5m.
6. GM330:

- For the CT current ratio specification, please select nA/5A. (nA: CT primary side input current, where n ranges from 200-5000, selected by the user based on actual requirements. 5A: CT secondary side output current.)
- The accuracy value for the CT is recommended to be 0.5, 0.5s, 0.2, or 0.2s, ensuring the CT current sampling error is ≤ 1%.
- To ensure the current detection accuracy of the CT, the CT cable length is recommended not to exceed 30m, and the cable's current-carrying capacity is recommended to be 6A.

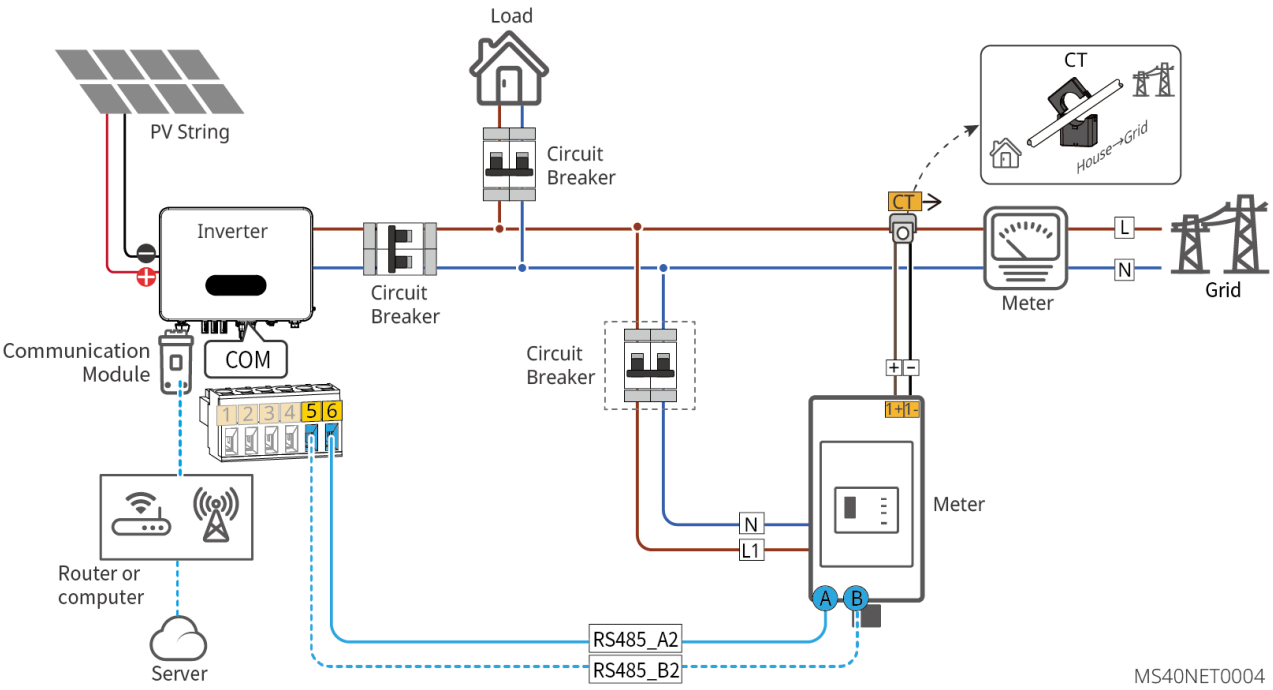
7. Please ensure the meter wiring and phase sequence are correct. Recommended cross-sectional area for the meter input voltage cable: 1mm² (18AWG).
8. Multi-unit networking power limitation requires matching with Ezlink3000. If needed, please contact after-sales service or a distributor for purchase.
9. The inverter supports parameter setting locally via 4G or WiFi/LAN communication modules, connecting to a mobile phone or WEB interface to set device-related parameters, view device operation information and error messages, and stay informed about the system status.
10. When there is only one inverter in the system, you can use the 4G Kit-CN-G20, 4G Kit-CN-G21, WiFi/LAN Kit-20, or WiFi Kit-20 smart dongle.
11. When the system contains multiple inverters for unit networking, the master inverter needs to install the Ezlink3000 smart dongle for networking, while the slave inverters do not need to connect to a smart dongle. The Ezlink3000 version must be V1.6.8 or higher.
12. After wiring is completed, set the relevant parameters via the LCD display or the SolarGo APP to complete the anti-backflow or output power limitation function.

NOTICE

This electricity meter is primarily used for power control at the grid connection point. The measured power generation and consumption are for reference only and cannot be used as the basis for electricity billing. Electricity billing must be based on the metering electricity meter provided by the grid company.

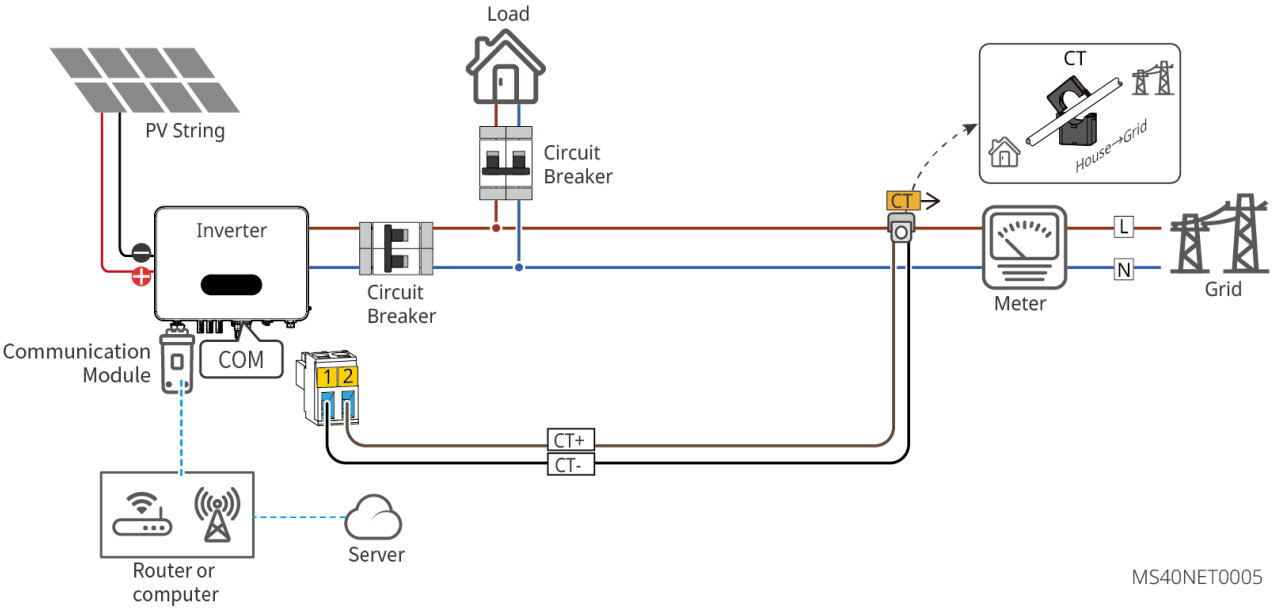
Single-Unit Power Limitation Networking Solution

Meter Solution (GM1000/GMK110)



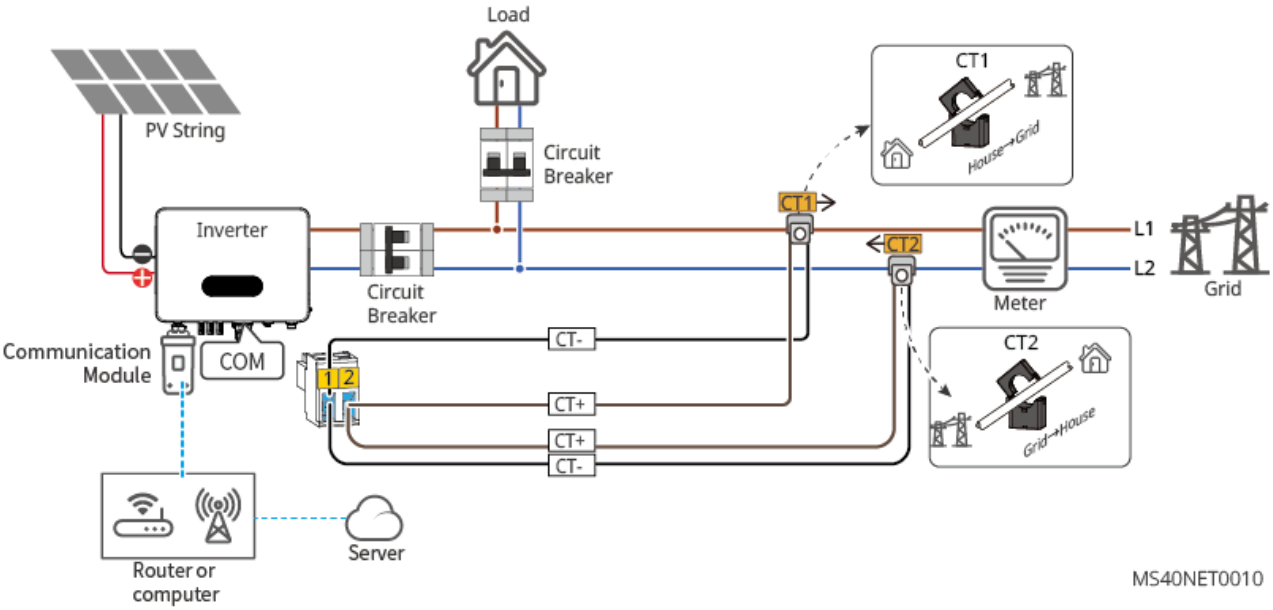
CT Solution

NOTICE
CTs are shipped with the inverter for the Australian region and are optional for other regions. CT ratio: 90A/90mA.

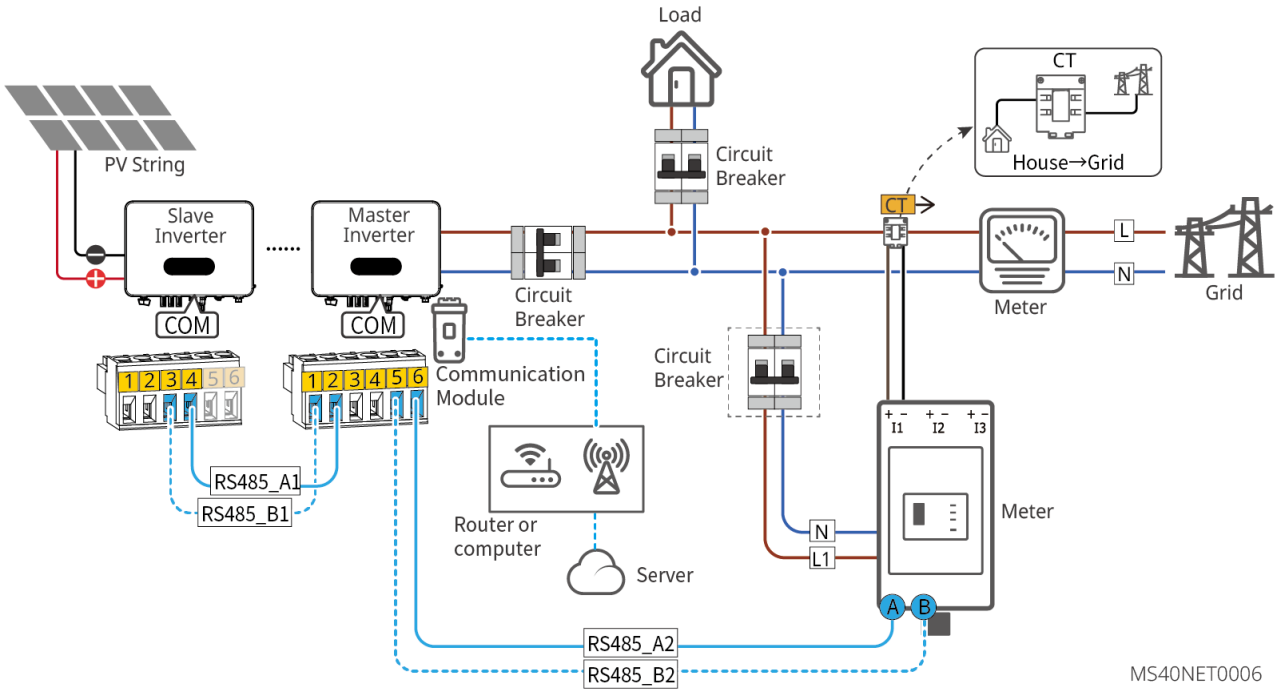


Single-Unit Power Limitation Networking Solution when connected to a split-phase grid

NOTICE
Users shall prepare CT themselves or purchase it from the manufacturer. CT transformation ratio: 90A/45mA.

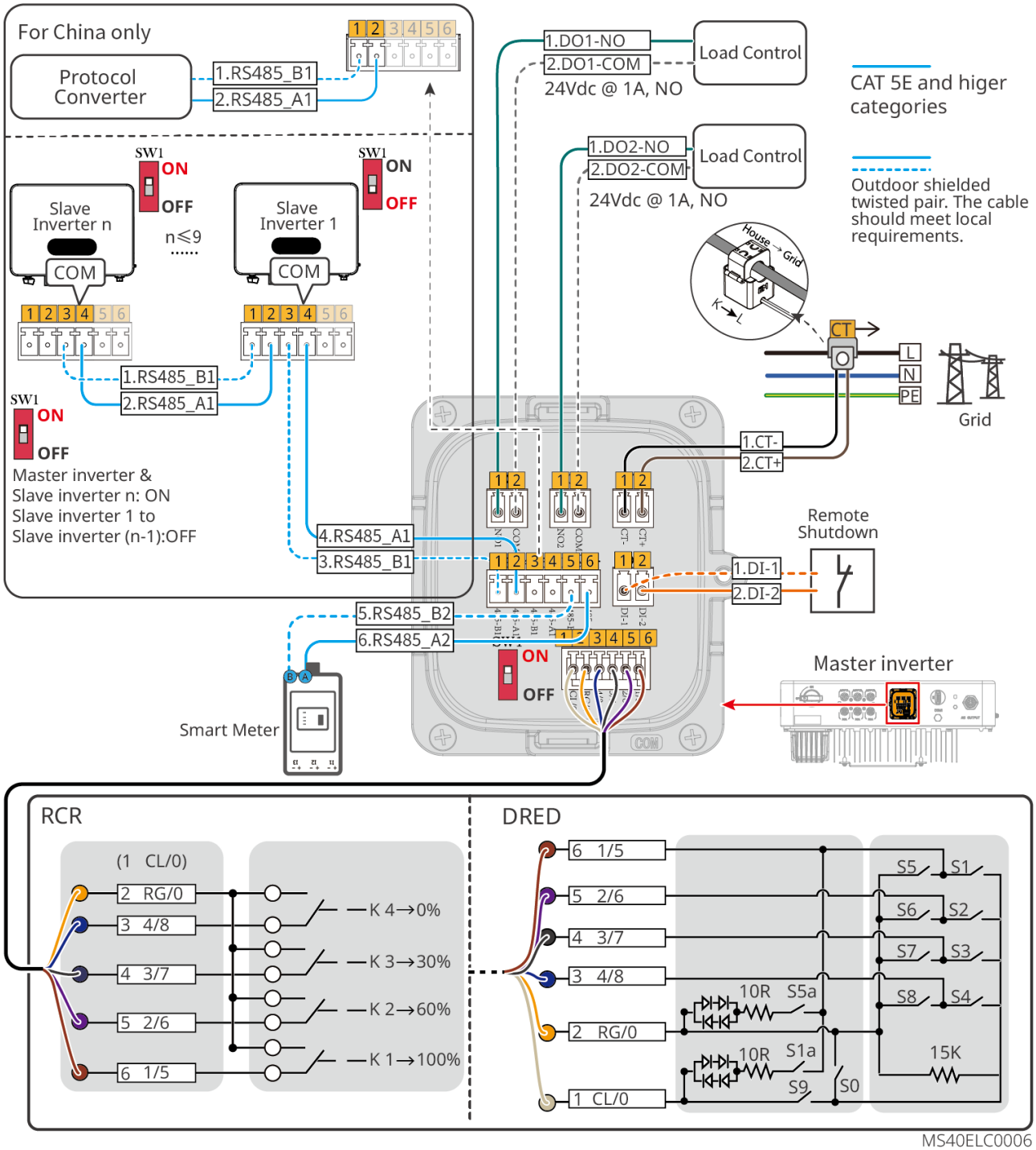


Multi-Unit Power Limitation Networking Solution (GM330+Ezlink3000)


Load
CT
House→Grid
PV String
Slave Inverter
Master Inverter
Circuit Breaker
CT
Meter
L
N
Grid
COM
COM
Circuit Breaker
Communication Module
Circuit Breaker
1 2 3 4 5 6
1 2 3 4 5 6
RS485_A1
RS485_B1
Router or computer
Server
N
L1
I1 I2 I3
Meter
A B
RS485_A2
RS485_B2
MS40NET0006

5.5.2

Connecting Communication Cables



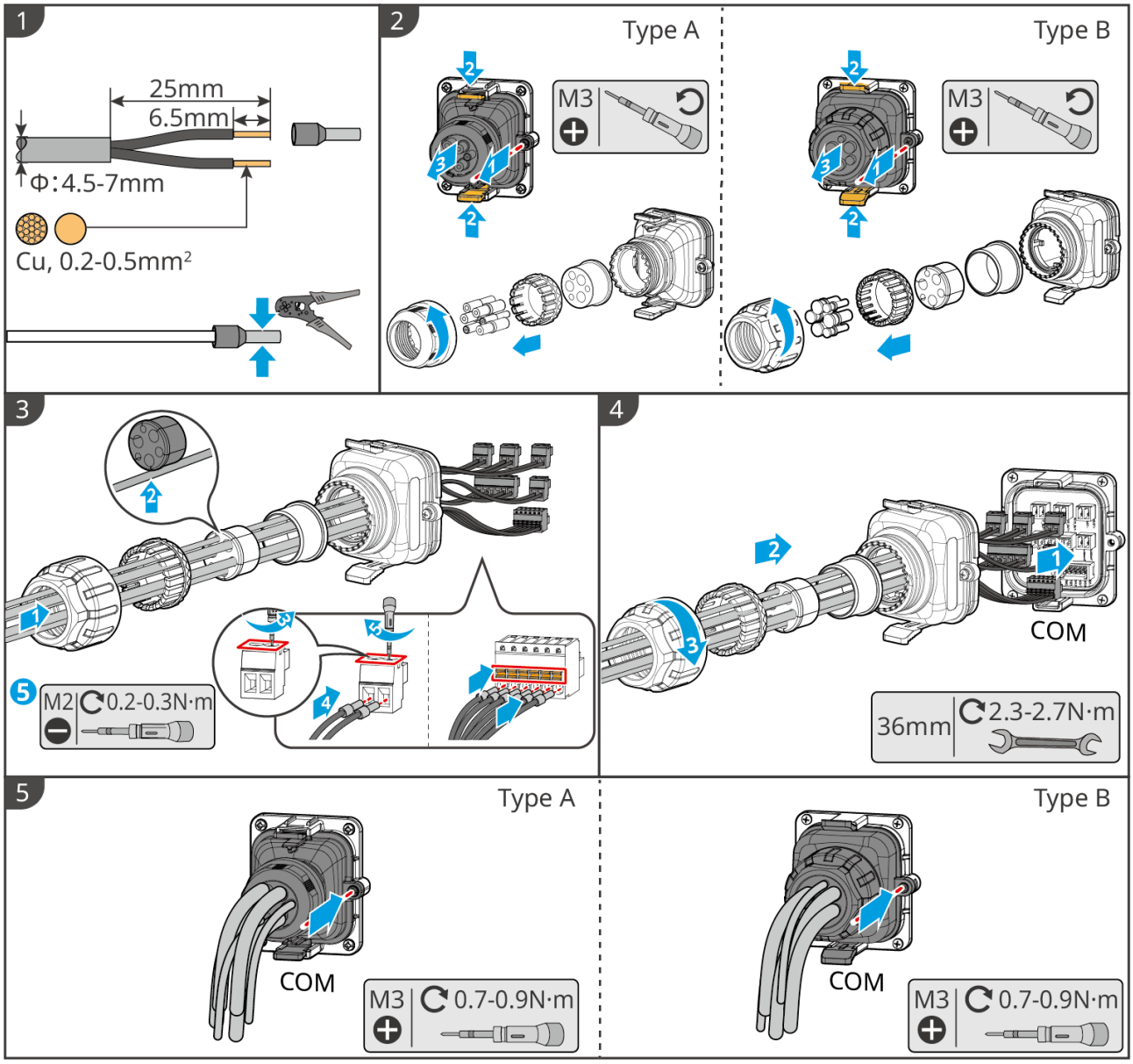
MS40ELC0006

Silkscreen	Function	Description
DO1 DO2	Load Control (Optional)	• Supports connection to dry contact signals to achieve functions such as load control. The DO contact rating is 24VDC@1A, with NO (Normally Open) contacts. • Supports SG Ready heat pump integration, controlling the heat pump via dry contact signals.
CT	CT Connection Port (CT)	Used for single-unit output power limitation.
RS484	Parallel Communication Port or Protocol Converter Communication Port (RS485-1)	• Used for communication between multiple inverters in parallel or for connecting to a protocol converter (China only). • The inverter uses the same set of RS485 ports for connecting to a protocol converter and for parallel operation. If a protocol converter is connected, the inverter parallel function cannot be used; conversely, in a parallel inverter setup, a protocol converter cannot be connected.
Meter	Meter Connection Port (RS485-2)	The inverter, paired with a meter, achieves output power limitation function. If matching equipment is needed, please contact the inverter manufacturer for purchase.
DI	Remote Shutdown	After receiving a shutdown signal from the emergency switch, the inverter's AC side automatically disconnects, stopping grid connection. Requires an external emergency shutdown switch.

Silkscreen	Function	Description
DRM/RCR	DRED (Australia) or RCR (Europe) Connection Port	• DRED (Demand Response Enabling Device): Provides a DRED signal control port, meeting the grid dispatch requirements for DRED in Australia and New Zealand. DRM1-4 functions are reserved. The DRM device must be provided by the user. • RCR (Ripple Control Receiver): Provides an RCR signal control port, meeting grid dispatch requirements in regions such as Germany.
SW1	Terminal Resistor DIP Switch	The inverter is equipped with an RS485 terminal resistor. This terminal resistor DIP switch is enabled by default. "ON" represents enabled, "1" represents disabled. Operation method: Open the cover of the communication port, use an insulated tool to slide the terminal resistor DIP switch to "1" (OFF).

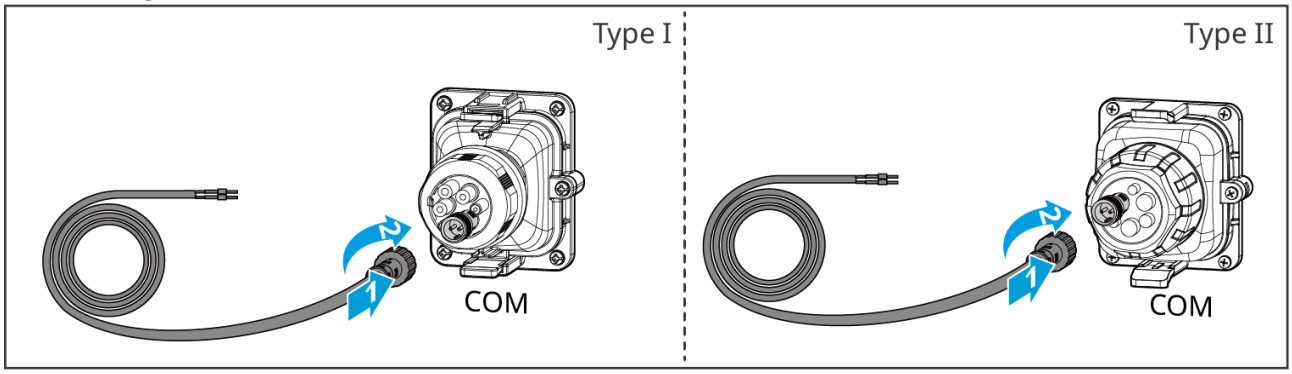
NOTICE

- When connecting communication cables, ensure that the wiring port definitions exactly match the device. The cable routing path should avoid interference sources, power lines, etc., to prevent affecting signal reception.
- When connecting remote shutdown, CT, or dry contact communication cables, use a 2PIN communication terminal.
- When connecting R485(meter), DRED/RCR communication cables, use a 6PIN communication terminal.
- If you need to use DRED, RCR or remote shutdown function, after wiring is completed, please enable this function in the SolarGo APP .
- If the inverter is not connected to DRED, RCR or remote shutdown devices, do not enable this function in the SolarGo APP , otherwise the inverter cannot operate in grid-connected mode.
- For more detailed information on the communication module, please obtain it from the official website.
- USB-RS485 adapter cable is only for Brazilian models. If needed, please contact after-sales service.
- Communication cable type requirement: RS485 communication cables must meet local standards for outdoor shielded twisted pair.



MS40ELC0005

China only



MS40ELC0007

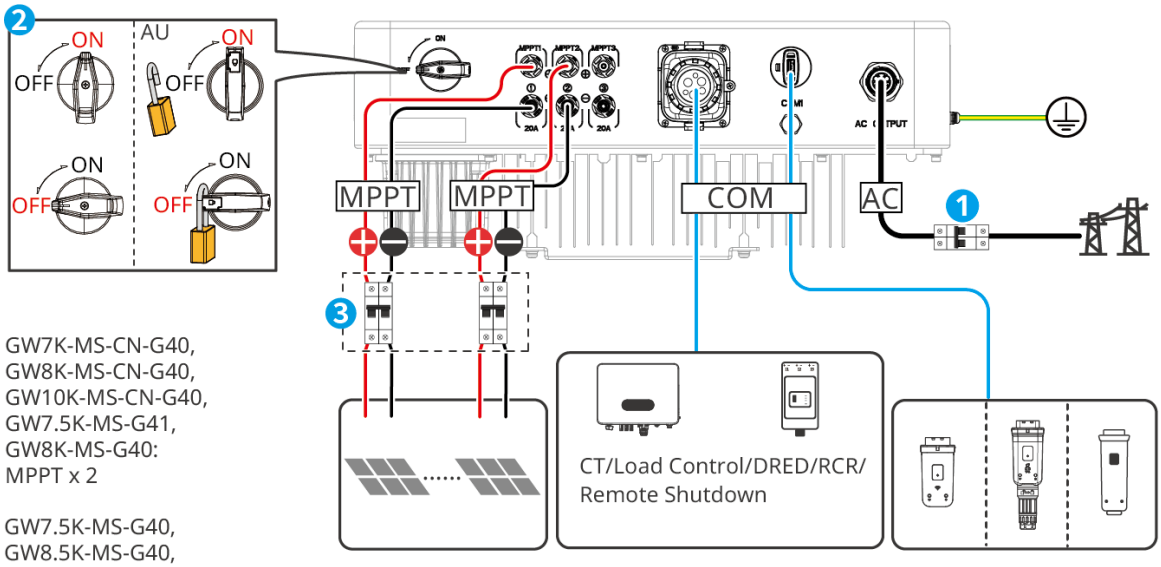
6 Equipment Trial Run

6.1 Pre-power-on Check

No.	Inspection Item
1	The inverter is securely installed. The installation location facilitates operation and maintenance, the installation space allows for ventilation and heat dissipation, and the installation environment is clean and tidy.
2	The PE cable, DC input cable, AC output cable, and communication cable are connected correctly and securely.
3	Cable bundling meets wiring requirements, is reasonably distributed, and shows no damage.
4	Unused ports are sealed.
5	The voltage and frequency at the inverter grid connection point meet the grid interconnection requirements.

6.2 Device Power-On

1. Close the AC switch between the inverter and the grid.
2. Close the DC switch between the inverter and the PV modules.
3. Close the DC switch of the inverter.



GW7K-MS-CN-G40,
GW8K-MS-CN-G40,
GW10K-MS-CN-G40,
GW7.5K-MS-G41,
GW8K-MS-G40:
MPPT x 2

GW7.5K-MS-G40,
GW8.5K-MS-G40,
GW9.999K-MS-G40,
GW10K-MS-G40: MPPT x 3

Power On : 1 → 3 → 2

Power Off : 1 → 2 → 3

MS40PWR0001

7 System Commissioning

7.1 Indicator Light Description

Indicator	Status	Description
Power		Constantly lit: Device powered on
		Off: Device not powered on
Run		Constantly lit: Grid normal, grid connection successful
		Off: Not grid-connected
		Single slow flash: Self-check before grid connection
		Single fast flash: About to connect to grid
Communication		Constantly lit: Wireless monitoring normal
		Single flash: Wireless module reset or reboot
		Two flashes: Not connected to base station or router
		Four flashes: Not connected to monitoring server
		Flashing: RS485 communication normal
		Off: Wireless module restoring factory settings
Fault		Constantly lit: System fault
		Off: No fault

7.2 Setting Inverter Parameters via the Display Screen

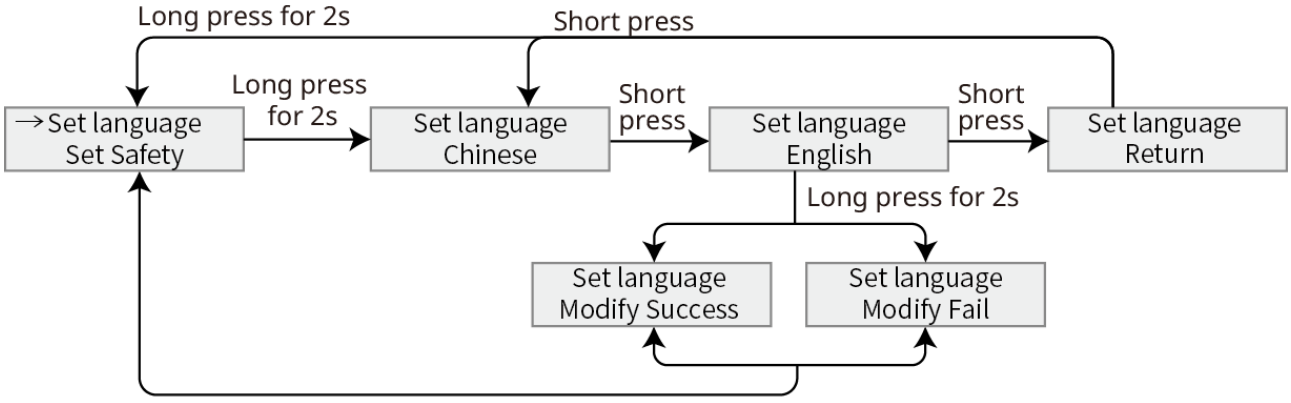
NOTICE

- The interface images in this document correspond to inverter firmware version: V1.00.00; communication version: V1.00. The interface is for reference only; the actual interface shall prevail.
- Parameter names, ranges, and default values may be changed or adjusted subsequently. Please refer to the actual display.
- Inverter power parameters must be set and monitored by professionals to avoid incorrect settings affecting inverter power generation.

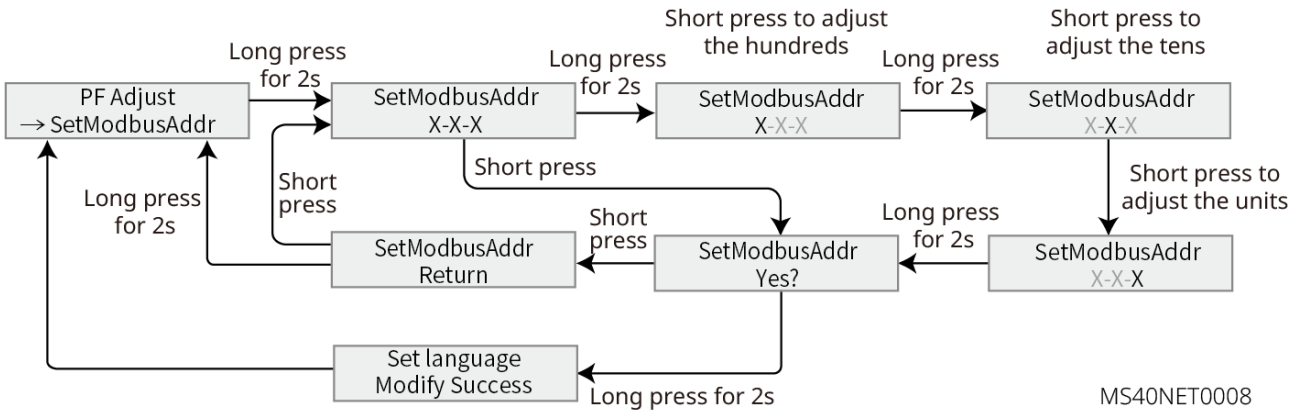
Display Screen Button Instructions

- At any menu level, if no button is pressed for a certain period, the LCD screen will dim, and the interface will automatically return to the initial screen.
- Short press the display screen operation button: Switch menu interfaces or adjust parameter values.
- Long press the display screen operation button: Confirm and save the adjusted parameter value; Enter the next sub-menu level.

Button Operation Example:



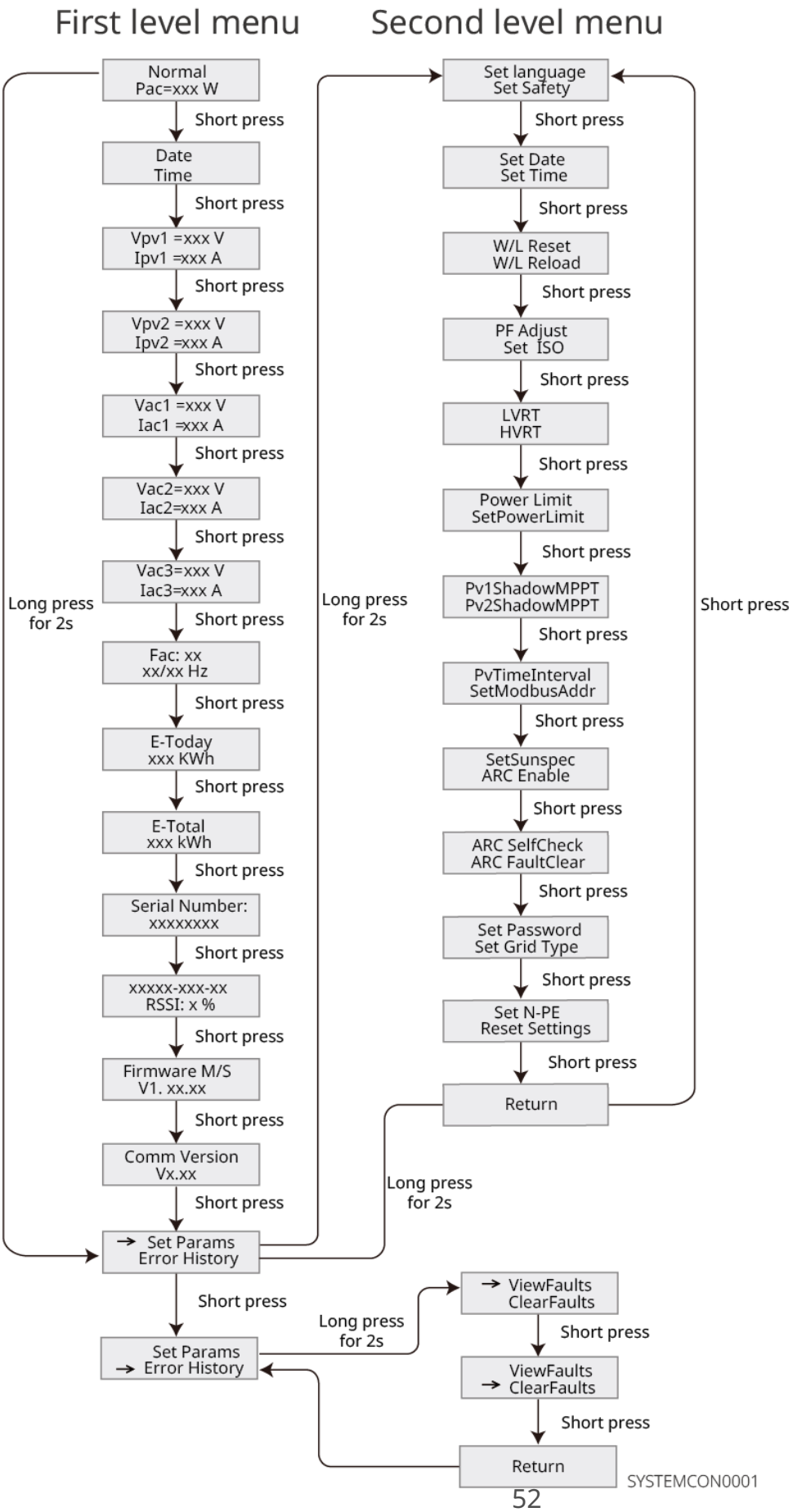
MS40NET0007



MS40NET0008

7.2.1 Display Screen Menu Introduction

Introduces the display screen menu structure, allowing you to navigate through various menu levels to view inverter information and set related inverter parameters.



7.3 Setting Inverter Parameters via the SolarGo APP

SolarGo APP is a mobile application software that can communicate with inverters via

7.4 Download SEMS+ APP

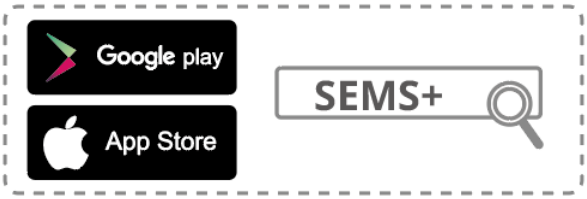
Phone Requirements:

- Operating System: Android 6.0 and above, iOS 13.0 and above.
- The phone must support a web browser and connect to the Internet.
- The phone must support WLAN/Bluetooth functionality.

Download Methods:

Method 1:

Search for SEMS+ in Google Play (Android) or the App Store (iOS) to download and install.



Method 2:

Scan the QR code below to download and install.

8 Maintenance

8.1 Inverter Shutdown

DANGER

- When performing operation and maintenance on the inverter, please power off the inverter. Operating the device while powered on may cause damage to the inverter or result in electric shock DANGER.
- After the inverter is powered off, internal components require some time to discharge. Please wait until the device is completely discharged according to the time requirement on the label.

Step 1: (Optional) Issue the stop grid connection command to the inverter.
Step 2: Disconnect the AC switch between the inverter and the grid.
Step 3: Turn off the DC switch of the inverter.
Step 4: (Optional) Disconnect the switch between the inverter and the PV modules.

8.2 Inverter Removal

WARNING

- Ensure the inverter is powered off.
- When operating the inverter, please wear personal protective equipment.

Step 1: Disconnect all electrical connections to the inverter, including: DC cables, AC cables, Communication cable, smart dongle, PE cable.
Step 2: Remove the inverter from the back mounting plate.
Step 3: Remove the back mounting plate.
Step 4: Store the inverter properly. If the inverter will be put into use later, ensure the storage conditions meet the requirements.

8.3 Scrapped Inverter

When an inverter can no longer be used and needs to be scrapped, please dispose of

it according to the electrical waste disposal requirements specified by the regulations in the country/region where the inverter is located. The inverter must not be treated as general household waste.

8.4 Inverter Fault

8.4.1 Troubleshooting (Fault Codes F01-F40)

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F01	Grid disconnected	1. Grid power outage. 2. AC line or AC switch is disconnected.	1. The alarm disappears automatically after grid power is restored. 2. Check if the AC line or AC switch is disconnected.
F02	Grid Overvoltage Protection	Grid voltage is higher than the allowable range, or the duration of high voltage exceeds the high voltage ride-through setting.	1. If it occurs occasionally, it may be a temporary grid anomaly. The Inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check if the grid voltage is within the allowable range. If not, contact the local power operator. If it is, you also need to modify the grid overvoltage protection point after obtaining consent from the local power operator. 3. If it cannot be restored for a long time, check if the AC-side circuit breaker and output cables are properly connected.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F03	Grid Undervoltage Protection	Grid voltage is lower than the allowable range, or the duration of low voltage exceeds the low voltage ride-through setting.	1. If it occurs occasionally, it may be a temporary grid anomaly. The Inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check if the grid voltage is within the allowable range. If not, contact the local power operator. If it is, you also need to modify the grid undervoltage protection point after obtaining consent from the local power operator. 3. If it cannot be restored for a long time, check if the AC-side circuit breaker and output cables are properly connected.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F04	Grid Overvoltage Fast Protection	Grid voltage detection anomaly or ultra-high voltage triggers the fault.	1. If it occurs occasionally, it may be a temporary grid anomaly. The Inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check if the grid voltage is within the allowable range. If not, contact the local power operator. If it is, you also need to modify the grid undervoltage protection point after obtaining consent from the local power operator. 3. If it cannot be restored for a long time, check if the AC-side circuit breaker and output cables are properly connected.
F05	10min Overvoltage Protection	The sliding average of grid voltage within 10min exceeds the range specified by safety regulations.	Check if the grid voltage operates at a high level for an extended period. If it occurs frequently, check if the grid frequency is within the allowable range. If not, contact the local power operator. If it is, you also need to modify the grid 10min overvoltage protection point after obtaining consent from the local power operator.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F06	Grid Overfrequency Protection	Grid anomaly: The actual grid frequency is higher than the local grid standard requirement.	1. If it occurs occasionally, it may be a temporary grid anomaly. The Inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check if the grid frequency is within the allowable range. If not, contact the local power operator. If it is, you also need to modify the grid overfrequency protection point after obtaining consent from the local power operator.
F07	Grid Underfrequency Protection	Grid anomaly: The actual grid frequency is lower than the local grid standard requirement.	1. If it occurs occasionally, it may be a temporary grid anomaly. The Inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check if the grid frequency is within the allowable range. If not, contact the local power operator. If it is, you also need to modify the grid overfrequency protection point after obtaining consent from the local power operator.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F08	Grid Frequency Shift Protection	Grid anomaly: The rate of change of the actual grid frequency does not comply with the local grid standard.	1. If it occurs occasionally, it may be a temporary grid anomaly. The Inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check if the grid frequency is within the allowable range. If not, contact the local power operator.
F09	Anti-Islanding Protection	The grid has been disconnected, but the grid voltage is maintained due to the presence of loads. Grid connection is stopped according to safety regulation protection requirements.	1. If it occurs occasionally, it may be a temporary grid anomaly. The Inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check if the grid frequency is within the allowable range. If not, contact the local power operator.
F10	Voltage Ride-Through Undervoltage Fault	Grid anomaly: The duration of abnormal grid voltage exceeds the time specified for high/low voltage ride-through.	1. If it occurs occasionally, it may be a temporary grid anomaly. The Inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check if the grid voltage and frequency are within the allowable range and stable. If not, contact the local power operator.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F11	Voltage Ride-Through Overvoltage Fault	Grid anomaly: The duration of abnormal grid voltage exceeds the time specified for high/low voltage ride-through.	1. If it occurs occasionally, it may be a temporary grid anomaly. The Inverter will resume normal operation after detecting a normal grid, requiring no manual intervention. 2. If it occurs frequently, check if the grid voltage and frequency are within the allowable range and stable. If not, contact the local power operator.
F12	30mAGfci Protection	The input-to-ground insulation impedance becomes low during Inverter operation.	1. If it occurs occasionally, it may be caused by temporary external line anomalies. Normal operation resumes after the fault is cleared, requiring no manual intervention. 2. If it occurs frequently or cannot be restored for a long time, check if the PV string's impedance to ground is too low.
F13	60mAGfci Protection	The input-to-ground insulation impedance becomes low during Inverter operation.	1. If it occurs occasionally, it may be caused by temporary external line anomalies. Normal operation resumes after the fault is cleared, requiring no manual intervention. 2. If it occurs frequently or cannot be restored for a long time, check if the PV string's impedance to ground is too low.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F14	150mAGfci Protection	The input-to-ground insulation impedance becomes low during Inverter operation.	1. If it occurs occasionally, it may be caused by temporary external line anomalies. Normal operation resumes after the fault is cleared, requiring no manual intervention. 2. If it occurs frequently or cannot be restored for a long time, check if the PV string's impedance to ground is too low.
F15	Gfci Gradual Change Protection	The input-to-ground insulation impedance becomes low during Inverter operation.	1. If it occurs occasionally, it may be caused by temporary external line anomalies. Normal operation resumes after the fault is cleared, requiring no manual intervention. 2. If it occurs frequently or cannot be restored for a long time, check if the PV string's impedance to ground is too low.
F16	DCI Level 1 Protection	The DC component of the inverter output current is higher than the range allowed by safety regulations or the machine's default.	1. If it is due to an anomaly introduced by an external fault, the Inverter automatically resumes normal operation after the fault disappears, requiring no manual intervention. 2. If this alarm occurs frequently, affecting the normal power generation of the power station, contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F17	DCI Level 2 Protection	The DC component of the inverter output current is higher than the range allowed by safety regulations or the machine's default.	1. If it is due to an anomaly introduced by an external fault, the Inverter automatically resumes normal operation after the fault disappears, requiring no manual intervention. 2. If this alarm occurs frequently, affecting the normal power generation of the power station, contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F18	Low Insulation Impedance	1. PV string short-circuited to protective earth. 2. The PV string is installed in a long-term humid environment with poor line-to-ground insulation. 3. Low insulation impedance of the battery port lines to ground.	1. Check the impedance of the PV string/battery port to protective earth. A value greater than 80kΩ is normal. If the checked value is less than 80kΩ, locate and rectify the short circuit point. 2. Check if the Inverter's protective earth wire is correctly connected. 3. If it is confirmed that the impedance is indeed below the default value in rainy/cloudy conditions, reset the Inverter's "Insulation Impedance Protection Point" via the App. For Inverters in the Australian and New Zealand markets, the insulation impedance fault can also be alerted in the following ways: 1. The Inverter is equipped with a buzzer. When a fault occurs, the buzzer sounds continuously for 1 minute; if the fault is not resolved, the buzzer sounds again every 30 minutes. 2. If the Inverter is added to a monitoring platform and an alarm reminder method is set, the alarm information can be sent to the customer via email.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F19	System Grounding Anomaly	1. The Inverter's protective earth wire is not connected. 2. When the PV string output is grounded, the Inverter output side is not connected to an isolation transformer.	1. Please confirm if the Inverter's protective earth wire is properly connected. 2. In scenarios where the PV string output is grounded, please confirm if an isolation transformer is connected to the Inverter output side.
F20	Hard Anti-Reverse Power Flow Protection	Load abnormal fluctuation	1. If it is due to an anomaly introduced by an external fault, the Inverter automatically resumes normal operation after the fault disappears, requiring no manual intervention. 2. If this alarm occurs frequently, affecting the normal power generation of the power station, contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F21	Internal Communication Link Break	Sub DSP1 communication timeout - Main DSP, Sub DSP2 communication timeout - Main DSP, Sub DSP2 communication timeout - Sub DSP1, Main DSP communication timeout - Sub DSP1, Main DSP communication timeout - Sub DSP2, or Sub DSP1 communication timeout - Sub DSP2: 1. Chip not powered on 2. Chip program version error	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
		Main DSP can module error, Sub DSP1 can module error, or Sub DSP2 can module error: 1. Frame format error 2. Parity check error 3. can bus offline 4. Hardware CRC check error 5. Control bit is receive (send) when sending (receiving) 6. Transmission to a disallowed unit	
F22	Generator Waveform Detection Fault	1. This fault will be displayed continuously when no generator is connected; 2. When the generator is operating, failure to meet generator safety regulations will trigger this fault.	1. Ignore this fault when no generator is connected; 2. It is normal for this fault to appear when the generator malfunctions. Wait for a period after the generator recovers, and the fault will clear automatically; 3. This fault does not affect the normal operation of off-grid mode. 4. When both generator and grid are connected and meet safety regulation requirements, grid priority is given for grid connection, and the system will operate in grid-connected state.
F23	Generator Abnormal Connection		
F24	Generator Voltage Low		
F25	Generator Voltage High		
F26	Generator Frequency Low		
F27	Generator Frequency High		

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F28	Parallel Unit I/O Self-Test Anomaly	Parallel communication cable not securely connected or parallel IO chip damaged	Check if the parallel communication cable is securely connected, then check if the IO chip is damaged. If yes, replace the IO chip.
F29	Parallel Unit Grid Connection Reversed	Grid wires of some units are reversed with others	Reconnect the grid wires correctly.
F30	AC Sensor Self-Test Anomaly	AC sensor has sampling anomaly	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.
F31	Leakage Current Sensor Self-Test Anomaly	Leakage current sensor has sampling anomaly	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.
F32	Inverter Internal Fault	Inverter has a fault	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.
F33	Flash Read/Write Error	Possible causes: flash content changed; flash lifespan exhausted;	1. Upgrade to the latest program version. 2. Contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F34	DC Arc Self-Test Fault	During the arc self-test process, the arc detection module did not detect an arc fault as expected.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.
F35	Enclosure Temperature Too High	Enclosure temperature is too high, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	1. Check if the ventilation at the Inverter installation location is good, and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, improve its ventilation and heat dissipation conditions. 3. If both ventilation and ambient temperature are normal, contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F36	Bus Overvoltage	BUS overvoltage, possible causes: 1. PV voltage too high; 2. Inverter BUS voltage sampling anomaly; 3. Poor isolation effect of the dual-split transformer at the Inverter output side, causing mutual interference when two inverters are connected in parallel, with one inverter reporting DC overvoltage upon grid connection;	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F37	PV Input Overvoltage	PV input voltage too high, possible cause: PV array configuration error, too many PV panels connected in series per string, causing the string's open-circuit voltage to be higher than the Inverter's maximum operating voltage.	Check the series configuration of the corresponding PV array string to ensure the string's open-circuit voltage does not exceed the Inverter's maximum operating voltage. After the PV array is correctly configured, the Inverter alarm will disappear automatically.
F38	PV Continuous Hardware Overcurrent	1. Component configuration unreasonable. 2. Hardware damage.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.
F39	PV Continuous Software Overcurrent	1. Component configuration unreasonable. 2. Hardware damage.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F40, F98	String Reverse Connection (String 1-n) n: Determined based on the actual number of Inverter strings.	PV string reverse connection	Check if the string is reversely connected.

8.4.2 Troubleshooting (Fault Codes F41-F80)

Fault Code	Fault Name	Fault Cause	Fault Handling Recommendation
F41	Generator Port Overload	1. Off-grid side output exceeds specifications. 2. Off-grid side short circuit. 3. Off-grid side voltage is too low. 4. When used as a heavy load port, the heavy load exceeds specifications.	1. Confirm the off-grid side output voltage, current, power, and other data to identify the cause of the issue.

Fault Code	Fault Name	Fault Cause	Fault Handling Recommendation
F42	DC Arc Fault (String 1-n) n: Determined based on the actual number of inverter strings.	1. DC side connection terminals are loose. 2. DC side connection terminals have poor contact. 3. DC cable core is damaged, causing poor contact.	1. After the machine reconnects to the grid, check if the voltage and current of each circuit abnormally decrease or become zero. 2. Check if the DC side terminals are securely connected.
F43	Voltage Waveform Detection Abnormal	Utility grid abnormality: Abnormal utility grid voltage detection triggers the fault.	1. If it occurs occasionally, it may be due to a short-term utility grid abnormality. The inverter will resume normal operation after detecting normal grid conditions, requiring no manual intervention. 2. If it occurs frequently, please check if the utility grid voltage and frequency are within the allowable range and stable. If not, please contact the local power operator.
F44	Utility Grid Phase Loss Protection	Utility grid abnormality: Single-phase voltage dip in the utility grid.	1. If it occurs occasionally, it may be due to a short-term utility grid abnormality. The inverter will resume normal operation after detecting normal grid conditions, requiring no manual intervention. 2. If it occurs frequently, please check if the utility grid voltage and frequency are within the allowable range and stable. If not, please contact the local power operator.

Fault Code	Fault Name	Fault Cause	Fault Handling Recommendation
F45	Utility Grid Voltage Unbalance	Excessive difference in utility grid phase voltages.	1. If it occurs occasionally, it may be due to a short-term utility grid abnormality. The inverter will resume normal operation after detecting normal grid conditions, requiring no manual intervention. 2. If it occurs frequently, please check if the utility grid voltage and frequency are within the allowable range and stable. If not, please contact the local power operator.
F46	Utility Grid Phase Sequence Fault	Inverter and utility grid wiring abnormality: Wiring is not in positive sequence.	1. Check if the inverter and utility grid wiring are in positive sequence. The fault will automatically disappear after correcting the wiring (e.g., swapping any two live wires). 2. If the fault persists despite correct wiring, please contact the dealer or after-sales service center.
F47	Utility Grid Power Outage Fast Protection	Quickly shuts off output after detecting a utility grid power outage condition.	The fault automatically disappears after utility grid power supply is restored.
F48	Utility Grid Neutral Line Loss (Split Phase Grid)	Split-phase grid neutral line is lost.	1. The alarm automatically disappears after utility grid power supply is restored. 2. Check if the AC wiring or AC switch is disconnected.
F49	Live Wire to Ground Short Circuit	Output phase line has low impedance or short circuit to PE.	Measure the impedance of the output phase line to PE, identify the location with low impedance and repair it.

Fault Code	Fault Name	Fault Cause	Fault Handling Recommendation
F50	DCV Level 1 Protection	Load abnormal fluctuation.	1. If the abnormality is caused by an external fault, the inverter will automatically resume normal operation after the fault disappears, requiring no manual intervention. 2. If this alarm occurs frequently, affecting normal power generation of the power station, please contact the dealer or after-sales service center.
F51	DCV Level 2 Protection	Load abnormal fluctuation.	
F52	Leakage Current (GFCI) Multiple Fault Shutdown	North American safety regulations require no automatic recovery after multiple faults; manual recovery or waiting 24h is needed.	Please check if the PV string's impedance to ground is too low.
F53	DC Arc (AFCI) Multiple Fault Shutdown	North American safety regulations require no automatic recovery after multiple faults; manual recovery or waiting 24h is needed.	1. After the machine reconnects to the grid, check if the voltage and current of each circuit abnormally decrease or become zero. 2. Check if the DC side terminals are securely connected.

Fault Code	Fault Name	Fault Cause	Fault Handling Recommendation
F54	External Communication Link Broken	Inverter external device communication lost, possibly due to peripheral power issues, communication protocol mismatch, or missing configuration for the corresponding peripheral.	Judgment is based on the actual model and detection enable bits. Peripherals not supported by certain models will not be detected.
F55	Back-up Port Overload Fault	Prevents the inverter from continuously outputting overload.	Turn off some off-grid loads to reduce the inverter's off-grid output power.
F56	Back-up Port Overvoltage Fault	2 Prevents inverter output overvoltage from damaging loads.	1. If it occurs occasionally, it may be caused by load switching and requires no manual intervention. 2. If it occurs frequently, please contact the dealer or after-sales service center.
F57	External Box Fault	Waiting time for Box relay switching is too long during grid-to-off-grid transition.	1. Check if the Box is working normally. 2. Check if the Box communication wiring is correct.
F58	CT Loss Fault	CT connection wire is disconnected (Japanese safety regulation requirement).	Check if the CT wiring is correct.

Fault Code	Fault Name	Fault Cause	Fault Handling Recommendation
F59	Parallel CAN Communication Abnormal	Parallel communication cable is not securely connected or some machines are offline.	Check if all machines are powered on and if the parallel communication cables are securely connected.
F60	Parallel Back-up Connection Reversed	Backup wiring of some machines is reversed with others.	Reconnect the backup wiring.
F61	Inverter Soft Start Failure	Inverter soft start failure during off-grid cold start.	Check if the inverter module is damaged.
F62	AC Sensor Fault	HCT sensor is abnormal.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F63	Leakage Current Sensor Fault	Leakage current sensor is abnormal.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F64	Inverter Internal Fault	Inverter has a fault.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Fault Handling Recommendation
F65	AC Terminal Temperature Too High	AC terminal temperature is too high. Possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	1. Check if the ventilation at the inverter installation location is good and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, please improve its ventilation and heat dissipation conditions. 3. If both ventilation and ambient temperature are normal, please contact the dealer or after-sales service center.
F66	INV Module Temperature Too High	Inverter module temperature is too high. Possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	1. Check if the ventilation at the inverter installation location is good and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, please improve its ventilation and heat dissipation conditions. 3. If both ventilation and ambient temperature are normal, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Fault Handling Recommendation
F67	Boost Module Temperature Too High	Boost module temperature is too high. Possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	1. Check if the ventilation at the inverter installation location is good and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, please improve its ventilation and heat dissipation conditions. 3. If both ventilation and ambient temperature are normal, please contact the dealer or after-sales service center.
F68	Output Filter Capacitor Over-temperature	Output filter capacitor temperature is too high. Possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	1. Check if the ventilation at the inverter installation location is good and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, please improve its ventilation and heat dissipation conditions. 3. If both ventilation and ambient temperature are normal, please contact the dealer or after-sales service center.
F69	PV IGBT Short Circuit Fault	Possible causes: 1. IGBT short circuit. 2. Inverter sampling circuit abnormal.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Fault Handling Recommendation
F70	PV IGBT Open Circuit Fault	1. Software issue causing no PWM generation. 2. Drive circuit abnormal. 3. IGBT open circuit.	
F71	NTC Abnormal	NTC temperature sensor is abnormal.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F72	PWM Generation Abnormal Fault	PWM has abnormal waveform.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F73	CPU Interrupt Abnormal	CPU interrupt is abnormal.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F74	Microelectronics Fault	Functional safety detection detected an abnormality.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Fault Handling Recommendation
F75	PV HCT Fault	boost current sensor abnormal.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F76	1.5V Reference Abnormal	Reference circuit fault.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F77	0.3V Reference Abnormal	Reference circuit fault.	
F78	CPLD Version Identification Error	CPLD version identification error.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F79	CPLD Communication Fault	CPLD and DSP communication content error or timeout.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F80	Model Identification Fault	Fault regarding model identification error.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

8.4.3 Troubleshooting (Fault Codes F81-F121)

Fault Code	Fault Name	Possible Cause	Troubleshooting Recommendation
F81	Upper Bus Overvoltage	BUS overvoltage, possible causes: 1. PV voltage is too high; 2. Inverter BUS voltage sampling anomaly; 3. Poor isolation effect of the dual-split transformer at the inverter's rear end, causing mutual interference when two inverters are grid-connected, with one inverter reporting DC overvoltage during grid connection;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F82	Lower Bus Overvoltage		
F83	Bus Overvoltage (Sub CPU1)		

Fault Code	Fault Name	Possible Cause	Troubleshooting Recommendation
F84	Upper Bus Overvoltage (Sub CPU1)	BUS overvoltage, possible causes: 1. PV voltage is too high; 2. Inverter BUS voltage sampling anomaly; 3. Poor isolation effect of the dual-split transformer at the inverter's rear end, causing mutual interference when two inverters are grid-connected, with one inverter reporting DC overvoltage during grid connection;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F85	Lower Bus Overvoltage (Sub CPU1)		
F86	Bus Overvoltage (Sub CPU2)		Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F87	Upper Bus Overvoltage (Sub CPU2)		

Fault Code	Fault Name	Possible Cause	Troubleshooting Recommendation
F88	Lower Bus Overvoltage (Sub CPU2)	BUS overvoltage, possible causes: 1. PV voltage is too high; 2. Inverter BUS voltage sampling anomaly; 3. Poor isolation effect of the dual-split transformer at the inverter's rear end, causing mutual interference when two inverters are grid-connected, with one inverter reporting DC overvoltage during grid connection;	
F89	Upper Bus Overvoltage(CPLD)		Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Possible Cause	Troubleshooting Recommendation
F90	Lower Bus Overvoltage(CPLD)	BUS overvoltage, possible causes: 1. PV voltage is too high; 2. Inverter BUS voltage sampling anomaly; 3. Poor isolation effect of the dual-split transformer at the inverter's rear end, causing mutual interference when two inverters are grid-connected, with one inverter reporting DC overvoltage during grid connection;	
F91	Flying Capacitor Software Overvoltage	Flying capacitor overvoltage, possible causes: 1. PV voltage is too high; 2. Inverter flying capacitor voltage sampling anomaly;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F92	Flying Capacitor Hardware Overvoltage		

Fault Code	Fault Name	Possible Cause	Troubleshooting Recommendation
F93	Flying Capacitor Undervoltage	Flying capacitor undervoltage, possible causes: 1. PV energy insufficient; 2. Inverter flying capacitor voltage sampling anomaly;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F94	Flying Capacitor Precharge Failure	Flying capacitor precharge failure, possible causes: 1. PV energy insufficient; 2. Inverter flying capacitor voltage sampling anomaly;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F95	Flying Capacitor Unable to Precharge	1. Unreasonable control loop parameters 2. Hardware damage	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Possible Cause	Troubleshooting Recommendation
F96, F97	String Overcurrent(String1-n) n: Determined based on the actual number of inverter strings	Possible causes: 1. String overcurrent; 2. String current sensor anomaly	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F99, F100	String Loss(String1-n) n: Determined based on the actual number of inverter strings	String fuse disconnected (if present)	Check if the fuse is disconnected.
F101	Battery1 Precharge Fault	Battery1 precharge circuit fault (precharge resistor burnt out, etc.)	Check if the precharge circuit is in good condition. After only the Battery is powered on, check if the Battery voltage and bus voltage are consistent. If not, please contact the dealer or after-sales service center.
F102	Battery1 Relay Fault	Battery1 relay cannot operate normally	After the Battery is powered on, check if the Battery relay is working and if a closing sound is heard. If it does not operate, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Possible Cause	Troubleshooting Recommendation
F103	Battery1 Connection Overvoltage	Battery1 connection voltage exceeds the machine's rated range	Confirm if the Battery voltage is within the machine's rated range.
F104	Battery2 Precharge Fault	Battery2 precharge circuit fault (precharge resistor burnt out, etc.)	Check if the precharge circuit is in good condition. After only the Battery is powered on, check if the Battery voltage and bus voltage are consistent. If not, please contact the dealer or after-sales service center.
F105	Battery2 Relay Fault	Battery2 relay cannot operate normally	After the Battery is powered on, check if the Battery relay is working and if a closing sound is heard. If it does not operate, please contact the dealer or after-sales service center.
F106	Battery2 Connection Overvoltage	Battery2 connection voltage exceeds the machine's rated range	Confirm if the Battery voltage is within the machine's rated range.
F107	Grid Synchronization Timeout Fault During Grid Connection	Abnormality occurred during carrier synchronization grid connection	1. Check if the synchronization cable connection is normal 2. Check if the master/slave settings are normal; 3. Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F108	DSP Communication Fault	-	-

Fault Code	Fault Name	Possible Cause	Troubleshooting Recommendation
F109	External STS Fault	Abnormal cable connection between inverter and STS	Check if the wiring sequence of the harness between the inverter and the STS corresponds one-to-one in order.
F110	Anti-Reverse Flow Fault	1 Inverter reports error and disconnects from grid 2 meter communication unstable 3 Reverse flow condition occurs	1 Check if the inverter has any other error messages. If so, handle them accordingly; 2 Check if the meter connection is reliable; 3.If this alarm occurs frequently, affecting normal power generation of the power station, please contact the dealer or after-sales service center.
F111	Bypass Overload	-	-
F112	Black Start Fault	-	-
F113	Off-grid Output Instantaneous Overvoltage Fault	-	-
F114	Relay Fault2	Relay abnormality, causes: 1. Relay anomaly (relay short circuit) 2. Relay sampling circuit anomaly. 3. AC side wiring anomaly (possible loose connection or short circuit)	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Possible Cause	Troubleshooting Recommendation
F115	SVG Precharge Failure	SVG precharge hardware failure	Contact the dealer or after-sales service center.
F116	Nighttime SVG PID Prevention Fault	PID prevention hardware anomaly	
F117	DSP Version Identification Error	DSP software version identification error	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F118	MOS Continuous Overvoltage	1. Software issue causing inverter drive to shut off earlier than flyback drive: 2. Inverter drive circuit anomaly preventing turn-on: 3. PV voltage too high; 4. Mos voltage sampling anomaly;	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F119	Bus Short Circuit Fault	Hardware damage	If the inverter remains in a disconnected state after a BUS short circuit fault occurs, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Possible Cause	Troubleshooting Recommendation
F120	Bus Sampling Anomaly	1. BUS voltage sampling hardware fault	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
F121	DC Side Sampling Anomaly	1. BUS voltage sampling hardware fault 2. Battery voltage sampling hardware fault 3. Dcrly relay fault	Disconnect the AC output side switch and the DC input side switch, wait for 5 minutes, then close the AC output side switch and the DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Possible Cause	Troubleshooting Recommendation
F122	PV Connection Mode Setting Error	There are three PV connection modes. Taking four MPPT channels as an example: 1. Parallel mode: i.e., AAAA mode (same-source mode), PV1-PV4 are from the same source, all 4 PV channels connect to the same solar panel 2. Partial parallel mode: i.e., AACC mode, PV1 and PV2 are from the same source and connected together, PV3 and PV4 are from the same source and connected together 3. Independent mode: i.e., ABCD mode (non-same-source), PV1, PV2, PV3, PV4 are independently connected, each of the 4 PV channels connects to one solar panel	Check if the PV connection mode is set correctly (ABCD, AACC, AAAA), reset the PV connection mode correctly. 1. Confirm that the actual connected PV channels are correctly wired; 2. If the PV is correctly wired, check the currently set "PV Connection Mode" via the APP or screen to see if it corresponds to the actual connection mode; 3. If the currently set "PV Connection Mode" does not match the actual connection mode, use the APP or screen to set the "PV Connection Mode" to the mode consistent with the actual situation. After setting, disconnect the PV and AC power supply and restart; 4. After setting, if the current "PV Connection Mode" matches the actual connection mode but this fault is still reported, please contact the dealer or after-sales service center.

Fault Code	Fault Name	Possible Cause	Troubleshooting Recommendation
		If the actual PV connection mode does not match the PV connection mode set on the device, this fault will be reported.	

8.4.4 Troubleshooting (Fault Codes F122-F163)

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F123	Multi-string PV Phase Error	PV Input Mode Setting Error	Check if the PV connection mode is correctly set (ABCD, AACC, AAAA), and reset the PV connection mode correctly. 1. Confirm that all connected PV strings are correctly wired; 2. If the PV is correctly connected, check via the APP or screen whether the currently set "PV Connection Mode" corresponds to the actual connection mode; 3. If the currently set "PV Connection Mode" does not match the actual connection mode, use the APP or screen to set the "PV Connection Mode" to match the actual situation. After setting, disconnect and restart the PV and AC power supply; 4. After setting, if the current "PV Connection Mode" matches the actual connection mode but the fault persists, please contact the dealer or after-sales service center.
F124	Battery 1 Reverse Connection Fault	Battery 1 positive and negative poles are reversed	Check if the polarities of the battery and the machine's terminals are consistent.
F125	Battery 2 Reverse Connection Fault	Battery 2 positive and negative poles are reversed	Check if the polarities of the battery and the machine's terminals are consistent.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F126	Abnormal Battery Connection	Abnormal Battery Connection	Check if the battery is working normally.
F127	Battery Heatsink Over Temperature	Battery temperature is too high. Possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault still exists, please contact the dealer or after-sales service center.
F128	Reference Voltage Abnormality	Reference Circuit Fault	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault still exists, please contact the dealer or after-sales service center.
F129	Chassis Temperature Too Low	Chassis temperature is too low. Possible cause: Ambient temperature is too low.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault still exists, please contact the dealer or after-sales service center.
F130	AC Side SPD Fault	AC Side Surge Protective Device Failure	Replace the AC side surge protective device.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F131	DC Side SPD Fault	DC Side Surge Protective Device Failure	Replace the DC side surge protective device.
F132	Internal Fan Abnormality	Internal fan abnormality. Possible causes: 1. Fan power supply abnormality; 2. Mechanical fault (stall); 3. Fan aging or damage.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault still exists, please contact the dealer or after-sales service center.
F133	External Fan Abnormality	External fan abnormality. Possible causes: 1. Fan power supply abnormality; 2. Mechanical fault (stall); 3. Fan aging or damage.	Disconnect the AC output side switch and DC input side switch, wait for 5 minutes, then close the AC output side switch and DC input side switch. If the fault still exists, please contact the dealer or after-sales service center.
F134	PID Diagnosis Abnormality	PID hardware fault or PV voltage too high causing PID suspension	Warning caused by high PV voltage suspending PID requires no action. PID hardware fault can be cleared by turning the PID switch off and then on. Replace the PID device.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F135	Breaker Trip Warning	Possible causes: 1 Overcurrent or PV reverse connection caused the breaker to trip;	Contact the dealer or after-sales service center; The trip reason is PV short circuit or reverse connection. Check if there is a historical PV short circuit warning or historical PV reverse connection warning. If present, maintenance personnel need to check the corresponding PV condition. After checking and confirming no fault, you can manually close the breaker and clear this warning via the APP interface by clearing historical faults.
F136	Historical PV IGBT Short Circuit Warning	Possible causes: Overcurrent caused the breaker to trip;	Contact the dealer or after-sales service center; Maintenance personnel need to check the Boost hardware and external string for faults according to the historical PV short circuit warning subcode. After checking and confirming no fault, this warning can be cleared via the APP interface by clearing historical faults.
F137, F138	Historical PV Reverse Connection Warning (String 1-n) (n: determined by the actual number of inverter strings)	Possible causes: PV reverse connection caused the breaker to trip;	Contact the dealer or after-sales service center; Maintenance personnel need to check if the corresponding string is reverse connected according to the historical PV reverse connection warning subcode, and check if there is a voltage difference in the PV panel configuration. After checking and confirming no fault, this warning can be cleared via the APP interface by clearing historical faults.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F139	Flash Read/Write Error Warning	Possible causes: 1. Flash content changed; 2. Flash life exhausted;	1. Upgrade to the latest firmware; 2. Contact the dealer or after-sales service center.
F140	Meter Communication Abnormality Alarm	This warning may only appear after enabling anti-backflow function. Possible causes: 1 Meter not connected; 2 Incorrect wiring of the communication cable between the meter and the inverter.	Check the meter wiring, connect the meter correctly. If the fault persists after checking, please contact the dealer or after-sales service center.
F141	PV Panel Type Identification Failure	PV panel identification hardware abnormality	Contact the dealer or after-sales service center.
F142	String Mismatch	PV string mismatch, two strings under the same MPPT have different open-circuit voltage configurations	Check the open-circuit voltage of the two strings, configure strings with the same open-circuit voltage under the same MPPT. Long-term string mismatch poses a safety hazard.
F143	CT Not Connected	CT Not Connected	Check CT wiring.
F144	CT Reverse Connection	CT Reverse Connection	Check CT wiring.
F145	Ground Wire Missing Warning	Ground wire not connected	Check the ground wire.

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F146	String Terminal High Temperature (String 1~8)	Register 37176 PV terminal temperature alarm subcode 1 is set	-
F147	String Terminal High Temperature (String 9~16)	Register 37177 PV terminal temperature alarm subcode 2 is set	-
F148	String Terminal High Temperature (String 17~20)	Register 37178 PV terminal temperature alarm subcode 3 is set	-
F149	Historical PV Reverse Connection Warning (String 33~48)	Possible causes: 1 PV reverse connection caused the breaker to trip;	Contact the dealer or after-sales service center; Maintenance personnel need to check if the corresponding string is reverse connected according to the historical PV reverse connection warning subcode, and check if there is a voltage difference in the PV panel configuration. After checking and confirming no fault, this warning can be cleared via the APP interface by clearing historical faults.
F150	Battery 1 Low Voltage	Battery voltage is below the set value	-
F151	Battery 2 Low Voltage	Battery voltage is below the set value	-

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F152	Battery Power Supply Low Voltage	Battery in non-charging mode, voltage below shutdown voltage	-
F153	Battery 1 High Voltage	-	-
F154	Battery 2 High Voltage	-	-
F155	Online Insulation Impedance Low	1. Photovoltaic string short-circuited to protective earth. 2. The photovoltaic string installation environment is humid for a long time and the line has poor insulation to ground.	1. Check the impedance of the photovoltaic string to protective earth. If a short circuit is found, rectify the short circuit point. 2. Check if the inverter's protective earth wire is correctly connected. 3. If it is confirmed that the impedance is indeed below the default value in rainy weather, please reset the "Insulation Impedance Protection Point".
F156	Microgrid Overload Warning	backup side input current too high	Occasional occurrence requires no action; if this alarm appears frequently, please contact the dealer or after-sales service center.
F157	Manual Reset	-	-
F158	Generator Phase Sequence Abnormality	-	-

Fault Code	Fault Name	Fault Cause	Fault Handling Suggestions
F159	Multiplex Port Configuration Abnormality	Multiplex (Generator) port configured as microgrid or large load, but a generator is actually connected	Use the APP to change the Multiplex (Generator) port configuration.
F160	EMS Forced Off-grid	EMS issued forced off-grid command, but off-grid function is not enabled	Enable the off-grid function.
F161	Passive Islanding Protection	-	-
F162	Grid Type Error	Actual grid type (two-phase or split-phase) does not match the set safety standard	Switch to the corresponding safety standard according to the actual grid type.
F163	Grid Phase Shift Protection	Grid abnormality: Grid voltage phase change rate does not comply with local grid standards.	1. If it occurs occasionally, it may be a temporary grid abnormality. The inverter will resume normal operation after detecting the grid is normal, requiring no manual intervention. 2. If it occurs frequently, please check if the grid frequency is within the allowable range. If not, please contact the local power operator.

8.4.5 Fault Symptom Handling

Fault Name	Fault Cause	Fault Handling Suggestions
Generator Fault	1. This fault will be continuously displayed when the generator is not connected. 2. During generator operation, failure to meet generator safety regulations will trigger this fault.	1. If the generator is not connected, ignore this fault. 2. If this fault appears when the generator has a fault, it is normal. Wait for a period after the generator recovers, and the fault will clear automatically. 3. This fault does not affect the normal operation of off-grid mode. 4. When both generator and grid are connected and meet safety requirements, grid connection takes priority, and the system will operate in grid-connected mode.
BMS Status Bit Error	BMS module fault	Disconnect the AC output side switch and DC input side switch. After 5 minutes, close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.
Ambient Temperature Too High	1. Poor machine ventilation 2. Hot air flow back to the ambient temperature sampling point	Disconnect the AC output side switch and DC input side switch. After 5 minutes, close the AC output side switch and DC input side switch. If the fault persists, please contact the dealer or after-sales service center.

Fault Name	Fault Cause	Fault Handling Suggestions
PV Terminal Temperature Too High	PV terminal temperature too high, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	1. Check if the ventilation at the inverter installation location is good and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, please improve ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are normal, please contact the dealer or after-sales service center.
Bat Terminal Temperature Too High	Bat terminal temperature too high, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high.	1. Check if the ventilation at the inverter installation location is good and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, please improve ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are normal, please contact the dealer or after-sales service center.

Fault Name	Fault Cause	Fault Handling Suggestions
AC Terminal Temperature High Warning	AC terminal temperature too high, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high. 3. Internal fan operation is abnormal.	
Bat Terminal Temperature High Warning	Bat terminal temperature too high, possible causes: 1. Inverter installation location is not ventilated. 2. Ambient temperature is too high.	1. Check if the ventilation at the inverter installation location is good and if the ambient temperature exceeds the maximum allowable range. 2. If ventilation is poor or ambient temperature is too high, please improve ventilation and heat dissipation conditions. 3. If ventilation and ambient temperature are normal, please contact the dealer or after-sales service center.
Group Three-Phase Grid Connection Wiring Fault	Group three-phase external wiring error	Re-wire the connections.

Fault Name	Fault Cause	Fault Handling Recommendation
Parallel Unit Communication Timeout Shutdown	In parallel configuration, if a slave unit fails to communicate with the master unit for more than 400 seconds.	Check if the parallel communication harness is securely connected. Check for duplicate slave addresses.
Group Three-Phase Off-grid Phase Loss Fault	Phase loss in a group three-phase system.	1. Check if all inverters are powered on; 2. Check if each phase of the group three-phase system is connected to an inverter;
Emergency Stop	External triggering of the hardware emergency stop button or remote triggering of the emergency stop command.	1. If it was actively triggered by remote shutdown, it can be ignored; 2. If not actively triggered, please contact the dealer or after-sales service center.
One-Button Shutdown	Check via the App if the one-button shutdown function is enabled.	Disable the one-button shutdown.
Offline Shutdown	-	-
Remote Shutdown	-	-
Grid-side Surge Protection Fault	-	-

Fault Name	Fault Cause	Fault Handling Recommendation
Off-grid-side Surge Protection Fault	-	-
Sub-node Communication Fault	Internal communication abnormality.	Restart the unit and observe if the fault clears.
Generator Communication Fault	Abnormal communication link between the control board and the generator.	1. Check the link communication harness, observe if the fault clears; 2. Try restarting the unit, observe if the fault clears; 3. If the fault persists after restarting, contact the after-sales service center.
Battery Overvoltage Protection	1. Single cell voltage too high. 2. Voltage sensing line abnormality.	Record the fault phenomenon, restart the battery, wait a few minutes, confirm if the fault disappears. If the problem persists after restarting, please contact the after-sales service center.
	1. Battery total voltage too high. 2. Voltage sensing line abnormality.	
Battery Undervoltage Protection	1. Single cell voltage too low. 2. Voltage sensing line abnormality.	
	1. Battery total voltage too low. 2. Voltage sensing line abnormality.	

Fault Name	Fault Cause	Fault Handling Recommendation
Battery Overcurrent Protection	1. Charging current too high, battery current limiting abnormality: sudden changes in temperature and voltage values. 2. Inverter response abnormality.	
	Battery discharge current too high.	
Battery Overtemperature Protection	1. Ambient temperature too high. 2. Temperature sensor abnormality.	
	1. Ambient temperature too high. 2. Temperature sensor abnormality.	
Battery Low-temperature Protection	1. Ambient temperature too low. 2. Temperature sensor abnormality.	
	1. Ambient temperature too low. 2. Temperature sensor abnormality.	

Fault Name	Fault Cause	Fault Handling Recommendation
Battery Terminal Overtemperature Protection	Terminal temperature too high.	
Battery Imbalance Protection	1. Excessive temperature difference. At different stages, the battery will limit its power, i.e., limit charge/discharge current. Therefore, this issue is generally difficult to occur. 2. Cell capacity degradation leads to excessive internal resistance, causing large temperature rise during overcurrent, resulting in large temperature difference. 3. Poor welding of cell tabs leads to rapid cell temperature rise during overcurrent. 4. Temperature sampling issue; 5. Power line connection loose.	

Fault Name	Fault Cause	Fault Handling Recommendation
	1. Inconsistent cell aging levels. 2. Slave board chip issues can also cause excessive cell voltage difference; 3. Slave board balancing issues can also cause excessive cell voltage difference. 4. Caused by harness issues.	
	1. Inconsistent cell aging levels. 2. Slave board chip issues can also cause excessive cell voltage difference; 3. Slave board balancing issues can also cause excessive cell voltage difference. 4. Caused by harness issues.	
Insulation Resistance Protection	Insulation resistance damaged.	Check if the ground wire is properly connected, restart the battery. If the problem persists after restarting, please contact the after-sales service center.

Fault Name	Fault Cause	Fault Handling Recommendation
Pre-charge Failure Fault	Pre-charge failure.	Indicates that during the pre-charge process, the voltage across the pre-charge MOS always exceeds the specified threshold. Power off and restart, observe if the fault persists. Check if wiring is correct, check if the pre-charge MOS is damaged.
Sensing Line Fault	Battery sensing line poor contact or disconnected.	Check wiring, restart the battery. If the problem persists after restarting, please contact the after-sales service center.
	Cell voltage sensing line poor contact or disconnected.	Check wiring, restart the battery. If the problem persists after restarting, please contact the after-sales service center.
	Cell temperature sensing line poor contact or disconnected.	
	Dual-channel current comparison error too large, or current sensing line loop abnormal.	
	Dual-channel voltage comparison error too large, or MCU and AFE voltage comparison error too large, or voltage sensing line loop abnormal.	

Fault Name	Fault Cause	Fault Handling Recommendation
	Temperature sensing line loop abnormal or poor contact, disconnected.	
	Overvoltage level 5 or Overtemperature level 5, tripped three-terminal fuse.	Tripped three-terminal fuse, need to contact after-sales service center to replace the main control board.
Relay or MOS Overtemperature	Relay or MOS overtemperature.	This fault indicates the MOS transistor temperature exceeds the specified threshold. Power off and let it sit for 2h waiting for temperature recovery.
Shunt Overtemperature	Shunt overtemperature.	This fault indicates the shunt temperature exceeds the specified threshold. Power off and let it sit for 2h waiting for temperature recovery.
BMS1 Other Fault 1 (Residential Storage)	Relay or MOS open circuit.	1. Upgrade software, power off and let it sit for 5 minutes, restart and see if the fault persists; 2. If it persists, replace the battery pack.
	Relay or MOS short circuit.	1. Upgrade software, power off and let it sit for 5 minutes, restart and see if the fault persists; 2. If it persists, replace the battery pack.
	Communication abnormality between master cluster and slave cluster, or cell inconsistency between clusters.	1. Check the slave unit's battery information and software version, and if the communication cable connection to the master unit is normal. 2. Upgrade software.

Fault Name	Fault Cause	Fault Handling Recommendation
	Battery system loop harness abnormal, causing the interlock signal not to form a loop.	Check if the terminal resistor is installed correctly.
	BMS and PCS communication abnormality.	1. Confirm if the communication cable interface definition between the inverter and the connected battery is correct; 2. Please contact the after-sales service center, check backend data, observe if the inverter and battery software are correctly matched.
	BMS master controller and slave controller communication harness abnormality.	1. Check wiring, restart the battery; 2. Upgrade the battery, if the problem persists after restarting, please contact the after-sales service center.
	Communication loss between main negative chips.	
	Circuit breaker, shunt trip abnormality.	1. Power off and let it sit for 5 minutes, restart and see if the fault persists; 2. Observe the PACK and PCU bottom blind plugs, check if communication pins are loose or bent;
	MCU self-test failure.	Upgrade software, restart the battery. If the problem persists after restarting, contact the after-sales service center.

Fault Name	Fault Cause	Fault Handling Recommendation
	1. Software version too low or BMS board damaged. 2. Large number of parallel inverters, excessive inrush current during battery pre-charge.	1. Upgrade software, observe if the fault persists. 2. If in parallel configuration, start the battery with black start first, then start the inverters.
	MCU internal fault.	Upgrade software, restart the battery. Usually indicates detection of MCU or external component damage. If the problem persists after restarting, please contact the after-sales service center.
	Total control current exceeds the specified threshold.	1. Power off and let it sit for 5 minutes, restart and see if the fault persists; 2. Check if the inverter power setting is too high, causing it to exceed the bus load;
	Parallel cluster battery cell inconsistency.	Confirm if the cells of the parallel cluster batteries are consistent.
	Parallel cluster battery positive and negative polarity reversed.	Check if the positive and negative terminals of the parallel cluster batteries are reversed.
	Severe overtemperature/overvoltage etc. triggering the fire protection system.	Contact the after-sales service center.

Fault Name	Fault Cause	Fault Handling Recommendation
System Air Conditioner Faults	Air conditioner abnormal failure.	Try restarting the system. If the fault is not resolved, please contact the after-sales service center.
	Cabinet door not closed.	Check if the cabinet door is properly closed.
	Supply voltage too high.	Confirm if the supply voltage value meets the air conditioner input voltage requirements. Confirm compliance before reapplying power.
	Insufficient supply voltage.	
	No voltage input.	
	Unstable supply voltage.	
	Compressor voltage unstable.	Try restarting the system. If the fault is not resolved, please contact the after-sales service center.
	Sensor poor contact or damaged.	
	Air conditioner fan abnormal.	
BMS1 Other Fault 2 (Residential Storage)	DCDC internal voltage or current abnormality.	Refer to specific DC fault content.
	DCDC overload or heatsink temperature too high, etc.	
	Cell sensing abnormality or inconsistent aging levels.	Please contact the after-sales service center.

Fault Name	Fault Cause	Fault Handling Recommendation
	Fan action not executed normally.	Please contact the after-sales service center.
	Output terminal screw loose or poor contact.	1. Power off the battery, check wiring and output terminal screw condition. 2. After confirmation, restart the battery, observe if the fault persists. If it exists, please contact the after-sales service center.
	Battery used for too long or cells severely damaged.	Please contact the after-sales service center to replace the pack.
	1. Software version too low or BMS board damaged. 2. Large number of parallel inverters, excessive inrush current during battery pre-charge.	1. Upgrade software, observe if the fault persists. 2. If in parallel configuration, start the battery with black start first, then start the inverters.
	Heating film damaged.	Please contact the after-sales service center.
	Heating film three-terminal fuse blown, heating function unavailable.	Please contact the after-sales service center.
	Software model, Cell Type, hardware model mismatch.	Check if the software model, SN, Cell Type, and hardware model are consistent. If not, please contact the after-sales service center.
	Thermal management board communication wire break.	1. Power off and let it sit for 5 minutes, restart and see if the fault persists; 2. If the fault does not recover, contact after-sales to replace the pack.

Fault Name	Fault Cause	Fault Handling Recommendation
	Thermal management board communication wire break.	1. Power off and let it sit for 5 minutes, restart and see if the fault persists; 2. If the fault does not recover, contact after-sales to replace the pack.
	Thermal management board communication wire break.	1. Power off and let it sit for 5 minutes, restart and see if the fault persists; 2. If the fault does not recover, contact after-sales to replace the pack.
	Pack fan fault signal triggered.	1. Power off and let it sit for 5 minutes, restart and see if the fault persists; 2. If the fault does not recover, contact after-sales to replace the pack.
DCDC Fault	Output terminal voltage too high.	Check the output terminal voltage. If the output terminal voltage is normal and the fault cannot clear itself after restarting the battery, please contact the after-sales service center.
	DCDC module detects battery voltage exceeds maximum charging voltage.	Stop charging, discharge to below 90% SOC or let it sit for 2h. If ineffective and the fault persists after restarting, please contact the after-sales service center.
	Heatsink temperature too high.	Let the battery sit for 1h, wait for heatsink temperature to drop. If ineffective and the fault persists after restarting, please contact the after-sales service center.
	Battery discharge current too high.	Check if the load exceeds the battery's discharge capability. Turn off the load or stop the PCS for 60s. If ineffective and the fault persists after restarting, please contact the after-sales service center.

Fault Name	Fault Cause	Fault Handling Recommendation
	Output terminal power harness positive/negative reversed with parallel cluster battery or PCS.	Turn off the battery manual switch, check if the output terminal wiring is correct, restart the battery.
	Output power relay cannot close.	Check if the output terminal wiring is correct, check for short circuits. If ineffective and the fault persists after restarting, please contact the after-sales service center.
	Power device temperature too high.	Let the battery sit for 1h, wait for internal power device temperature to drop. If ineffective and the fault persists after restarting, please contact the after-sales service center.
	Relay welded/stuck.	If the fault persists after restarting, please contact the after-sales service center.
Inter-cluster Circulation Fault	1. Cell imbalance. 2. First power-up without full charge calibration.	Record the fault phenomenon, restart the battery, wait a few minutes, confirm if the fault disappears. If the problem persists after restarting, please contact the after-sales service center.
BMS1 Other Fault 3 (Utility Storage)	Communication abnormality with linux module.	1. Check if the communication cable link is normal. 2. Upgrade software, restart the battery and observe if the fault persists. If it exists, please contact the after-sales service center.
	Cell temperature rise too fast.	Cell abnormal, contact after-sales to replace the pack.
	SOC below 10%.	Charge the battery.

Fault Name	Fault Cause	Fault Handling Recommendation
	SN writing does not conform to rules.	Check if the SN digit count is normal. If abnormal, please contact the after-sales service center.
	1. Daisy chain communication abnormality within a battery cluster. 2. Inconsistent cell aging levels between battery clusters.	1. Check the pack contact condition within a single cluster battery. 2. Confirm the usage status of each cluster battery, such as cumulative charge/discharge capacity, cycle count, etc. 3. Please contact the after-sales service center.
	Excessive humidity inside the pack.	-
	Fuse blown.	Contact after-sales to replace the pack.
	Battery low charge.	Charge the battery.
BMS1 Other Fault 4 (Utility Storage)	Circuit breaker abnormality.	Contact after-sales to replace the pack.
	External device abnormality.	Contact after-sales to replace the pack.
Contactor Fault 1	-	-
Contactor Fault 2	-	-
Overload Protection (Jinggui)	Sustained overload (exceeding 690KVA) for 10s.	Please contact the after-sales service center.
Overload Protection (Smart Port)	Sustained overload (exceeding 690KVA) for 10s.	Please contact the after-sales service center.

Fault Name	Fault Cause	Fault Handling Recommendation
Overcurrent Protection (Jinggui)	-	-
Overcurrent Protection (Smart Port)	-	-
Master Unit AC Power-up and Meter Communication Abnormality	1. Possibly the meter is not connected to the master unit. 2. Possibly the meter communication cable is loose.	1. Check if the meter is connected to the master unit. 2. Check if the meter communication cable is loose.
Slave Unit with Meter Abnormality in Parallel System	Meter connected to a slave unit.	Set the unit with the meter as the master unit.
Slave Unit AC Power-up >10 Minutes Communication Timeout Abnormality with Master	1. Slave address setting error. 2. Slave communication cable loose.	1. Check if the slave address is duplicated. 2. Check if the parallel communication cable is loose.

8.5 Routine Maintenance

DANGER

When performing operation or maintenance on the inverter, please de-energize the inverter. Operating the equipment while energized may cause inverter damage or an electrical shock hazard.

Maintenance Content	Maintenance Method	Maintenance Cycle
System Cleaning	Check if there are any foreign objects or dust on the heat sink and air inlet/outlet.	Once per half-year - Once per year
Fan	Check if the fan is operating normally, if there is any abnormal noise, and if the appearance is normal.	Once per year
DC switch	Turn the DC switch on and off 10 times consecutively to ensure its function is normal.	Once per year
Electrical Connections	Check if electrical connections are loose, if cable appearance is damaged, or if copper exposure is present.	Once per half-year - Once per year
Sealing	Check if the sealing of the equipment's cable entry holes meets requirements. If gaps are too large or unsealed, reseal them.	Once per year

9 Inverter Parameters

Technical Data	GW7.5K-MS-G40	GW8.5K-MS-G40	GW9.999K-MS-G40
Input			
Max.Input Power (W)*1	15000	17000	19998
Max.Input Voltage (V)*2	600	600	600
MPPT Operating Voltage Range (V)	40~560	40~560	40~560
MPPT Voltage Range at Nominal Power (V)	160-500	185-500	210-500
Start-up Voltage (V)	50	50	50
Nominal Input Voltage (V)	360	360	360
Max. Input Current per MPPT (A)	20	20	20
Max. Short Circuit Current per MPPT (A)	26	26	26
Max.Backfeed Current to The Array (A)	0	0	0
Number of MPPT	3	3	3
Number of Strings per MPPT	1	1	1
Output			
Nominal Output Power (W)	7500	8500	9999
Nominal Output Apparent Power (VA)	7500	8500	9999
Max. AC Active Power (W)	7500	8500	9999

Technical Data	GW7.5K-MS-G40	GW8.5K-MS-G40	GW9.999K-MS-G40
Max. AC Apparent Power (VA)	7500	8500	9999
Nominal Power at 40℃（W）(Only for Brazil)	7500	8500	/
Max Power at 40℃ (Including AC Overload)（W）(Only for Brazil)	7500	8500	/
Nominal Output Voltage (V)	220/230/240，L/N/PE	220/230/240，L/N/PE	220/230/240，L/N/PE
Output Voltage Range (V)	160~270 (according to local standard)		
Nominal AC Grid Frequency (Hz)	50/60	50/60	50/60
AC Grid Frequency Range (Hz)	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65
Max. Output Current (A)	34.1	38.7	45.5
Max. Output Fault Current (Peak and Duration) (A/us)	28185	33298	109/3
Inrush Current (Peak and Duration) (A/ms)	23/15	26/15	30/15
Nominal Output Current (A)（at 220V）	34.1@220V 32.6@230V 31.3@240	38.7@220V 37.0@230V 35.5@240V	45.5@220V 43.5@230V 41.7@240V
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)	~1 (Adjustable from 0.8 leading to 0.8 lagging)	~1 (Adjustable from 0.8 leading to 0.8 lagging)

Technical Data	GW7.5K-MS-G40	GW8.5K-MS-G40	GW9.999K-MS-G40
Max. Total Harmonic Distortion	<3%	<3%	<3%
Efficiency			
Max. Efficiency	97.8%	97.9%	97.9%
European Efficiency	97.2%	97.3%	97.3%
Protection			
PV String Current Monitoring	Integrated	Integrated	Integrated
PV Insulation Resistance Detection	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated
DC Reverse Polarity Protection	Integrated	Integrated	Integrated
Anti-islanding Protection	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated
DC Switch	Integrated	Integrated	Integrated
DC Surge Protection	Type II	Type II	Type II
AC Surge Protection	Type II	Type II	Type II
AFCI	Optional	Optional	Optional
Emergency Power Off	Optional	Optional	Optional

Technical Data	GW7.5K-MS-G40	GW8.5K-MS-G40	GW9.999K-MS-G40
Rapid Shutdown	Optional	Optional	Optional
Remote Shutdown	Optional	Optional	Optional
Power Supply at Night	Optional	Optional	Optional
General Data			
Operating Temperature Range (℃)	-25~+60	-25~+60	-25~+60
Relative Humidity	0~100%	0~100%	0~100%
Max. Operating Altitude (m)	4000	4000	4000
Cooling Method	Natural Convection	Natural Convection	Natural Convection
Display	LCD, WLAN + APP	LCD, WLAN + APP	LCD, WLAN + APP
Communication	RS485, WIFI, LAN, Bluetooth，4G	RS485, WIFI, LAN, Bluetooth，4G	RS485, WIFI, LAN, Bluetooth，4G
Communication Protocols	Modbus-RTU (SunSpec Compliant)		
Weight (kg)	16	16	16
Dimension W×H×D (mm)	493*365*187	493*365*187	493*365*187
Noise Emission (dB)	< 30	< 30	< 30
Topology	Non-isolated	Non-isolated	Non-isolated
Self-consumption at Night (W)	<1	<1	<1

Technical Data	GW7.5K-MS-G40	GW8.5K-MS-G40	GW9.999K-MS-G40
Ingress Protection Rating	IP66	IP66	IP66
Anti-corrosion Class	C4	C4	C4
DC Connector	MC4(4-6mm²)	MC4(4-6mm²)	MC4(4-6mm²)
AC Connector	Plug and play connector (Max.16mm²)		
Environmental Category	4K4H	4K4H	4K4H
Pollution Degree	III	III	III
Overvoltage Category	DC II / AC III	DC II / AC III	DC II / AC III
Protective Class	I	I	I
The Decisive Voltage Class (DVC)	PV: C AC: C Com: A		
Country of Manufacture	China	China	China

Technical Data	GW10K-MS-G40	GW7.5K-MS-G41	GW8K-MS-G40
Input			
Max.Input Power (W)*1	20000	13500	14400
Max.Input Voltage (V)*2	600	600	600
MPPT Operating Voltage Range (V)	40~560	40~560	40~560
MPPT Voltage Range at Nominal Power (V)	210-500	220-500	240-500
Start-up Voltage (V)	50	50	50

Technical Data	GW10K-MS-G40	GW7.5K-MS-G41	GW8K-MS-G40
Nominal Input Voltage (V)	360	360	360
Max. Input Current per MPPT (A)	20	20	20
Max. Short Circuit Current per MPPT (A)	26	26	26
Max.Backfeed Current to The Array (A)	0	0	0
Number of MPPT	3	2	2
Number of Strings per MPPT	1	1	1
Output			
Nominal Output Power (W)	10000	7500	8000
Nominal Output Apparent Power (VA)	10000	7500	8000
Max. AC Active Power (W)	10000	7500	8000
Max. AC Apparent Power (VA)	10000	7500	8000
Nominal Power at 40℃（W）(Only for Brazil)	10000	7500	8000
Max Power at 40℃ (Including AC Overload)（W）(Only for Brazil)	10000	7500	8000
Nominal Output Voltage (V)	220/230/240，L/N/PE	220/230，L/N/PE	220/230，L/N/PE

Technical Data	GW10K-MS-G40	GW7.5K-MS-G41	GW8K-MS-G40
Output Voltage Range (V)	160~270(according to local standard)		
Nominal AC Grid Frequency (Hz)	50/60	50/60	50/60
AC Grid Frequency Range (Hz)	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65
Max. Output Current (A)	45.5	34.1	36.4
Max. Output Fault Current (Peak and Duration) (A/us)	109/3	28185	28185
Inrush Current (Peak and Duration) (A/ms)	30/15	23/15	23/15
Nominal Output Current (A)（at 220V）	45.5@220V 43.5@230V 41.7@240V	34.1@220 32.6@230	36.4@220V 34.8@230V
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)		
Max. Total Harmonic Distortion	<3%	<3%	<3%
Efficiency			
Max. Efficiency	97.9%	97.8%	97.8%
European Efficiency	97.3%	97%	97%
Protection			
PV String Current Monitoring	Integrated	Integrated	Integrated
PV Insulation Resistance Detection	Integrated	Integrated	Integrated

Technical Data	GW10K-MS-G40	GW7.5K-MS-G41	GW8K-MS-G40
Residual Current Monitoring	Integrated	Integrated	Integrated
DC Reverse Polarity Protection	Integrated	Integrated	Integrated
Anti-islanding Protection	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated
DC Switch	Integrated	Integrated	Integrated
DC Surge Protection	Type II	Type II	Type II
AC Surge Protection	Type II	Type II	Type II
AFCI	Optional	Optional	Optional
Emergency Power Off	Optional	Optional	Optional
Rapid Shutdown	Optional	Optional	Optional
Remote Shutdown	Optional	Optional	Optional
Power Supply at Night	Optional	Optional	Optional
General Data			
Operating Temperature Range (℃)	-25~+60	-25~+60	-25~+60
Relative Humidity	0~100%	0~100%	0~100%
Max. Operating Altitude (m)	4000	4000	4000

Technical Data	GW10K-MS-G40	GW7.5K-MS-G41	GW8K-MS-G40
Cooling Method	Natural Convection	Natural Convection	Natural Convection
Display	LCD, WLAN + APP	LCD, WLAN + APP	LCD, WLAN + APP
Communication	RS485, WIFI, LAN, Bluetooth，4G	RS485, WIFI, LAN, Bluetooth，4G	RS485, WIFI, LAN, Bluetooth，4G
Communication Protocols	Modbus-RTU (SunSpec Compliant)		
Weight (kg)	16	16	16
Dimension W×H×D (mm)	493*365*187	493*365*187	493*365*187
Noise Emission (dB)	< 30	< 30	< 30
Topology	Non-isolated	Non-isolated	Non-isolated
Self-consumption at Night (W)	<1	<1	<1
Ingress Protection Rating	IP66	IP66	IP66
Anti-corrosion Class	C4	C4	C4
DC Connector	MC4(4-6mm^2)	MC4(4-6mm^2)	MC4(4-6mm^2)
AC Connector	Plug and play connector (Max.16mm^2)		
Environmental Category	4K4H	4K4H	4K4H
Pollution Degree	III	III	III
Overvoltage Category	DC II / AC III	DC II / AC III	DC II / AC III

Technical Data	GW10K-MS-G40	GW7.5K-MS-G41	GW8K-MS-G40
Protective Class	I	I	I
The Decisive Voltage Class (DVC)	PV: C AC: C Com: A		
Country of Manufacture	China	China	China

*1: The actual value depends on the specific input power of the PV panel.

*2: When the input voltage ranges from 560 V to 600 V, the inverter will enter standby state. When the input voltage returns to the MPPT operating voltage range of 40 V to 560 V, the inverter will resume normal operation.

10 Explanation of Terms

Explanation of Overvoltage Categories

- **Overvoltage Category I**: Equipment connected to circuits that have measures to limit transient overvoltages to a relatively low level.
- **Overvoltage Category II**: Energy-consuming equipment supplied from fixed electrical installations. This category includes appliances, portable tools, and other household and similar loads. Overvoltage Category III is adopted if special requirements for the reliability and suitability of such equipment exist.
- **Overvoltage Category III**: Equipment in fixed electrical installations where the reliability and suitability of the equipment must meet special requirements. This includes switching devices in fixed electrical installations and industrial equipment permanently connected to fixed electrical installations.
- **Overvoltage Category IV**: Equipment used at the origin of the electrical installation, including meters and primary overcurrent protection devices, etc.
- **Explanation of Damp Location Categories**

Environmental Parameters	Level		
	3K3	4K2	4K4H
Temperature Range	0~+40℃	-33~+40℃	-33~+40℃
Humidity Range	5% to 85%	15% to 100%	4% to 100%

- **Explanation of Environmental Categories:**
  - **Outdoor Inverter**: Ambient air temperature range is -25~+60°C, suitable for Pollution Degree 3 environments;
  - **Indoor Type II Inverter**: Ambient air temperature range is -25~+40°C, suitable for Pollution Degree 3 environments;
  - **Indoor Type I Inverter**: Ambient air temperature range is 0~+40°C, suitable for Pollution Degree 2 environments;
- **Explanation of Pollution Degree Categories**
  - **Pollution Degree 1**: No pollution or only dry, non-conductive pollution;
  - **Pollution Degree 2**: Normally only non-conductive pollution, but temporary conductivity due to condensation must be considered;
  - **Pollution Degree 3**: Conductive pollution occurs, or non-conductive pollution

becomes conductive due to condensation;
- **Pollution Degree 4**: Persistent conductive pollution, e.g., due to conductive dust, rain, or snow.

11 Obtaining Related Product Manuals

Document Name	Official Website Link
EzLink3000 Quick Installation Guide	https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_EzLink_Quick%20Installation%20Guide-EN.pdf
4G Kit-CN-G20 & 4G Kit-CN-G21 Quick Installation Guide	https://en.goodwe.com/Ftp/Installation-instructions/4G-KIT.pdf
WiFi/LAN Kit-20 & WiFi Kit-20 Quick Installation Guide	https://en.goodwe.com/Ftp/Installation-instructions/WiFi-LAN-Kit-20.pdf
GMK110 & GMK110D Quick Installation Guide	https://en.goodwe.com/Ftp/Installation-instructions/GMK110-110D.pdf
GM1000 & GM3000 & GM1000 Quick Installation Guide	https://en.goodwe.com/Ftp/Installation-instructions/Smart-Meter.pdf
GMK330 & GMK360 & GM330 Quick Installation Guide	https://en.goodwe.com/Ftp/Installation-instructions/GMK330-360.pdf