V1.6-2026-09-30

Grid-Tied PV Inverter

MS Series (7-10kW) G4
User Manual

GOODWE

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NOTE

This document may be updated periodically due to product version upgrades or other reasons. Unless otherwise agreed, the contents of this document do not supersede the safety precautions on the product label. All descriptions in this document are provided for guidance only.

Preface

This document primarily describes the inverter's product information, installation and wiring, configuration and commissioning, troubleshooting, and maintenance. Before installing or using this product, read this manual carefully to understand the product safety information and familiarize yourself with its functions and features. This document may be updated periodically. Visit the official website for the latest version of the documentation and more product information.

Applicable Products

This document applies to inverters of the following models:

Model	Rated Output Power	Rated 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

Only qualified personnel who are familiar with local laws and regulations and electrical systems, have received professional training, and are knowledgeable about this product may use this document.

Symbol Definitions

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

DANGER
Indicates a highly hazardous situation that, if not avoided, will result in death or serious injury.
WARNING
Indicates a moderately hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION
Indicates a low-level hazardous situation which, if not avoided, could result in moderate or minor injury.
NOTE
Emphasizes and supplements the content, and may also provide tips or tricks for optimizing product use to help you solve a problem or save time.

Table of Contents

1 Safety Precautions 7
1.1 General Safety 7
1.2 DC Side 7
1.3 AC Side 8
1.4 Abnormal Inverter 9
1.5 EU Declaration of Conformity 10
1.5.1 Devices with Wireless Communication Functionality 10
1.5.2 Devices Without Wireless Communication Functionality 10
1.6 Personnel Requirements 11
2 Product Introduction 12
2.1 Introduction 12
2.2 Circuit Block Diagram 13
2.3 Supported Grid Configurations 14
2.4 Features 15
2.5 Appearance Overview 16
2.5.1 Component Overview 17
2.5.2 Product Dimensions 18
2.5.3 Nameplate Description 19
2.5.4 Indicator Light Description 20
3 Equipment Inspection and Storage 22
3.1 Equipment Inspection 22

3.2 Items Supplied 22
3.3 Equipment Storage 24
4 Installation 26
4.1 Installation Requirements 26
4.2 Installing the Inverter 29
4.2.1 Handling the Inverter 29
4.2.2 Installing the Inverter 29
5 Electrical Connections 31
5.1 Safety Precautions 31
5.2 Connect the Protective Grounding Conductor 31
5.3 Connecting the AC Output Cable 32
5.4 Connecting the DC Input Cable 35
5.5 Communication Connections 37
5.5.1 Communication Network Overview 38
5.5.2 Connecting the Communication Cable 41
6 Equipment Commissioning 47
6.1 Pre-Power-on System Check 47
6.2 Energize the Equipment 47
7 System Commissioning 49
7.1 Indicator Light Description 49
7.2 Setting Inverter Parameters via the Display 49
7.2.1 Display Menu Overview 51

7.3 Download the SEMS+ App 52
8 System Maintenance 53
8.1 De-Energizing the Inverter 53
8.2 Removing the Inverter 53
8.3 Decommissioning the Inverter 53
8.4 Inverter Fault 54
8.4.1 Fault Handling (Fault Codes F01–F40) 54
8.4.2 Troubleshooting (Fault Codes F41–F80) 71
8.4.3 Fault Handling (Fault Codes F81–F121) 81
8.4.4 Fault Handling (Fault Codes F122–F163) 90
8.4.5 Fault Troubleshooting 102
8.5 Periodic Maintenance 121
9 Inverter Parameters 123
10 Glossary 139
11 Related Product Manuals 141
12 Contact Details 142

1 Safety Precautions

The safety information in this document must always be observed when operating the equipment.

⚠WARNING

The equipment is designed and tested in strict compliance with safety regulations. However, as electrical equipment, it must be operated in accordance with the relevant safety instructions. Improper operation may result in serious injury or property damage.

1.1 General Safety

WARNING

- As products are upgraded or for other reasons, this document may be updated from time to time. Unless otherwise agreed, the information in this document does not replace the safety precautions on the product label. All descriptions in this document are provided for guidance only.
- Please read this document carefully before installing the equipment to learn about the product and the precautions to be taken.
- All work on the equipment must be performed by qualified electrical professionals who are familiar with the relevant standards and safety regulations in the project location.
- When working on the equipment, use insulated tools and wear personal protective equipment to ensure personal safety. When handling electronic components, wear antistatic gloves, an antistatic wrist strap, antistatic clothing, and other protective equipment to prevent electrostatic discharge from damaging the equipment.
- Unauthorized disassembly or modification may damage the equipment. Such damage is not covered by the warranty.
- The equipment manufacturer is not liable for equipment damage or personal injury caused by failure to install, use, or configure the equipment as specified in this document or the corresponding user manual. For more information about the product warranty, visit the official website:https://www.goodwe.com/warrantyrelated.html。

1.2 DC Side

DANGER

- Use the DC Connector supplied with the inverter to connect the inverter's DC cables. Using a different model of DC connector may have serious consequences. The manufacturer is not liable for any resulting equipment damage.
- For devices that support PV string connection, the PV input terminals have limited surge current withstand capability. It is strictly prohibited to power the device by connecting a DC voltage source directly to the PV terminals. If powering via the PV terminals is required, follow the steps below. Damage to the device resulting from improper operation is considered user-caused damage and is not covered by the product warranty.
  1. First, limit the output current of the DC voltage source to within the maximum input current permitted at the PV port.
  2. Then close the inverter's DC Switch.
  3. Finally, slowly increase the DC source output voltage from zero to the target value at a rate of ≤50 V/s.

WARNING

- Ensure that the module frames and mounting system are properly grounded.
- After connecting the DC cables, ensure that all connections are secure and not loose.
- The manufacturer is not liable for damage caused by reverse polarity, Overvoltage, or Overcurrent when measuring PV strings with a multimeter.
- PV modules connected to the same MPPT must be of the same model. The voltage difference between different MPPTs must be <160 V.
- When the input voltage is between 1000 V and 1100 V, the inverter will enter standby mode. When the voltage returns to the MPPT operating Voltage Range (140 V to 1000 V), the inverter will resume normal operation.
- It is recommended that the sum of the peak power currents of the strings connected to each MPPT not exceed the inverter's Max. MPPT Current.
- When multiple PV strings are connected to the inverter, it is recommended to connect at least one string to each MPPT; do not leave any MPPT unconnected.
- PV modules used with the inverter must comply with IEC 61730 Class A.

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 install a circuit breaker, fuse, or other Protection device on the inverter's AC side. The rating of the Protection device must be greater than 1.25 times the inverter's Max. Current to Grid.
- The inverter's protective earth conductor must be securely connected.
- Copper-core cables are recommended for the AC output. If aluminum cables are used, connect them using copper-to-aluminum transition terminals.

1.4 Abnormal Inverter

⚠DANGER

- During installation, do not allow the bottom terminals to bear any load, as this may damage them.
- After installing the inverter, ensure that the labels and warning signs on the enclosure are clearly visible. Do not cover, alter, or damage them.
-
- Use the connectors supplied with the inverter to connect its cables. Using a different model of connector may have serious consequences. The manufacturer is not liable for any resulting equipment damage.
- The warning labels on the inverter enclosure are as follows:

No.	Symbol	Description
1		High-voltage hazard. High voltage is present while the inverter is operating. Ensure that the inverter is de-energized before performing any work on it.
2		Delayed discharge. After powering off the equipment, wait5minutes for it to fully discharge.
3		Read the product manual carefully before operating the inverter.

4		Operating the equipment presents potential hazards. Use appropriate protective measures when performing any work.
5		The inverter surface becomes hot during operation. Do not touch it while the equipment is running, as this may cause burns.
6		Protective earth connection point.
7		CECertification mark.
8		Do not dispose of the equipment as household waste. Dispose of it in accordance with local laws and regulations, or return it to the equipment manufacturer.
9		RCMmark.

1.5 EU Declaration of Conformity

1.5.1 Devices with Wireless Communication Functionality

GoodWe Technologies Co., Ltd. hereby declares that equipment with wireless communication capabilities intended for sale in the European market complies with the requirements of 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)

1.5.2 Devices Without Wireless Communication Functionality

GoodWe Technologies Co., Ltd. hereby declares that equipment without wireless communication capabilities intended for sale in the European market complies with the requirements of the following directives:

- 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)

MoreEUDeclarations of Conformity are available on the official website:https://en.goodwe.com.

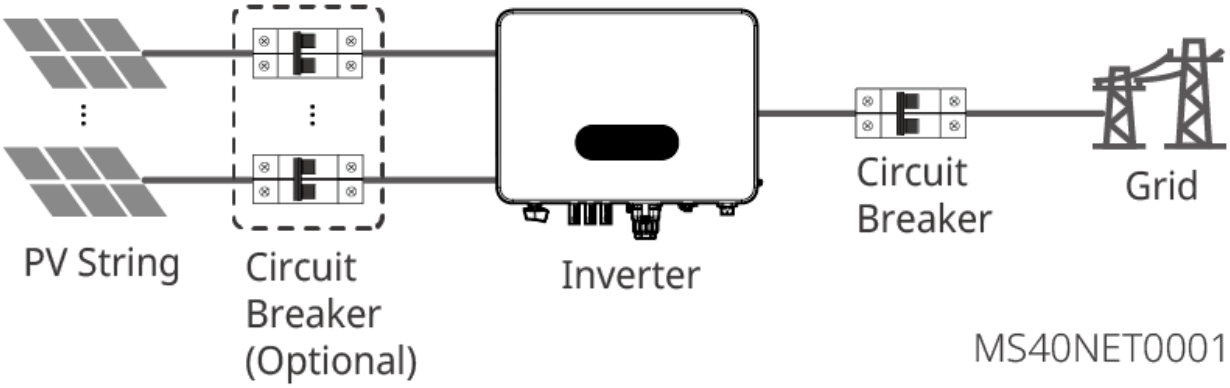
1.6 Personnel Requirements

NOTE
• Personnel responsible for installing and maintaining the equipment must first undergo rigorous training, understand the safety precautions for various products, and master the correct operating procedures. • Only qualified professionals or trained personnel may install, operate, maintain, or replace the equipment or its components.

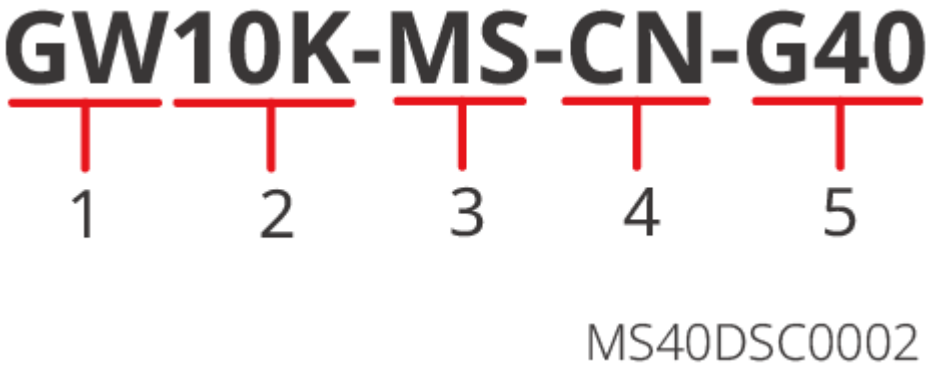
2 Product Introduction

2.1 Introduction

MSseries inverter is a single-phase string grid-connected PV inverter. It converts the DC power generated by PV modules into AC power that meets grid requirements and feeds it into the grid. The inverter is primarily used in the following applications:



Model designation



No.	Description	Description
1	Brand Code	GW: GoodWe
2	Rated Power	10K:Rated Power is10kW 8K:Rated Power is8kW 7K:Rated Power is7kW
3	Series Name	MS：MSseries

No.	Description	Description
4	Special country code	CN: China version
5	Version Code	G40: Fourth-generation product

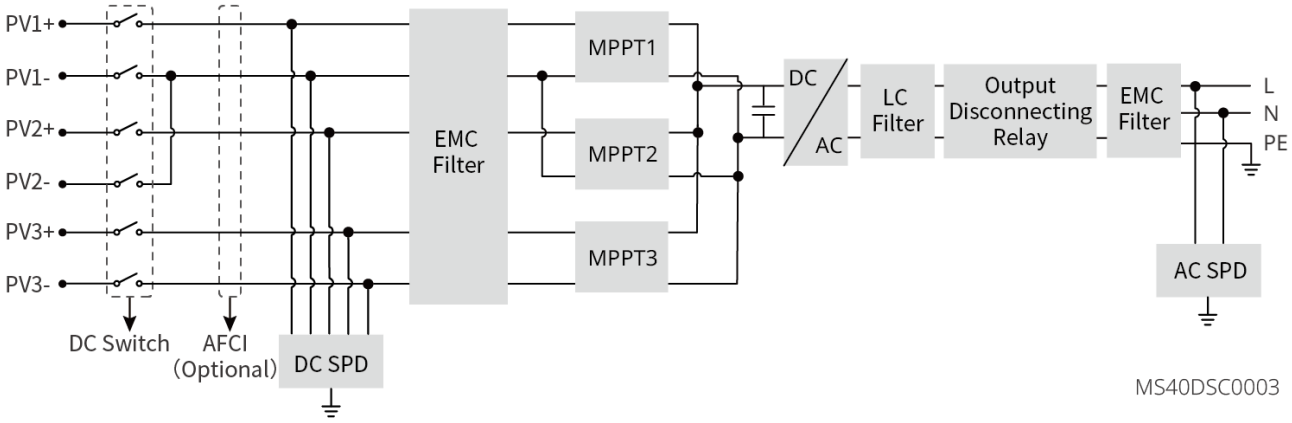


MS40DSC0007

No.	Description	Description
1	Brand Code	GW: GoodWe
2	Rated Power	10K:Rated Power is10kW 9.999K:Rated Power is9.999kW 8.5K:Rated Power is8.5kW 8K:Rated Power is8kW 7.5K:Rated Power is7.5kW
3	Series Name	MS：MSseries
4	Version Code	G40/G41: Fourth-generation product

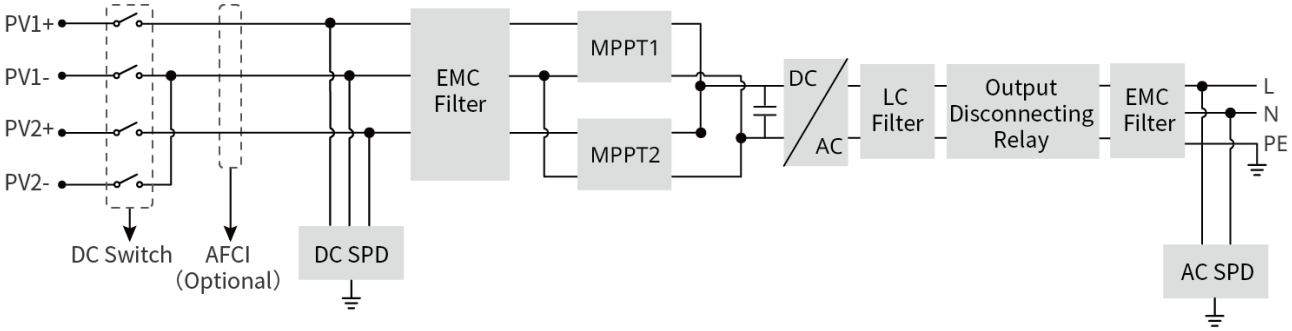
2.2 Circuit Block Diagram

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



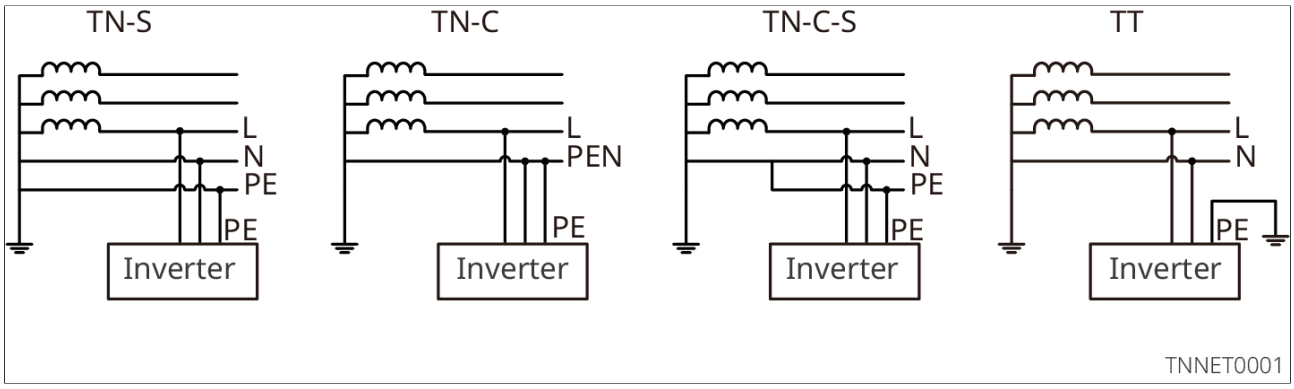
MS40DSC0003

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

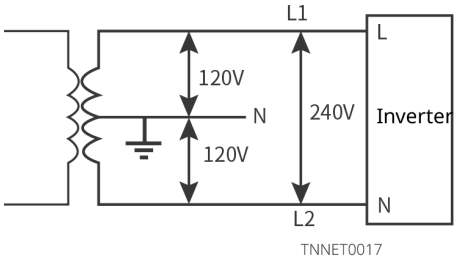


MS40DSC0004

2.3 Supported Grid Configurations



TNNET0001



2.4 Features

NOTE
The specific feature configuration is subject to the actual model.

AFCI

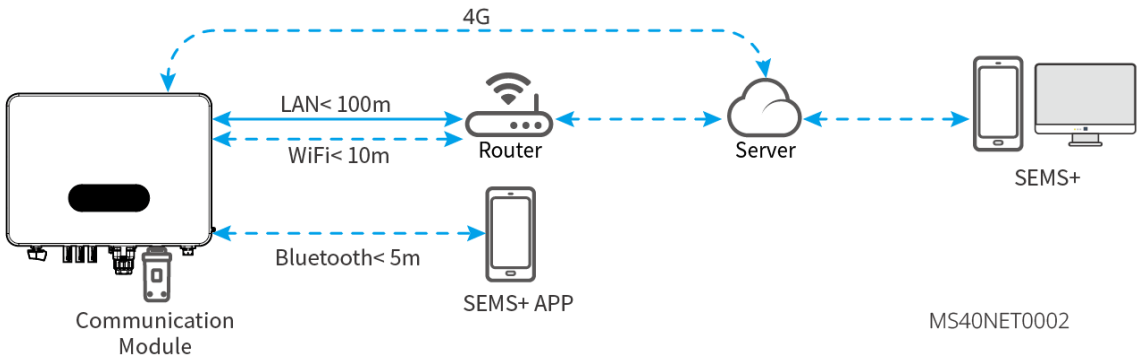
The AFCI function detects arc faults on the inverter's DC side. When an arc fault occurs, the inverter automatically provides Protection.
Causes of arc faults:

- The DC Connector in the PV system is damaged or improperly connected.
- Incorrectly connected or damaged cables.
- Aged connectors or cables.

Communications

The inverter supports parameter configuration via Bluetooth locally. It also supports connection to a monitoring platform viaWiFi、LANor4Gto monitor inverter operating status, power plant operation, and more.

- Bluetooth: Complies with theBluetooth 5.1standard.
- WiFi/LAN2.0(optional): WirelessIEEE 802.11 b/g/n @2.4 GHz; Ethernet10M/100Mbps auto-negotiation; if a third-party monitoring platform is used, it must support theModbusTCPcommunication protocol.
- 4G(optional): Supports connection to a third-party monitoring platform via theMQTTcommunication protocol.



RSD

In a Rapid Shutdown system, the Rapid Shutdown transmitter and receiver work together to achieve system rapid shutdown. The receiver maintains the module output by receiving signals from the transmitter. The transmitter can be installed externally or integrated into the inverter. In an emergency, the transmitter can be stopped by enabling an external triggering device, thereby shutting down the modules.

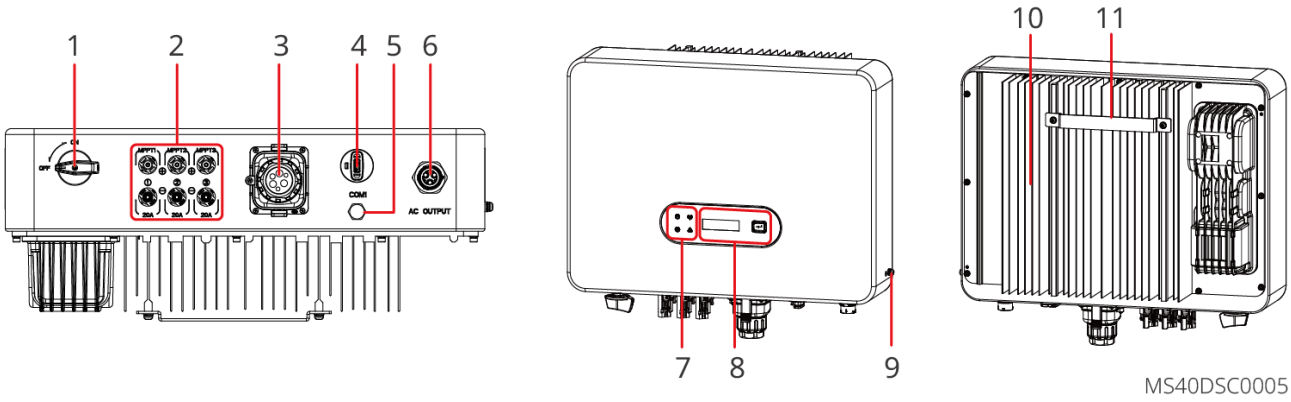
- **External transmitter:**
  - Transmitter models: GTP-F2L-20, GTP-F2M-20
    https://www.goodwe.com/Ftp/user-manual/RSD2.0-transmitter.pdf
  - Receiver models: GR-B1F-20, GR-B2F-20
    https://www.goodwe.com/Ftp/Installation-instructions/RSD2.0.pdf
- **Built-in transmitter:**
  - External triggering device: AC-side circuit breaker
  - Receiver models: GR-B1F-20, GR-B2F-20
  - If the inverter cannot be connected to an external synchronization signal and multiple inverters need to operate in parallel, ensure that the PV cables for different inverters are routed in separate cable trays, with a minimum clearance of 20 cm between the trays.
  - If the inverter can be connected to an external synchronization signal, ensure that no more than 5 transmitters are connected in the same synchronization group.

https://en.goodwe.com/Ftp/EN/Downloads/User%20Manual/GW_RSD-20_Quick-Installation-Guide-POLY.pdf

2.5 Appearance Overview

The Color and Appearance Vary Among Inverter Models; the Actual Product Takes Precedence.

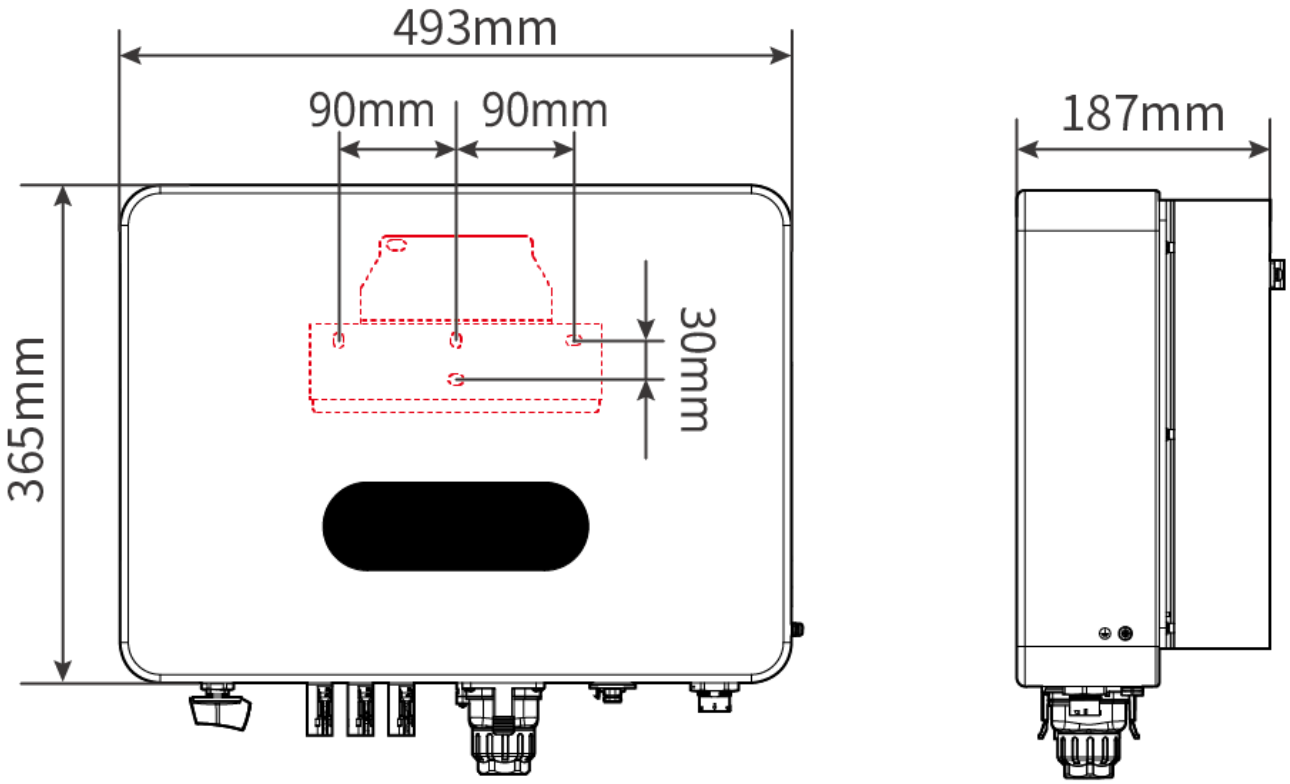
2.5.1 Component Overview



No.	Component/Screen Printing	Description
1	DC Switch	Controls connection and disconnection of the DC input.
2	PV input terminals	Connects toPVmodule DC input cables. 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 ports	Connects to communication cables for load control,CT(optional),RS485(electricity meter), Remote Shutdown,DRED(Australia)/RCR(Europe), etc.
4	Communication module port	Connects to communication modules, such as4G、WiFi/LAN, etc. Select the module type according to actual requirements. Supports connection to aUdrive for local inverter software version upgrades. For the Brazilian market, connects to aUSB-RS485adapter cable.
5	Breather valve	-

No.	Component/Screen Printing	Description
6	AC output cable terminals	Connects to the AC output cable to connect the inverter to the grid.
7	Indicator	Indicates the inverter operating status.
8	Display and buttons	• View inverter 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. • Used to operate the display.
9	Protection earth terminal	Connects to the protective earth conductor.
10	Heat sink	Dissipates heat from the inverter.
11	Mounting bracket	Used to mount the inverter.

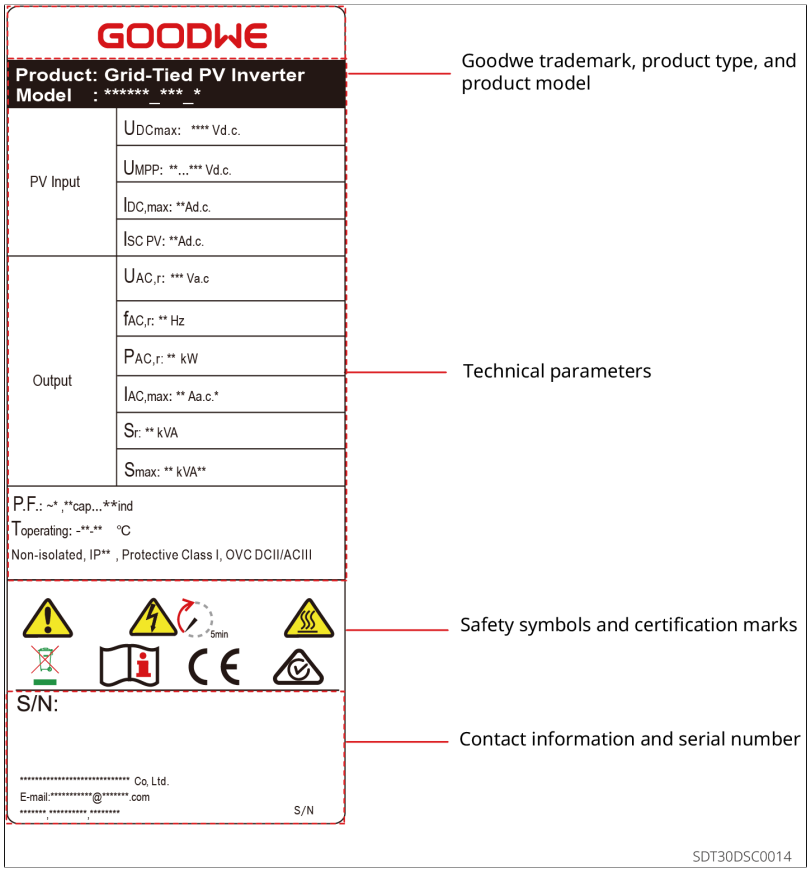
2.5.2 Product Dimensions



MS40DSC0006

2.5.3 Nameplate Description

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



2.5.4 Indicator Light Description

Indicator	Status	Description
Power		Steady on: Device powered on
		Off: Device not powered on
Operation		Steady on: Grid is normal and grid connection is successful
		Off: Not connected to the grid
		Single slow flash: Pre-grid-connection self-check
		Single fast flash: Grid connection imminent
		Steady on: Wireless monitoring is operating normally

Communication		Single flash: Wireless module restarting or resetting
		Two flashes: Not Connected to the base station or router
		Four flashes: Not Connected to the monitoring server
		Flashing: RS485 communication is operating normally
		Off: Wireless module is restoring factory settings
Fault		Steady on: System fault
		Off: No fault

3 Equipment Inspection and Storage

3.1 Equipment Inspection

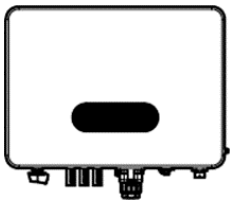
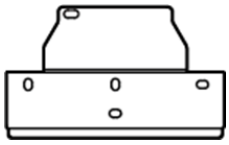
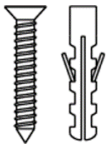
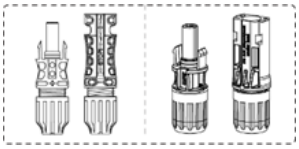
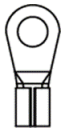
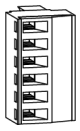
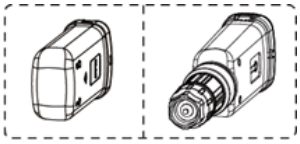
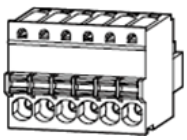
Before signing for receipt of the products, carefully check the following:

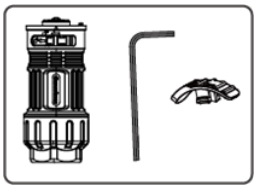
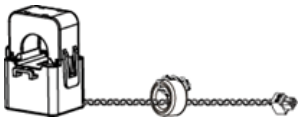
1. Check the outer packaging for damage, such as deformation, holes, cracks, or other signs that may indicate damage to the equipment inside. If damaged, do not open the package and contact your distributor.
2. Check that the inverter model is correct. If it is not, do not open the package and contact your distributor.
3. Check that the type and quantity of the delivered items are correct and that they are undamaged. If any items are damaged, contact your distributor.

3.2 Items Supplied

⚠WARNING
When making electrical connections, use the terminals supplied with the product. Equipment damage caused by using incompatible connector models is not covered by the warranty.

NOTE
[1] The number of DC Connectors matches the number of DC terminals on the inverter. Please confirm according to the number of DC terminals on the inverter. [2] Communication module types include:WiFi/LAN、4Getc. The type actually shipped depends on the selected inverter communication method. [3] The number of communication terminals and tubular terminals matches the selected communication method. Please confirm according to the communication configuration. Depending on the inverter configuration , the items supplied with the inverter include2PINCommunication terminals,DRED/RCRThe number of communication terminals may vary. Please refer to the actual . [4] The protocol converter connection cable is shipped only within China. [5] CTStandard in Australia; optional in other regions. [6] China x 0; other regions x 1。

Component	Description	Component	Description
	Inverter x1		Mounting bracket x1
	Expansion bolts x 4		PV terminals[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
	GroundingOTterminal x 1		2-pin communication terminal x N[3]
	6-pin RS485 communication terminal x 1		Tubular terminal x N[3]
	Communication module x 1[2]		DRED/RCRcommunication terminal x N[3]

Component	Description	Component	Description
	• AC terminal x 1 • Hex screwdriver x 1 • AC terminal unlocking tool x 1		(Optional) CT x 1[5]
	Protocol converter connection cable (inverter side) x 1[4]		Protocol converter connection cable (protocol converter side) x 1[4]
	Product documentation x 1		PVunlocking tool x N[6]
	Tubular terminal x 3	-	-

3.3 Equipment Storage

If the equipment will not be put into operation immediately, store it according to the following requirements:

1. Ensure that the outer packaging box has not been opened and that the desiccant inside the box has not been lost.
2. Ensure that the storage environment is clean, the temperature and humidity are within the appropriate ranges, and there is no condensation.
3. Ensure that the inverter stacking height and orientation comply with the instructions on the packaging labels.
4. Ensure that the stacked inverters are secure and cannot topple.
5. If an inverter has been stored for more than two years or has been inactive for more than 6 months after installation, it is recommended that qualified personnel

inspect and test it before use.

6. To ensure the electrical performance of the inverter's internal electronic components, it is recommended that the inverter be energized once every 6 months during storage. If it has not been energized for more than 6 months, qualified personnel should inspect and test it before use.

4 Installation

4.1 Installation Requirements

Installation Environment Requirements

1. Do not install the equipment in environments that are flammable, explosive, corrosive, or similar.
2. The mounting structure is sturdy and reliable and can support the weight of the inverter.
3. The installation space must meet the equipment's ventilation, heat dissipation, and operating space requirements.
4. The equipment Ingress Protection Rating is suitable for indoor and outdoor installation. The temperature and humidity of the installation environment must be within the appropriate range.
5. Install the inverter away from direct sunlight, rain, snow accumulation, and other adverse environmental conditions. Installation in a sheltered location is recommended; install a sunshade if necessary.
6. Install the inverter out of the reach of children and avoid locations where it can be easily touched. The surface may become hot while the equipment is operating, posing a burn hazard.
7. Install the equipment at a height that allows for easy operation and maintenance. Ensure that the indicator lights and all labels are easy to view and that the terminals are easily accessible.
8. The inverter installation altitude must be below the Max. Operating Altitude of 4,000 m.
9. Installing the inverter in salt-affected areas may result in corrosion. Salt-affected areas are those within 1,000 m of the coast or areas exposed to sea breezes. Areas affected by sea breezes vary depending on meteorological conditions (such as typhoons and seasonal winds) and topography (such as the presence of dikes or hills).
10. Keep the equipment away from strong magnetic fields to prevent electromagnetic interference. If a radio station or wireless communication equipment operating below 30 MHz is located near the installation site, install the equipment in accordance with the following requirements:
    - Add a ferrite core with multiple turns on the inverter DC input or AC output cable, or install a low-pass EMI filter.
    - Maintain a distance of more than 30 m between the inverter and radio

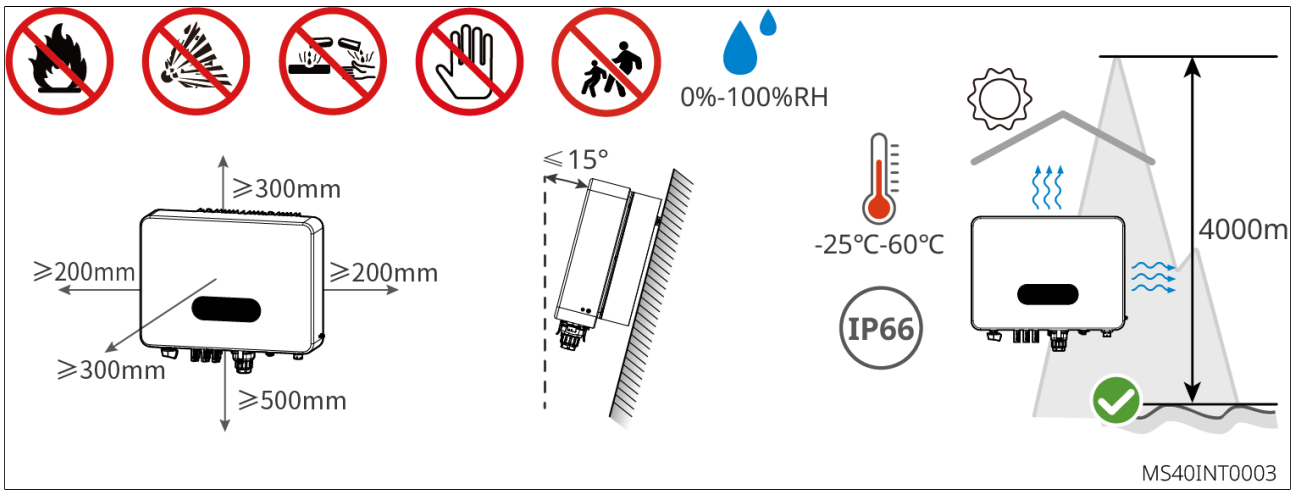
interference equipment.

Mounting structure requirements

- The mounting structure must be made of non-combustible material and have fire-resistant properties.
- Ensure that the mounting surface is sturdy and that the mounting structure can support the weight of the equipment.
- The equipment vibrates during operation. Do not install it on a structure with poor sound insulation to prevent operating noise from disturbing residents in nearby living areas.

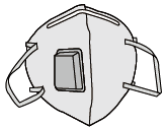
Installation Angle Requirements

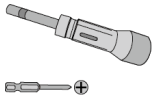
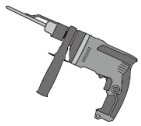
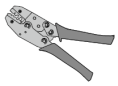
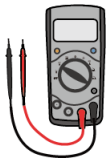
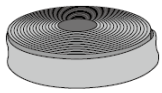
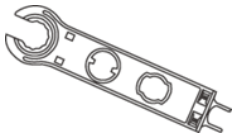
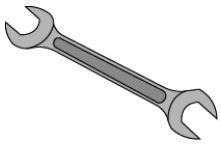
- Recommended Inverter Installation Angle: vertical or tilted backward by ≤ 15°.
- Do not install the inverter upside down, tilted forward, tilted backward beyond the specified angle, or horizontally.

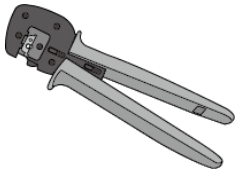


Installation Tool Requirements

The following installation tools are recommended. Other auxiliary tools may be used on-site when necessary.

Tool Type	Description	Tool Type	Description
	Insulating gloves, protective gloves		Dust mask

Tool Type	Description	Tool Type	Description
	Safety goggles		Safety shoes
	Torque Wrench M3/M5		Hammer drill
	Diagonal Cutters		Heat Gun
	Wire Strippers		Terminal crimping tool
	Rubber Mallet		Marker
	Multimeter		Heat-Shrink Tubing
	Vacuum Cleaner		Spirit level
 or 	DC unlocking tool		Wrench

Tool Type	Description	Tool Type	Description
	Crimping tool	-	-

4.2 Installing the Inverter

4.2.1 Handling the Inverter

⚠CAUTION

Before installation, move the inverter to the installation location. To prevent personal injury or equipment damage during transport, observe the following precautions:

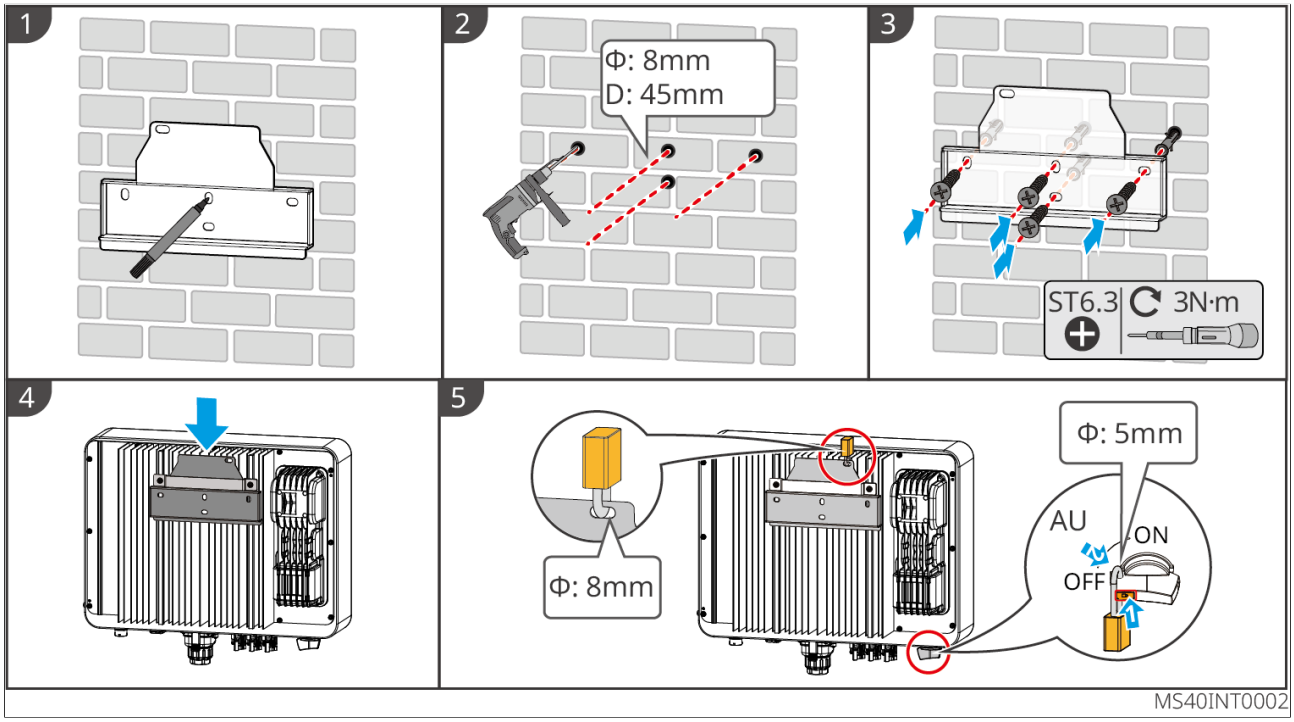
1. Assign an appropriate number of personnel based on the equipment Weight to prevent the equipment from exceeding the safe manual lifting capacity and injuring personnel.
2. Wear safety gloves to prevent injury.
3. Keep the equipment balanced while handling to prevent it from falling.

4.2.2 Installing the Inverter

NOTE

- When drilling, ensure that the drilling locations avoid water pipes, cables, and other items inside the wall to prevent hazards.
- Wear safety goggles and a dust mask when drilling to prevent dust from entering your respiratory tract or eyes.
- The DC Switch lock is user-supplied(Australia only）。
- The anti-theft lock is user-supplied. Select a suitable lock; otherwise, installation may not be possible.
- Ensure that the inverter is securely installed to prevent it from falling and injuring personnel.

1. Place the mounting plate level against the wall and mark the drilling locations with a marker.
2. Use a hammer drill with an8mmdrill bit to make the holes. Ensure that the holes are approximately45mm。
3. Use expansion bolts to secure the mounting plate to the wall or support.
4. Hang the inverter on the mounting plate and secure the inverter to the plate.
5. Install the anti-theft lock using an8mmhole. Install the DC Switch lock (Australia only) using a5mm。



5 Electrical Connections

5.1 Safety Precautions

DANGER

- Before making electrical connections, turn off the inverter's DC Switch and AC output switch, and ensure that the equipment is de-energized. Live work is strictly prohibited, as it may result in electric shock or other hazards.
- All operations performed and the specifications of the cables and components used during electrical connection must comply with local laws and regulations.
- Excessive tensile force on the cables may result in poor connections. When wiring, leave some slack in the cables before connecting them to the inverter terminals.

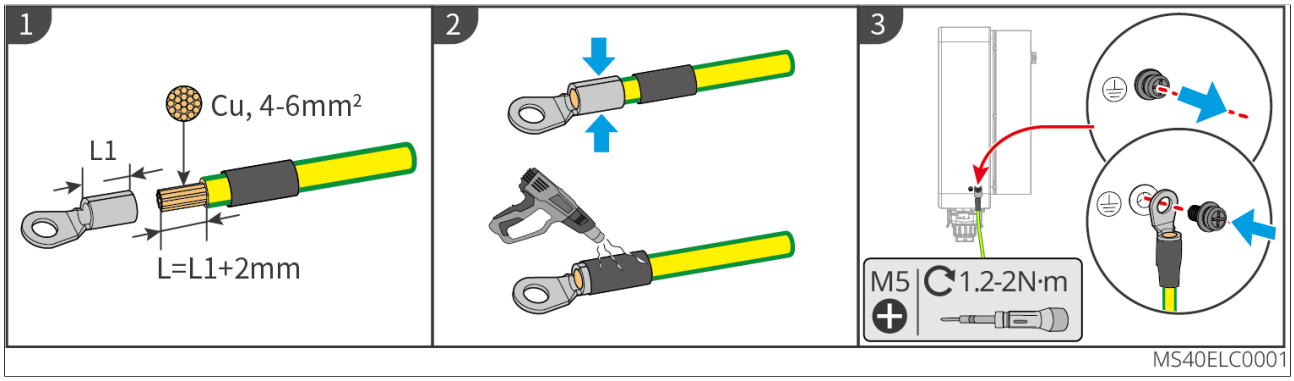
NOTE

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

5.2 Connect the Protective Grounding Conductor

WARNING

- The protective grounding of the chassis enclosure cannot replace the protective ground conductor at the AC output port. When wiring, ensure that both protective ground conductors are securely connected.
- When multiple inverters are installed, ensure that the protective earthing points on all inverter enclosures are equipotentially bonded.
- To improve the corrosion resistance of the terminals, after completing the protective ground conductor connections, apply silicone sealant or paint to the outside of the grounding terminals for protection.
- Provide your own protective earth conductor. Recommended specifications:
  - Type: single-core copper wire for outdoor use
  - Conductor cross-sectional area:4-6mm^2



5.3 Connecting the AC Output Cable

⚠WARNING

- Do not connect any loads between the inverter and the AC Switch directly connected to the inverter.
- The inverter has an integrated Residual Current Monitoring Unit (RCMU). If the inverter detects leakage current exceeding the permitted value, it will quickly disconnect from the grid.
-

Recommended RCD Specifications	Remarks
Select according to local laws and regulations • Type A • ON-GRID side*1: 300mA	Self-provided
*1: The inverter has a built-in general-purpose, current-sensing residual current monitoring unit. If it detects leakage current exceeding the limit, the inverter will immediately disconnect from the utility grid. However, if regulations require an external residual current device (RCD), an RCD Type A with a rated residual operating current of at least 300 mA is recommended (for Apparent Power below 30 kVA, 300 mA is recommended; for ratings above 30 kVA, select 10 mA/kVA). Alternatively, select an RCD with a rated residual operating current that complies with local regulations. For example, in Chile, local regulations require an RCD with a rated residual operating current of no more than 30 mA between the inverter and the grid for inverters rated 5 kVA or less. Note, however, that due to the PV modules, RCDs with lower rated residual operating currents are more prone to nuisance tripping in adverse conditions such as rainy or cloudy weather.	

NOTE

- Each inverter must be equipped with an AC output switch. Multiple inverters must not be connected to the same AC Switch.
- If the inverter's AC output terminals are not in use, seal them with a waterproof cap; otherwise, the equipment's Ingress Protection Rating will be affected.

To ensure that the inverter can be safely disconnected from the grid in the event of an abnormal condition, install an AC Switch on the inverter's AC side. Select an appropriate AC Switch in accordance with local regulations. The following switch specifications are provided for reference:

Inverter Model	AC Switch Specifications
GW7K-MS-CN-G40	50A
GW8K-MS-CN-G40	50A
GW10K-MS-CN-G40	63A
GW7.5K-MS-G40	50A

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

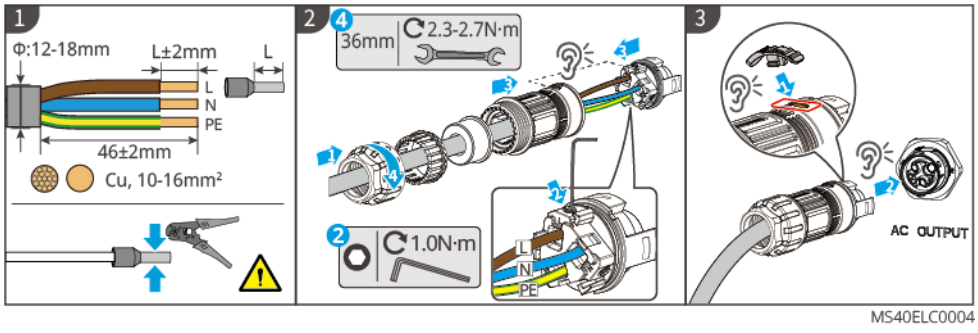
NOTE

Each inverter must be equipped with an AC output switch. Multiple inverters must not be connected to the same AC Switch.

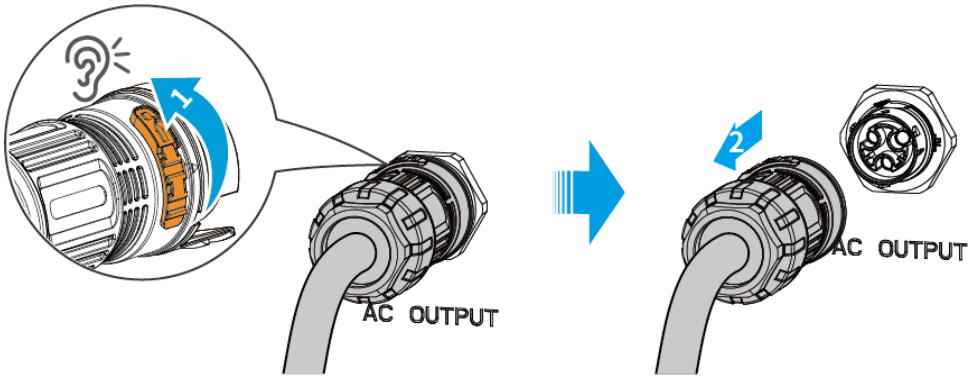
⚠WARNING

- When connecting the AC cable, be sure to crimp it using a tubular terminal.
- When wiring, ensure that the AC output wires match the "L”、“N”、“PE" ports on the AC terminals. Incorrect cable connections will damage the inverter.
- Ensure that the conductor cores are fully inserted into the AC terminal wiring holes, with no exposed wire.
- Ensure that the cables are securely connected. Otherwise, the terminals may overheat during operation and damage the inverter.

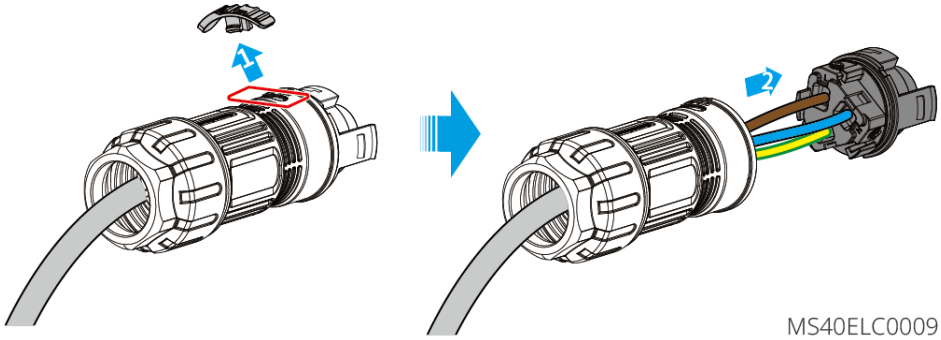
1. Prepare the AC output cable.
2. Disassemble the AC terminal, connect the AC output cable to it, and then reassemble the terminal.
3. Connect the AC terminal to the inverter.



Removing theACterminal



MS40ELC0008



MS40ELC0009

NOTE

- After completing the wiring, check that all connections are correct and secure, and remove any debris left over from installation and maintenance work.
- The AC output terminals must be sealed to ensure the equipment's Ingress Protection Rating.

5.4 Connecting the DC Input Cable

DANGER

Before connecting the PV strings to the inverter, verify the following. Failure to do so may cause permanent damage to the inverter and, in severe cases, fire, resulting in personal injury or property damage.

1. Ensure that the maximum short-circuit current and Max. Input Voltage of eachMPPTare within the inverter's permitted range.
2. Ensure that the positive terminal of eachPVstring is connected to the inverter'sPV+,PVstring is connected to the inverter'sPV-。

WARNING

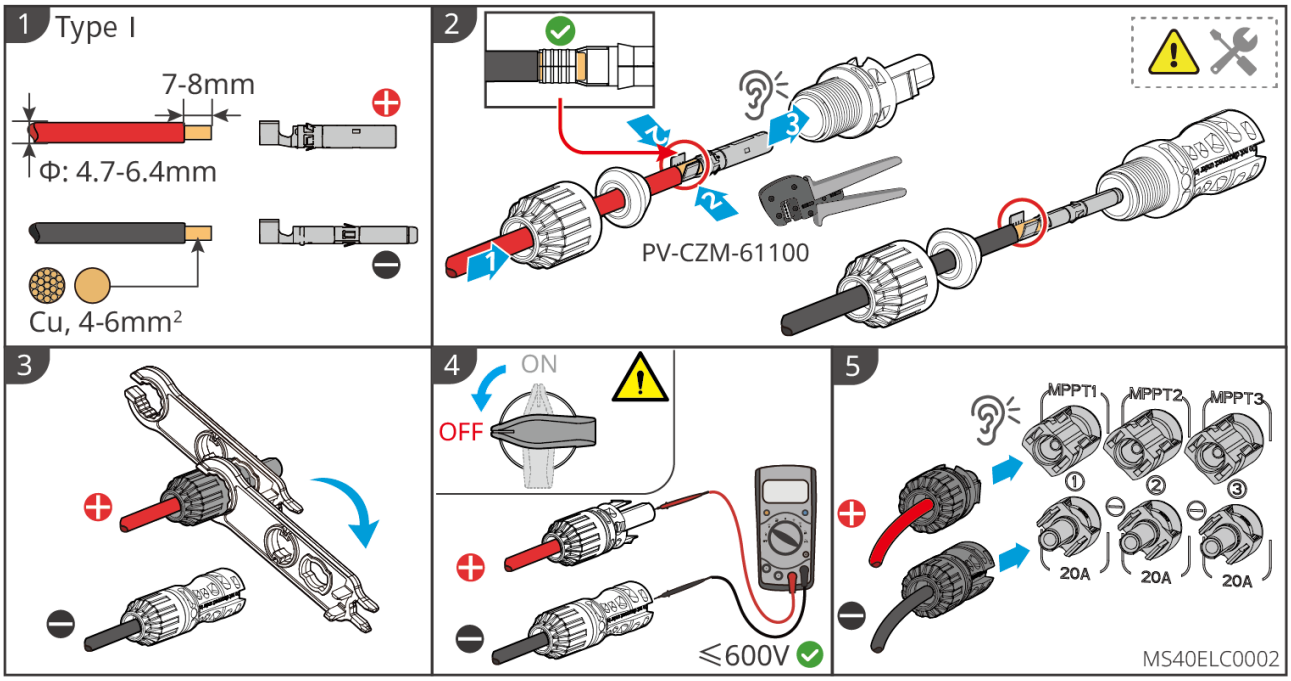
- UsingPVmodules of different brands or models on the sameMPPT, or connectingPVmodules with different azimuths or tilt angles in the samePVstring may not damage the inverter, but will reduce system performance.
- The inverter's maximum DC input voltage is600V. Ensure that the open-circuit voltage of theMPPT-connectedPVstring does not exceed600V. When the input voltage is between560V-600V, the inverter will enter standby mode. When the voltage returns to theMPPToperating40V-560Vof 40V-560V, the inverter will resume normal operation.
- The voltage difference between differentMPPTs is recommended to be no more than150V。
- The sum of the peak power currents of the strings connected to eachMPPTmust not exceed the inverter'sMPPTMax. MPPT Current.
- When multiplePVstrings are connected to the inverter, it is recommended to maximize the number ofMPPTinputs used.
- PVGrounding is not supported at the string output. Before connectingPVthe string to the inverter, ensure thatPVthe string's minimum insulation resistance to ground meets the minimum insulation resistance requirement.
- Prepare the DC input cables.

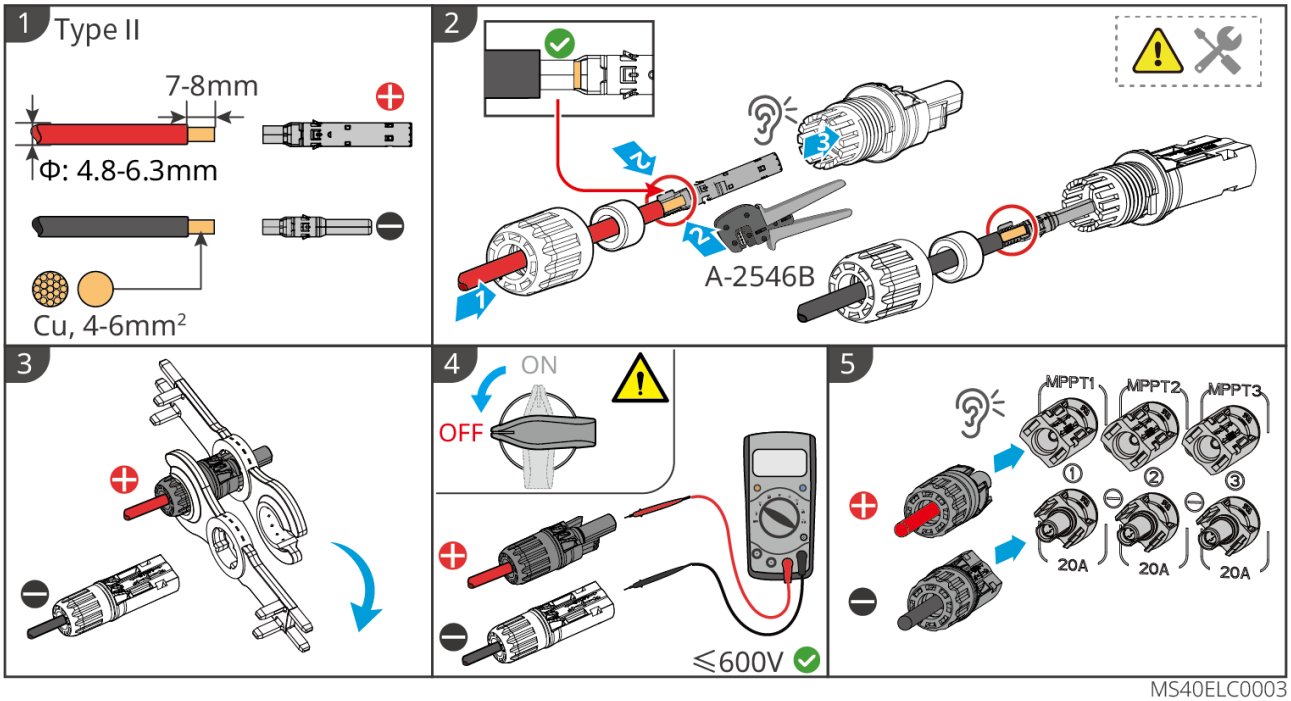
NOTE

If noPVstrings are to be connected to the inverter's DC input terminals, seal the terminals with waterproof caps; otherwise, the equipment's Ingress Protection Rating may be affected.

Connecting the DC Input Cable

1. Prepare the DC cables.
2. Crimp the DC input terminals and assemble the DC Connector.
3. Tighten the DC Connector.
4. Measure the DC input voltage.
5. Connect the DC Connector to the inverter's DC terminals.





5.5 Communication Connections

NOTE

- For the specific product function configuration, refer to the actual inverter model available in your region.
- As product versions are upgraded or for other reasons, this document may be updated periodically. For compatibility between inverters and IoT products, 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 Network Overview

Power Limit Networking Solution

NOTE

- The inverter can connect to a smart meter orCTto enable output power limiting and load monitoring.
- Enable the "Grid-Connected Power Limit" function in App.

The PV plant's Energy Generation is used for Self-consumption. If the loads cannot consume all the energy and excess power would otherwise flow back to the grid, the inverter can monitor power at the point of grid connection in real time using a smart meter and adjust its output power to prevent excess power from being fed into the grid.

WARNING

1. For a single-inverter setup, duringCT, the CT current-sensing direction does not need to be checked. When replacing or servicing theCT, use the meterApp's meter/CT-assisted detection function to recalibrate the inverter to theCTcurrent-sensing direction.
2. For multi-inverter networking, install theCTnear the point of grid connection and ensure it is oriented correctly. The "CT" marking "-->" indicates the direction of current flow from the inverter to the grid. If installed in the reverse direction, the inverter will trigger an alarm and output power limiting will not work.
3. CTThe aperture must be larger than the outer diameter of the AC power cable to ensure that the AC power cable can pass throughCT。

4. CTmust be clipped ontoLcable. Do not clip it onto theNcable.
5. Specifications of theCTsupplied with the inverter: measurement range:90A; ratio:1000:1; cable length:5m。
6. GM330:

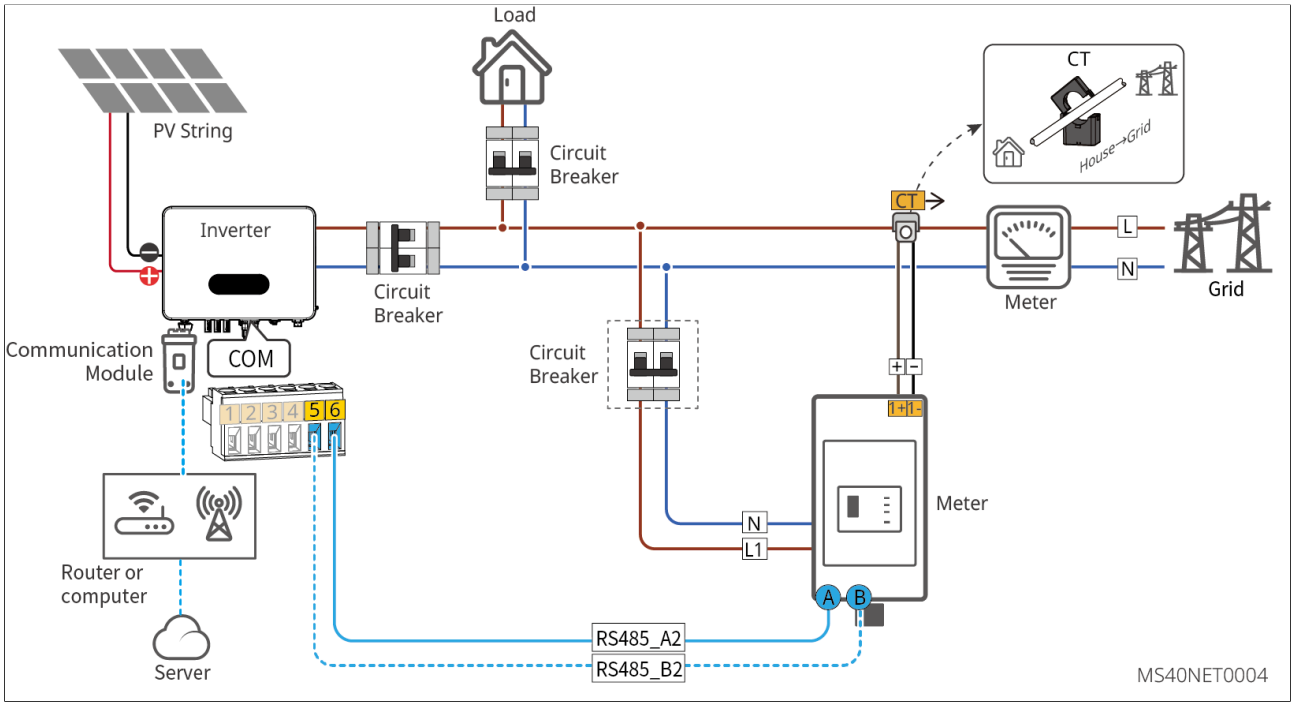
- CTSelect the current transformation ratio specification ofnA/5A。（nA：CTPrimary-side input current,nranges from200-5000,Select based on actual requirements.5A：CTSecondary-side output current.)
- CTThe recommended accuracy value for0.5、0.5s、0.2、0.2s,Ensure thatCTthe current sampling error of is ≤1%。
- To ensure accurate current measurement by theCT, the recommendedCTcable length is no more than30m, and the recommended cable ampacity is6A。

7. Ensure that the meter is wired correctly and the phase sequence is correct. Recommended cross-sectional area for the meter voltage input cables:1mm²(18AWG）。
8. Multi-inverter power limiting requires a compatibleEzlink3000. To use this device, contact after-sales service or your distributor to purchase one.
9. The inverter supports local parameter configuration through4G、WiFi/LANcommunication modules. Connect to a mobile phone or theWEBinterface to configure device parameters and view operating and error information, allowing you to monitor system status in a timely manner.
10. For systems with only one inverter, use the4G Kit-CN-G20 、4G Kit-CN-G21、WiFi/LAN Kit-20orWiFi Kit-20smart communication stick.
11. For systems with multiple inverters connected in parallel, install anEzlink3000smart communication stick on the master inverter for Parallel Networking. The slave inverters do not need a smart communication stick.Ezlink3000 versionV1.6.8or later is required.
12. After completing the wiring, configure the relevant parameters using theLCDdisplay or the SEMS+ Appto enable Power Limit or output power limiting.

NOTE
This meter is intended primarily for Power Control at the point of grid connection. Its measurements of Energy Generation and energy consumption are for reference only and must not be used for billing. Electricity billing must be based on the utility's revenue meter.

Single-Inverter Power Limit Networking Solution

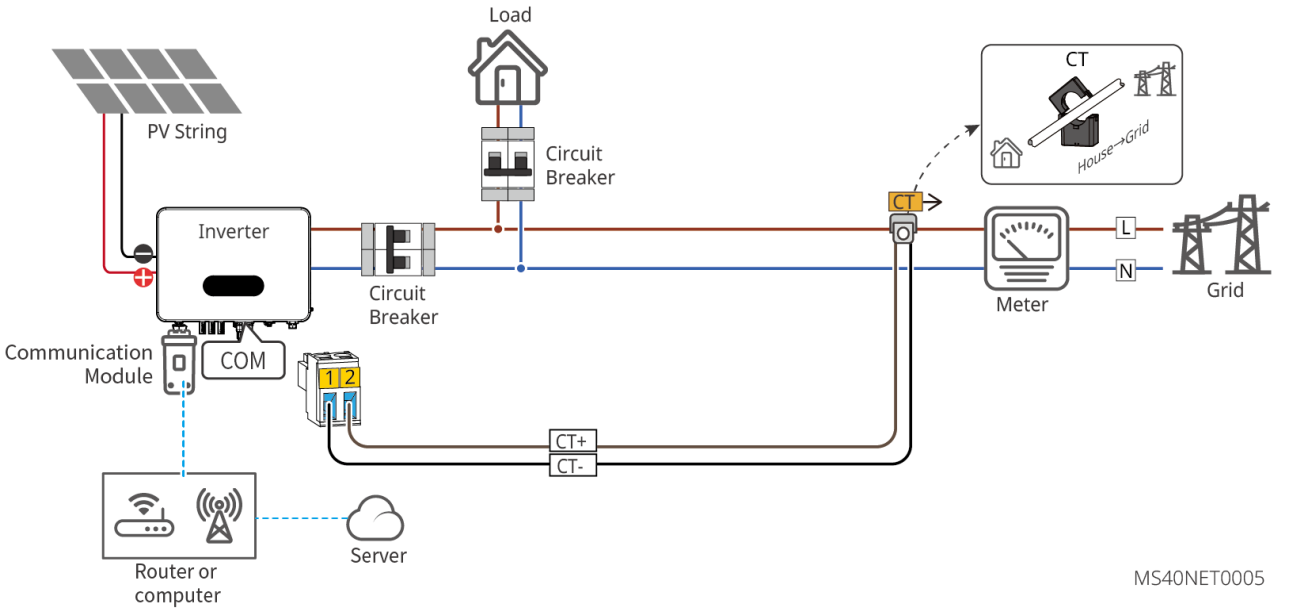
Meter Solution (GM1000/GMK110/GM330/GMK330）



CT Solution

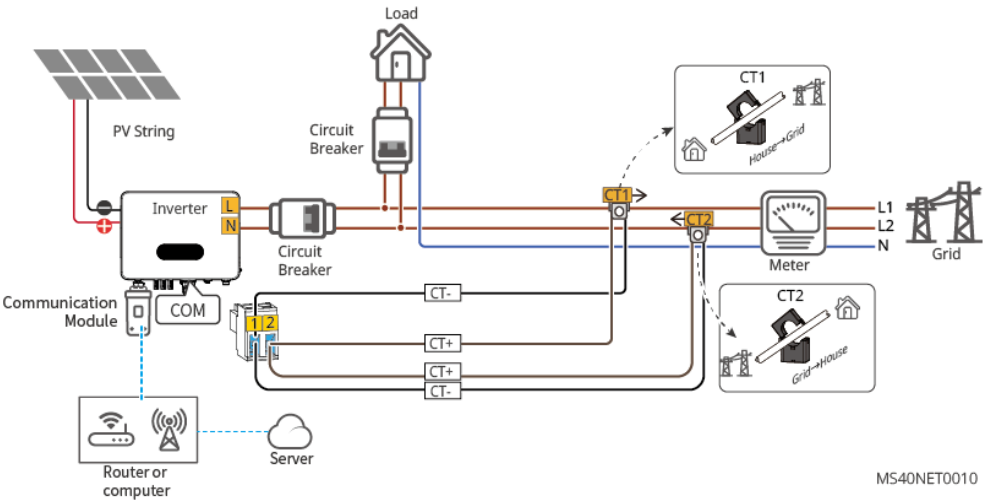
NOTE

For Australia, the CT is supplied with the inverter; for other regions, it is optional。
CT ratio：90A/90mA。

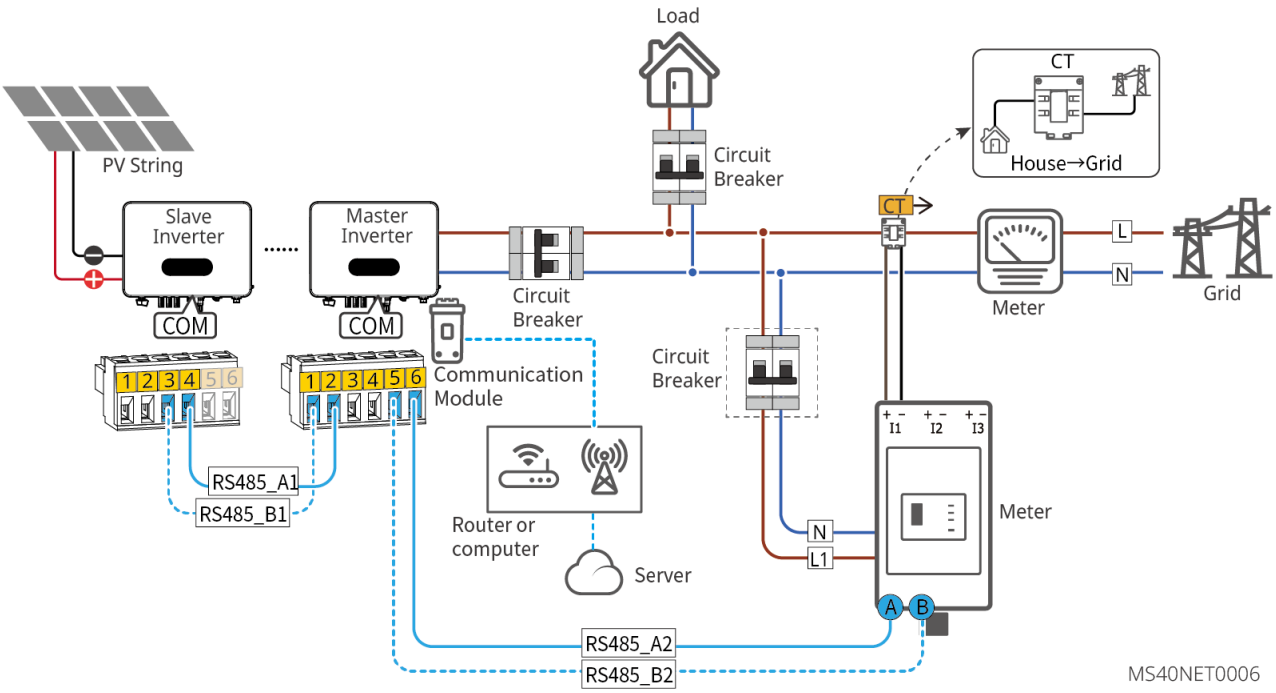


When connecting to a split-phase gridSingle-Inverter Power Limit Networking Solution

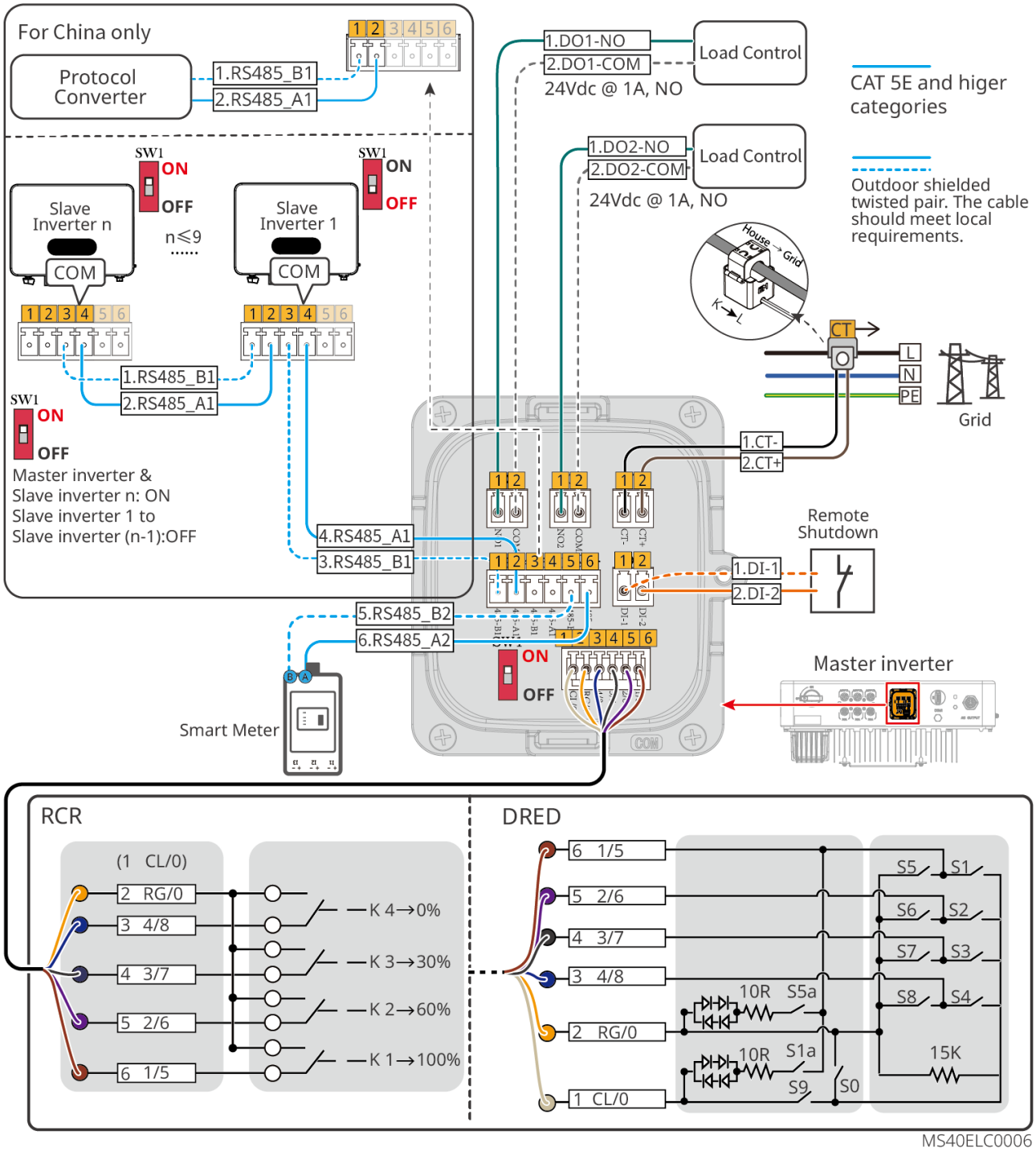
NOTE
The user must supply or purchase the CT from the manufacturer. CTratio:90A/45mA。



Multi-Inverter Power Limitation Networking Solution (GM330/GMK330+Ezlink3000)



5.5.2 Connecting the Communication Cable



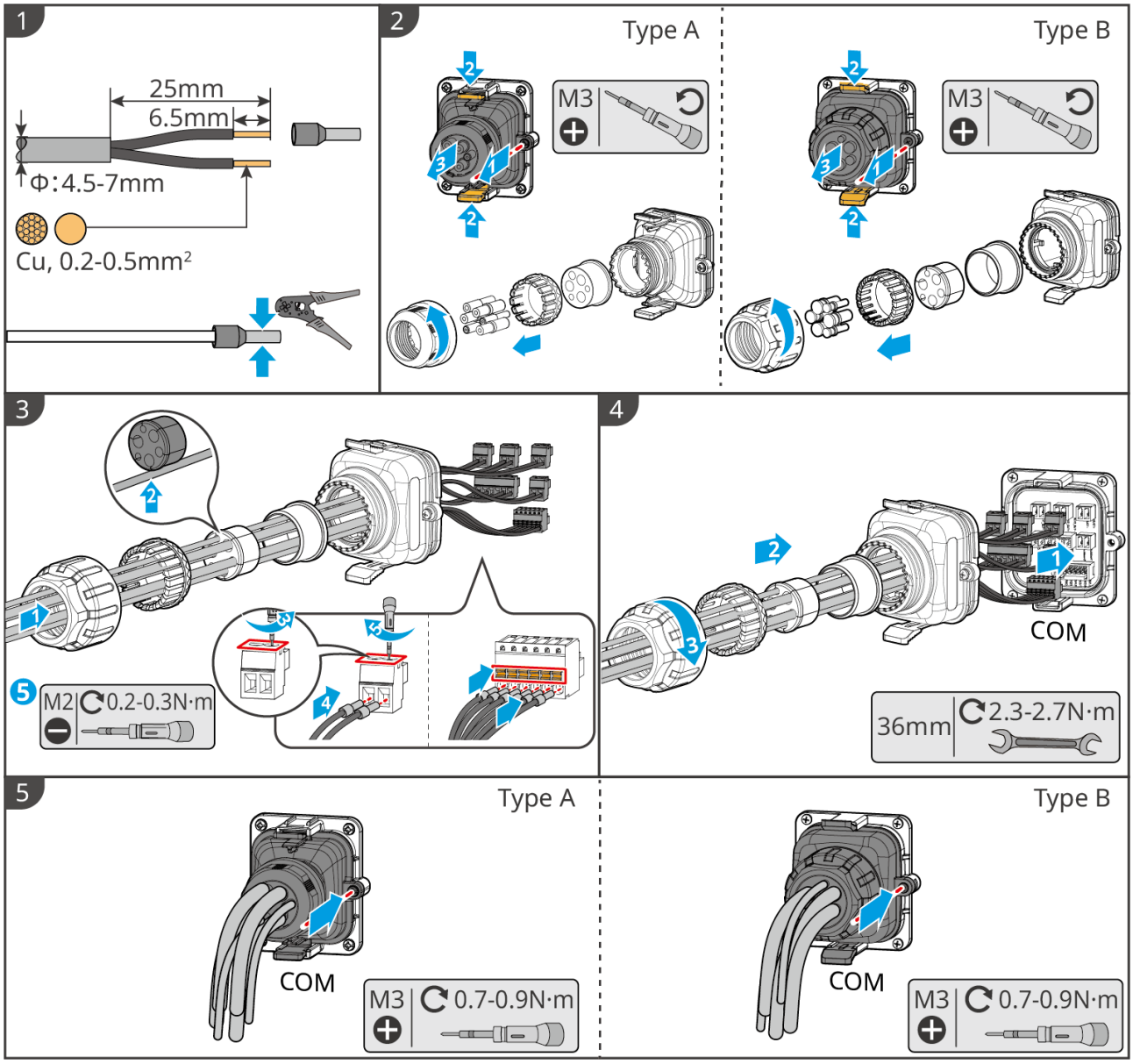
MS40ELC0006

Silkscreen Label	Function	Description
DO1 DO2	Load Control (Optional)	• Supports connection to dry contacts for functions such as load control. TheDOcontact rating is24VDC@1A,NO normally open contact. • Supports connection of an SG Ready heat pump, which can be controlled via dry-contact signals.
CT	CTconnection port (CT)	Used for single-inverter output power limitation.
RS485	Parallel inverter communication port or protocol converter communication port (RS485-1)	• Used for parallel connection of multiple inverters or communication with a protocol converter (China only). • The inverter uses the sameRS485port group to connect to a protocol converter and for parallel operation. If a protocol converter is connected, the inverter parallel operation function cannot be used. In an inverter parallel connection, a protocol converter cannot be connected.
Meter	Power meter connection port (RS485-2)	A power meter can be used with the inverter to enable output power limitation. Contact the inverter manufacturer to purchase compatible equipment, if required.
DI	Remote Shutdown	When the emergency switch sends a shutdown signal,the inverter automatically disconnects from the AC side and stops feeding power to the grid. An external Emergency Power Off switch is required.

Silkscreen Label	Function	Description
DRM/RCR	DRED(Australia) orRCR(Europe) connection port	• DRED (Demand Response Enabling Device）： Provides aDREDsignal control port to meet the grid dispatch requirements for DREDin Australia and New Zealand. TheDRM1-4function is reserved; the user must provide theDRMdevice. • RCR (Ripple Control Receiver）： Provides anRCRsignal control port to meet grid dispatch requirements in Germany and other regions.
SW1	Termination resistor DIP switch	The inverter is equipped with anRS485termination resistor, which is enabled by default using the DIP switch. “ON" means enabled; "1" means disabled. Procedure: Open the cover of the communication port, then use an insulated tool to set the termination resistor DIP switch to "1" (OFF).

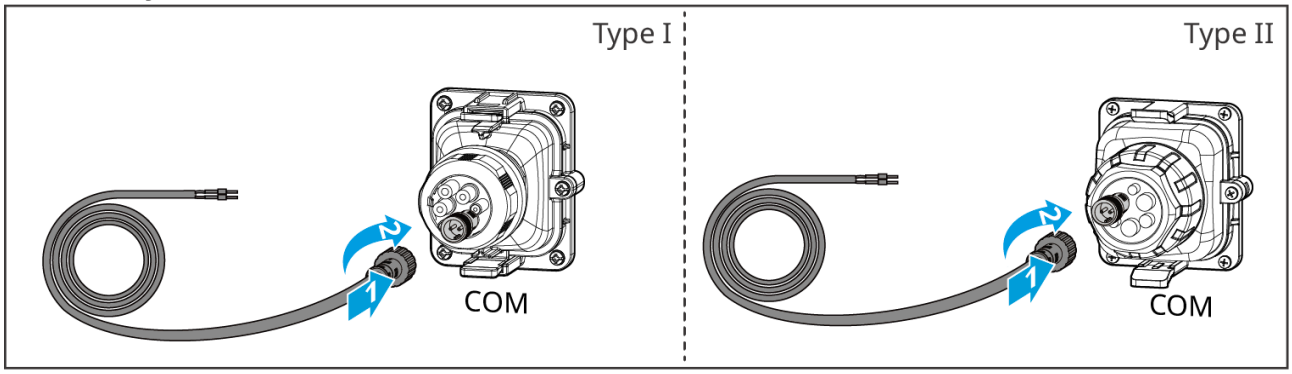
NOTE

- When connecting communication cables, ensure that the terminal definitions match the device exactly. Route the cables away from sources of interference, such as power cables, to avoid affecting signal reception.
- When connecting the Remote Shutdown,CT, or dry contact communication cables, use the2PINcommunication terminal.
- When connectingR485(meter）、DRED/RCRcommunication cables, use the6PINcommunication terminal.
- If you need to use DRED、RCR or the Remote Shutdown function, enable the function in theSEMS+ App after completing the wiring.
- If the inverter is DRED、RCR or Remote Shutdown device is Not Connected, do not enable the function in theSEMS+ App; otherwise, the inverter cannot operate in grid-connected mode.
- For more information about the communication module, visit the official website.
- USB-RS485adapter cable, for use with Brazilian models only. Contact after-sales service if required.
- Communication cable requirements:RS485communication cables must be outdoor shielded twisted-pair cables that comply with local standards.



MS40ELC0005

China only



MS40ELC0007

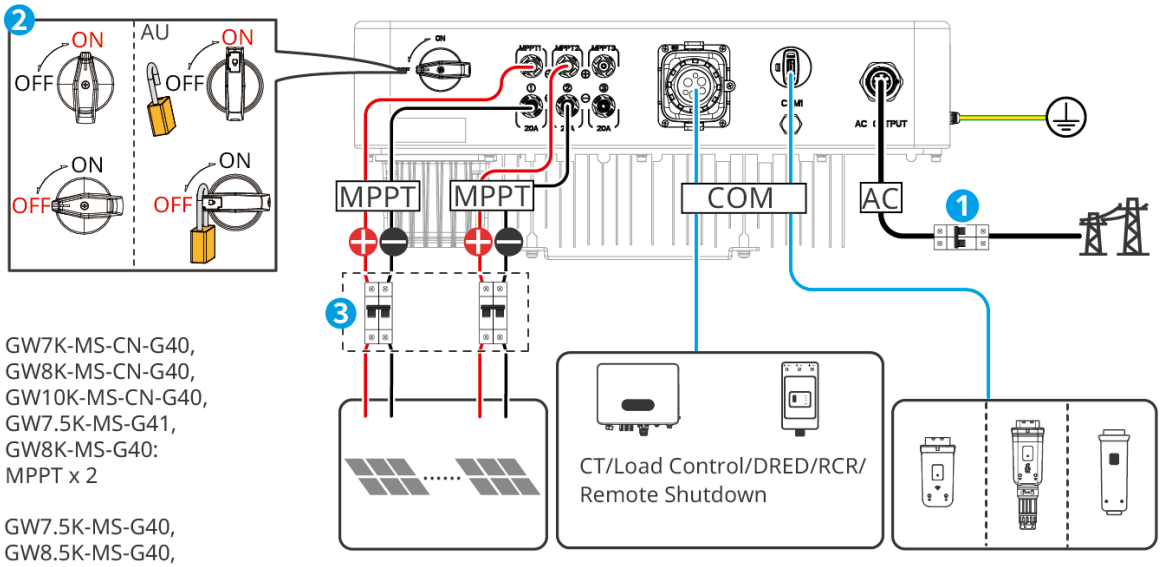
6 Equipment Commissioning

6.1 Pre-Power-on System Check

No.	Inspection item
1	The equipment is securely installed. The installation location allows easy operation and maintenance, the installation space provides adequate ventilation and heat dissipation, and the installation environment is clean and tidy.
2	The protective earth, DC, AC, and communication cables are connected correctly and securely.
3	The cables are bundled in accordance with routing requirements, are arranged properly, and are undamaged.
4	For unused cable entry holes and ports, be sure to use the supplied terminals to ensure reliable connections and seal them securely.
5	Ensure that all used cable entry holes are properly sealed.
6	The voltage and frequency at the inverter grid-connection point comply with grid-connection requirements.

6.2 Energize the Equipment

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 inverter's DC Switch.



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		Steady on: Device powered on
		Off: Device not powered on
Operation		Steady on: Grid is normal and grid connection is successful
		Off: Not connected to the grid
		Single slow flash: Pre-grid-connection self-check
		Single fast flash: Grid connection imminent
Communication		Steady on: Wireless monitoring is operating normally
		Single flash: Wireless module restarting or resetting
		Two flashes: Not Connected to the base station or router
		Four flashes: Not Connected to the monitoring server
		Flashing: RS485 communication is operating normally
		Off: Wireless module is restoring factory settings
Fault		Steady on: System fault
		Off: No fault

7.2 Setting Inverter Parameters via the Display

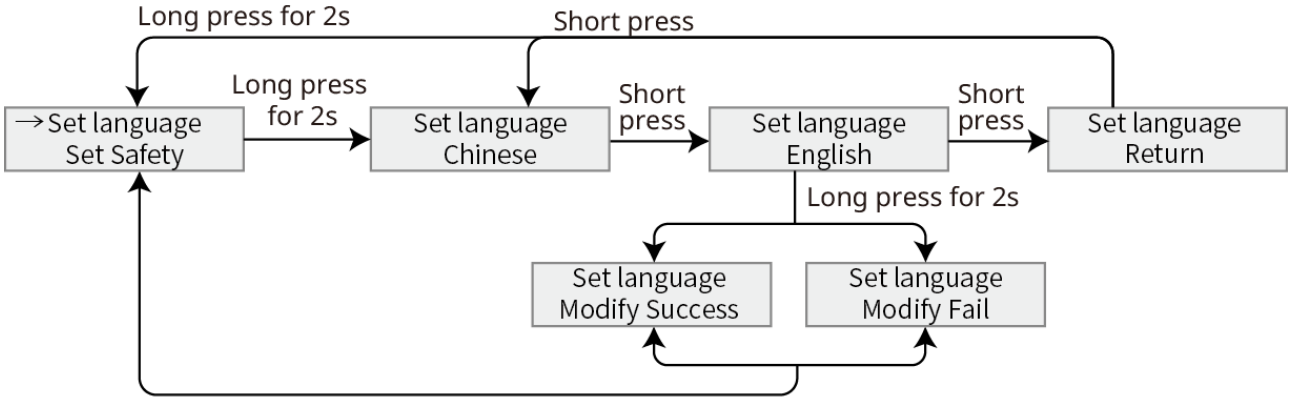
NOTE

- 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 may differ.
- Parameter names, ranges, and default values may be changed or adjusted later. Refer to the actual display.
- Inverter power parameters must be set and monitored by qualified personnel to prevent incorrect settings from affecting the inverter's energy generation.

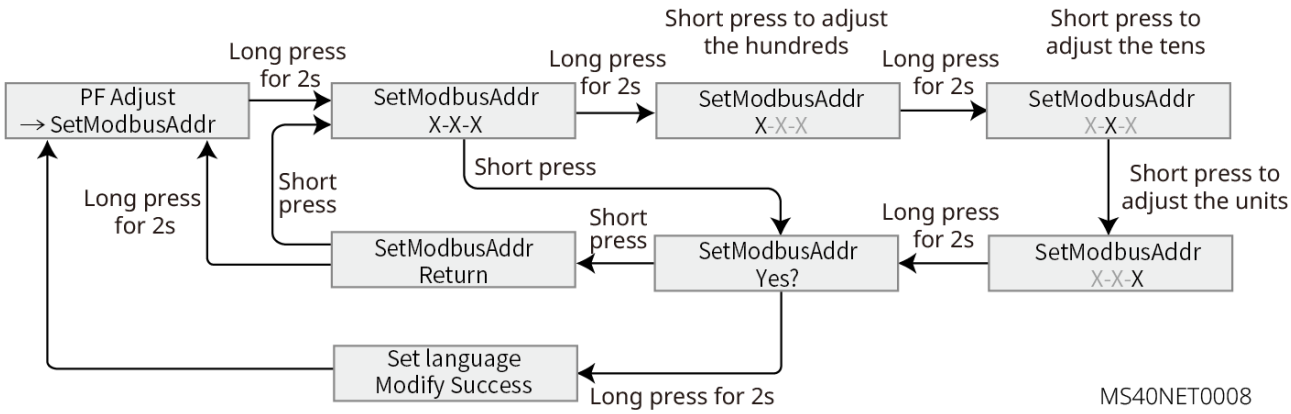
Display Button Instructions

- In any menu, if no button is pressed for a certain period, the LCD will dim and automatically return to the home screen.
- Short press the display button: switch between menu screens and adjust parameter values.
- Long press the display button: after adjusting a parameter value, long press to confirm the setting; enter the next submenu.

Button Operation Example:



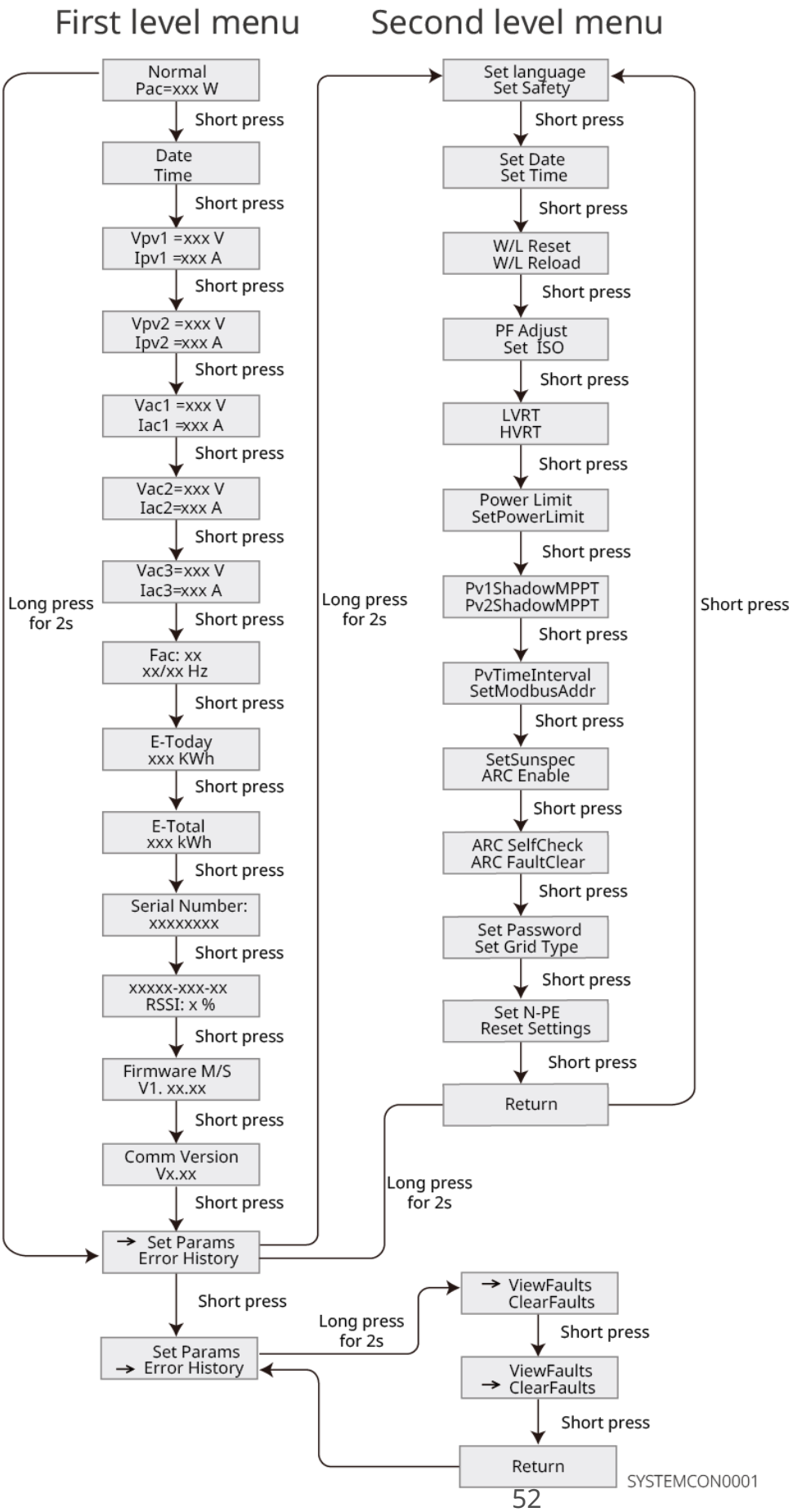
MS40NET0007



MS40NET0008

7.2.1 Display Menu Overview

This section describes the display menu structure to help you navigate the menus, view inverter information, and configure inverter parameters.



7.3 Download the SEMS+ App

Mobile phone requirements:

8 System Maintenance

8.1 De-Energizing the Inverter

DANGER

- When performing operations or maintenance on the inverter, power it off. Operating the equipment while energized may damage the inverter or cause an electric shock.
- After the inverter is powered off, its internal components take some time to discharge. Wait until the equipment has fully discharged, as indicated on the label.

Step 1: (Optional) Send a command to the inverter to stop grid connection.
Step 2: Open the AC Switch between the inverter and the grid.
Step 3: Open the inverter's DC Switch.
Step 4: (Optional) Open the switch between the inverter and the PV modules.

8.2 Removing the Inverter

WARNING

- Ensure that the inverter is de-energized.
- Wear personal protective equipment when working on the inverter.

Step 1: Disconnect all electrical connections to the inverter, including the DC cables, AC cables, communication cables, communication module, and Protection earth cable.
Step 2: Remove the inverter from the mounting bracket.
Step 3: Remove the mounting bracket.
Step 4: Store the inverter properly. If it will be used again, ensure that the storage conditions meet the requirements.

8.3 Decommissioning the Inverter

When the inverter can no longer be used and needs to be disposed of, handle it in accordance with the electrical waste disposal requirements of the country/region where it is located. Do not dispose of the inverter as household waste.

8.4 Inverter Fault

8.4.1 Fault Handling (Fault Codes F01–F40)

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F01	Grid Power Outage	1. Grid power outage. 2. The AC line or AC Switch is disconnected.	1. The alarm will automatically clear when grid power is restored. 2. Check whether the AC line or AC Switch is disconnected.
F02	Grid Overvoltage Protection	The grid voltage exceeds the permitted range, or the duration of the overvoltage exceeds the high-voltage ride-through setting.	1. If this occurs occasionally, it may be due to a brief grid abnormality. The inverter will resume normal operation once it detects that the grid is operating normally; no manual intervention is required. 2. If this occurs frequently, check whether the grid voltage is within the permitted range. If not, contact the local power utility. If it is, the Grid Overvoltage Protection threshold may need to be adjusted with the local power utility's approval. 3. If normal operation does not resume for an extended period, check that the AC-side circuit breaker and output cables are properly connected.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F03	Grid Undervoltage Protection	The grid voltage is below the permitted range, or the duration of the undervoltage exceeds the low-voltage ride-through setting.	1. If this occurs occasionally, it may be due to a brief grid abnormality. The inverter will resume normal operation once it detects that the grid is operating normally; no manual intervention is required. 2. If this occurs frequently, check whether the grid voltage is within the permitted range. If not, contact the local power utility. If it is, the Grid Undervoltage Protection threshold may need to be adjusted with the local power utility's approval. 3. If normal operation does not resume for an extended period, check that the AC-side circuit breaker and output cables are properly connected.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F04	Grid Rapid Overvoltage Protection	A grid voltage detection abnormality or excessively high voltage has triggered the fault.	1. If this occurs occasionally, it may be due to a brief grid abnormality. The inverter will resume normal operation once it detects that the grid is operating normally; no manual intervention is required. 2. If this occurs frequently, check whether the grid voltage is within the permitted range. If not, contact the local power utility. If it is, the Grid Undervoltage Protection threshold may need to be adjusted with the local power utility's approval. 3. If normal operation does not resume for an extended period, check that the AC-side circuit breaker and output cables are properly connected.
F05	10minOvervoltage Protection	The grid voltage rolling average over10minexceeds the range specified by the applicable safety standards.	Check whether the grid voltage remains high for an extended period. If this occurs frequently, check whether the grid frequency is within the permitted range. If not, contact the local power utility. If it is, the grid10minOvervoltage Protection threshold may need to be adjusted with the local power utility's approval.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F06	Grid Overfrequency	Grid abnormality: The actual grid frequency is higher than the requirements of the local grid standard.	1. If this occurs occasionally, it may be due to a brief grid abnormality. The inverter will resume normal operation once it detects that the grid is operating normally; no manual intervention is required. 2. If this occurs frequently, check whether the grid frequency is within the permitted range. If not, contact the local power utility. If it is, the Grid Overfrequency protection threshold may need to be adjusted with the local power utility's approval.
F07	Grid Underfrequency	Grid abnormality: The actual grid frequency is lower than the requirements of the local grid standard.	1. If this occurs occasionally, it may be due to a brief grid abnormality. The inverter will resume normal operation once it detects that the grid is operating normally; no manual intervention is required. 2. If this occurs frequently, check whether the grid frequency is within the permitted range. If not, contact the local power utility. If it is, the Grid Underfrequency protection threshold may need to be adjusted with the local power utility's approval.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F08	Grid Frequency Instability	Grid abnormality: The rate of change of the actual grid frequency does not comply with the local grid standard.	1. If this occurs occasionally, it may be due to a brief grid abnormality. The inverter will resume normal operation once it detects that the grid is operating normally; no manual intervention is required. 2. If this occurs frequently, check whether the grid frequency is within the permitted range. If not, contact the local power utility.
F09	Anti-islanding Protection	The grid has been disconnected, but the load is maintaining the grid voltage. Stop grid connection in accordance with safety protection requirements.	1. If this occurs occasionally, it may be due to a brief grid abnormality. The inverter will resume normal operation once it detects that the grid is operating normally; no manual intervention is required. 2. If this occurs frequently, check whether the grid frequency is within the permitted range. If not, contact the local power utility.
F10	LVRT Undervoltage Fault	Grid Abnormality: The grid voltage abnormality duration exceeds the specified HVRT/LVRT duration.	1. If this occurs occasionally, it may be due to a brief grid abnormality. The inverter will resume normal operation once it detects that the grid is operating normally; no manual intervention is required. 2. If this occurs frequently, check whether the grid voltage and frequency are within the permitted ranges and stable. If not, contact your local power utility.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F11	HVRT Overvoltage	Grid Abnormality: The grid voltage abnormality duration exceeds the specified HVRT/LVRT duration.	1. If this occurs occasionally, it may be due to a brief grid abnormality. The inverter will resume normal operation once it detects that the grid is operating normally; no manual intervention is required. 2. If this occurs frequently, check whether the grid voltage and frequency are within the permitted ranges and stable. If not, contact your local power utility.
F12	30mAGfciProtection	The input-to-ground insulation resistance decreases while the inverter is operating.	1. If this occurs occasionally, it may be caused by an occasional external circuit fault. The inverter will resume normal operation after the fault is cleared; no manual intervention is required. 2. If this occurs frequently or does not clear for an extended period, check whether the insulation resistance of the PV strings to ground is too low.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F13	60mAGfciProtection	The input-to-ground insulation resistance decreases while the inverter is operating.	1. If this occurs occasionally, it may be caused by an occasional external circuit fault. The inverter will resume normal operation after the fault is cleared; no manual intervention is required. 2. If this occurs frequently or does not clear for an extended period, check whether the insulation resistance of the PV strings to ground is too low.
F14	150mAGfciProtection	The input-to-ground insulation resistance decreases while the inverter is operating.	1. If this occurs occasionally, it may be caused by an occasional external circuit fault. The inverter will resume normal operation after the fault is cleared; no manual intervention is required. 2. If this occurs frequently or does not clear for an extended period, check whether the insulation resistance of the PV strings to ground is too low.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F15	GfciSlow-Change Protection	The input-to-ground insulation resistance decreases while the inverter is operating.	1. If this occurs occasionally, it may be caused by an occasional external circuit fault. The inverter will resume normal operation after the fault is cleared; no manual intervention is required. 2. If this occurs frequently or does not clear for an extended period, check whether the insulation resistance of the PV strings to ground is too low.
F16	DCILevel 1 Protection	The DC component of the inverter output current exceeds the range permitted by the safety standards or the machine's default settings.	1. If the abnormality is caused by an external fault, the inverter will automatically resume normal operation once the fault is cleared; no manual intervention is required. 2. If this alarm occurs frequently and affects normal power generation at the plant, contact your distributor or after-sales service center.
F17	DCILevel 2 Protection	The DC component of the inverter output current exceeds the range permitted by the safety standards or the machine's default settings.	1. If the abnormality is caused by an external fault, the inverter will automatically resume normal operation once the fault is cleared; no manual intervention is required. 2. If this alarm occurs frequently and affects normal power generation at the plant, contact your distributor or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F18	Low Insulation Resistance	1. The PV string is short-circuited to protective earth. 2. The PV string installation environment has been consistently damp, and the insulation of the wiring to ground is inadequate. 3. The insulation resistance of the battery port wiring to ground is low.	1. Check the impedance between the PV strings/battery port and protective earth. If a short circuit is detected, locate and rectify the short-circuit point. 2. Check that the inverter's protective earth conductor is connected correctly. 3. If you confirm that this impedance is indeed below the default value in rainy or overcast conditions, use the Appto reset the inverter's“Insulation Resistance Protection Threshold”。 For inverters in the Australian and New Zealand markets,an insulation resistance fault can also trigger the following alerts: 1. The inverter is equipped with a buzzer. When a fault occurs, the buzzer sounds continuously for1minute. If the fault is not resolved, the buzzer sounds again every30minutes. 2. If the inverter is added to the monitoring platform, configure the alarm notification method to have alarm messages sent to customers by email.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F19	Grounding Abnormal	1. The inverter's protective earth conductor is Not Connected. 2. When the PV string output is grounded, no isolation transformer is connected on the inverter output side.	1. Please check whether the inverter's protection ground wire is connected properly. 2. If the PV string output is grounded, please check whether an isolation transformer is connected on the inverter output side.
F20	Hard Power Limit Protection	Abnormal Load Fluctuation	1. If the abnormality is caused by an external fault, the inverter will automatically resume normal operation once the fault is cleared; no manual intervention is required. 2. If this alarm occurs frequently and affects normal power generation at the plant, contact your distributor or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F21	Internal Comm Loss	SubDSP1Communication Timeout-MainDSP; SubDSP2Communication Timeout-MainDSP; SubDSP2Communication Timeout-SubDSP1, MainDSPCommunication Timeout-SubDSP1, MainDSPCommunication Timeout-SubDSP2or SubDSP1Communication Timeout-SubDSP2: 1. Chip not powered on 2. Chip program version error	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
		MainDSPcanmodule error, SubDSP1canmodule error, or SubDSP2canmodule error: 1. Frame format error 2. Parity check error 3. can busoffline 4. HardwareCRCcheck error 5. The control bit is set to receive (transmit) during transmission (reception) 6. Transmission to a disallowed unit	
F22	Generator Waveform Detection Fault	1. This fault will remain displayed if no generator is connected; 2. When the generator is operating, this fault is triggered if the generator does not meet safety regulations.	
F23	Abnormal Generator Connection		
F24	Generator Voltage Low		
F25	Generator Voltage High		
F26	Generator Frequency Low		

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F27	Generator Frequency High		1. Ignore this fault if no generator is connected; 2. This fault may occur normally when the generator develops a fault. After the generator recovers, wait for a while and the fault will clear automatically; 3. This fault does not affect normal operation in off-grid mode 4. When the generator and grid are both connected and safety requirements are met, the grid takes priority for grid connection, and the system operates in grid-connected mode.
F28	Parallel OperationI/OSelf-Test Abnormal	Parallel communication cable is not securely connected or parallelIOchip is damaged	Check whether the parallel communication cable is securely connected, then check whether theIOchip is damaged. If so, replace theIOchip.
F29	Paralell Grid Line Reversed	The grid cables on some units are connected in reverse relative to the others	Reconnect the grid cables.
F30	AC HCT check Abnormal	Abnormal AC sensor sampling	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F31	GFCI HCT Check Abnormal	Abnormal leakage current sensor sampling	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F32	Inverter Internal Failure	Inverter malfunction detected	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F33	FlashFlash R/W Abnormal	Possible causes: flashcontents have changed;flashservice life has expired;	1. Upgrade to the latest firmware; 2. Contact your dealer or an after-sales service center.
F34	AFCI Check Failure	During the arc-fault self-check, the arc detection module failed to detect an arc fault	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F35	Cabinet Overtemperature	Cabinet Overtemperature, possible causes: 1. The inverter is installed in a poorly ventilated location. 2. Ambient Overtemperature. 3. The internal fan is not operating properly.	1. Check that the inverter installation location is well ventilated and that the ambient temperature is within the maximum permitted range. 2. If ventilation is inadequate or Ambient Overtemperature occurs, improve ventilation and heat dissipation. 3. If ventilation and ambient temperature are both normal, contact your dealer or an after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F36	Bus Overvoltage	BUSovervoltage, possible causes: 1. PVvoltage is too high; 2. Abnormal InverterBUSvoltage sampling; 3. The isolation performance of the dual-split transformer on the inverter output side is poor, causing two inverters to interfere with each other when connected to the grid. One inverter reports a DC overvoltage fault when it is connected to the grid;	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F37	PVInput Overvoltage	PVinput voltage is too high. Possible causes: Incorrect PV array configuration: too many PV modules connected in series in a string, causing the string open-circuit voltage to exceed the inverter's maximum operating voltage	Check the series configuration of the corresponding PV array string to ensure that its open-circuit voltage does not exceed the inverter's maximum operating voltage. The inverter alarm will clear automatically once the PV array is configured correctly.
F38	PVContinuous Hardware Overcurrent	1. Improper module configuration 2. Hardware damage	Disconnect the AC output-side switch and DC input-side switch,5minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F39	PVContinuous Software Overcurrent	1. Improper module configuration 2. Hardware damage	Disconnect the AC output-side switch and DC input-side switch,5minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F40, F98	String reverse connection(String1-n) n: Determine this based on the actual number of strings connected to the inverter	PVString reverse connection	Check whether the string is connected in reverse polarity.

8.4.2 Troubleshooting (Fault Codes F41–F80)

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F41	Generator Port Overload	1. Off-grid output exceeds the limits specified in the datasheet 2. Short circuit on the off-grid side 3. Off-grid terminal voltage is too low 4. When used as a high-load port, the load exceeds the limits specified in the datasheet	Review the data for off-grid output voltage, current, power, and other parameters to identify the cause of the issue.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F42, F164,F165	DC Arcing Failure(String1-n) n: Determine this based on the actual number of strings connected to the inverter	1. DC-side connection terminal is loose; 2. Poor contact at the DC-side connection terminal; 3. The conductor core of the DC cable is damaged, resulting in poor contact	1. After the inverter reconnects to the grid, check whether the voltage and current on each circuit have abnormally decreased to zero; 2. Check that the DC-side terminals are securely connected.
F43	Grid Waveform Abnormal	Grid abnormality: A fault is triggered by an abnormal grid voltage measurement.	1. If this occurs occasionally, it may be due to a brief grid abnormality. The inverter will resume normal operation once it detects that the grid is operating normally; no manual intervention is required. 2. If this occurs frequently, check whether the grid voltage and frequency are within the permitted ranges and stable. If not, contact your local power utility.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F44	Grid Phase Loss	Grid fault: Single-phase grid voltage dip detected.	1. If this occurs occasionally, it may be due to a brief grid abnormality. The inverter will resume normal operation once it detects that the grid is operating normally; no manual intervention is required. 2. If this occurs frequently, check whether the grid voltage and frequency are within the permitted ranges and stable. If not, contact your local power utility.
F45	Grid Voltage Imbalance	The grid phase voltages differ excessively.	1. If this occurs occasionally, it may be due to a brief grid abnormality. The inverter will resume normal operation once it detects that the grid is operating normally; no manual intervention is required. 2. If this occurs frequently, check whether the grid voltage and frequency are within the permitted ranges and stable. If not, contact your local power utility.
F46	Grid Phase Sequence Failure	Inverter-to-grid wiring fault: Incorrect phase sequence	1. Check that the inverter-to-grid wiring has the correct phase sequence. The fault will clear automatically once the wiring is corrected (for example, by swapping any two phase wires). 2. If the wiring is correct but the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F47	Grid Rapid Shutdown Protection	Output is shut down rapidly upon detection of a Grid Power Outage condition	The fault will clear automatically when grid power is restored.
F48	Grid Neutral Wire Loss (Split-phase grid)	Split-phase grid neutral wire loss	1. The alarm will automatically clear when grid power is restored. 2. Check whether the AC line or AC Switch is disconnected.
F49	L-PE Short Circuit	Output phase pairPELow impedance or short circuit	Measure the impedance between the output phase wire andPEto locate the point of low impedance and repair it.
F50	DCVLevel 1 Protection	Abnormal Load Fluctuation	1. If the abnormality is caused by an external fault, the inverter will automatically resume normal operation once the fault is cleared; no manual intervention is required. 2. If this alarm occurs frequently and affects normal power generation at the plant, contact your distributor or after-sales service center.
F51	DCVLevel 2 Protection	Abnormal Load Fluctuation	
F52	Repeated leakage current (GFCI) faults causing shutdown	North American safety standards require that the system not automatically recover after multiple faults; manual intervention or a waiting period is required.24hrecover afterward	Check whether the insulation resistance from the PV strings to ground is too low.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F53	Repeated DC arc (AFCI) faults causing shutdown	North American safety standards require that the system not automatically recover after multiple faults; manual intervention or a waiting period is required.24hrecover afterward	1. After the inverter reconnects to the grid, check whether the voltage and current on each circuit have abnormally decreased to zero; 2. Check that the DC-side terminals are securely connected.
F54	External Communication Link Disconnected	Communication with an external device connected to the inverter has been lost. Possible causes include an external device power supply issue, a Communication Protocols mismatch, or the relevant external device not being configured.	Detection depends on the actual inverter model and the detection enable bit. Unsupported external devices are not detected on some models.
F55	Back-upOutput Overload	Prevents the inverter from continuously supplying an Overload.	Disconnect some off-grid loads to reduce the inverter's off-grid output power.
F56	Back-upOutput Overvoltage	Prevents load damage caused by inverter output overvoltage.	1. If this occurs occasionally, it may be caused by load switching and requires no manual intervention. 2. If this occurs frequently, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F57	External connection BoxFault	Waiting too long for theBoxswitching relay when switching from on-grid to off-grid	1. Check whether theBoxis operating normally; 2. Check whether theBoxcommunication wiring is correct;
F58	CTLoss	CTconnection cable is disconnected (Japanese safety regulation requirement)	Check whether theCTwiring is correct;
F59	Parallel OperationCANComm Abnormal	The parallel communication cable is not securely connected, or a unit is offline	Check that all units are powered on and that the parallel communication cable is securely connected
F60	Parallel OperationBack-upConnected with reversed polarity	Thebackupline on some units is connected in reverse relative to the others	Reconnect thebackupline.
F61	Inverter Soft Start Failure	Inverter Soft Start Failure during off-grid cold start	Check whether the inverter module is damaged.
F62	AC HCT Failure	HCTsensor is abnormal	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F63	GFCI HCT Failure	The leakage current sensor is abnormal	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F64	Inverter Internal Failure	Inverter malfunction detected	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F65	AC Terminal Overtemperature	AC Terminal Overtemperature, possible causes: 1. The inverter is installed in a poorly ventilated location. 2. Ambient Overtemperature. 3. The internal fan is not operating properly.	1. Check that the inverter installation location is well ventilated and that the ambient temperature is within the maximum permitted range. 2. If ventilation is inadequate or Ambient Overtemperature occurs, improve ventilation and heat dissipation. 3. If ventilation and ambient temperature are both normal, contact your dealer or an after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F66	INVModule temperature too high	The inverter module is overheated. Possible causes: 1. The inverter is installed in a poorly ventilated location. 2. Ambient Overtemperature. 3. The internal fan is not operating properly.	1. Check that the inverter installation location is well ventilated and that the ambient temperature is within the maximum permitted range. 2. If ventilation is inadequate or Ambient Overtemperature occurs, improve ventilation and heat dissipation. 3. If ventilation and ambient temperature are both normal, contact your dealer or an after-sales service center.
F67	BoostModule temperature too high	BoostModule temperature too high. Possible causes: 1. The inverter is installed in a poorly ventilated location. 2. Ambient Overtemperature. 3. The internal fan is not operating properly.	1. Check that the inverter installation location is well ventilated and that the ambient temperature is within the maximum permitted range. 2. If ventilation is inadequate or Ambient Overtemperature occurs, improve ventilation and heat dissipation. 3. If ventilation and ambient temperature are both normal, contact your dealer or an after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F68	AC Capacitor Overtemperature	The output filter capacitor is overheated. Possible causes: 1. The inverter is installed in a poorly ventilated location. 2. Ambient Overtemperature. 3. The internal fan is not operating properly.	1. Check that the inverter installation location is well ventilated and that the ambient temperature is within the maximum permitted range. 2. If ventilation is inadequate or Ambient Overtemperature occurs, improve ventilation and heat dissipation. 3. If ventilation and ambient temperature are both normal, contact your dealer or an after-sales service center.
F69	PV IGBT Short-Circuit Fault	Possible causes: 1. IGBTShort Circuit 2. Inverter Sampling Circuit Abnormality	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F70	PV IGBTOpen Circuit	1. No PWM Output Due to a Software Issue: 2. Drive Circuit Abnormality: 3. IGBTOpen Circuit	
F71	NTCAbnormal	NTCTemperature Sensor Abnormality	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F72	PWM Abnormal	PWMAbnormal Waveform	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F73	CPUInterrupt Abnormal	CPUInterrupt Abnormality	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F74	Microelectronics Failure	Anomaly Detected by Function Safety	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F75	PV HCTFault	boostCurrent Sensor Abnormality	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F76	1.5VRef Abnormal	Reference Circuit Failure	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F77	0.3VRef Abnormal	Reference Circuit Failure	
F78	CPLDVersion Error	CPLDVersion Error	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F79	CPLDComm Failure	CPLDandDSPcommunication data error or timeout	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F80	Model Recognition Fault	Fault Related to Model Recognition Error	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.

8.4.3 Fault Handling (Fault Codes F81–F121)

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F81	P-Bus Overvoltage	BUSovervoltage, possible causes: 1. PVvoltage is too high; 2. Abnormal InverterBUSvoltage sampling; 3. The isolation performance of the dual-split transformer on the inverter output side is poor, causing two inverters to interfere with each other when connected to the grid. One inverter reports a DC overvoltage fault when it is connected to the grid;	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F82	N-Bus Overvoltage		

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F83	Bus Overvoltage (SecondaryCPU1)	BUSovervoltage, possible causes: 1. PVvoltage is too high; 2. Abnormal InverterBUSvoltage sampling; 3. The isolation performance of the dual-split transformer on the inverter output side is poor, causing two inverters to interfere with each other when connected to the grid. One inverter reports a DC overvoltage fault when it is connected to the grid;	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F84	P-Bus Overvoltage (SecondaryCPU1)		
F85	N-Bus Overvoltage (AuxiliaryCPU1)		
F86	Bus Overvoltage (SecondaryCPU2)		Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F87	P-Bus Overvoltage (SecondaryCPU2)		

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F88	N-Bus Overvoltage (AuxiliaryCPU2)	BUSovervoltage, possible causes: 1. PVvoltage is too high; 2. Abnormal InverterBUSvoltage sampling; 3. The isolation performance of the dual-split transformer on the inverter output side is poor, causing two inverters to interfere with each other when connected to the grid. One inverter reports a DC overvoltage fault when it is connected to the grid;	
F89	P-Bus Overvoltage(CPLD)		Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F90	N-Bus Overvoltage(CPLD)	BUSovervoltage, possible causes: 1. PVvoltage is too high; 2. Abnormal InverterBUSvoltage sampling; 3. The isolation performance of the dual-split transformer on the inverter output side is poor, causing two inverters to interfere with each other when connected to the grid. One inverter reports a DC overvoltage fault when it is connected to the grid;	
F91	FlyCap Software Overvoltage	FlyCap Overvoltage, possible causes: 1. PVvoltage is too high; 2. Abnormal inverter FlyCap voltage sampling;	Disconnect the AC output-side switch and DC input-side switch,5minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F92	FlyCap Hardware Overvoltage		

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F93	FlyCap Undervoltage	FlyCap Undervoltage, possible causes: 1. PVenergy is insufficient; 2. Abnormal inverter FlyCap voltage sampling;	Disconnect the AC output-side switch and DC input-side switch,5minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F94	FlyCap Precharge Failure	FlyCap Precharge Failure, possible causes: 1. PVenergy is insufficient; 2. Abnormal inverter FlyCap voltage sampling;	Disconnect the AC output-side switch and DC input-side switch,5minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F95	FlyCap Precharge Abnormal	1. Improper control-loop parameters 2. Hardware damage	Disconnect the AC output-side switch and DC input-side switch,5minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F96, F97	String Overcurrent(String1-n) n: Determine this based on the actual number of strings connected to the inverter	Possible causes: 1. String overcurrent; 2. Abnormal string current sensor	Disconnect the AC output-side switch and DC input-side switch,5minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F99, F100	String Loss(String1-n) n: Determine this based on the actual number of strings connected to the inverter	String fuse blown (if applicable)	Check whether the fuse is blown.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F101	BAT1Precharge Failure	BAT1precharge circuit failure (e.g., precharge resistor burned out)	Check that the precharge circuit is in good condition. After the battery is powered on, check whether the battery voltage matches the bus voltage. If they do not match, contact your dealer or after-sales service center.
F102	BAT1Relay Failure	BAT1relay does not operate correctly	After powering on the battery, check whether the battery relay operates and whether a closing sound can be heard. If it does not operate, contact your dealer or after-sales service center.
F103	BAT1Overvoltage on Connection	BAT1Input voltage exceeds the inverter's rated range	Confirm that the Battery Voltage is within the inverter's rated range.
F104	BAT2Precharge Failure	BAT2precharge circuit failure (e.g., precharge resistor burned out)	Check that the precharge circuit is in good condition. After the battery is powered on, check whether the battery voltage matches the bus voltage. If they do not match, contact your dealer or after-sales service center.
F105	BAT2Relay Failure	BAT2relay does not operate correctly	After powering on the battery, check whether the battery relay operates and whether a closing sound can be heard. If it does not operate, contact your dealer or after-sales service center.
F106	BAT2Overvoltage on Connection	BAT2Input voltage exceeds the inverter's rated range	Confirm that the Battery Voltage is within the inverter's rated range.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F107	On-grid PWM Sync Failure	Abnormality during carrier synchronization for grid connection	1. Check that the synchronization cable is connected properly 2. Check that the master/slave settings are correct; 3. Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, please contact your dealer or after-sales service center.
F108	DSPCommunication Failure	-	-
F109	External connectionSTSFault	The inverter andSTSAbnormal connection cable	Check that the wire sequence of the harness connecting the inverter andSTScorresponds pin by pin.
F110	Export Limit Protection	1. Inverter reports an error and disconnects from the grid 2. meterUnstable communication 3. Reverse power flow occurs	1. Check whether the inverter has any other error messages. If so, take appropriate corrective action; 2. Check whether themeteris securely connected; 3. If this alarm occurs frequently and affects normal power generation at the plant, contact your distributor or after-sales service center.
F111	BypassOverload	-	-
F112	Black Start Failure	-	-
F113	Offgrid AC Ins Volt High	-	-

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F114	Relay Failure2	Relay abnormality, cause: 1. Relay abnormality (relay short circuit) 2. Relay sampling circuit abnormality. 3. AC-side wiring abnormality (possibly a loose connection or short circuit)	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F115	SVGPrecharge Disabled	SVGprecharge hardware failure	Contact your dealer or an after-sales service center.
F116	NighttimeSVG PIDPrevention Failure	PIDhardware abnormality	
F117	DSPVersion Error	DSPsoftware version identification error	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F118	MOSContinuous Overvoltage	1. A software issue causes the inverter drive to be disabled before the flyback drive: 2. An abnormality in the inverter drive circuit prevents it from turning on: 3. PVvoltage is too high; 4. Mosvoltage sampling;	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F119	DC bus short-circuit fault	Hardware damage	If the inverter remains disconnected from the grid after aBUSshort-circuit fault, contact your dealer or after-sales service center.
F120	DC bus sampling abnormality	1. BUSvoltage sampling hardware failure	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F121	DC-side sampling abnormality	1. BUSvoltage sampling hardware failure 2. Battery voltage sampling hardware failure 3. DcrlyRelay Failure	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.

8.4.4 Fault Handling (Fault Codes F122–F171)

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F122	PVInput Mode Error	PVThere are three PV input modes. Using a four-channelMPPTas an example: 1. Parallel mode: that is,AAAAmode(same-source mode），PV1-PV4same source,4pathsPVconnected to the same PV module 2. Partial parallel mode: theAACCmode, in whichPV1andPV2are connected to the same source, andPV3andPV4are connected to the same source 3. Independent mode: that is,ABCDmode(different sources），PV1、PV2、PV3、PV4Connected independently,4pathsPVConnect one PV module to each This fault is reported	Check whether thePVAccess Mode is set correctly (ABCD、AACC、AAAA), then reset thePVAccess Mode 1. Confirm that each actualPVinput is connected correctly; 2. If thePVinputs are connected correctly, use theAPPor screen to check whether the current "PVAccess Mode" matches the actual access mode; 3. If the current "PVAccess Mode" does not match the actual access mode, use theAPPor screen to set the "PVAccess Mode" to match the actual configuration. After setting it, disconnect thePVandACpower supplies and restart the unit; 4. After setting, if the current "PVAccess Mode" matches the actual access mode but this fault is still reported, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
		if the actualPVinput mode does not match the device's configuredPVinput mode	
F123	Multi-channelPVphase error	PVinput mode incorrectly set	Check whether thePVAccess Mode is set correctly (ABCD、AACC、AAAA), then reset thePVAccess Mode 1. Confirm that each actualPVinput is connected correctly; 2. If thePVinputs are connected correctly, use theAPPor screen to check whether the current "PVAccess Mode" matches the actual access mode; 3. If the current "PVAccess Mode" does not match the actual access mode, use theAPPor screen to set the "PVAccess Mode" to match the actual configuration. After setting it, disconnect thePVandACpower supplies and restart the unit; 4. After setting, if the current "PVAccess Mode" matches the actual access mode but this fault is still reported, contact your dealer or after-sales service center.
F124	BAT1reversed polarity	BAT1positive and negative terminals reversed	Check that the battery polarity matches the polarity of the machine terminals.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F125	BAT2reversed polarity	BAT2positive and negative terminals reversed	Check that the battery polarity matches the polarity of the machine terminals.
F126	Abnormal battery connection	Abnormal battery connection	Check that the battery is operating normally.
F127	BAT Overtemperature	Battery temperature is too high. Possible causes: 1. The inverter is installed in a poorly ventilated location. 2. Ambient Overtemperature. 3. The internal fan is not operating properly.	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F128	Ref Voltage Abnormal	Reference Circuit Failure	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F129	Cabinet Under Temperature	Cabinet Under Temperature	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F130	AC-sideSPDFault	AC-side surge protection device failure	Replace theAC-side surge protection device.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F131	DC-sideSPDFault	DC-side surge protection device failure	Replace theDC-side surge protection device.
F132	Fan Abnormal	Fan Abnormal, possible causes: 1. Abnormal fan power supply; 2. Mechanical failure(seized rotor）; 3. Fan worn out or damaged.	Disconnect the AC output-side switch and DC input-side switch,5 minutes later, close the AC output-side switch and DC input-side switch. If the fault persists, contact your dealer or after-sales service center.
F133	External Fan Abnormal	External Fan Abnormal. Possible causes: 1. Abnormal fan power supply; 2. Mechanical failure(seized rotor）; 3. Fan worn out or damaged.	
F134	PIDAbnormal	PIDhardware fault orPVvoltage too highPIDpaused	PVvoltage too high causingPIDpause warning requires no action. For aPIDhardware fault, turn thePIDswitch off and then back on to clear thePIDfault; replace thePIDdevice.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F135	Trip-Switch Trip Warning	Possible causes: Overcurrent orPVreverse polarity caused the trip switch to trip;	Contact your dealer or after-sales service center. To determine the cause of the trip, which may be aPVshort circuit or reverse polarity, check for historicalPVshort-circuit warnings or historicalPVreverse-polarity warnings. If any are present, have a service technician inspect the correspondingPVsystem. After confirming that there are no faults, manually reset the trip switch, then clear this warning by using the clear historical faults function in theAPPinterface.
F136	HistoricalPV IGBT Short-Circuit Warning	Possible causes: Overcurrent caused the trip switch to trip;	Contact your dealer or after-sales service center. Based on the subcode of the historicalPVshort-circuit warning, a service technician should check theBoosthardware and external strings for faults in the shorted circuit. After confirming that there are no faults, clear this warning by using the clear historical faults function in theAPPinterface.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F137, F138	HistoricalPV Reverse-Polarity Warning(String1-n) (n: determined by the actual number of inverter strings)	Possible causes: OccursPVreverse polarity caused the trip switch to trip;	Contact your dealer or after-sales service center. Based on the subcode of the historicalPVreverse-polarity warning, a service technician should check whether the corresponding string is reverse-connected and whether there is a voltage difference in thePVmodule configuration. After confirming that there are no faults, clear this warning by using the clear historical faults function in theAPPinterface.
F139	FlashR/W Error	Possible causes: 1. Flashcontents have changed; 2. Flashservice life has expired;	1. Upgrade to the latest firmware; 2. Contact your dealer or an after-sales service center.
F140	Meter Comm Loss	This warning may occur only when the Power Limit function is enabled. Possible causes: 1. The meter is not connected; 2. The communication cable between the meter and the inverter is wired incorrectly.	Check the meter wiring and connect the meter correctly. If the fault persists after checking, contact your dealer or after-sales service center.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F141	PVType Identification Failure	PVmodule identification hardware abnormality	Contact your dealer or an after-sales service center.
F142	PV String Mismatch	PVstring mismatch: the two strings connected to the sameMPPThave different open-circuit voltage configurations	Check the open-circuit voltages of the two strings and configure strings with the same open-circuit voltage on the sameMPPT. Prolonged string mismatch may pose a safety risk.
F143	CTnot connected	CTnot connected	Check whether theCTwiring.
F144	CTReversed	CTReversed	Check whether theCTwiring.
F145	PE Loss	Ground wire not connected	Check the ground wire.
F146	PV String Terminal Overtemperature(String 1~8)	37176registerPVterminal temperature alarm subcode1is set	-
F147	PV String Terminal Overtemperature(String 9~16)	37177registerPVterminal temperature alarm subcode2is set	-
F148	PV String Terminal Overtemperature(String 17~20)	37178registerPVterminal temperature alarm subcode3is set	-

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F149	HistoricalPV Reverse-Polarity Warning(String33~48)	Possible causes: OccursPVreverse polarity caused the trip switch to trip;	Contact your dealer or after-sales service center. Based on the subcode of the historicalPVreverse-polarity warning, a service technician should check whether the corresponding string is reverse-connected and whether there is a voltage difference in thePVmodule configuration. After confirming that there are no faults, clear this warning by using the clear historical faults function in theAPPinterface.
F150	BAT1Voltage Low	Battery Voltage below the set value	-
F151	BAT2Voltage Low	Battery Voltage below the set value	-
F152	Low Voltage of Battery Power	In non-charging mode, battery voltage is below the shutdown voltage	-
F153	BAT1Voltage High	-	-
F154	BAT2Voltage High	-	-

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F155	Online Low Insulation Resistance	1. The PV string is short-circuited to protective earth. 2. The PV string installation environment has been consistently damp, and the insulation of the wiring to ground is inadequate.	1. Check the insulation resistance between the PV strings and protective earth. If a short circuit is present, rectify the short-circuit point. 2. Check that the inverter's protective earth conductor is connected correctly. 3. If you confirm that the insulation resistance is indeed below the default value in rainy or overcast conditions, reset the "Insulation Resistance Protection Threshold".
F156	Micro-grid Overload Warning	backupport input current too high	No action is needed if this occurs occasionally. If this alarm occurs frequently, contact your dealer or after-sales service center.
F157	Manual Reset	-	-
F158	Generator Phase Sequence Abnormal	-	-
F159	Multiplexed Port Configuration Abnormal	The multiplexed port(generator）is configured for microgrid or heavy-load operation, but a generator is actually connected	Use theAPPto change the multiplexed(generator）port configuration.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F160	EMSForced Off-grid	EMSEMS has issued a forced off-grid command, but off-grid operation is not enabled	Enable off-grid operation.
F161	Passive Anti-islanding Protection	-	-
F162	Grid Type Fault	Actual Type of Electrical Supply System(two-phase or split-phase） does not match the configured grid code	Select the corresponding grid code based on the actual Type of Electrical Supply System.
F163	Grid Phase Instability	Grid abnormality: The grid voltage phase rate of change does not meet local grid standards.	1. If this occurs occasionally, it may be due to a brief grid abnormality. The inverter will resume normal operation once it detects that the grid is operating normally; no manual intervention is required. 2. If this occurs frequently, check whether the grid frequency is within the permitted range. If not, contact the local power utility.

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F166	PV Terminal Overtemperature	PV Terminal Overtemperature. Possible causes: 1. The inverter is installed in a poorly ventilated location. 2. Ambient Overtemperature. 3. The internal fan is not operating properly.	1. Check that the inverter installation location is well ventilated and that the ambient temperature is within the maximum permitted range. 2. If ventilation is inadequate or Ambient Overtemperature occurs, improve ventilation and heat dissipation. 3. If ventilation and ambient temperature are both normal, contact your dealer or an after-sales service center.
F167	AC Terminal Overtemperature Warning	AC Terminal Overtemperature, possible causes: 1. The inverter is installed in a poorly ventilated location. 2. Ambient Overtemperature. 3. The internal fan is not operating properly.	
F168	Battery Terminal Overtemperature	Battery terminal overtemperature. Possible causes: 1. The inverter is installed in a poorly ventilated location. 2. Ambient Overtemperature.	

Fault Code	Fault Name	Fault Cause	Troubleshooting Recommendations
F169	Battery Terminal Overtemperature Warning	Battery terminal overtemperature. Possible causes: 1. The inverter is installed in a poorly ventilated location. 2. Ambient Overtemperature.	
F170	STS Overtemperature	STS overtemperature. Possible causes: 1. Poor ventilation at the STS installation location. 2. Ambient Overtemperature.	
F171	Abnormal wiring between the inverter and battery	Abnormal power cable connection between the battery and inverter	Check whether the power cable connection between the battery and inverter is correct.

8.4.5 Fault Troubleshooting

Fault Name	Fault Cause	Troubleshooting Recommendations
Generator Failure	1. This fault will remain displayed if no generator is connected 2. This fault is triggered when the generator is operating and does not meet the grid code requirements	1. If no generator is connected, ignore this fault; 2. This fault is normal when the generator has failed. After the generator recovers, wait for a while and the fault will clear automatically; 3. This fault does not affect normal operation in off-grid mode 4. If both the generator and grid are connected and meet grid code requirements, the grid takes priority for grid-tied operation.
BMS Status Bit Error	BMS module fault	Open the AC output-side and DC input-side switches. After 5 minutes, close both switches. If the fault persists, contact your dealer or after-sales service center.
Ambient Overtemperature	1. Poor ventilation 2. Hot air recirculating to the ambient temperature sampling point	Open the AC output-side and DC input-side switches. After 5 minutes, close both switches. If the fault persists, contact your dealer or after-sales service center.
PV Terminal Overtemperature	PV Terminal Overtemperature. Possible causes: 1. The inverter is installed in a poorly ventilated location. 2. Ambient Overtemperature. 3. The internal fan is not operating properly.	1. Check whether the inverter installation location is well ventilated and whether the ambient temperature exceeds the maximum permissible range. 2. If ventilation is poor or the ambient temperature is too high, improve ventilation and heat dissipation. 3. If ventilation and ambient temperature are both normal, contact your dealer or after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendations
Battery Terminal Overtemperature	Battery terminal overtemperature. Possible causes: 1. The inverter is installed in a poorly ventilated location. 2. Ambient Overtemperature.	1. Check whether the inverter installation location is well ventilated and whether the ambient temperature exceeds the maximum permissible range. 2. If ventilation is poor or the ambient temperature is too high, improve ventilation and heat dissipation. 3. If ventilation and ambient temperature are both normal, contact your dealer or after-sales service center.
AC Terminal Overtemperature Warning	AC Terminal Overtemperature, possible causes: 1. The inverter is installed in a poorly ventilated location. 2. Ambient Overtemperature. 3. The internal fan is not operating properly.	
Battery Terminal Overtemperature Warning	Battery terminal overtemperature. Possible causes: 1. The inverter is installed in a poorly ventilated location. 2. Ambient Overtemperature.	1. Check whether the inverter installation location is well ventilated and whether the ambient temperature exceeds the maximum permissible range. 2. If ventilation is poor or the ambient temperature is too high, improve ventilation and heat dissipation. 3. If ventilation and ambient temperature are both normal, contact your dealer or after-sales service center.
Three-phase on-grid fault	Three-phase external wiring error	Reconnect the wiring.

Fault Name	Fault Cause	Troubleshooting Recommendations
External STS Failure	Abnormal cable connection between the inverter and STS	Check that the wire sequence of the harness connecting the inverter and STS matches pin by pin.

Fault Name	Fault Cause	Troubleshooting Recommendations
Parallel Comm Timeout Shutdown	In parallel operation, if a slave fails to communicate with the master for more than400seconds	Check that the parallel communication harness is securely connected and verify that slave addresses are not duplicated.
Three-phase off-grid phase loss fault	A phase is missing in the three-phase system	1. Check that all inverters are powered on; 2. Check that an inverter is connected to each phase of the three-phase system;
EPO	An external hardware emergency-stop button was triggered, or an EPO command was triggered remotely	1. If Remote Shutdown was triggered intentionally, this can be ignored; 2. If it was not triggered intentionally,contact your dealer or after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendations
High concentration of combustible gas	The combustible gas detection device automatically triggers an alarm when the concentration reaches 20% LEL or higher	1. When this fault occurs, the unit automatically opens the air damper to exhaust gas and reduce the concentration. The fault clears automatically when the concentration remains below 5% LEL for 15 minutes. 2. If a cluster-level Fire Fighting Failure is triggered after this fault occurs, the air damper will close automatically. The damper status will be verified within 30 s to ensure that cluster-level fire protection is carried out in an enclosed space. 3. Please contact your dealer or after-sales service center.
The combustible gas device's air damper open command does not match the feedback signal	The air damper open control signal does not match the feedback signal	1. Check that the wiring harness signal connections are correct. 2. Please contact your dealer or after-sales service center.
One-click shutdown	Check in the app whether the one-click shutdown function is enabled.	Disable one-click shutdown.
Offline shutdown	-	-
Remote shutdown	-	-

Fault Name	Fault Cause	Troubleshooting Recommendations
On-Grid SPD Fault	-	1. Try restarting the unit and check whether the fault is cleared; 2. If the fault persists after restarting, please contact your dealer or after-sales service center.
Off-Grid SPD Fault	-	1. Try restarting the unit and check whether the fault is cleared; 2. If the fault persists after restarting, please contact your dealer or after-sales service center.
Child Node Communication Failure	Internal Comm Abnormal	1. Try restarting the unit and check whether the fault is cleared; 2. If the fault persists after restarting, please contact your dealer or after-sales service center.
Dehumidifier communication failure	Communication link between the dehumidifier and the LC control box is abnormal	1. Check the communication link wiring harness and see whether the fault is cleared; 2. Try restarting the unit and check whether the fault is cleared; 3. If the fault persists after restarting, please contact your dealer or after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendations
Flammable gas detector communication failure	1. The flammable gas detector was not correctly configured at the factory with a 485 address of 2. 2. Communication link between the flammable gas detector and the LC control box is abnormal	1. Check the communication link wiring harness and see whether the fault is cleared; 2. Try restarting the unit and check whether the fault is cleared; 3. Use the method provided by the flammable gas detector manufacturer to check whether the device address is 2. If not, change it; 4. If the fault persists after restarting, please contact your dealer or after-sales service center.
DG Communication Failure	Communication link between the control board and the DG is abnormal	1. Check the communication link wiring harness and see whether the fault is cleared; 2. Try restarting the unit and check whether the fault is cleared; 3. If the fault persists after restarting, please contact your dealer or after-sales service center.
Battery Over Voltage	1. Individual cell voltage is too high 2. Voltage sensing wire is abnormal	Record the fault symptoms, restart the battery, and wait a few minutes to check whether the fault clears. If the problem persists after restarting, please contact the after-sales service center.
	1. Total battery voltage is too high 2. Voltage sensing wire is abnormal	
Battery Undervoltage	1. Single-cell voltage too low 2. Voltage sensing wire is abnormal	

Fault Name	Fault Cause	Troubleshooting Recommendations
	1. Total battery voltage too low 2. Voltage sensing wire is abnormal	
Battery Overcurrent	1. Charging current too high; abnormal battery current limiting: sudden changes in temperature and voltage 2. Inverter response fault	
	Battery discharge current too high	
Battery Overtemperature	1. Ambient Overtemperature 2. Temperature sensor fault	
Battery Undertemperature	1. Ambient temperature too low 2. Temperature sensor fault	
Battery Terminal Overtemperature	Battery terminal temperature too high	

Fault Name	Fault Cause	Troubleshooting Recommendations
Battery Imbalance	1. At different stages, the battery limits its power output when the temperature difference is too large, thereby limiting the charge and discharge current. Therefore, this issue is generally unlikely to occur. 2. Cell capacity degradation can result in excessive internal resistance, causing a significant temperature rise under Overcurrent and thus a large temperature difference. 3. Poor cell tab welding can cause the cell temperature to rise too quickly under Overcurrent. 4. Temperature sampling issue; 5. Loose power cable connection	

Fault Name	Fault Cause	Troubleshooting Recommendations
	1. Cell aging is inconsistent 2. A slave board chip issue can also cause an excessive cell voltage difference; 3. A slave board balancing issue can also cause an excessive cell voltage difference 4. Harness issue	
Insulation Resistance	Insulation resistance failure	Check that the ground wire is connected properly, then restart the battery. If the issue persists after restarting, contact the after-sales service center.
Pre-charging Failure Fault	Pre-charging Failure	This indicates that during pre-charging, the voltage across the pre-charge MOSFET remains above the specified threshold. After shutting down and restarting, check whether the fault persists. Verify that the wiring is correct and that the pre-charge MOSFET is not damaged.
Sensing wire fault	Battery sensing wire has poor contact or is disconnected	Check the wiring, then restart the battery. If the issue persists after restarting, contact the after-sales service center.
	Cell voltage sensing wire has poor contact or is disconnected	Check the wiring, then restart the battery. If the issue persists after restarting, contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendations
	Cell temperature sensing wire has poor contact or is disconnected	
	Excessive discrepancy between dual-channel current readings, or an abnormal current sensing circuit	
	Excessive discrepancy between dual-channel voltage readings or between MCU and AFE voltage readings, or an abnormal voltage sensing circuit	
	Temperature sensing circuit is abnormal, has poor contact, or is disconnected	
	Level 5 overvoltage or level 5 overtemperature; three-terminal fuse blown	The three-section fuse has blown. Contact the after-sales service center to replace the main control board.

Fault Name	Fault Cause	Troubleshooting Recommendations
Relay or MOS overtemperature	Relay or MOS overtemperature	This fault indicates that the MOSFET temperature has exceeded the specified threshold. Shut down the system and leave it idle for 2 hours to allow the temperature to return to normal.
Shunt overtemperature	Shunt overtemperature	This fault indicates that the shunt temperature has exceeded the specified threshold. Shut down the system and leave it idle for 2 hours to allow the temperature to return to normal.
BMS1 Other Fault 1 (Residential Energy Storage)	Relay or MOS open circuit	1. Update the software, shut down the system and leave it idle for 5 minutes, then restart it and check whether the fault persists. 2. If the fault persists, replace the battery pack.
	Relay or MOS short circuit	1. Update the software, shut down the system and leave it idle for 5 minutes, then restart it and check whether the fault persists. 2. If the fault persists, replace the battery pack.
	Communication between the main and secondary clusters is abnormal, or the cells in different clusters are inconsistent.	1. Check the battery information and software version of the secondary unit, and verify that its communication cable connection to the main unit is secure. 2. Update the software.

Fault Name	Fault Cause	Troubleshooting Recommendations
	The battery system loop wiring harness is abnormal, preventing the interlock signal from forming a closed circuit.	Check that the terminating resistor is installed correctly.
	Communication between the BMS and PCS is abnormal.	1. Confirm that the communication cable pinout between the battery and inverter is correct. 2. Contact the after-sales service center to review the backend data and verify that the inverter and battery software versions are compatible.
	Abnormal communication harness between the BMS master controller and slave controller	1. Check the wiring and restart the battery. 2. Update the battery software. If the issue persists after restarting, contact the after-sales service center.
	Communication loss between the main and negative-terminal chips	
	Circuit breaker or shunt trip abnormality	1. Shut down the system and leave it idle for 5 minutes, then restart it and check whether the fault persists. 2. Check the blind-mate connectors at the bottom of the PACK and PCU for loose or misaligned communication pins.

Fault Name	Fault Cause	Troubleshooting Recommendations
	MCU self-test failed	Update the software and restart the battery. If the issue persists after restarting, contact the after-sales service center.
	1. The software version is too old, or the BMS board is damaged. 2. The number of paralleled inverters is high, causing excessive inrush current during battery precharge.	1. Update the software and check whether the fault persists. 2. If the inverters are operating in parallel, black-start the battery before starting the inverters.
	MCU internal fault	Update the software and restart the battery. This is generally caused by a faulty MCU or external component. If the issue persists after restarting, contact the after-sales service center.
	Master control current exceeds the specified threshold	1. Shut down and leave the system idle for 5 minutes, then restart it and check whether the fault persists; 2. Check whether the inverter power setting is too high, causing the total bus load to be exceeded;
	Inconsistent cells in parallel battery clusters	Confirm that the cells in the parallel battery clusters are consistent
	Reverse polarity connection of parallel battery clusters	Check whether the positive and negative terminals of the parallel battery clusters are connected in reverse

Fault Name	Fault Cause	Troubleshooting Recommendations
	A severe overtemperature or overvoltage condition has triggered the fire suppression system	Contact the after-sales service center.
Air Conditioner Failure	Air conditioner malfunction	Try restarting the system. If the fault persists, contact the after-sales service center.
	Cabinet door is not closed	Check that the cabinet door is properly closed
	Supply voltage is too high	Confirm that the supply voltage is within the air conditioner's input voltage requirements, then restore power.
	Supply voltage is insufficient	
	No voltage input	
	Unstable supply voltage	
	Unstable compressor voltage	Try restarting the system. If the fault persists, contact the after-sales service center.
	Poor sensor contact or sensor damage	
	Air conditioner fan fault	
BMS1 Other Fault 2 (Residential Energy Storage)	Abnormal voltage or current detected inside the DCDC	See the specific DC Failure details.
	DCDC overload or excessive heatsink temperature, etc.	

Fault Name	Fault Cause	Troubleshooting Recommendations
	Abnormal cell data acquisition or inconsistent aging levels	Please contact the after-sales service center.
	Fan operation was not performed correctly	Please contact the after-sales service center.
	Loose output terminal screws or poor contact	1. Shut down the battery and check the wiring and the screws at the output terminals. 2. After checking, restart the battery and see whether the fault persists. If it does, contact the after-sales service center.
	The battery has been in use for too long, or the cells are severely damaged.	Contact the after-sales service center to replace the pack.
	1. The software version is too old, or the BMS board is damaged. 2. The number of paralleled inverters is high, causing excessive inrush current during battery precharge.	1. Upgrade the software and check whether the fault persists. 2. For parallel operation, black-start the battery before starting the inverter.
	Heating film damaged	Please contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendations
	The three-terminal fuse of the heating film is open, so the heating function cannot be used.	Please contact the after-sales service center.
	Mismatch between the software model, cell type, and hardware model	Check whether the software model, SN, cell type, and hardware model are consistent. If not, contact the after-sales service center.
	Thermal management board communication interrupted	1. Shut down the system and leave it idle for 5 minutes, then restart it and check whether the fault persists. 2. If the fault persists, contact after-sales service to replace the pack.
	Pack fan fault signal triggered	
DCDC Failure	Output terminal voltage too high	Check the output terminal voltage. If it is normal and the fault does not clear after restarting the battery, contact the after-sales service center.
	The DCDC module detected that the Battery Voltage exceeds the maximum charging voltage.	Stop charging and discharge the battery to below 90% SOC or leave it idle for 2 hours. If this does not resolve the issue and the fault persists after restarting, contact the after-sales service center.
	Heatsink temperature too high	Leave the battery idle for 1 hour until the heatsink temperature drops. If this does not resolve the issue and the fault persists after restarting, contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendations
	Battery discharge current too high	Check whether the load exceeds the battery's discharge capacity. Turn off the load or stop the PCS for 60 seconds. If this does not resolve the issue and the fault persists after restarting, contact the after-sales service center.
	The positive and negative conductors of the output power cable are reversed at the parallel-connected battery or PCS	Turn off the battery's manual switch, check that the output terminal wiring is correct, and restart the battery.
	Output power relay failed to close	Check that the output terminal wiring is correct and that there is no short circuit. If this does not resolve the issue and the fault persists after restarting, contact the after-sales service center.
	Power device temperature too high	Leave the battery idle for 1 hour until the temperature of the internal power devices drops. If this does not resolve the issue and the fault persists after restarting, contact the after-sales service center.
	Relay stuck closed	If the fault persists after restarting, contact the after-sales service center.
Battery Rack Circulating Current Failure	1. Cell imbalance 2. Full-charge calibration not performed during initial power-up	Record the fault symptoms, restart the battery, and wait a few minutes to check whether the fault clears. If the problem persists after restarting, please contact the after-sales service center.

Fault Name	Fault Cause	Troubleshooting Recommendations
BMS1 Other Fault 3 (Utility-Scale Energy Storage)	Communication error with the Linux module	1. Check whether the communication connection is normal 2. Upgrade the software and restart the battery. Check whether the fault persists. If it does, contact the after-sales service center.
	Cell temperature rising too quickly	Abnormal cell. Contact after-sales service to replace the battery pack.
	SOC below 10%	Charge the battery.
	SN write does not comply with the rules	Check whether the SN length is correct. If it is incorrect, contact the after-sales service center.
	1. Daisy-chain communication error within the battery cluster 2. Cell aging levels are inconsistent between battery clusters	1. Check the connections of the battery pack in the individual cluster 2. Check the usage of each battery cluster, such as cumulative charge/discharge capacity and cycle count 3. Contact the after-sales service center.
	Excessive humidity inside the battery pack	-
	Fuse blown	Contact after-sales service to replace the battery pack.
	Low battery charge	Charge the battery.
BMS1 Other Fault 4 (Utility-Scale Energy Storage)	Circuit Breaker Abnormality	Contact after-sales service to replace the battery pack.
	External equipment abnormality	Contact after-sales service to replace the battery pack.

Fault Name	Fault Cause	Troubleshooting Recommendations
Contactor Failure 1	-	-
Contactor Failure 2	-	-
Overload Protection (Ksic)	Continuous Overload (>690 kVA) for 10 s	Please contact the after-sales service center.
Overload Protection (Smart Port	Continuous Overload (>690 kVA) for 10 s	Please contact the after-sales service center.
Overcurrent Protection (Ksic)	-	-
Overcurrent Protection (Smart Port)	-	-
Master AC On Meter Comm Error	1. The meter may not be connected to the master unit 2. The meter communication cable may be loose	1. Check whether the meter is connected to the master unit 2. Check whether the meter communication cable is loose
Parallel Slave Meter Error	Meter connected to the slave	Set the unit connected to the meter as the master
Slave AC On Timeout with Master	1. Incorrect slave address setting 2. Loose slave communication cable	1. Check whether any slave addresses are duplicated 2. Check whether the parallel communication cable is loose

8.5 Periodic Maintenance

⚠DANGER
When performing operations or maintenance on the inverter, power it off. Operating the equipment while energized may damage the inverter or cause an electric shock.

Maintenance Item	Maintenance Method	Maintenance Interval
System Cleaning	Check whether there are foreign objects or dust on the heat sink and at the air inlet/outlet.	Once every six months - once a year
Fan	Check that the fan operates normally, makes no abnormal noise, and is in good physical condition.	Once a year
DC Switch	Turn the DC Switch on and off 10 times in succession to ensure that it functions properly.	Once a year
Electrical Connections	Check whether the electrical connections are loose and whether the cable sheaths are damaged or expose copper conductors.	Once every six months - once a year
Sealing	Check whether the sealing of the equipment cable entry holes meets the requirements. If the gaps are too large or the holes are not sealed, reseal them.	Once a 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	Integrated	Integrated	Integrated
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
Active Anti-islanding Method	SMS(Slip-mode frequency) +AFD*3		
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

Technical Data	GW10K-MS-G40	GW7.5K-MS-G41	GW8K-MS-G40
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	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	Integrated	Integrated	Integrated
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
Active Anti-islanding Method	SMS(Slip-mode frequency) +AFD*3		
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 PV panel.

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

*3: AFD: Active Frequency Drift with Positive Feedback

Technical Data	GW7K3-MS-G40	GW7K3-MS-G41	GW9K1-MS-G40	GW10K5-MS-G40
Input				
Max.Input Power (W)*1	14,600	14,600	18,200	21,000
Max.Input Voltage (V)*2	600	600	600	600
MPPT Operating Voltage Range (V)	40~560	40~560	40~560	40~560
MPPT Voltage Range at Nominal Power (V)	240-500	185-500	210-500	210-500
Start-up Voltage (V)	50	50	50	50
Nominal Input Voltage (V)	360	360	360	360

Technical Data	GW7K3-MS-G40	GW7K3-MS-G41	GW9K1-MS-G40	GW10K5-MS-G40
Max. Input Current per MPPT (A)	20	20	20	20
Max. Short Circuit Current per MPPT (A)	26	26	26	26
Max.Backfeed Current to The Array (A)	0	0	0	0
Number of MPPT	2	3	3	3
Number of Strings per MPPT	1	1	1	1
Output				
Nominal Output Power (W)	7,300	7,300	9,100	10,500
Nominal Output Apparent Power (VA)	7,300	7,300	9,100	10,500
Max. AC Active Power (W)	8,800*3	8,800*3	11,000*3	10,500*3
Max. AC Apparent Power (VA)	8,800*3	8,800*3	11,000*3	10,500*3
Nominal Power at 40℃（W）	7,300	7,300	9,100	10,500
Max Power at 40℃ (Including AC Overload)（W）	8,800*3	8,800*3	11,000*3	10,500*3

Technical Data	GW7K3-MS-G40	GW7K3-MS-G41	GW9K1-MS-G40	GW10K5-MS-G40
Nominal Output Voltage (V)	220/230，L/N/PE	220/230，L/N/PE	220/230，L/N/PE	220/230，L/N/PE
Output Voltage Range (V)	160~270(according to local standard)			
Nominal AC Grid Frequency (Hz)	50/60	50/60	50/60	50/60
AC Grid Frequency Range (Hz)	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65	45~55 / 55~65
Max. Output Current (A)	33.2	33.2	41.4	47.7
Max. Output Fault Current (Peak and Duration) (A/us)	77/3	91/3	109/3	109/3
Inrush Current (Peak and Duration) (A/ms)	23/15	26/15	30/15	30/15
Nominal Output Current (A)（at 220V）	33.2@220V 31.7@230V	33.2@220V3 31.7@230V	41.4@220V 39.6@230V	47.7@220V 45.7@230V
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)			
Max. Total Harmonic Distortion	<3%	<3%	<3%	<3%
Efficiency				
Max. Efficiency	97.80%	97.90%	97.90%	97.90%

Technical Data	GW7K3-MS-G40	GW7K3-MS-G41	GW9K1-MS-G40	GW10K5-MS-G40
European Efficiency	97%	97.30%	97.30%	97.30%
Protection				
PV String Current Monitoring	Integrated	Integrated	Integrated	Integrated
PV Insulation Resistance Detection	Integrated	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated	Integrated
DC Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated
Anti-islanding Protection	Integrated	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated	Integrated
DC Switch	Integrated	Integrated	Integrated	Integrated
DC Surge Protection	Type II	Type II	Type II	Type II
AC Surge Protection	Type II	Type II	Type II	Type II
AFCI	Integrated			

Technical Data	GW7K3-MS-G40	GW7K3-MS-G41	GW9K1-MS-G40	GW10K5-MS-G40
Emergency Power Off	Optional	Optional	Optional	Optional
Rapid Shutdown	Optional	Optional	Optional	Optional
Remote Shutdown	Optional	Optional	Optional	Optional
Power Supply at Night	Optional	Optional	Optional	Optional
General Data				
Operating Temperature Range (℃)	-25~+60	-25~+60	-25~+60	-25~+60
Relative Humidity	0~100%	0~100%	0~100%	0~100%
Max. Operating Altitude (m)	4000	4000	4000	4000
Cooling Method	Natural Convection	Natural Convection	Natural Convection	Natural Convection
User Interface	LED, LCD, WLAN + APP	LED, LCD, WLAN + APP	LED, LCD, WLAN + APP	LED, LCD, WLAN + APP
Communication	RS485, WIFI, LAN, Bluetooth，4G	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	16

Technical Data	GW7K3-MS-G40	GW7K3-MS-G41	GW9K1-MS-G40	GW10K5-MS-G40
Dimension W×H×D (mm)	493*365*187	493*365*187	493*365*187	493*365*187
Noise Emission (dB)	< 30	< 30	< 30	< 30
Topology	Non-isolated	Non-isolated	Non-isolated	Non-isolated
Self-consumption at Night (W)	<1	<1	<1	<1
Ingress Protection Rating	IP66	IP66	IP66	IP66
Anti-corrosion Class	C4	C4	C4	C4
DC Connector	MC4(4-6mm^2)	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	4K4H
Pollution Degree	III	III	III	III
Overvoltage Category	DC II / AC III	DC II / AC III	DC II / AC III	DC II / AC III
Protective Class	I	I	I	I
The Decisive Voltage Class (DVC)	PV: C AC: C Com: A			

Technical Data	GW7K3-MS-G40	GW7K3-MS-G41	GW9K1-MS-G40	GW10K5-MS-G40
Active Anti-islanding Method	SMS(Slip-mode frequency) +AFD*4			
Country of Manufacture	China	China	China	China

*1: The actual value depends on the specific input power of PV panel.
*2: When the input voltage ranges from 560 V to 600 V, the inverter will enter the standby state. When the input voltage returns to the MPPT operating voltage range of 40 V to 560 V, the inverter will resume normal operating state.
*3: For Brazil, and Chile, the Max. AC output power is Pn, , such as the max. AC output power of GW7K3-MS-G40 is 7.3kW
*4: AFD: Active Frequency Drift with Positive Feedback

10 Glossary

Overvoltage Category Definitions

- **Overvoltage Category I**: Equipment connected to circuits with measures that limit transient overvoltages to a relatively low level.
- **Overvoltage Category II**: Energy-consuming equipment supplied by fixed electrical installations. This category includes appliances, portable tools, and other household and similar loads. Overvoltage Category III applies when special requirements for the reliability and suitability of such equipment must be met.
- **Overvoltage Category III**: Equipment in fixed electrical installations, for which special requirements for reliability and suitability must be met. This includes switching devices in fixed electrical installations and industrial equipment permanently connected to fixed electrical installations.
- **Overvoltage Category IV**: Equipment used at the power supply of an electrical installation, including measuring instruments and upstream overcurrent Protection devices.
- **Definitions of Humid Location Categories**

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

- **Environmental Category Definitions:**
  - **Outdoor inverter**: Ambient air temperature range: -25 to +60°C; suitable for environments with Pollution Degree 3;
  - **Indoor Type II inverter**: Ambient air temperature range: -25 to +40°C; suitable for environments with Pollution Degree 3;
  - **Indoor Type I inverter**: Ambient air temperature range: 0 to +40°C; suitable for environments with Pollution Degree 2;
- **Pollution Degree Category Definitions**
  - **Pollution Degree 1**: No pollution or only dry, non-conductive pollution;
  - **Pollution Degree 2**: Normally, only non-conductive pollution occurs; however, occasional temporary conductivity caused by condensation must be expected;

- **Pollution Degree 3**: Conductive pollution is present, or non-conductive pollution becomes conductive due to condensation;
- **Pollution Degree 4**: Persistent conductive pollution, such as pollution caused by conductive dust, rain, or snow.

11 Related Product Manuals

Document Title	Official Website Link
EzLink3000Quick 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-G21Quick Installation Guide	https://www.goodwe.com/Ftp/Installation-instructions/4G-KIT.pdf
WiFi/LAN Kit-20 & WiFi Kit-20 Quick Installation Guide	https://www.goodwe.com/Ftp/Installation-instructions/WiFi-LAN-Kit-20.pdf
GMK110 & GMK110D Quick Installation Guide	https://www.goodwe.com/Ftp/Installation-instructions/GMK110-110D.pdf
GM1000 & GM3000 & GM1000Quick Installation Guide	https://www.goodwe.com/Ftp/Installation-instructions/Smart-Meter.pdf
GMK330 & GMK360 & GM330 Quick Installation Guide	https://www.goodwe.com/Ftp/Installation-instructions/GMK330-360.pdf

12 Contact Details

GoodWe Technologies Co., Ltd.
No. 90 Zijin Rd., New District, Suzhou, China
en.goodwe.com
service@goodwe.com