V1.0 2025-7-20

Commercial & Industrial Grid-tied Inverter

SMT G2 35-60kW

- **GW35K-SMT-L-G20**
- **GW37.5K-SMT-L-G20**
- **GW60K-SMT-G20**

User Manual

GOODWE

Copyright Statement

NOTICE

The information in this user manual is subject to change due to product updates or other reasons. This guide cannot replace the notices and warnings of the device unless otherwise specified. All descriptions in the manual are for guidance only.

Table of Contents

1 About This Manual

This manual describes the product information, installation, electrical connection, commissioning, troubleshooting, and maintenance. Read through this manual before installing and operating the product. All the installers and users have to be familiar with the product features, functions, and safety precautions. This manual is subject to update without notice. For more product details and latest documents, visit www.goodwe.com.

1.1 Applicable Model

This manual applies to the listed inverters below :

Model	Nominal Output Power	Nominal Output Voltage
GW60K-SMT-G20	60kW	220/380V, 230/400V, 3L/N/PE or 3L/PE
GW35K-SMT-L-G20	35kW	127/220V, 3L/N/PE or 3L/PE
GW37.5K-SMT-L-G20	37.5kW	

1.2 Target Audience

This manual applies to trained and knowledgeable technical professionals. The technical personnel has to be familiar with the product, local standards, and electric systems.

1.3 Symbol Definition

Different levels of warning messages in this manual are defined as follows:

⚠DANGER
Indicates a high-level hazard that, if not avoided, will result in death or serious injury.

⚠WARNING

Indicates a medium-level hazard that, if not avoided, could result in death or serious injury.

⚠CAUTION

Indicates a low-level hazard that, if not avoided, could result in minor or moderate injury.

NOTICE

Highlights key information and supplements the texts. Or some skills and methods to solve product-related problems to save time.

2 Safety Precaution

⚠WARNING

The inverters are designed and tested strictly to comply with related safety rules. Read and follow all the safety instructions and cautions before any operations. Improper operation might cause personal injury or property damage.

2.1 General Safety

NOTICE

- The information in this user manual is subject to change due to product updates or other reasons. This guide cannot replace the notices and warnings of the device unless otherwise specified. All descriptions in the manual are for guidance only.
- Before installations, read through the user manual to learn about the product and the precautions.
- All installations should be performed by trained and knowledgeable technicians who are familiar with local standards and safety regulations.
- When operating the equipment, insulated tools must be used and personal protective equipment must be worn to ensure personal safety. Wear anti-static gloves, cloths, and wrist strips when touching electronic components to protect the inverter from damage.
- Strictly follow the installation, operation, and configuration instructions in this manual. The manufacturer shall not be liable for equipment damage or personal injury if you do not follow the instructions. For more warranty details, visit :https://www.goodwe.com/support-service/warranty-related.

2.2 DC Side

⚠DANGER

- Connect the DC cables using the provided DC connectors and terminals. The manufacturer shall not be liable for equipment damage if other connectors or terminals are used.
- Confirm the following information before connecting the PV string to the inverter. Otherwise, the inverter may be damaged permanently or even cause fire and cause personal and property losses. Damage and injury caused by failure to operate in accordance with the requirements of this document or the corresponding user manual are not covered by the warranty.
  - Make sure that the positive pole of the PV string connects to the PV+ of the inverter. And the negative pole of the PV string connects to the PV- of the inverter.
  - Make sure that the open circuit voltage of the PV string connected to each MPPT shall not exceed Max.Input Voltage.
    - 60K: Max.Input Voltage is 1100V
    - 35K&37.5K: Max.Input Voltage is 900V
  - For 60kW inverters: when the input voltage ranges from 1000V to 1100V, the inverter will enter the standby state; when the input voltage returns to the MPPT operating voltage range, the inverter will resume normal operating state.
  - Ensure that the voltage difference between different MPPT channels is less than or equal to 150V.

⚠WARNING

- Ensure that the PV module frames and the PV mounting system are securely grounded.
- Ensure that the DC cables are connected tightly and securely.
- The PV modules used with the inverter must have an IEC61730 class A rating.
- Make sure that the PV strings connected to the same MPPT should contain the same model and number of identical PV modules.
- To maximize the power generation of the inverter, please ensure that the Vmp of the PV modules connected in series is within the MPPT Voltage Range at Nominal Power of the inverter, as shown in the Technical Parameters.
- Make sure that the input current of each MPPT does not exceed the Max. Input Current per MPPT, as shown in the the Technical Parameters.
- When there are multiple PV string inputs, please connect them to as much inverter MPPTs as possible.

2.3 AC Side

⚠WARNING

- The inverter can only be connected to the power grid after obtaining the grid access permission.
- The voltage and frequency at the connecting point should meet the on-grid requirements.
- An additional protective device like the circuit breaker or fuse is recommended on the AC side. Specification of the protective device should be at least 1.25 times the Max. output current of the inverter.
- Copper is recommended for the AC output cables. Aluminium cables are allowed, but only with the addition of copper to aluminium adapter terminals.

2.4 Inverter Side

⚠DANGER

- Do not apply mechanical load to the terminals, otherwise they can be damaged.
- All labels and warning marks must be clear and distinct after the installation. Do not block, alter, or damage any label.

Warning labels on the inverter are as follows.

No.	Mark	Explanation
1		There are potential hazards during equipment operation. Please take protective measures when operating the equipment.
2		High voltage hazard. High voltage exists when the equipment is in operation. Ensure the equipment is powered off before performing any operations on it.
3		The surface of the inverter may become hot. Do not touch it when the equipment is running, otherwise, it may cause burns.
4		Delayed discharge. Wait for 5 minutes to allow it to discharge completely after the equipment is powered off.
5		Read the product manual carefully before operating the equipment.
6		Do not dispose of the inverter as household waste. Discard the product in compliance with local laws and regulations, or send it back to the manufacturer.
7		PE connection point.
8		CE marking

2.5 Declaration of Conformity (DoC)

2.5.1 Devices with wireless communication functionality

Devices with wireless communication functionality that can be sold on the European

market must comply with the following directive requirements:

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

2.5.2 Devices without wireless communication functionality

Devices without wireless communication functionality that can be sold on the European market must comply with the following directive requirements:

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

2.6 Personnel Requirements

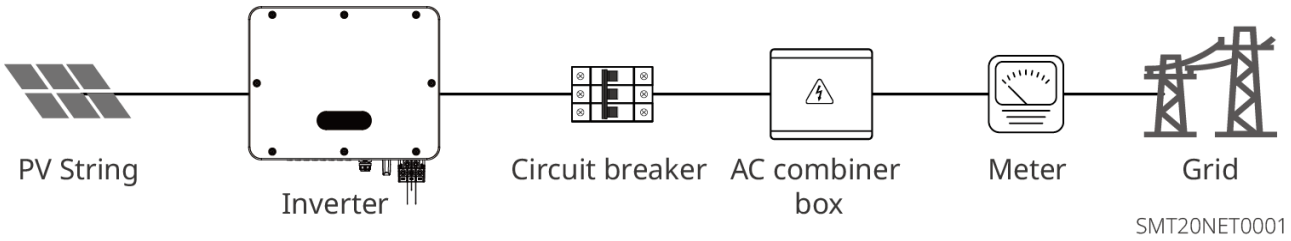
NOTICE

- Personnel who install or maintain the equipment must be strictly trained, learn about safety precautions and correct operations.
- Only qualified professionals or trained personnel are allowed to install, operate, maintain, and replace the equipment or parts.

3 Product Introduction

3.1 Application Scenarios

The SMT inverter is a three-phase PV string grid-tied inverter. The inverter converts the DC power generated by the PV module into AC power and feeds it into the utility grid. The intended use of the inverter is as follows:



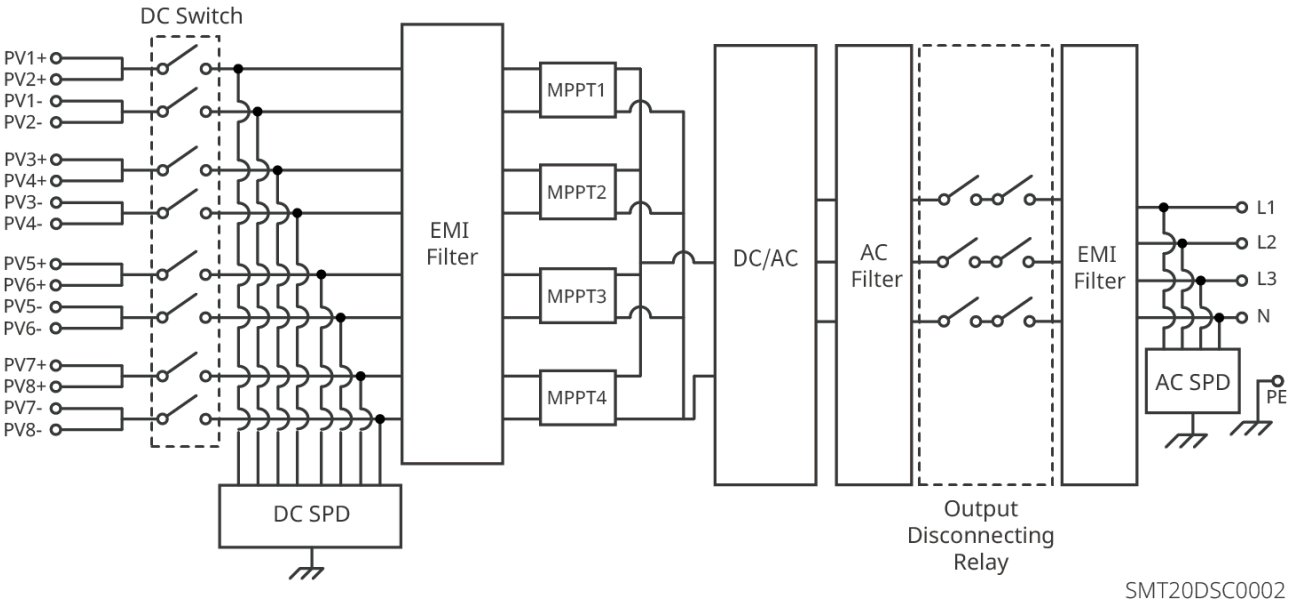
SMT20NET0001

3.1 Model Description

SMT20DSC0009

No.	Definition	Explanation
1	Brand Code	GW: GoodWe
2	Rated Power	35K: Nominal output power is 35kW
3	Series Name	SMT: SMT series
4	Low Voltage	L: Low voltage version
5	Version Code	G20: Second-generation product

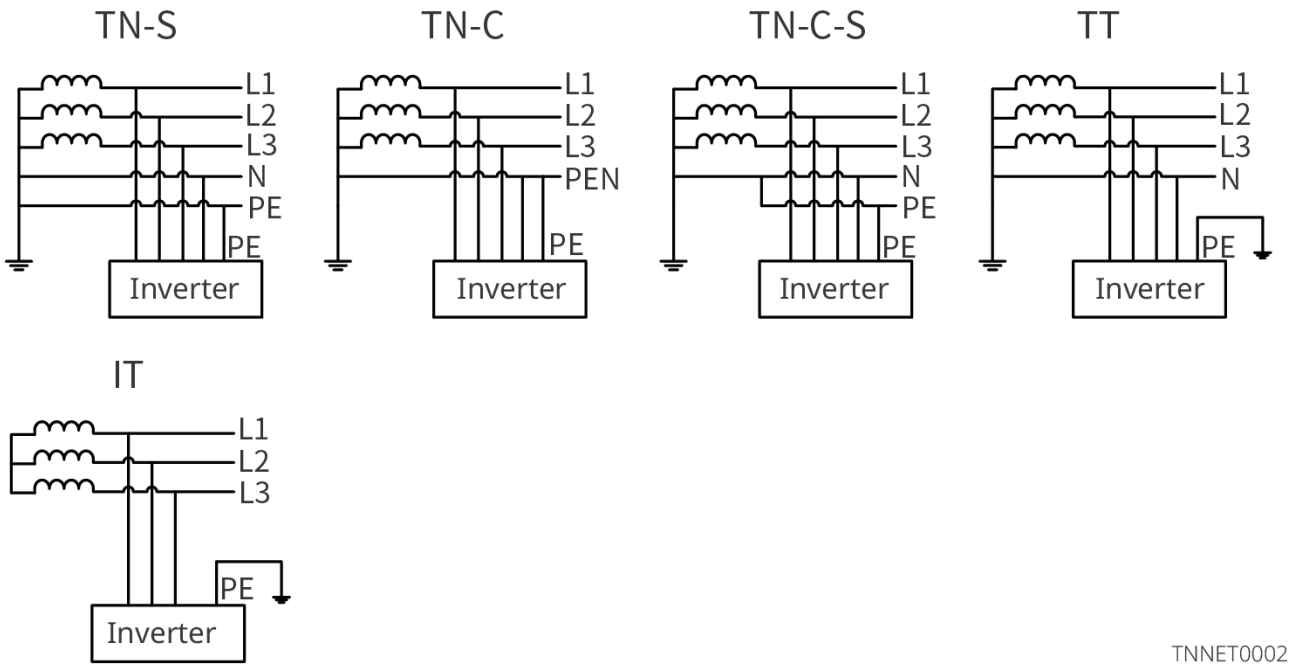
3.2 Circuit Diagram



3.3 Supported Grid Types

NOTICE

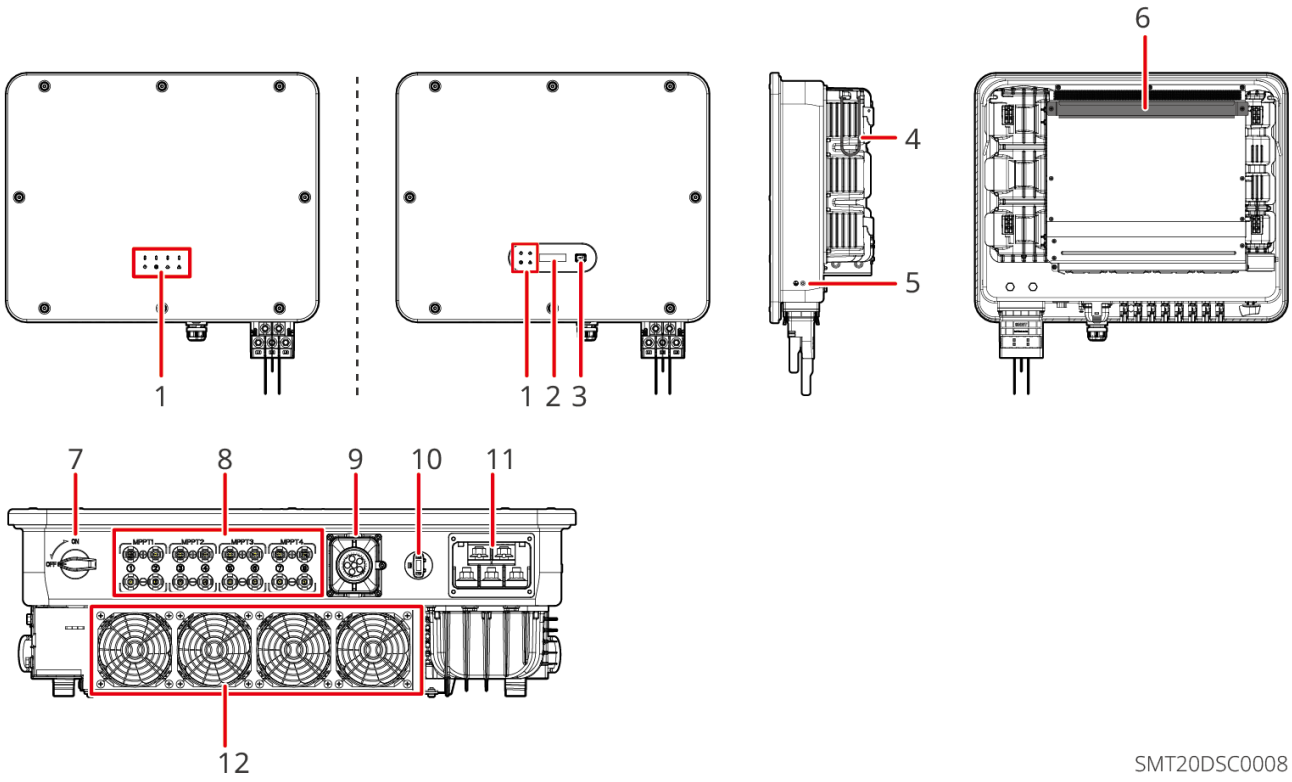
- For the TT grid structure, the effective value of the voltage between the neutral wire and the ground wire must be less than 20V.
- For power grids connected to the neutral wire, the voltage between N and earth must be less than 10V.



3.4 Appearance & Dimensions

Inverters of different models may vary in color and appearance; please refer to the actual product for details.

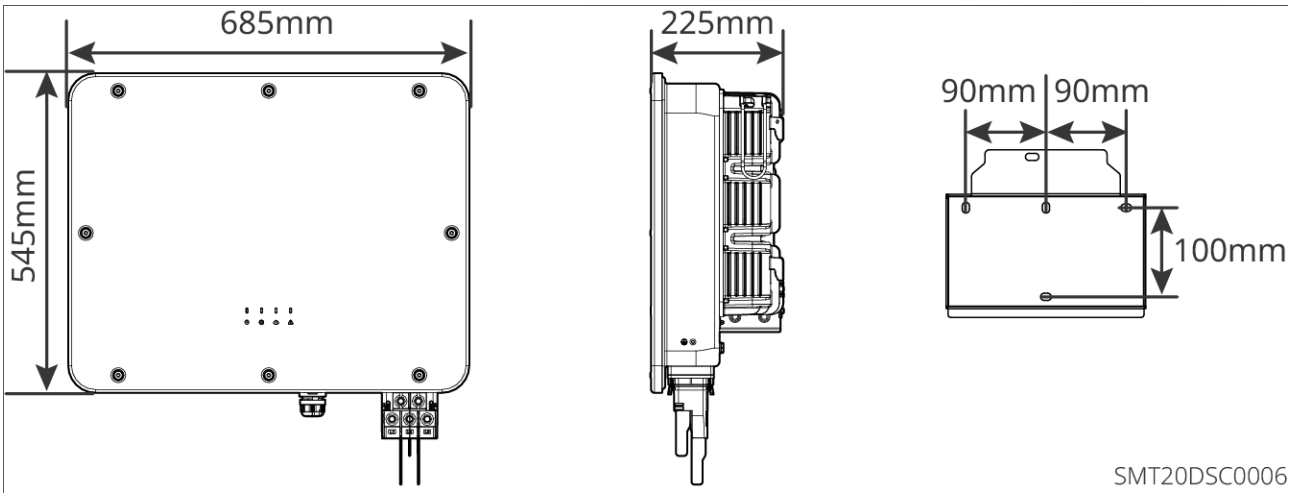
3.4.1 Appearance



No.	Parts	Description
1	LED Indicators (Without screen)	Indicate the operating status of the inverter
1	LED Indicators (With screen)	
2	LCD screen (Optional)	Check relevant information of the inverter.
3	Button (Optional)	To control contents displayed on the screen.
4	Handle	Used to move the inverter
5	Grounding Port	To connect the PE cable.
6	Mounting Hardware	Used to mount the inverter onto the back panel.

No.	Parts	Description
7	DC Switch	To control the connection or disconnection of DC input MPPT1-4.
8	PV Input Port	Used to connect PV strings.
9	Communication Port	Includes multiple communication interfaces such as RS485, RCR, DRM, etc., for connecting communication cables corresponding to their functions.
10	Smart Dongle Port	Used to connect a smart dongle. Please select the corresponding smart dongle according to actual needs.
11	AC Output Port	Used to connect AC cables.
12	Fan	Used for cooling the device.

3.4.2 Dimensions

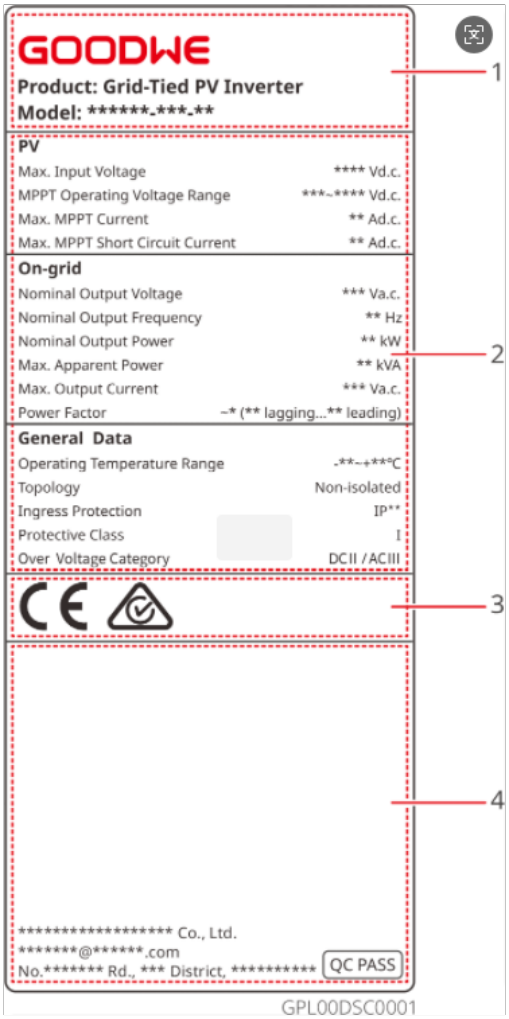


3.4.3 LED Indicators

Indicator	Status	Description
Power Supply		ON: THE INVERTER IS POWERED ON
		OFF: THE INVERTER IS POWERED OFF
Operation		ON: THE INVERTER IS FEEDING POWER TO THE GRID
		OFF: THE INVERTER IS NOT FEEDING POWERTO THE GRID
		SINGLE SLOW FLASH: SELF CHECK BEFORE CONNECTING TO THE GRID
		SINGLE FLASH CONNECTING TO THE GRID
Communication		ON: WIRELESS IS CONNECTED/ACTIVE
		BLINK 1: WIRELESS SYSTEM IS RESETTING
		BLINK 2: WIRELESS ROUTER PROBLEM
		BLINK 4: WIRELESS SERVER PROBLEM
		BLINK : RS485 IS CONNECTED
		OFF: WIRELESS IS RESTORE FACTORY SETTINGS
Fault		ON: A FAULT HAS OCCURRED
		OFF: No FAULT

3.4.4 Nameplate

The nameplate is for reference only.



1	2	3	4
Goodwe trademark, product type, and product model	Technical parameters	Safety symbols and certification marks	Contact information and serial number

3.5 Functionalities

3.5 AFCI

Inverters with AFCI functionality have built-in dedicated current sensors to detect high-frequency current signals and determine whether an arc fault occurs. If an arc fault is detected, the inverter can automatically perform self-protection.
Reason to occur electric arcs:

- Damaged connectors in PV system.
- Wrong connected or broken cables.
- Aging connectors and cables.

Method to detect electric arcs:

- The inverter integrates the AFCI function and complies with the IEC 63027 standard.
- When the inverter detects an arc, the time and phenomenon of the alarm can be viewed through the App.
- After the inverter triggers an AFCI alarm, it will shut down for protection. Once the alarm is cleared, the inverter will automatically reconnect to the grid and resume operation.
  - Automatic reconnection: If the inverter triggers the AFCI alarm less than 5 times within 24 hours, the alarm will be automatically cleared after 5 minutes, and the inverter will reconnect to the grid and work again.
  - Manual reconnection: If the inverter triggers the 5th AFCI alarm within 24 hours, the alarm must be cleared manually before the inverter can reconnect to the grid and operate. For specific operations, please refer to the SolarGo App User Manual.

Model	Label	Description
GW60K-SMT-G20	F-I-AFPE-1-4-2	F (Full coverage): Full coverage of inverter PV input ports I (Integrated): Integrated into the inverter AFPE (Arc Fault Protection Equipment): Combines two arc detection functions, AFD and AFI 1: One pair of PV input ports (PV+, PV-) connected to one string of PV input 4: Number of PV input ports detected by one arc detection sensor 2: Quantity of arc detection sensors
GW35K-SMT-L-G20		
GW37.5K-SMT-L-G20		

NOTICE

- The AFCI function is standard-equipped for the Brazilian market and is enabled by default at the factory.
- For other regions, the AFCI function is optional and disabled by default at the factory. If you need to use it, please enable the "Arc Detection" function through the "Advanced Settings" interface on the SolarGo App.

3.5 PID repair (optional)

During operation of photovoltaic panels, due to the potential difference between the output electrode and the grounded frame of the panel, long-term operation may lead to attenuation of the panel's power generation efficiency, which is known as the Potential Induced Degradation (PID) effect.
The PID function of this device works by raising the voltage difference between the photovoltaic panel and the frame to create a positive voltage difference (referred to as positive voltage elevation), thereby achieving the effect of PID suppression. It is applicable to P-type panels and N-type panels that require positive voltage elevation to suppress the PID effect. For N-type panels that require negative voltage reduction to suppress the PID effect, it is recommended to disable this function. For information on whether an N-type module belongs to the type that requires positive voltage elevation for PID suppression, please consult the module supplier.

3.6 Inverter Operation Mode

No.	Mode	Description
1	Waiting Mode	Waiting stage after the inverter is powered on. • When the conditions are met, the inverter enters the self-check mode. • If there is a fault, the inverter enters the fault mode. • If received an upgrade request, the inverter enters the upgrading mode.
2	Self-check Mode	Before the inverter starts up, it continuously performs self-check, initialization, etc. • When the conditions are met, the inverter enters the grid-tied mode, and the inverter starts on-grid connection. • If received an upgrade request, the inverter enters the upgrading mode. • If the self-check does not passed, it enters the fault mode.
3	Grid-tied Mode	The inverter has connected to the grid and is operating normally. • If a fault is detected, it enters the fault mode. • If received an upgrade request, the inverter enters the upgrading mode.
4	Fault Mode	If a fault is detected, the inverter enters the fault mode. When the fault is cleared, it enters the waiting mode. When the waiting mode ends, the inverter detects the running status and it enters the next mode.
5	Upgrading Mode	Inverters enter this mode when the firmware update process is initiated. After the upgrading, the inverter enters the waiting mode. When the waiting mode ends, the inverter detects the running status and it enters the next mode.

4 Check and Storage

4.1 Check

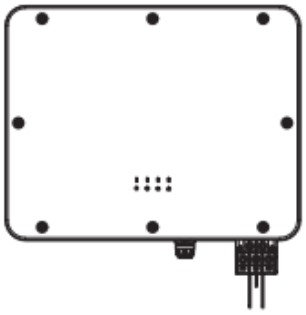
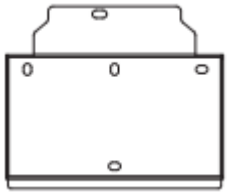
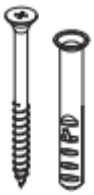
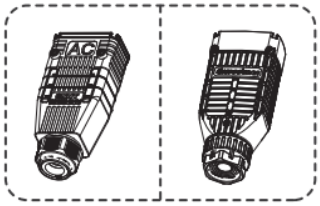
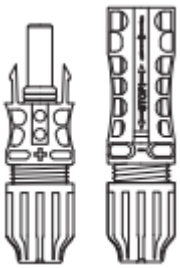
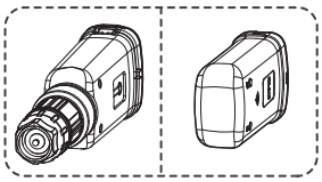
Check the following items before receiving the product.

1. Check the outer packing box for damage, such as holes, cracks, deformation, and others signs of equipment damage. Do not unpack the package and contact the supplier as soon as possible if any damage is found.
2. Check the inverter model. If the inverter model is not what you requested, do not unpack the product and contact the supplier.
3. Check the package content to make sure that the correct model is provided and there is no damage, and if nothing is missing. If that is not the case, contact the supplier.

4.2 Deliverables

NOTICE

- For electrical connection, please use the terminal blocks shipped with the package. Damage to the equipment caused by using incompatible connectors will not be covered by the warranty.
- Depending on the inverter configuration, the quantities of fastening screws and pinhole terminals shipped with the package may vary; please refer to the actual items.
- "N" indicates that the quantity of accessories shipped with the package depends on the product configuration.

Deliverables	Quantity	Deliverables	Quantity
	Inverter x1		Mounting plate x1
	Expansion bolt x4		AC protective cover × 1
	Positive PV connectors × 8 Negative PV connectors × 8		Smart dongle x1
	Grounding terminal × 1		PIN terminals x N
	6pin terminals × N		2pin terminals × N

Deliverables	Quantity	Deliverables	Quantity
	DC connector wrench × 1		Document x1

4.3 Storage

If the equipment is not to be installed or used immediately, please ensure that the storage environment meets the following requirements:

1. Do not unpack the outer package or throw the desiccant away.
2. Store the equipment in a clean place. Make sure the temperature and humidity are appropriate and no condensation.
3. Follow the instructions on the packing box when stacking the inverters.
4. Stack with caution to prevent them from falling over.
5. If the inverter has been long term stored, it should be checked by professionals before being put into use.
6. To ensure the good electrical performance of the electronic components inside the inverter, it is recommended to power it on once every 6 months during storage. If it has not been powered on for more than 6 months, it is advisable to have it inspected and tested by professionals before putting it into use.

5 Installation

5.1 Installation Requirements

Installation Environment Requirements

1. Do not install the equipment in a place near flammable, explosive, or corrosive materials.
2. Install the equipment on a surface that is solid enough to bear the inverter weight.
3. Install the equipment in a well-ventilated place to ensure good dissipation. Also, the installation space should be large enough for operations.
4. The equipment with a high ingress protection rating can be installed indoors or outdoors. The temperature and humidity at the installation site should be within the appropriate range.
5. Install the equipment in a sheltered place to avoid direct sunlight, rain, and snow. Build a sunshade if it is needed.
6. Do not install the equipment in a place that is easy to touch, especially within children's reach. High temperature exists when the equipment is working. Do not touch the surface to avoid burning.
7. Install the inverters far away from noise-sensitive areas, such as the residential area, school, hospital etc., in order to avoid the noises bothering people nearby.
8. The installation altitude of the inverter must be lower than the maximum operating altitude of 4000m.
9. Inverters installed in salt-damaged areas may suffer from corrosion. Salt-damaged areas refer to areas within 1000m of the coast or affected by sea winds. The areas affected by sea wind vary depending on meteorological conditions (such as typhoons, seasonal winds) or terrain (with embankments, hills).
10. Install the inverter away from high magnetic field to avoid electromagnetic interference. If there is any radio or wireless communication equipment below 30MHz near the inverter, you have to:

- Add a low pass EMI filter or a multi winding ferrite core to the DC input cable or AC output cable of the inverter.
- Install the inverter at least 30m far away from the wireless equipment.

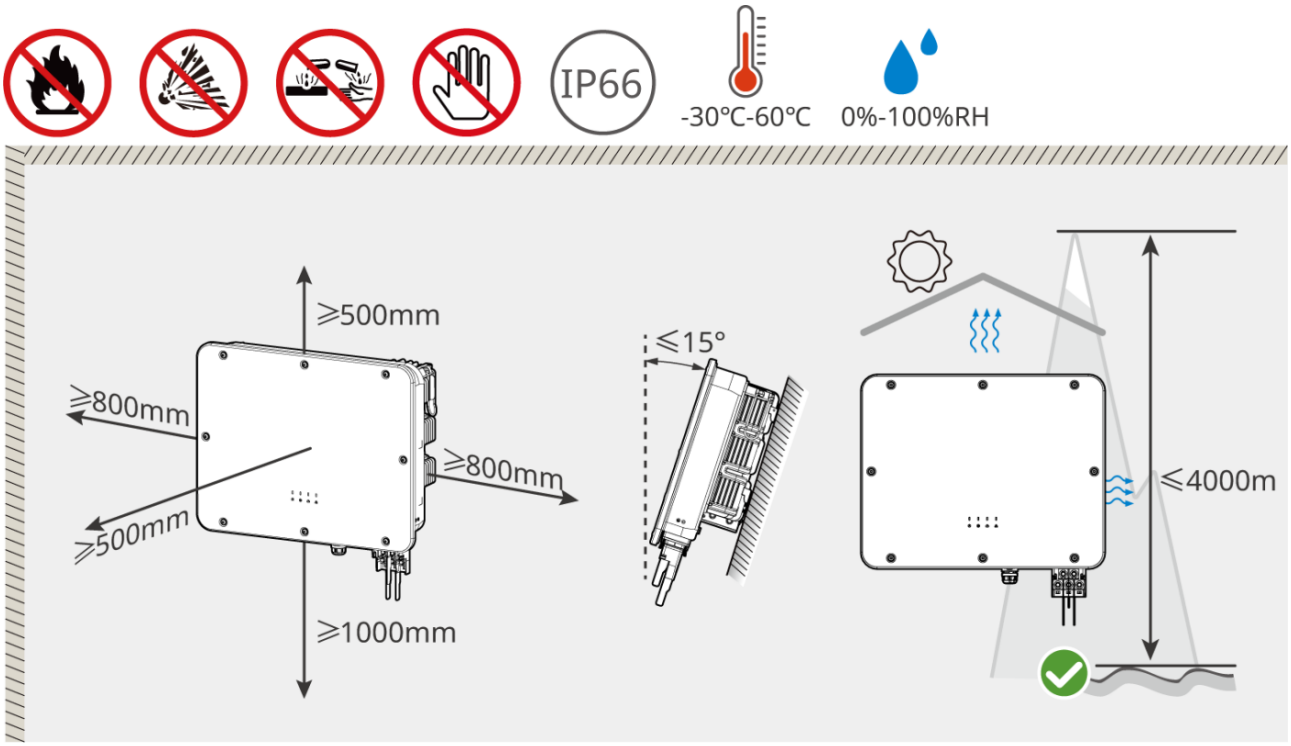
Mounting Support Requirements

- The mounting support shall be nonflammable and fireproof.

- Make sure that the support surface is solid enough to bear the product weight load.
- During operation, the device will generate vibrations. Do not install it on a carrier with poor sound insulation, to avoid noise from the operating device causing disturbance to residents in the living area.

Installation Angle Requirements

- Install the inverter vertically, with at maximum possible back tilt of 15 degrees.
- Do not install the inverter upside down, forward tilt, back forward tilt, or horizontally.



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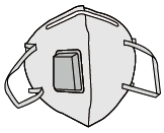
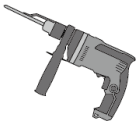
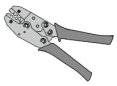
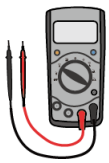
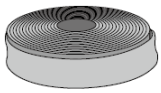
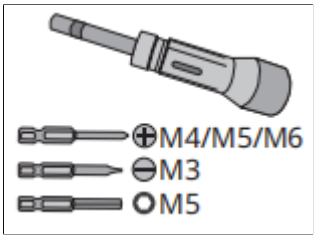
Installation Tool Requirements

The following tools are recommended when installing the equipment. Use other auxiliary tools on site if necessary.

Tool Type	Explanation	Tool Type	Explanation
	Safety gloves		Dust mask
	Goggles		Safety shoes
	Socket wrench (M8)		Hammer drill
	Wire cutters		Heat gun
	Wire stripper		Terminal crimping tool
	Rubber hammer		Marker
	Multimeter		Heat shrink tube

Tool Type	Explanation	Tool Type	Explanation
	Vacuum cleaner		Level
	Torque screwdriver (Slotted head: M2; Phillips head: M5)		Cable tie

5.2 Inverter Installation

5.2.1 Moving the Inverter

⚠CAUTION

Move the inverter to the site before installation. Follow the instructions below to avoid personal injury or equipment damage.

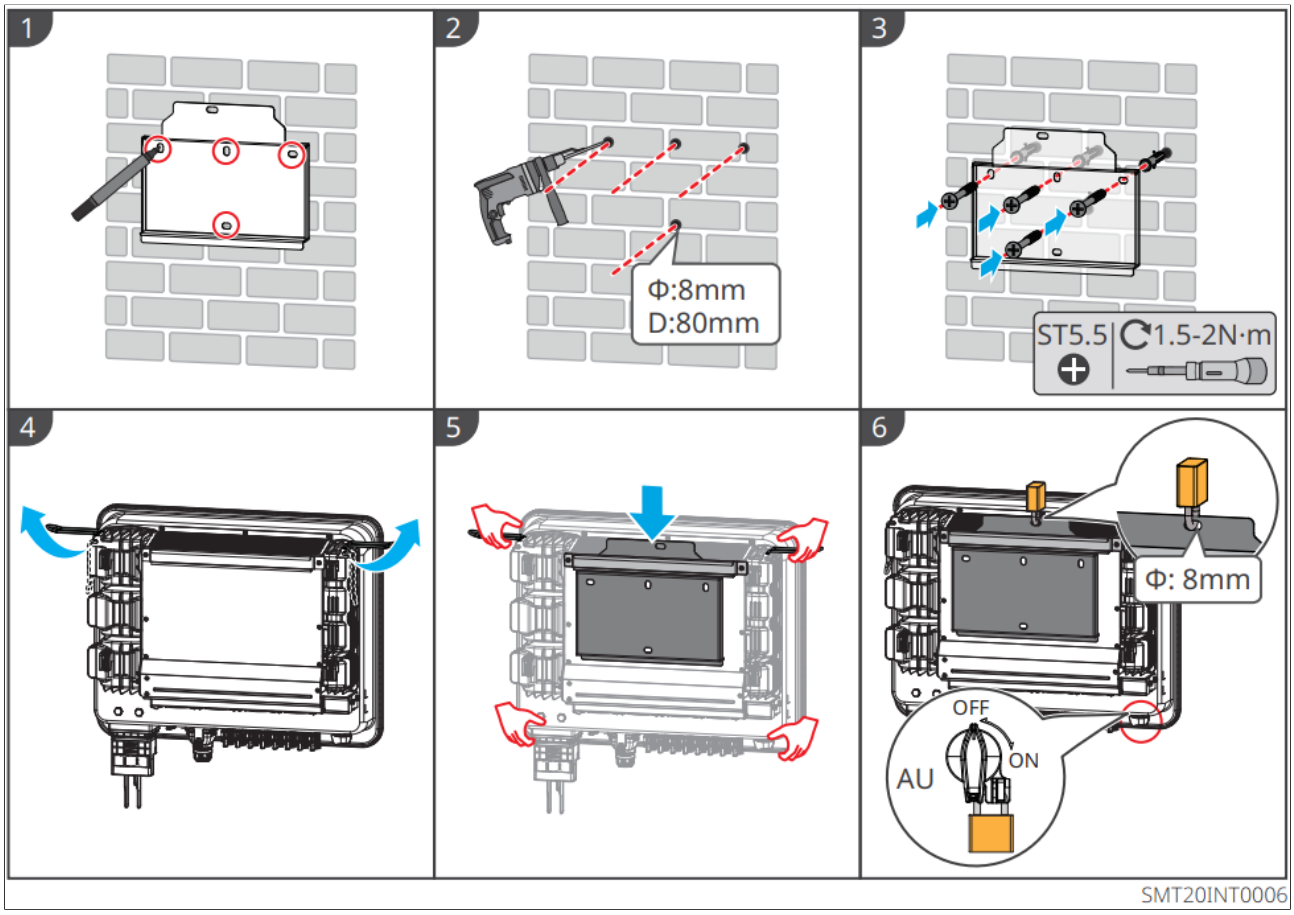
1. Consider the weight of the equipment before moving it. Assign enough personnel to move the equipment to avoid personal injury.
2. Wear safety gloves to avoid personal injury.
3. Keep balance when moving the equipment.

5.2.2 Installing the Inverter

NOTICE

- Avoid the water pipes and cables buried in the wall when drilling holes.
- Wear goggles and a dust mask to prevent the dust from being inhaled or contacting eyes when drilling holes.
- Ensure that the drilling positions avoid water pipes, cables, etc., inside the wall to prevent hazards.
- If a bracket is required for installing the inverter, please prepare the bracket yourself and secure it properly.
- If handles or lifting rings are needed, please contact the after-sales service center to purchase them.
- The graphic appearance in this document is for reference only. Inverters of different models or different versions of the same model may vary in appearance, please refer to the actual product.

Step 1: Place the mounting plate horizontally on the wall and mark the drilling positions with a marker pen.
Step 2: Drill holes to a depth of 80mm using the hammer drill. The diameter of the drill bit should be 8mm.
Step 3: Use expansion screws to fix the back plate to the wall.
Step 4: Open the handles on both sides of the inverter.
Step 5: The installer should carry the inverter by holding the handles and hang it on the back plate.
Step 6: (Optional) Lock the inverter and the switch.


1
2
Φ:8mm
D:80mm
3
ST5.5
1.5-2N·m
4
5
6
Φ: 8mm
OFF
ON
AU
SMT20INT0006

6 Electrical Connection

6.1 Safety Precautions

⚠DANGER

- Make sure the DC switch is in the OFF position, and the AC output cable is disconnected before any electrical work. Do not work with the power on.
- All operations in the electrical connection process, as well as the specifications of cables and components used, must comply with local laws and regulations.
- Leave enough cable slack to make sure there is no tension on the cables when connected to the corresponding terminal.

NOTICE

- Wear personal protective equipment like safety shoes, safety gloves, and insulating gloves during electrical connections.
- All electrical connections should be performed by qualified professionals.
- Cable colors in this document are for reference only. The cable specifications should meet local laws and regulations.
- The graphic appearance in this document is for reference only. Inverters of different models or different versions of the same model may vary in appearance, please refer to the actual product.

6.1 Cable Requirement

Cable	Type	Outer Diameter (mm)	Cross-sectional Area (mm^2)
DC cables	PV cables meeting the 1100V standard	4.7~6.4	Recommended: 4~6

Cable	Type	Outer Diameter (mm)	Cross-sectional Area (mm^2)	
AC cables	Outdoor single-core/single conductor, four-core, five-core copper/aluminum cables	22~42	Copper core: 25~70	Aluminum core: 35~70
Protective earth wire	Outdoor cables	16~35		
Communication cables	Outdoor shielded twisted-pair cables meeting local standards	4.5~7	0.2~0.5	

Notes:

1. When using aluminum wires, copper-aluminum adapter terminals must be used.
2. The total length of communication wires must not exceed 1000m.
3. The values in this table are valid only when the external protective earthing conductor uses the same metal as the phase conductor. Otherwise, the cross-sectional area of the external protective earthing conductor shall be such that its electrical conductivity is equivalent to that specified in this table.

6.1 Specifications for RCD and AC circuit breaker:

Whether to install an RCD (Residual Current Device) shall be determined in accordance with local laws and regulations. The inverter can be externally connected to a type A RCD for protection when the DC component of the leakage current exceeds the limit value. The following RCD specifications are for reference:

Inverter Model	GW35K-SMT-L-G20	GW37.5K-SMT-L-G20	GW60K-SMT-G20
RCD Specifications	≥600mA		

To ensure that the inverter and the grid can be safely disconnected in case of

abnormal conditions, please connect an AC circuit breaker to the AC side of the inverter. Please select a suitable AC circuit breaker in accordance with local regulations. The following switch specifications are for reference:

Inverter Model	GW35K-SMT-L-G20	GW37.5K-SMT-L-G20	GW60K-SMT-G20
AC Circuit Breaker Specification	125A		

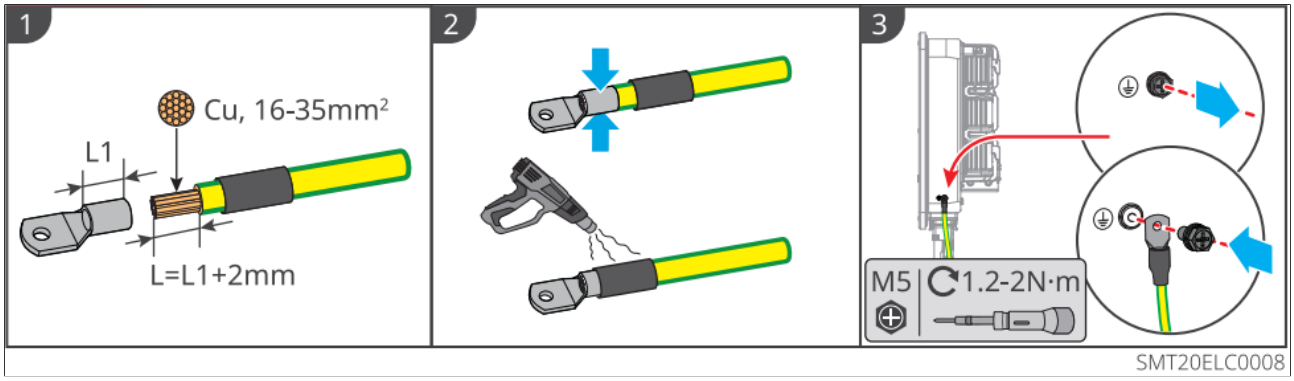
NOTICE

- Each inverter must be equipped with one AC circuit breaker, multiple inverters must not share a single AC circuit breaker.
- It is prohibited to connect loads between the inverter and the AC circuit breaker directly connected to the inverter.

6.2 Connecting the PE Cable

⚠WARNING

- The PE cable connected to the enclosure of the inverter cannot replace the PE cable connected to the AC output port. Both PE cables must be securely connected.
- Make sure that all the grounding points on the enclosures are equipotential connected when there are multiple inverters.
- To improve the corrosion resistance of the terminal, it is recommended to apply silica gel or paint on the ground terminal after installing the PE cable.
- Please prepare the protective earth wire and terminal blocks by yourself according to the recommended specifications.
- Other sizes of earth wires that comply with local standards and safety regulations can also be used for grounding connections. However, any damage caused thereby shall not be within the liability scope of the equipment manufacturer.



6.3 Connecting the AC Output Cable

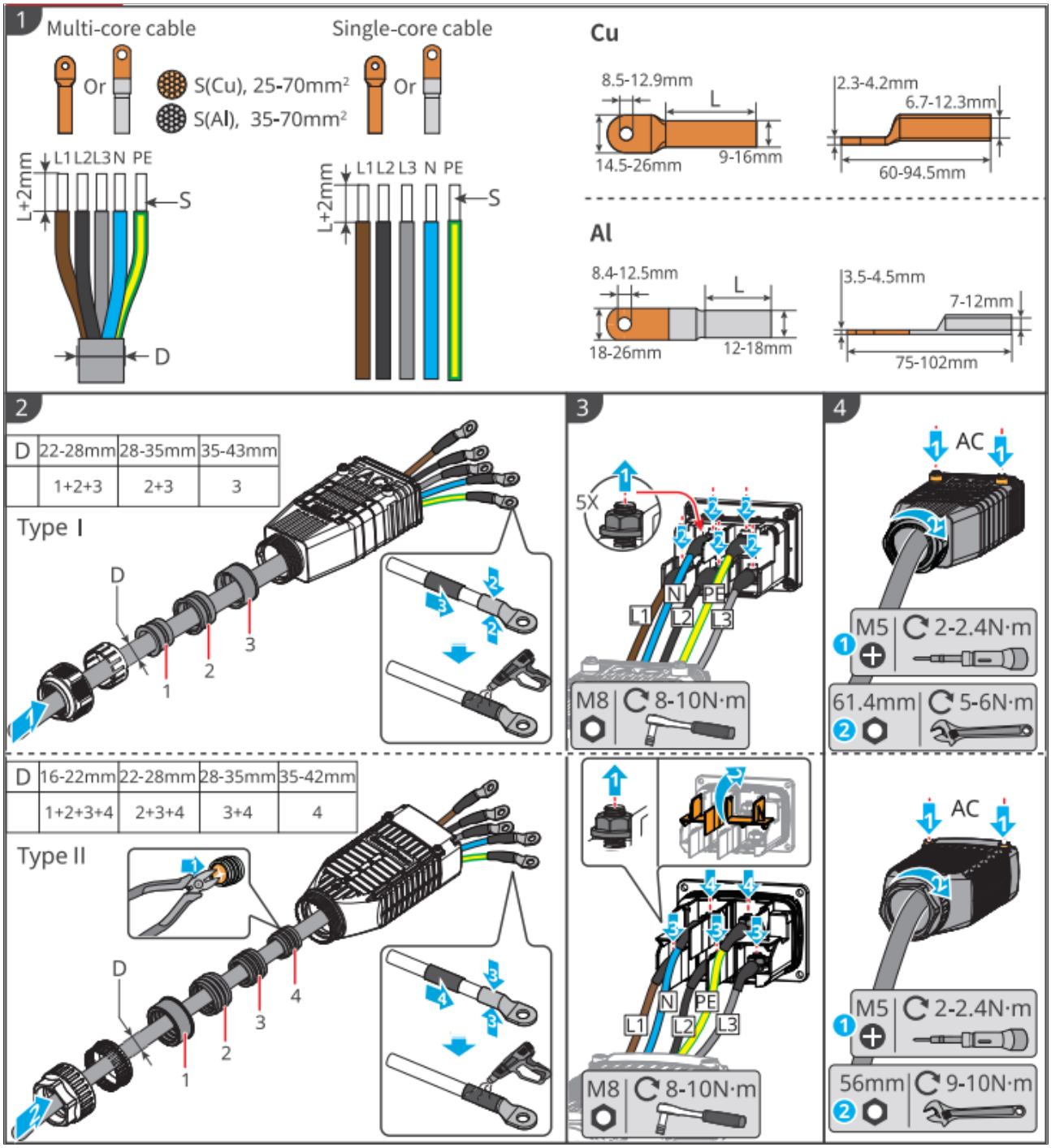
⚠WARNING

- When wiring, the AC output wires must be fully matched with the "L1", "L2", "L3", "N", and "PE" ports of the AC terminals. Incorrect cable connection will cause damage to the inverter.
- Ensure that the wire cores are fully inserted into the wiring holes of the AC terminals with no exposure.
- Ensure that the cable connections are tight. Otherwise, the terminal blocks may overheat during equipment operation, resulting in damage to the inverter.
- Copper is recommended for the AC output cables. Aluminium cables are allowed, but only with the addition of copper to aluminium adapter terminals.
- The AC terminals can be connected in three-phase four-wire or three-phase five-wire. The actual wiring method may be different. The figure below takes the three-phase five-wire as an example.
- The protective earth wire should be reserved with a length margin to ensure that the protective earth wire bears the stress last when the AC output wire is subjected to tension due to force majeure.

NOTICE

- The plug of the AC protective cover is suitable for single-strand multi-core wires. If multi-strand single-core wires are used, fireproof mud must be used to seal the AC protective cover.
- Please prepare fireproof mud that meets local environmental protection requirements by yourself.

Step 1: Prepare AC cables and corresponding terminals.
Step 2: Pass the AC cables through the AC protective cover in sequence, then crimp the OT terminals of the AC wires.
Step 3: Connect the AC cables.
Step 4: Install the AC protective cover.



6.4 Connecting DC Input Wires

⚠DANGER

1. Do not connect the same PV string to multiple inverters. Otherwise, it may cause damage to the inverters.
2. The positive and negative poles of the PV string are prohibited from being grounded. Before connecting the PV string to the inverter, ensure that the minimum insulation resistance of the PV string to the ground meets the minimum insulation impedance requirement.
3. Connect the DC cables using the provided DC connectors and terminals.
4. Confirm the following information before connecting the PV string to the inverter. Otherwise, the inverter may be damaged permanently or even cause fire and cause personal and property losses. Damage and injury caused by failure to operate in accordance with the requirements of this document or the corresponding user manual are not covered by the warranty.
   - Make sure that the positive pole of the PV string connects to the PV+ of the inverter. And the negative pole of the PV string connects to the PV- of the inverter.
   - Please ensure that the open-circuit voltage of the PV string connected to each MPPT does not exceed the maximum input voltage.
     - 60K: Max.Input Voltage is 1100V
     - 35K&37.5K: Max.Input Voltage is 900V
   - For 60kW inverters: when the input voltage ranges from 1000V to 1100V, the inverter will enter the standby state; when the input voltage returns to the MPPT operating voltage range, the inverter will resume normal operating state.
   - Ensure that the voltage difference between different MPPTs is <= 150V.

NOTICE

- PV strings of the same MPPT must use photovoltaic modules of the same model and quantity.
- To maximize the power generation of the inverter, please ensure that the Vmp of the PV modules connected in series is within the MPPT Voltage Range at Nominal Power of the inverter, as shown in the Technical Parameters.
- When there are multiple PV string inputs, please connect them to as much inverter MPPTs as possible.

PV String Connection Method:

• : Connect one string of PV modules
•• : Connect two strings of PV modules

Number of PV Strings	MPPT1	MPPT2	MPPT3	MPPT4
5	••	•	•	•
6	••	••	•	•
7	••	••	••	•
8	••	••	••	••

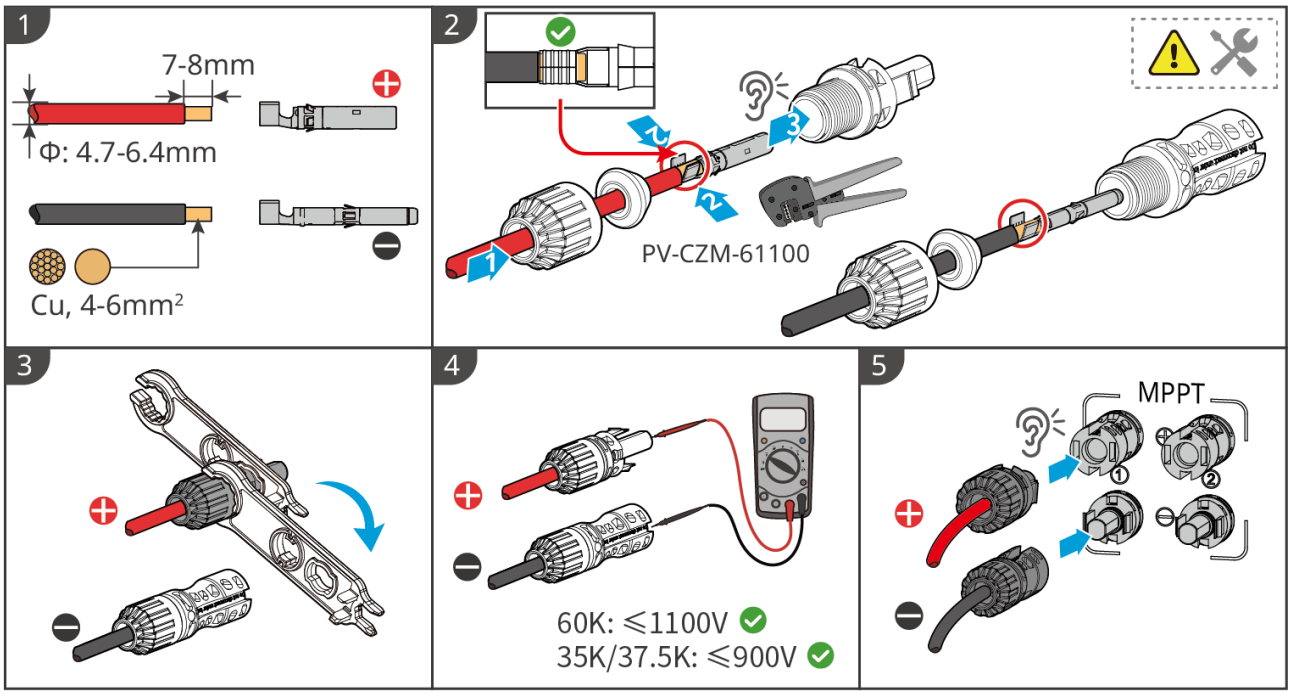
Wiring Steps

NOTICE

If the DC input port of the inverter is not connected, please install the dust cover in a timely manner. Otherwise, the protection level of the device will be affected.

Step 1: Prepare DC cables and PV terminals.
Step 2: Disassemble the DC connector, pass the DC cable through the DC connector, crimp the PV terminal, and then assemble the DC connector.
Step 3: Tighten the DC connector.
Step 4: Measure the voltage between the positive and negative poles of the photovoltaic module to ensure that the open-circuit voltage of the photovoltaic module does not exceed 1100V.

Step 5: Connect the DC connector to the DC port of the inverter.



SMT20ELC0009

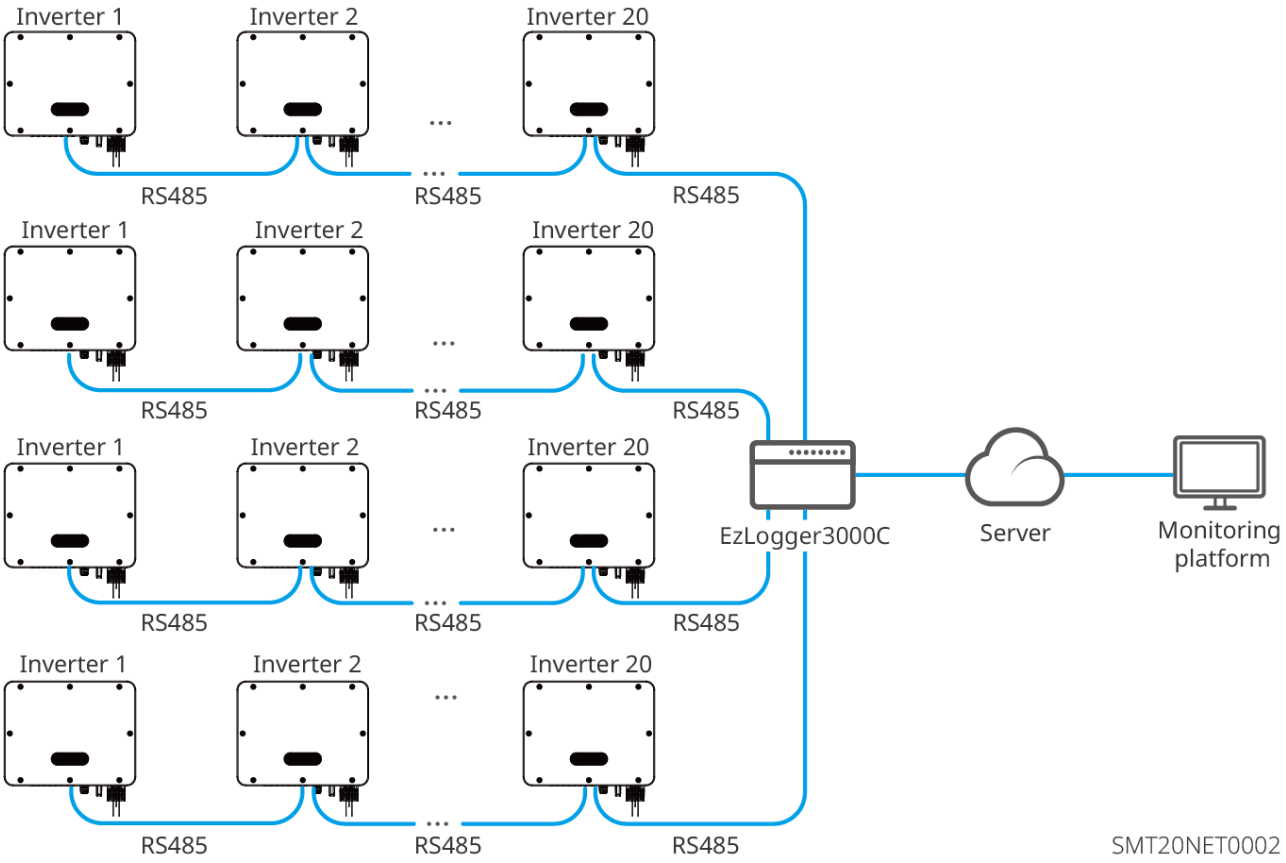
6.5 Communication

- The inverter supports connecting to other inverters, electric meters, data loggers (EzLogger3000C) and other devices via RS485 signals, enabling functions such as parallel networking and grid-connected export power limit.
- The inverter can be connected to a mobile phone or Web interface through a smart dongle to set relevant parameters of the device, view device operation information and error information, and upload system operation information to the monitoring platform, facilitating timely understanding of the system status.

6.5.1 RS485 Communication Networking

NOTICE

- If multiple inverters are connected to the EzLogger3000C for networking, the maximum number of inverters per COM port of the EzLogger3000C is 20, and the total length of the connecting cable should not exceed 1000m.
- It is recommended to use the communication cable with shielding layer, and make it grounded during wiring.



6.5.2 Power Export Limit

When all loads in the photovoltaic system cannot consume the electricity generated by the system, the remaining electricity will be fed into the grid. In this case, devices such as smart meters and data loggers can be used to monitor the system's power generation and control the amount of electricity fed into the grid.

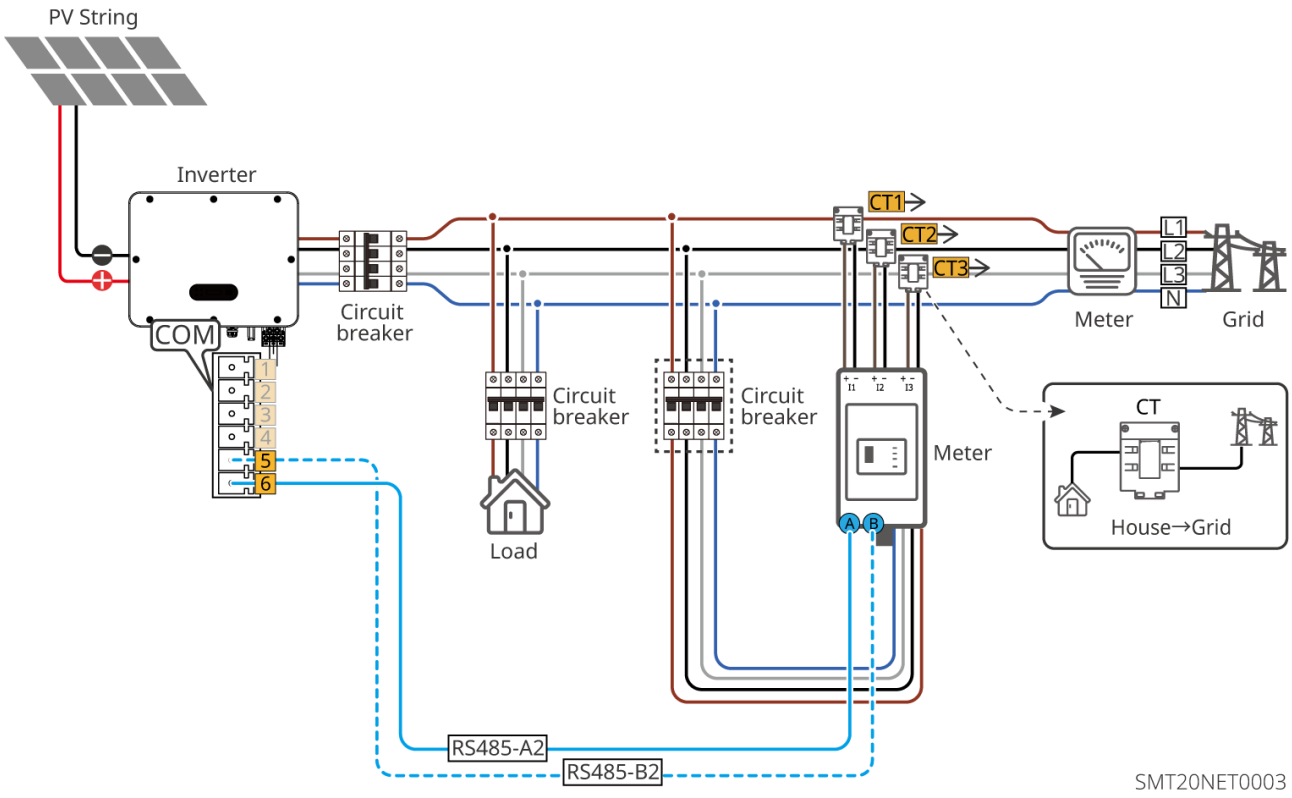
⚠WARNING

1. The CT installation position should be close to the grid connection point, with the correct installation direction. The "-->" on the CT indicates the direction of the inverter current flowing to the grid. If reversed, the inverter will trigger an alarm, and the anti-backflow function cannot be realized.
2. The aperture of the CT must be larger than the outer diameter of the AC power line to ensure that the AC power line can pass through the CT.
3. For the specific wiring method of the CT, please refer to the data provided by the corresponding manufacturer to ensure the correct wiring direction and normal function.
4. The CT must be clamped on the L1, L2, and L3 cables. Do not clamp it on the N cable.
5. CT Specification Requirements
   - For the current transformation ratio of the CT, please select nA/5A. (nA: Input current on the primary side of the CT, the range of n is 200-5000, which is selected by the user according to actual needs. 5A: Output current on the secondary side of the CT.)
   - The recommended accuracy class of the CT is 0.5, 0.5s, 0.2, or 0.2s, to ensure that the current sampling error of the CT is <= 1%.
6. To ensure the current detection accuracy of the CT, the recommended length of the CT cable does not exceed 30m, and the current-carrying capacity of the cable is recommended to be 6A.

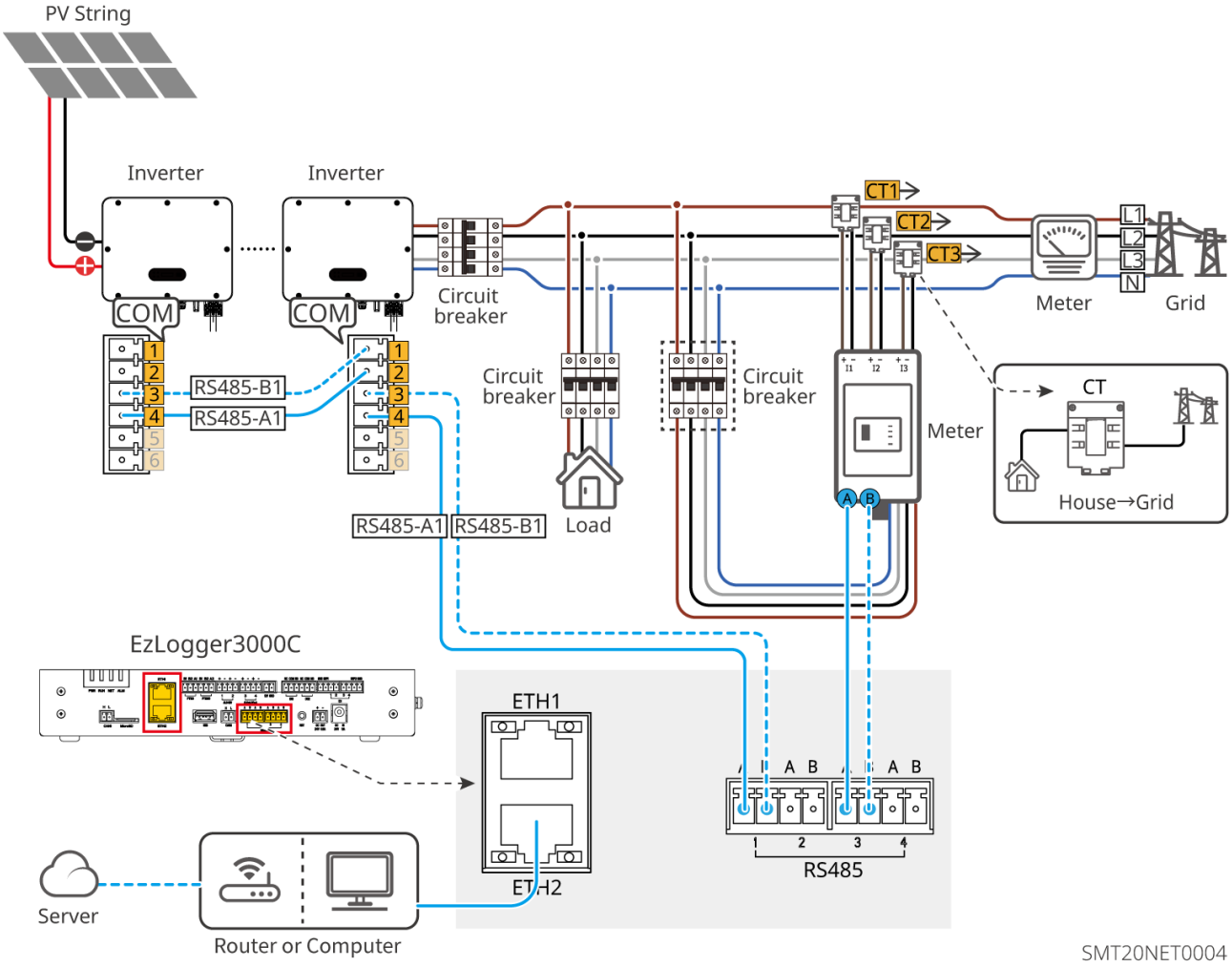
NOTICE

1. Ensure that the meter wiring and phase sequence are correct. Recommended cross-sectional area of the meter input voltage cable: 1mm² (18AWG).
2. Applicable only to GM330:
   - The external CT transformation ratio can be set via the Solargo App. For example: If a 200A/5A CT is selected, the CT transformation ratio needs to be set to 40.
   - If the networking scenario is three-phase three-wire, the N line and L2 line on the meter side must be short-circuited, and the L2 line on the grid side must not be connected to the CT.
   - For detailed setting information, please refer to: SolarGo App User Manual

Power export limit of single inveter with GM330



Power export limit of multi inveters with EzLogger 3000C+GM330

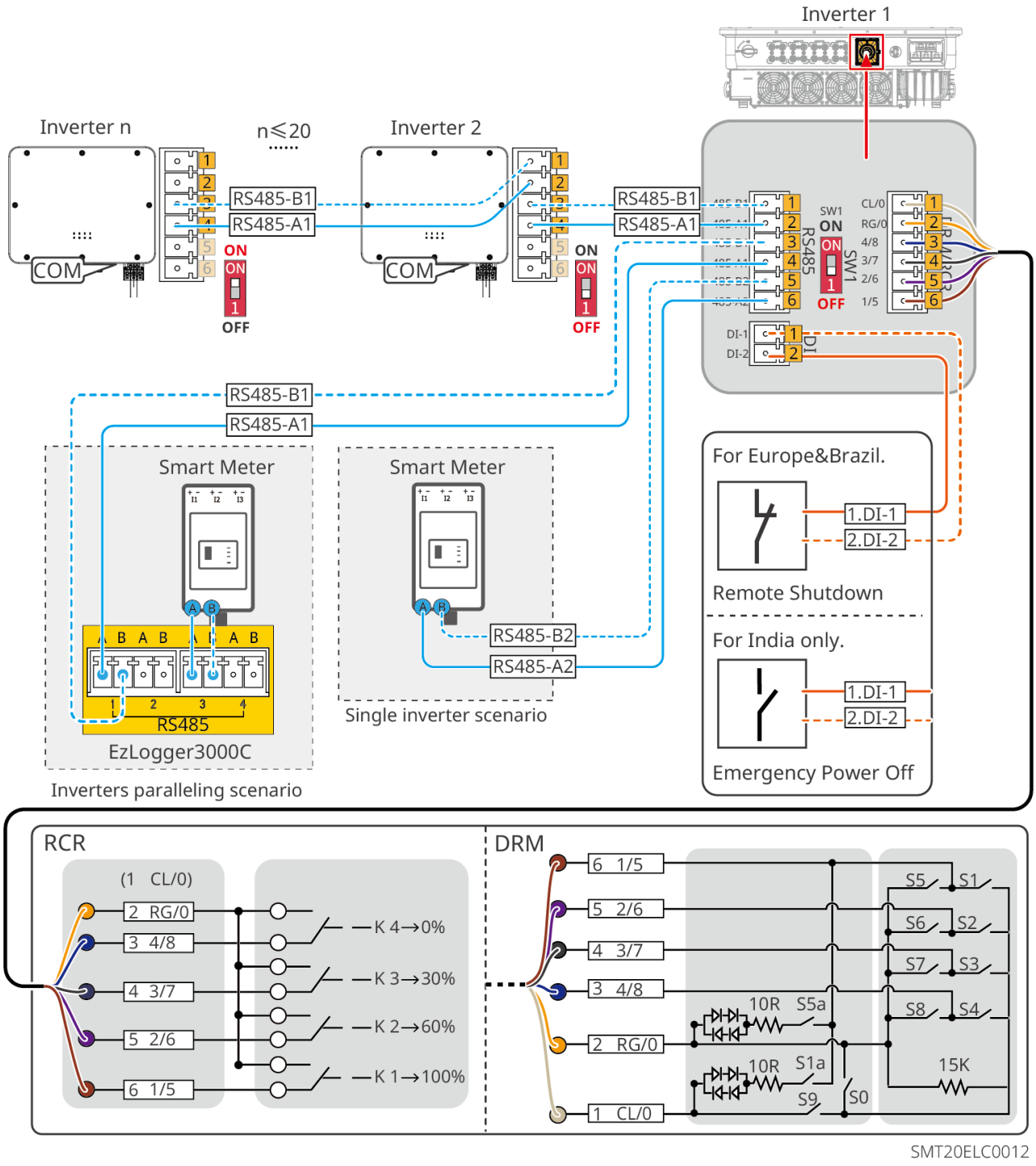


6.5.3 Connecting the Communication Cable

NOTICE

When connecting communication wires, ensure that the wiring port definitions fully match the device. The cable routing should avoid interference sources, power lines, etc., to prevent impact on signal reception.

Communication Port



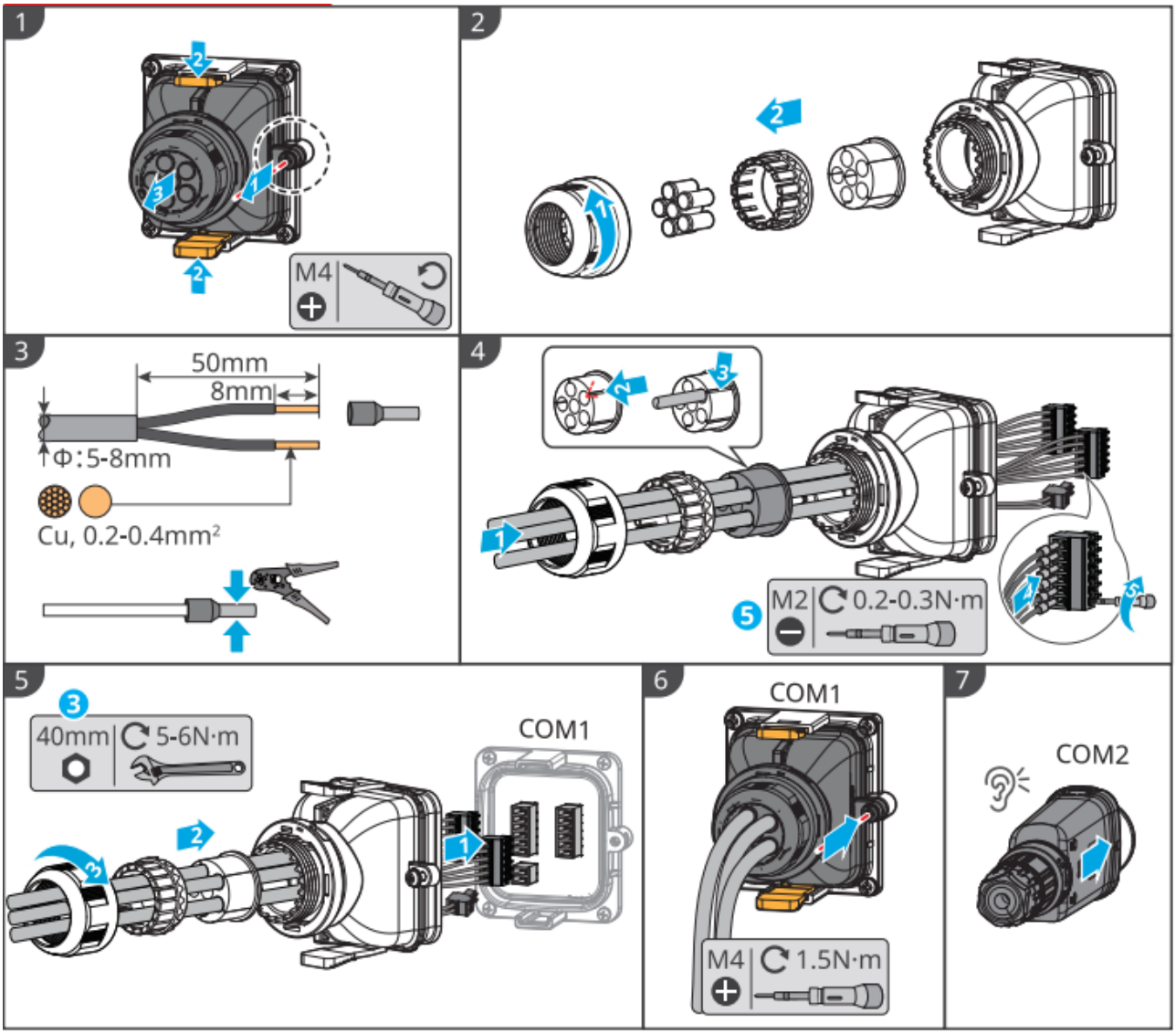
SMT20ELC0012

Function	No.	Port Name	Description
RS485	1	RS485-B1	Used to connect multiple inverters or the RS485 port of a data logger
	2	RS485-A1	

Function	No.	Port Name	Description
	3	RS485-B1	
	4	RS485-A1	
	5	RS485-B2	Realizes power export limit with the help of electric meters and CT
	6	RS485-A2	
Remote Shutdown & Emergency Power Off	1	DI-1	Inverter supports remote shutdown (Europe&Brazil) and emergency power-off (India only). Reserved wiring port for the inverter, related equipment must be prepared by the user
	2	DI-2	
DRM/RCR	1	CL/0	• DRM: Provides DRM signal control ports • RCR: RCR signal control ports, meeting grid dispatching requirements in regions such as Germany
	2	RG/0	
	3	4/8	
	4	3/7	
	5	2/6	
	6	1/5	

Wiring Steps

Step 1: Remove the communication connector.
Step 2: Dissemble the communication connector.
Step 3: Prepare the communication wire and crimp the tubular terminal.
Step 4: Pass the communication wire through the communication connector, then insert the tubular terminal into the 6pin/2pin terminal and fasten it.
Step 5: Insert the 6pin/2pin terminal into the corresponding port, then assemble the communication connector.
Step 6: Secure the communication connector to the inverter.
Step 7: Install the smart dongle.


1
M4
2
3
50mm
8mm
Φ:5-8mm
Cu, 0.2-0.4mm²
4
M2
0.2-0.3N·m
5
40mm
5-6N·m
COM1
6
COM1
M4
1.5N·m
7
COM2
SMT20ELC0011

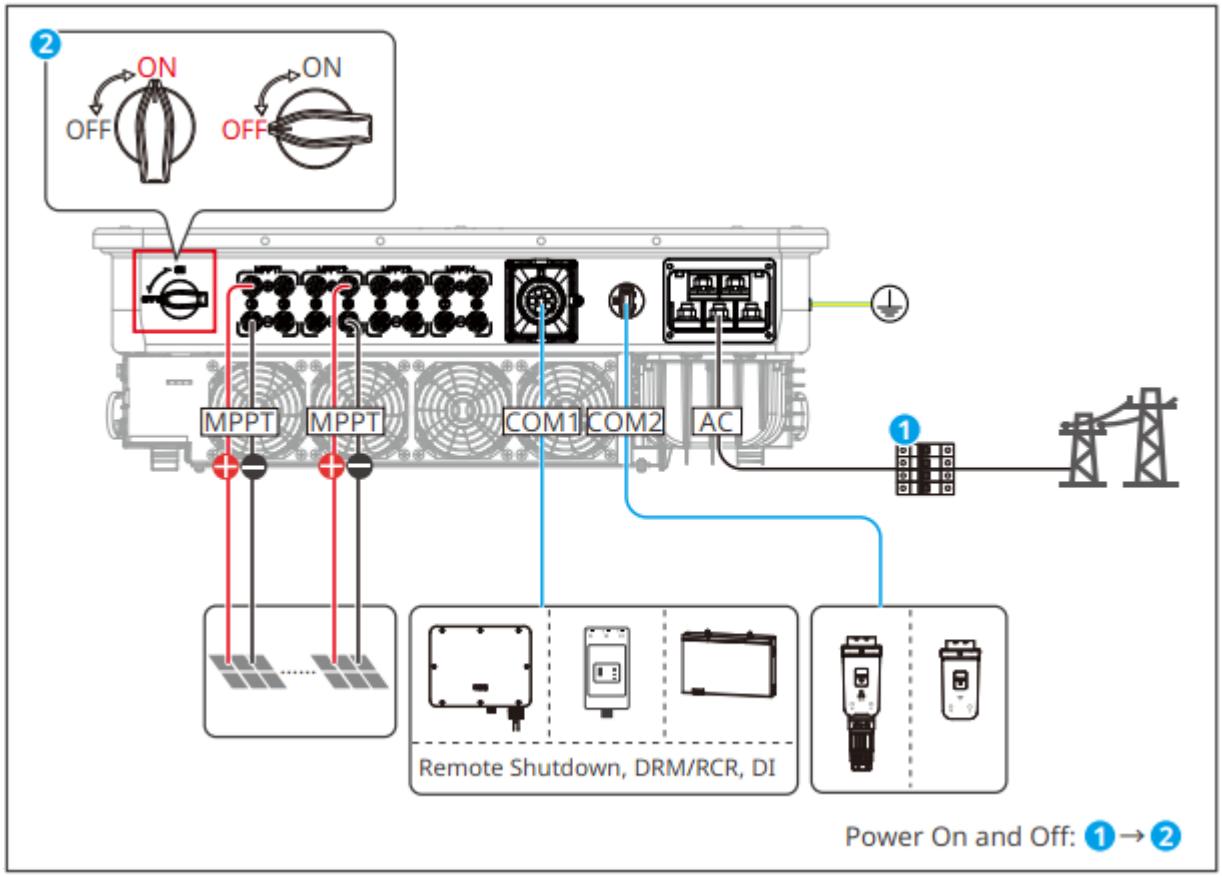
7 Equipment Commissioning

7.1 Checks before Power On

No.	Check Item
1	The inverter is firmly installed in a clean place where is well-ventilated and easy to operate.
2	The PE cable, DC input cable, AC output cable, and communication cable are connected correctly and securely.
3	Cable ties are routed properly and evenly, and no burrs.
4	Unused ports and terminals are sealed.
5	The voltage and frequency at the connection point meet the on-grid requirements.

7.2 Power On

Step 1: Turn on the AC breaker between the inverter and the utility grid.
Step 2: Turn on the DC breaker of the inverter.



SMT20PWR0002

8 System Commissioning

8.1 Setting Inverter Parameters via the Display Screen

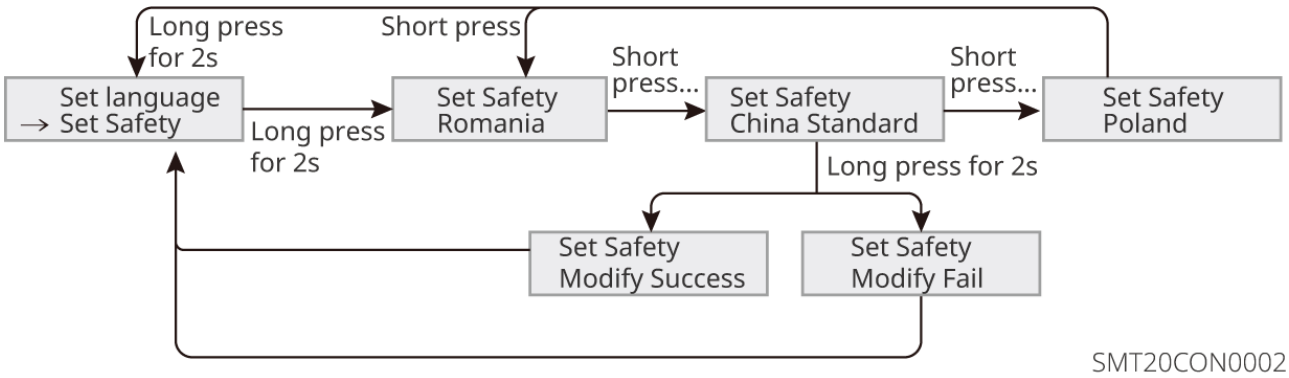
NOTICE

- The interface images in this manual correspond to the inverter software version V1.01.01. The interfaces are for reference only, please refer to the actual device.
- The parameter names, ranges, and default values may be changed or adjusted in the future, please refer to the actual display.
- Inverter power parameters must be set by professionals to avoid incorrect settings affecting the inverter's power generation.

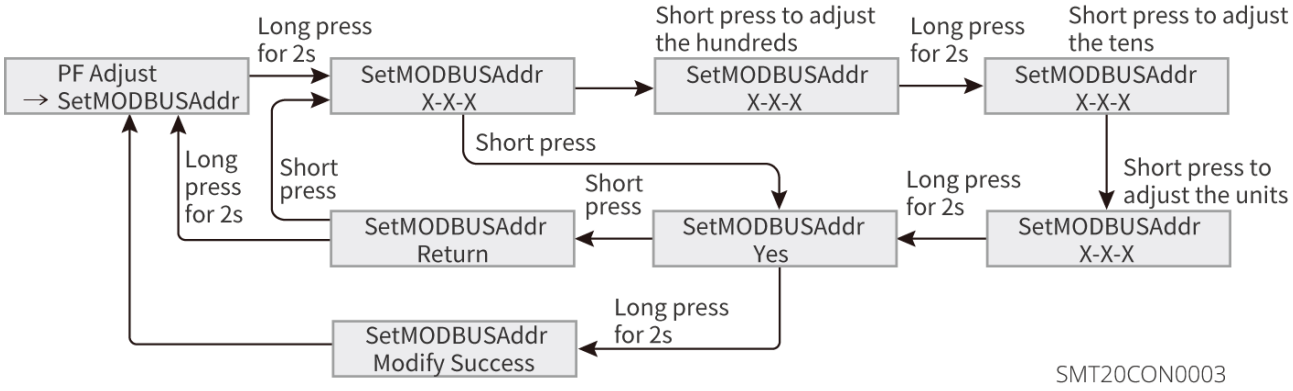
Display Button Instructions

- In all levels of menus, if no button operation is performed for a certain period of time, the LCD display will dim, and the interface will automatically return to the initial screen.
- Short-press the display operation button: Switch menu interfaces or adjust parameter values.
- Long-press the display operation button: After adjusting the parameter value, long-press to successfully set the parameter and enter the next submenu.

Button Operation Examples

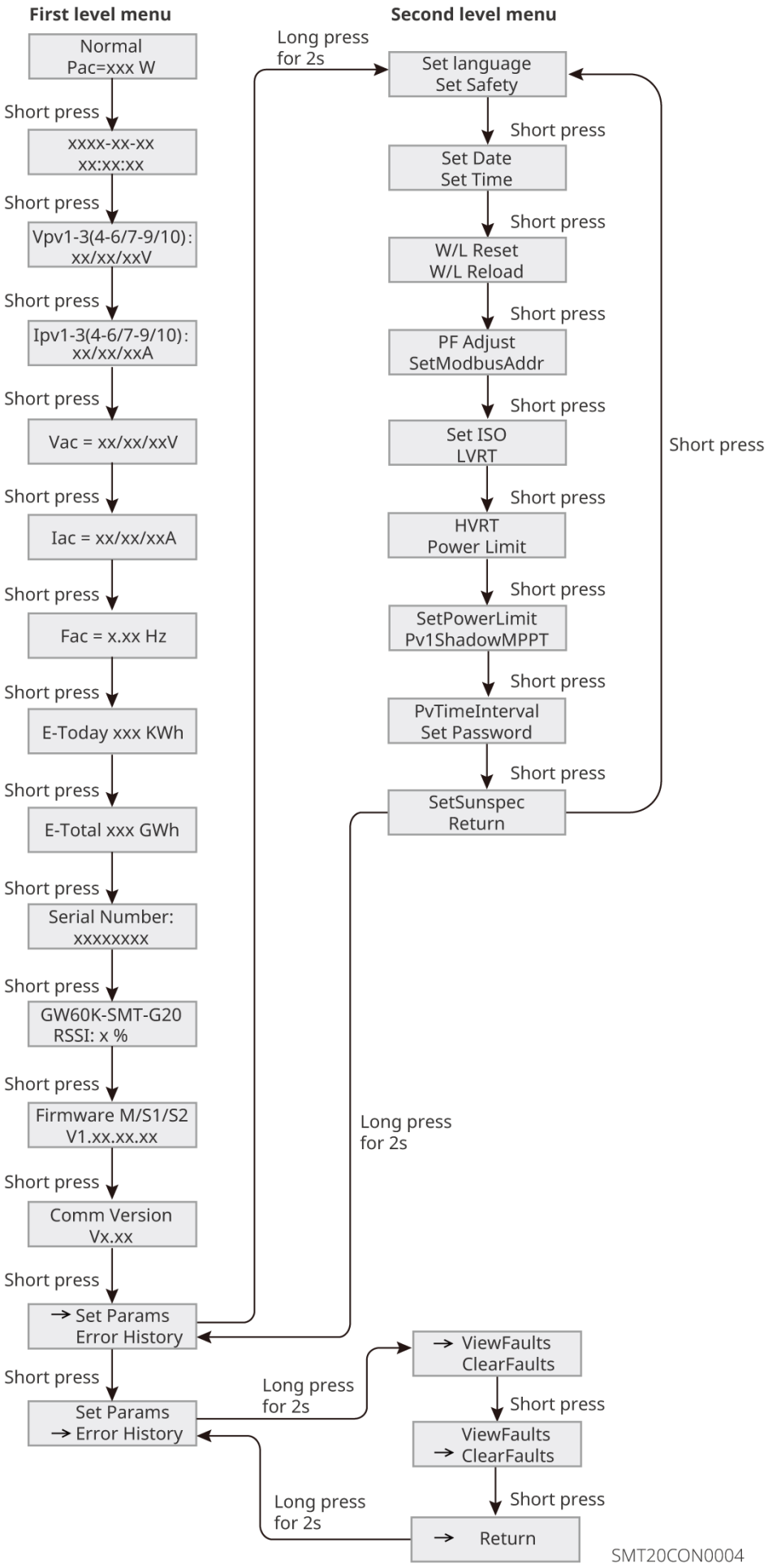


SMT20CON0002



8.1.1 Introduction to Display Menu

This section introduces the structure of the display menu, facilitating your navigation through various menu levels to check inverter information and set relevant inverter parameters.


First level menu
Second level menu
Normal
Pac=xxx W
Short press
xxxx-xx-xx
xx:xx:xx
Short press
Vpv1-3(4-6/7-9/10):
xx/xx/xxV
Short press
Ipv1-3(4-6/7-9/10):
xx/xx/xxA
Short press
Vac = xx/xx/xxV
Short press
Iac = xx/xx/xxA
Short press
Fac = x.xx Hz
Short press
E-Today xxx KWh
Short press
E-Total xxx GWh
Short press
Serial Number:
xxxxxxxx
Short press
GW60K-SMT-G20
RSSI: x %
Short press
Firmware M/S1/S2
V1.xx.xx.xx
Short press
Comm Version
Vx.xx
Short press
→ Set Params
Error History
Short press
Set Params
→ Error History
Long press
for 2s
Set language
Set Safety
Short press
Set Date
Set Time
Short press
W/L Reset
W/L Reload
Short press
PF Adjust
SetModbusAddr
Short press
Set ISO
LVRT
Short press
HVRT
Power Limit
Short press
SetPowerLimit
Pv1ShadowMPPT
Short press
PvTimeInterval
Set Password
Short press
SetSunspec
Return
Short press
Long press
for 2s
Long press
for 2s
→ ViewFaults
ClearFaults
Short press
ViewFaults
→ ClearFaults
Short press
Long press
for 2s
→ Return
SMT20CON0004

8.1.2 Introduction to Inverter Parameters

Parameter Name	Description
Grid-connected Power = 0W	Standby interface, displaying the real-time power of the inverter.
Date and Time	Check the date and time of the country/region where the inverter is located.
Input Voltage	Check the DC input voltage of the inverter.
Input Current	Check the DC input current of the inverter.
Mains Voltage	Check the grid voltage.
Output Current	Check the AC output current of the inverter.
Mains Frequency	Check the grid frequency.
Daily Power Generation	Check the power generated by the system on the current day.
Total Power Generation	Check the total power generated by the system.
Serial Number	Check the serial number of the inverter.
GW60K-SMT-G20 Signal Strength	Check the signal strength of the communication module (Signal strength: xx%).
Firmware Version	Check the firmware version of the inverter.
Communication Version	Check the ARM software version of the inverter.
Safety Regulation Settings	Set according to the grid standards of the country/region where the inverter is located and the actual application scenario of the inverter.
Date Setting	Set according to the actual time of the country/region where the inverter is located.
Time Setting	

Parameter Name	Description
W/L Restart	Power-off restart of the communication module.
W/L Reload	Restore the communication module to factory settings. After restoration, the network parameters of the communication module need to be reconfigured.
Power Factor Adjustment	Set the power factor of the inverter according to actual needs.
Set Modbus Address	Set according to the actual Modbus address that the inverter is connected to.
Set ISO	Set the insulation resistance threshold of PV-PE. If the detected actual value is less than the set value, an ISO fault will be reported.
LVRT	When enabled, the inverter will not immediately disconnect from the grid in case of short-term low-voltage abnormalities in the grid, but can sustain operation for a period of time.
HVRT	When enabled, the inverter will not immediately disconnect from the grid in case of short-term high-voltage abnormalities in the grid, but can sustain operation for a period of time.
Power Limitation Enable	Set according to the actual power that can be fed into the grid.
Set Power Limit	
Shading Mode	If the PV panel is severely shaded, the shading scanning function can be enabled.
Password Setting	The inverter's password supports modification. Please remember the password after modification. If you forget the password, please contact GoodWe After-sales Service Center for handling.
Set Sunspec	Set the Sunspec protocol according to actual communication needs.
Check Faults	Check the inverter's historical alarm records.
Clear Faults	Clear the inverter's historical alarm records.

8.2 Setting Inverter Parameters via App

SolarGo is an application used to communicate with the inverter via Bluetooth module, WiFi module. Commonly used functions are as follows:

1. Check the operating data, software version, alarms of the inverter, etc.
2. Set grid parameters and communication parameters of the inverter.
3. Maintain the equipment.

For more details, refer to the SolarGo APP User Manual. Scan the QR code or visit the official website to get the user manual.

SolarGo App

SolarGo App User Manual

8.3 Monitoring via SEMS Portal

SEMS Portal is an monitoring platform used to communicate with devices via WiFi, LAN, or 4G. Commonly used functions are as follows:

1. Manage organizations/users.
2. Add plants and monitor plant status.
3. Maintain the equipment.

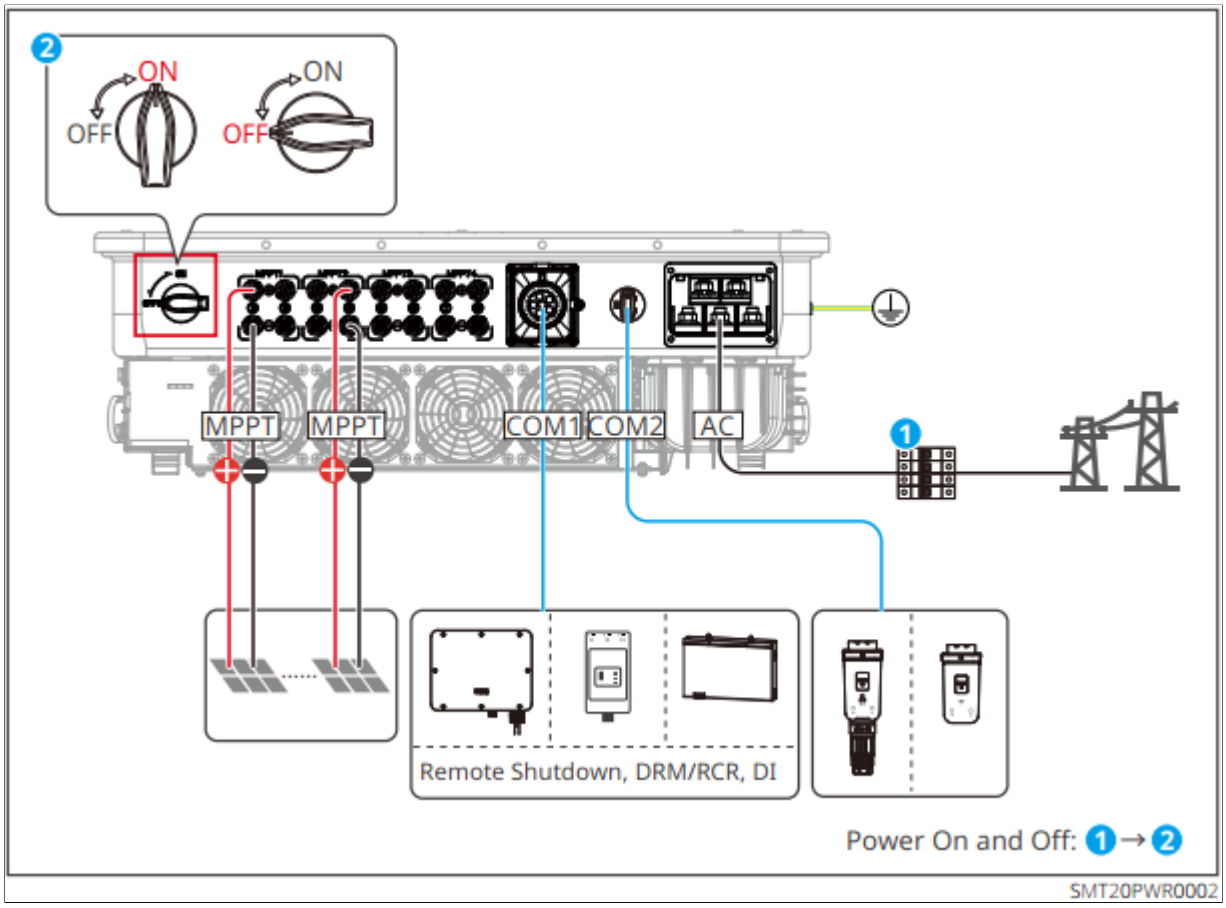
For more details, refer to the SEMS User Manual. Scan the QR code or visit the official website to get the user manual.

9 Maintenance

9.1 Inverter Shutdown

DANGER
• Power off the inverter before operations and maintenance. Otherwise, the inverter may be damaged or electric shocks may occur. • After the inverter is powered off, the internal components require a certain amount of time to discharge. Please wait until the device is completely discharged in accordance with the time specified on the label.

Step 1: Turn on the AC switch between the inverter and the utility grid.
Step 2: Turn on the DC breaker of the inverter.



9.2 Removing the Inverter

⚠WARNING

- Make sure that the inverter is powered off.
- Wear proper PPE before any operations.

Step 1: Disconnect all the cables, including DC cables, AC cables, communication cables, the smart dongle, and PE cables.
Step 2: Handle or hoist the inverter to take it down from the wall or the mounting plate.
Step 3: Remove the mounting plate.
Step 4: Store the inverter properly. If the inverter needs to be used later, ensure that the storage conditions meet the requirements.

9.3 Disposing of the Inverter

If the inverter cannot work any more, dispose of it according to the local disposal requirements for electrical equipment waste. Do not dispose of it as household waste.

9.4 Fault Information and Troubleshooting

Perform troubleshooting according to the following methods. Contact the after-sales service if these methods do not work.
Collect the information below before contacting the after-sales service, so that the problems can be solved quickly.

1. Product information like serial number, software version, installation date, fault time, fault frequency, etc.
2. Installation environment, including weather conditions, whether the PV modules are sheltered or shadowed, etc. It is recommended to provide some photos and videos to assist in analyzing the problem.
3. Utility grid situation.

9.4.1 System Failure

If unlisted problems occur in the system, or if following the instructions does not stop the problem or abnormality, stop operating the system immediately and contact your dealer immediately.

No.	Fault	Solutions/measures to address the issue
1	Unable to search for the wireless signal of the smart dongle.	1. Please ensure that no other devices are connected to the smart dongle's wireless signal. 2. Please ensure that the SolarGo app has been updated to the latest version. 3. Please ensure that the smart dongle is powered on properly, and the blue indicator light is blinking or steady on. 4. Ensure that the smart device is within the communication range of the smart dongle. 5. Refresh the device list in the app. 6. Restart the inverter.
2	Unable to connect to the wireless signal of the smart dongle.	1. Please ensure that no other devices are connected to the smart dongle's wireless signal. 2. Restart the inverter or smart dongle, and try to reconnect to the wireless signal of the smart dongle again. 3. Ensure successful pairing of Bluetooth.
3	Cannot find router SSID.	1. Put the router nearer to the Smart Dongle.Or add a WiFi relay device to enhance the WiFi signal. 2. Reduce the number of devices connected to router.

No.	Fault	Solutions/measures to address the issue
4	After completing all configurations, the Smart Dongle fails connecting to the router.	1. Restart the inverter. 2. Check if the SSID, encryption method and password on WiFi configuration page are the same with that of Router. 3. Restart the router. 4. Put the router nearer to the Smart Dongle.Or add a WiFi relay device to enhance the WiFi signal.
5	After completing all configurations, the Smart Dongle fails connecting to the router.	Restart the router and the inverter.

9.4.2 Inverter Troubleshooting

No.	Fault	Cause	Troubleshooting Suggestions:
1	Grid Power Outage	1.Utility grid power fails. 2.The AC circuit or the AC breaker is disconnected.	1.The alarm is automatically cleared after the grid power supply is restored. 2.Check whether the AC cable is connected and the AC breaker is on.

No.	Fault	Cause	Troubleshooting Suggestions:
2	Grid Overvoltage	The grid voltage is higher than the permissible range or the high voltage duration exceeds the high voltage ride-through setting.	1.If the problem occurs occasionally, the utility grid may be abnormal temporarily.The inverter will recover automatically after detecting that the utility grid is normal. 2.If it occurs frequently, please check if the grid voltage is within the allowable range. • Contact the local power company if the grid voltage exceeds the permissible range. • Modify the overvoltage protection threshold, HVRT or disable the overvoltage protection function after obtaining the consent of the local power company if the grid frequency is within the permissible range. 3. Check whether the AC breaker and the output cables are connected securely and correctly if the problem persists.

No.	Fault	Cause	Troubleshooting Suggestions:
3	Grid Undervoltage	The grid voltage is lower than the permissible range, or the duration of low voltage exceeds the requirement of LVRT.	1.If the problem occurs occasionally, the utility grid may be abnormal temporarily.The inverter will recover automatically after detecting that the utility grid is normal. 2.If it occurs frequently, please check if the grid voltage is within the allowable range. • Contact the local power company if the grid voltage exceeds the permissible range. • Modify the undervoltage protection threshold, LVRT or disable the undervoltage protection function after obtaining the consent of the local power company if the grid frequency is within the permissible range. 3. Check whether the AC breaker and the output cables are connected securely and correctly if the problem persists.

No.	Fault	Cause	Troubleshooting Suggestions:
4	Grid Overvoltage Protection	The grid voltage is detected to be abnormal or ultrahigh.	1.If the problem occurs occasionally, the utility grid may be abnormal temporarily.The inverter will recover automatically after detecting that the utility grid is normal. 2.If it occurs frequently, please check if the grid voltage is within the allowable range. • Contact the local power company if the grid voltage exceeds the permissible range. • Modify the undervoltage protection threshold, LVRT or disable the undervoltage protection function after obtaining the consent of the local power company if the grid frequency is within the permissible range. 3. Check whether the AC breaker and the output cables are connected securely and correctly if the problem persists.

No.	Fault	Cause	Troubleshooting Suggestions:
5	Grid 10min Overvoltage Protection	The moving average of grid voltage in 10min exceeds the range of safety requirements.	1. If the problem occurs occasionally, the utility grid may be abnormal temporarily.The inverter will recover automatically after detecting that the utility grid is normal. 2. Check if the grid voltage is running at a high voltage for a long time.If it occurs frequently, please check if the grid voltage is within the allowable range. • Contact the local power company if the grid voltage exceeds the permissible range. • If the grid voltage is within the allowable range, please modify the Grid 10min Overvoltage protection value with the consent of the local power operator.

No.	Fault	Cause	Troubleshooting Suggestions:
6	Grid overfrequency protection	Utility grid exception.The actual grid frequency exceeds the requirement of the local grid standard.	1.If the problem occurs occasionally, the utility grid may be abnormal temporarily.The inverter will recover automatically after detecting that the utility grid is normal. 2.If the problem occurs frequently, check whether the grid frequency is within the permissible range. • Contact the local power company if the grid frequency exceeds the permissible range. • Modify the grid overfrequency protection threshold after obtaining the consent of the local power company if the grid frequency is within the permissible range.

No.	Fault	Cause	Troubleshooting Suggestions:
7	Grid underfrequency protection	Utility grid exception.The actual grid frequency is lower than the requirement of the local grid standard.	1.If the problem occurs occasionally, the utility grid may be abnormal temporarily.The inverter will recover automatically after detecting that the utility grid is normal. 2.If the problem occurs frequently, check whether the grid frequency is within the permissible range. • Contact the local power company if the grid frequency exceeds the permissible range. Modify the grid overfrequency protection threshold after obtaining the consent of the local power company if the grid frequency is within the permissible range.

No.	Fault	Cause	Troubleshooting Suggestions:
8	Grid Frequency Unstable	Utility grid exception.The actual grid frequency change rate does not meet the requirement of the local grid standard	1.If the problem occurs occasionally, the utility grid may be abnormal temporarily.The inverter will recover automatically after detecting that the utility grid is normal. 2.If the problem occurs frequently, check whether the grid frequency is within the permissible range. • Contact the local power company if the grid frequency exceeds the permissible range. • Contact the dealer or the after-sales service if the grid frequency is within the permissible range.

No.	Fault	Cause	Troubleshooting Suggestions:
9	Grid Phase Unstable	Utility grid exception.Grid voltage phase change rates do not meet local grid standards.	1.If the problem occurs occasionally, the utility grid may be abnormal temporarily.The inverter will recover automatically after detecting that the utility grid is normal. 2.If the problem occurs frequently, check whether the grid frequency is within the permissible range. • Contact the local power company if the grid frequency exceeds the permissible range. • Contact the dealer or the after-sales service if the grid frequency is within the permissible range.

No.	Fault	Cause	Troubleshooting Suggestions:
10	Anti-islanding Protection	The utility grid is disconnected.The utility grid is disconnected according to the safety regulations, but the grid voltage is maintained due to the loads.	1.If the problem occurs occasionally, the utility grid may be abnormal temporarily.The inverter will recover automatically after detecting that the utility grid is normal. 2.If the problem occurs frequently, check whether the grid frequency is within the permissible range. • Contact the local power company if the grid frequency exceeds the permissible range. • Contact the dealer or the after-sales service if the grid frequency is within the permissible range.
11	LVRT Undervoltage	Utility grid exception.The duration of the grid voltage abnormality exceeds the time specified for high and low penetration.	

No.	Fault	Cause	Troubleshooting Suggestions:
12	HVRT Overvoltage	Utility grid exception.The duration of the grid voltage abnormality exceeds the time specified for high and low penetration.	1.If the problem occurs occasionally, the utility grid may be abnormal temporarily.The inverter will recover automatically after detecting that the utility grid is normal. 2.If the problem occurs frequently, check whether the voltage and frequency of the power grid are within the permissible range and stable.If no, contact the local power operator; If yes, please contact the local service center.
13	Grid Waveform Abnormal	Utility grid exception.Abnormal grid voltage detection triggers a fault.	1.If the problem occurs occasionally, the utility grid may be abnormal temporarily.The inverter will recover automatically after detecting that the utility grid is normal. 2.If it occurs frequently, please check whether the voltage and frequency of the power grid are within the permissible range and stable, if not, please contact your local power operator; if yes, please contact your dealer or after-sales service center.
14	电网缺相保护 Grid Phase Loss	Utility grid exception.There is a single phase drop in the grid voltage.	
15	Grid Voltage Imbalance	Excessive differences in grid phase voltages.	

No.	Fault	Cause	Troubleshooting Suggestions:
16	Grid Phase Sequence Abnormal	Abnormal wiring of inverter and grid: wiring out of sequence	1.Check whether the wiring of Inverter and Utility grid is in positive sequence.After the wiring is corrected (e.g., by swapping any two phase wires), the fault will automatically disappear. 2.If the wiring is correct and fault persists, please contact the dealer or GoodWe Customer Service Center.
17	Grid Rapid Shutdown Protection	Quickly shut down the output upon detecting the grid disconnected operating condition..	1.The fault automatically disappears after the grid power supply is restored.
18	Neutral Line Loss (Split Grid)	Phase separation Utility grid neutral line loss	1.The alarm is automatically cleared after the grid power supply is restored. 2.Check whether the AC cable is connected and the AC breaker is on.
19	EMS/Forced Off-Grid	EMS Issue a forced off-grid command, but the off-grid function is not enabled.	Enable off-grid function

No.	Fault	Cause	Troubleshooting Suggestions:
20	GFCI Protection (30mA)	The input insulation impedance becomes low when the inverter is working.	1.If the problem occurs occasionally, it may be caused by a cable exception.The inverter will recover automatically after the problem is solved. 2.Check whether the impedance between the PV string and PE is too low if the problem occurs frequently or persists.
21	GFCI Protection (60mA)	The input insulation impedance becomes low when the inverter is working.	1.If the problem occurs occasionally, it may be caused by a cable exception.The inverter will recover automatically after the problem is solved. 2.Check whether the impedance between the PV string and PE is too low if the problem occurs frequently or persists.
22	GFCI Protection (150mA)	The input insulation impedance becomes low when the inverter is working.	1.If the problem occurs occasionally, it may be caused by a cable exception.The inverter will recover automatically after the problem is solved. 2.Check whether the impedance between the PV string and PE is too low if the problem occurs frequently or persists.

No.	Fault	Cause	Troubleshooting Suggestions:
23	GFCI Protection (300mA)	The input insulation impedance becomes low when the inverter is working.	1.If the problem occurs occasionally, it may be caused by a cable exception.The inverter will recover automatically after the problem is solved. 2.Check whether the impedance between the PV string and PE is too low if the problem occurs frequently or persists.
24	DCI Protection Level 1	The DC component of the output current exceeds the safety range or default range.	1.If the exception is caused by an external fault, the inverter will recover automatically after solving the problem. 2.If the problem occurs frequently and the PV station cannot work properly, contact the dealer or the after-sales service.
25	DCI Protection Level 2	The DC component of the output current exceeds the safety range or default range.	1.If the exception is caused by an external fault, the inverter will recover automatically after solving the problem. 2.If the problem occurs frequently and the PV station cannot work properly, contact the dealer or the after-sales service.

No.	Fault	Cause	Troubleshooting Suggestions:
26	Low Insulation Resistance	1.The PV string is short-circuited to PE. 2.The installation environment of PV strings is relatively humid for a long time and the insulation of PE cable is poor.	1.Check the impedance of the PV string to the ground.If there is a short circuit phenomenon, please check the short circuit point and rectify it. 2.Check whether the PE cable is connected correctly. 3.If it is confirmed that the impedance is indeed lower than the default value in cloudy and rainy days, please reset the "insulation impedance protection value".
27	Grounding Abnormal	1.The PE cable of the inverter is not connected. 2.When the output of PV String is grounded, the output side of Inverter is not connected to an isolation transformer.	1.Please confirm if the PE cable of the inverter is properly connected. 2.In the scenario where the output of PV String is grounded, please confirm whether an isolation transformer is connected on the output side of Inverter.
28	L-PE Short Circuit	Output phase line to PE low impedance or short circuit	Detect output phase line to PE impedance, identify locations with low impedance and repair them.

No.	Fault	Cause	Troubleshooting Suggestions:
29	DCV Protection Level 1	Abnormal fluctuation of load	1.If the exception is caused by an external fault, the inverter will recover automatically after solving the problem. 2.If the problem occurs frequently and the PV station cannot work properly, contact the dealer or the after-sales service.
30	DCV Protection Level 2	Abnormal fluctuation of load	1.If the exception is caused by an external fault, the inverter will recover automatically after solving the problem. 2.If the problem occurs frequently and the PV station cannot work properly, contact the dealer or the after-sales service.
31	Hard Export Limit Protection	Abnormal fluctuation of load	1.If the exception is caused by an external fault, the inverter will recover automatically after solving the problem. 2.If the problem occurs frequently and the PV station cannot work properly, contact the dealer or the after-sales service.

No.	Fault	Cause	Troubleshooting Suggestions:
32	Internal Comm Loss	Reference specific subcode reasons	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
33	Multiple GFCI Failures	North American safety regulations require multiple failures can not be automatically recovered, you need to manually or wait for 24h recovery	1.Check if the PV String to ground impedance is too low.
34	Multiple AFCI Failures	North American safety regulations require multiple failures can not be automatically recovered, you need to manually or wait for 24h recovery	1.After the machine is re-on-grid, check whether the voltage current of each circuit is abnormally reduced to zero; 2.Check whether the DC side terminal is securely connected.
35	External Comm Loss	Inverter external device communication loss, may be peripheral power supply problems, communication protocol mismatch, not configure the appropriate peripheral, etc..	Judgement is based on the actual model and the detection enable bit, some models do not support the peripheral will not be detected.

No.	Fault	Cause	Troubleshooting Suggestions:
36	Back-up Output Overload	1.Prevent the Inverter from continuous overload output.	1.Disconnect some off-grid loads to reduce the off-grid output Power of the Inverter.
37	Back-up Output Overvoltage	2.Prevent damage to the load caused by Inverter output overvoltage.	1.If it occurs occasionally, it may be caused by load switching and does not require manual intervention. 2.If the problem occurs frequently, contact the dealer or the after-sales service.
38	On-grid PWM Sync Fault On-grid PWM Sync Fault	Abnormal occurrence in carrier synchronization on-grid	1.Check if the synchronization line connection is normal. 2.Check whether the master-slave settings are normal. 3.Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
39	External Box Failure	Excessive waiting time for Box cut relay when switching on-grid to off-grid	1.Check whether the Box is working properly; 2.Check whether the Box communication wiring is correct;

No.	Fault	Cause	Troubleshooting Suggestions:
40	Generator Failure	1.This fault will always be displayed when the generator is not connected. 2.During generator operation, failure to meet generator safety regulations will trigger this fault.	1.Ignore the fault when the generator is not connected. 2.The occurrence of fault in the generator under fault conditions is normal.After the generator recovers, wait for a period of time, and the fault will automatically clear. 3.The fault will not affect the normal operation of the off-grid mode. 4.The generator and Utility grid are connected simultaneously and meet the safety requirements, with utility grid taking priority for on-grid, operating in the Utility grid on-grid state.
41	External STS Failure	Inverter and STS connection cable abnormality	Check that the harness connection wire sequence between the inverter and STS corresponds in one-to-one sequence.
42	CT Loss	CT connecting wire disconnection (required by Japanese safety regulations)	1.Check whether the CT wiring is correct;

No.	Fault	Cause	Troubleshooting Suggestions:
43	Export Limit Protection	1.Inverter fault reporting and grid disconnection 2.Meter communication instability 3.Reverse flow conditions occur	1.Check if there are any other error messages in Inverter.If so, perform targeted troubleshooting. 2.Check if meter connection is normal. 3.If the problem occurs frequently and the PV station cannot work properly, contact the dealer or the after-sales service.
44	Bypass Over Load		
45	Black Start Failure		
46	Parallel I/O Check Abnormal	Parallel communication cable is not securely connected or parallel operation IO Chip damage	Check whether the parallel communication cable is firmly connected, and then check whether the IO chip is damaged, if so, replace the IO chip.
47	Parallel CAN Comm Abnormal	Parallel communication cable is not securely connected or some units are not online.	Check whether all machines are power on and whether the parallel communication cables are securely connected.
48	Parallel Grid Line Reversed /Paralell Grid Line Reversed	Some machines have grid wires reversed from others.	Rewire the grid.
49	Parallel Back-up Line Reversed	Some machines have backup cables reversed.	Reconnect the backup cable.

No.	Fault	Cause	Troubleshooting Suggestions:
50	Inverter Soft Start Failure	Inverter soft start failure during off-grid cold start	Check machine inverter module for damage
51	Off grid AC Ins Volt High		
52	AC HCT Check Abnormal	The sampling of the AC HCT is abnormal.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
53	AC HCT Failure	The sampling of HCT is abnormal.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
54	GFCI HCT Check Abnormal	The sampling of the GFCI HCT is abnormal.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.

No.	Fault	Cause	Troubleshooting Suggestions:
55	GFCI HCT Failure	GFCI HCT is abnormal.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
56	Relay Check Abnormal	Relay abnormal, reasons are as follows: 1.Relay abnormality (relay short circuit) 2.The relay sampling circuit is abnormal. 3.The AC cable is connected improperly, like a virtual connection or short circuit.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
57	Relay Failure	1.Relay abnormality (relay short circuit) 2.The relay sampling circuit is abnormal. 3.The AC cable is connected improperly, like a virtual connection or short circuit.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.

No.	Fault	Cause	Troubleshooting Suggestions:
58	AFCI Failure (String 17~32)	1.The DC side connection terminal is loose; 2.The DC side connection terminals are falsely connected; 3.The DC cable core breakage and false connection.	1.After the machine is re-on-grid, check whether the voltage current of each circuit is abnormally reduced to zero; 2.Check whether the DC side terminal is securely connected.
59	AFCI Failure (String 33~48)	1.The DC side connection terminal is loose; 2.The DC side connection terminals are falsely connected; 3.The DC cable core breakage and false connection.	1.After the machine is re-on-grid, check whether the voltage current of each circuit is abnormally reduced to zero; 2.Check whether the DC side terminal is securely connected.
60	Flash R/W Abnormal	Causes are possibly as follows: Flash content has changed; flash life is exhausted;	1.Upgrade the latest version of the program. 2.Contact the dealer or the after-sales service.

No.	Fault	Cause	Troubleshooting Suggestions:
61	AFCI Failure (String 1~16)	1.The DC side connection terminal is loose; 2.The DC side connection terminals are falsely connected; 3.The DC cable core breakage and false connection.	1.After the machine is re-on-grid, check whether the voltage current of each circuit is abnormally reduced to zero; 2.Check whether the DC side terminal is securely connected.
62	AFCI Check Failure	The arc-pulling module does not detect an arc-pulling fault during the arc-pulling self-test.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
63	AC Terminal Overtemperature	AC terminal temperature is too high, causes are possibly as follows: 1.The inverter is installed in a place with poor ventilation. 2.The ambient temperature exceeds 60℃. 3.A fault occurs in the internal fan of the inverter.	

No.	Fault	Cause	Troubleshooting Suggestions:
64	Cabinet Overtemperature	Cavity temperature is too high, causes are possibly as follows: 1.The inverter is installed in a place with poor ventilation. 2.The ambient temperature exceeds 60℃. 3.A fault occurs in the internal fan of the inverter.	1.Check whether the ventilation of the inverter installation location is good and whether the ambient temperature exceeds the maximum allowable ambient temperature range. 2.If the ventilation is poor or the ambient temperature is too high, please improve the ventilation and heat dissipation conditions. 3.Contact the dealer or after-sales service if both the ventilation and the ambient temperature are normal.
65	Inv Module Overtemperature	Inverter module temperature is too high, causes are possibly as follows: 1.The inverter is installed in a place with poor ventilation. 2.The ambient temperature exceeds 60℃. 3.A fault occurs in the internal fan of the inverter.	

No.	Fault	Cause	Troubleshooting Suggestions:
66	Boost Module Overtemperature	Boost module temperature is too high, causes are possibly as follows: 1.The inverter is installed in a place with poor ventilation. 2.The ambient temperature exceeds 60℃. 3.A fault occurs in the internal fan of the inverter.	
67	AC Capacitor Overtemperature	Output filter capacitor temperature is too high, causes are possibly as follows: 1.The inverter is installed in a place with poor ventilation. 2.The ambient temperature exceeds 60℃. 3.A fault occurs in the internal fan of the inverter.	

No.	Fault	Cause	Troubleshooting Suggestions:
68	Relay Failure 2	Relay abnormal, reasons are as follows: 1.Relay abnormality (relay short circuit) 2.The relay sampling circuit is abnormal. 3.The AC cable is connected improperly, like a virtual connection or short circuit.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
69	PV IGBT Short Circuit	Causes are possibly as follows: 1.IGBT short circuit 2.The inverter sampling circuit is abnormal.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
70	PV IGBT Open Circuit	1.A software problem caused the wave not to be sent: 2.The drive circuit is abnormal: 3.IGBT open circuit	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.

No.	Fault	Cause	Troubleshooting Suggestions:
71	NTC Abnormal	Abnormal NTC temperature sensor	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
72	PWM Abnormal	Abnormal waveform appears in PWM	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
73	CPU Interrupt Abnormal	CPU Interruption anomaly occurred	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
74	Microelectronic Failure	Functional safety detects an anomaly.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.

No.	Fault	Cause	Troubleshooting Suggestions:
75	PV HCT Failure	Abnormal boost current sensor	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
76	1.5V Ref Abnormal	The reference circuit is abnormal.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
77	0.3V Ref Abnormal	The reference circuit is abnormal.	
78	CPLD Version Error	CPLD version identification error	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
79	CPLD Comm Failure	CPLD and DSP communication content error or timeout	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.

No.	Fault	Cause	Troubleshooting Suggestions:
80	Model Type Error	Troubleshooting about model recognition error	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
81	SVG Precharge Failure	SVG Precharge hardware failure	Contact the dealer or the after-sales service.
82	SVG Mode PID Prevention Failure	PID prevent hardware anomaly	Contact the dealer or the after-sales service.
83	DSP Version Error	DSP version identification error	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
84	BUS Overvoltage		Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
85	P-BUS Overvoltage		
86	N-BUS Overvoltage		
87	BUS Overvoltage (Slave CPU 1) BUS/Overvoltage(Slave CPU 1)		
88	P-BUS Overvoltage (Slave CPU 1)		
89	N-BUS Overvoltage (Slave CPU 1)		

No.	Fault	Cause	Troubleshooting Suggestions:
90	BUS Overvoltage (Slave CPU 2)	BUS overvoltage.Causes are possibly as follows: 1.The PV voltage is too high. 2.The sampling of the inverter BUS voltage is abnormal. 3.The isolation of the transformer of the inverter is poor, so two inverters influence each other when connected to the grid.One of the inverters reports DC Overvoltage.	
91	P-BUS Overvoltage (Slave CPU 2)		
92	N-BUS Overvoltage (Slave CPU 2)		
93	P-BUS Overvoltage (CPLD)		
94	N-BUS Overvoltage (CPLD)		
95	MOS Continuous Overvoltage	1.Software issue causes the inverter drive to shut down earlier than the flyback drive. 2.Inverter drive circuit abnormality causes failure to turn on. 3.The PV voltage is too high. 4.Mos sampling anomaly.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.

No.	Fault	Cause	Troubleshooting Suggestions:
96	Bus Short Circuit	1.The hardware is damaged.	If the inverter continues to be off-grid after a BUS short-circuit fault occurs, please contact your dealer or after-sales service center.
97	Bus Sample Abnormal	1.Bus voltage sampling hardware failure.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
98	DC Sample Abnormal	1.Bus voltage sampling hardware failure. 2.Battery voltage sampling hardware failure. 3.Dcrly relay failure.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.

No.	Fault	Cause	Troubleshooting Suggestions:
99	PV Input Overvoltage	PV input voltage is too high.Causes are possibly as follows: Incorrect photovoltaic array configuration, with too many PV Battery panels connected in series in the string, causing the string's open-circuit voltage to exceed the maximum operating voltage of the Inverter.	Check the serial connection of the PV array.Make sure that the open circuit voltage of the PV string is not higher than the maximum operating voltage of the inverter.The inverter alarm disappears automatically when the PV array is configured correctly.
100	PV Continuous Hardware Overcurrent	1.The module configuration is not proper. 2.The hardware is damaged.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
101	PV Continuous Software Overcurrent	1.The module configuration is not proper. 2.The hardware is damaged.	

No.	Fault	Cause	Troubleshooting Suggestions:
102	FlyCap Software Overvoltage	FlyCap overvoltage.Causes are possibly as follows: 1.The PV voltage is too high. 2.The sampling of the inverter FlyCap voltage is abnormal.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
103	FlyCap Hardware Overvoltage	FlyCap overvoltage.Causes are possibly as follows: 1.The PV voltage is too high. 2.The sampling of the inverter FlyCap voltage is abnormal.	
104	FlyCap Undervoltage	FlyCap undervoltage.Causes are possibly as follows: 1.PV Energy deficit; 2.The sampling of the inverter FlyCap voltage is abnormal.	

No.	Fault	Cause	Troubleshooting Suggestions:
105	FlyCap Precharge Failure	FlyCap pre-charge failure.Causes are possibly as follows: 1.PV Energy deficit; 2.The sampling of the inverter FlyCap voltage is abnormal.	
106	FlyCap Precharge Abnormal	1.Unreasonable control loop parameters 2.The hardware is damaged.	
107	PV String Overcurrent (String 1~16)	Causes are possibly as follows: 1.String overcurrent. 2.String current sensor abnormality.	
108	PV String Overcurrent (String 17~32)	As above.	
109	PV String Reversed (String 1~16)	The PV strings are connected reversely.	Check whether PV strings are connected reversely.

No.	Fault	Cause	Troubleshooting Suggestions:
110	PV String Reversed (String 17~32)	The PV strings are connected reversely.	Check whether PV strings are connected reversely.
111	PV String Loss (String 1~16)	String fuse disconnected (if applicable).	Check if the fuse is blown.
112	PV String Loss (String 17~32)	String fuse disconnected (if applicable).	Check if the fuse is blown.

No.	Fault	Cause	Troubleshooting Suggestions:
113	PV Input Mode Error	There are three modes of PV access modes, taking the four-way MPPT as an example: 1.Parallel mode: i.e. AAAA mode (homogenous mode), PV1-PV4 homogenous, four-way PV connected to the same PV panel. 2.Partial parallel mode: i.e. AACC mode, PV1 and PV2 are connected in the same source, PV3 and PV4 are connected in the same source. 3.Independent mode: i.e. ABCD mode (non-homologous), PV1, PV2, PV3, PV4 are connected independently, and each of the four-way PV is connected to a photovoltaic panel. This fault is reported if the actual access mode of the PV does not match the PV	Check that the PV access mode is set correctly (ABCD, AACC, AAAA) and reset the PV access mode in the correct way. 1.Confirm that the actual access to each PV is properly connected. 2.If the PV has been connected correctly, check whether the currently set “PV Access Mode” corresponds to the actual access mode through APP or screen. 3.If the currently set “PV access mode” does not match the actual access mode, you need to set the “PV access mode” to a mode that matches the actual situation through APP or screen, and then disconnect the PV and AC power supply and restart after the setup is completed. 4.After the setting is completed, if the current "PV access mode" is consistent with the actual access mode, but this fault is still reported, please contact the dealer or after-sales service center.

No.	Fault	Cause	Troubleshooting Suggestions:
		access mode set by the device.	
114	PV String Reversed (String 33~48)	The PV strings are connected reversely.	Check whether PV strings are connected reversely.
115	PV String Loss (String 33~48)	String fuse disconnected (if applicable).	Check if the fuse is blown. As above.
116	PV String Overcurrent (String 33~48)	Causes are possibly as follows: 1.String overcurrent. 2.String current sensor abnormality.	
117	BAT 1 Precharge Failure	Battery 1 precharge circuit failure (burnt precharge resistor, etc.)	Check whether the pre-charging circuit is good, whether the battery voltage and bus voltage are consistent after powering up the battery only, if not, please contact the dealer or GoodWe after-sales service center.

No.	Fault	Cause	Troubleshooting Suggestions:
118	BAT 1 Relay Failure	Battery 1 relay does not operate properly.	After the battery is powered up, check if the battery relay works and if you hear a closing sound, if it does not work, please contact your dealer or GoodWe after-sales service center.
119	BAT 1 Overvoltage	Battery 1 access voltage exceeds the rated range of the machine.	Verify that the battery voltage is within the rated range of the machine.
120	BAT 2 Precharge Failure	Battery 2 precharge circuit failure (burnt precharge resistor, etc.)	Check whether the pre-charging circuit is good, whether the battery voltage and bus voltage are consistent after powering up the battery only, if not, please contact the dealer or GoodWe after-sales service center.
121	BAT 2 Relay Failure	Battery 2 relay does not operate properly.	After the battery is powered up, check if the battery relay works and if you hear a closing sound, if it does not work, please contact your dealer or GoodWe after-sales service center.
122	BAT 2 Overvoltage	Battery 2 access voltage exceeds the rated range of the machine.	Verify that the battery voltage is within the rated range of the machine.
123	BAT 1 Reversed	Battery 1 positive and negative are connected reversedly.	Check the battery and machine terminals for positive and negative consistency.

No.	Fault	Cause	Troubleshooting Suggestions:
124	BAT 2 Reversed	Battery 2 positive and negative are connected reversedly.	Check the battery and machine terminals for positive and negative consistency.
125	BAT Connection Abnormal	Battery abnormal connection	Check whether the battery is working properly.
125	Bat Overtemperature	Battery temperature is too high.Causes are possibly as follows: 1.The inverter is installed in a place with poor ventilation. 2.The ambient temperature exceeds 60℃. 3.A fault occurs in the internal fan of the inverter.	
127	Ref Voltage Abnormal	The reference circuit is abnormal.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
128	AC SPD Fault	AC side lightning protection device failure.	Replace AC side lightning protection devices.
129	DC SPD Fault	DC side lightning protection device failure.	Replace DC side lightning protection devices.

No.	Fault	Cause	Troubleshooting Suggestions:
130	Internal Fan Abnormal	Internal fan abnormality.Causes are possibly as follows: 1.Abnormal fan power supply. 2.Mechanical exception (blocking). 3.Fan aging damage.	Disconnect the AC output side switch and the DC input side switch.After 5 minutes, close the AC output side switch and the DC input side switch.If fault persists, please contact the dealer or GoodWe after-sales service center.
131	External Fan Abnormal	External fan abnormality.Causes are possibly as follows: 1.Abnormal fan power supply. 2.Mechanical exception (blocking). 3.Fan aging damage.	
132	PID Abnormal	PID hardware failure or high PV voltage PID pause	PID pause warning caused by high PV voltage does not need to be dealt with, PID hardware failure can be cleared by turning the PID switch off and on again to clear the PID fault, replace the PID unit.

No.	Fault	Cause	Troubleshooting Suggestions:
133	Trip-Switch Trip Warning	Causes are possibly as follows: 1.An overcurrent or PV reversal has occurred causing the disconnect switch to trip;	Contact the dealer or the after-sales service.The reason for disconnection, for the occurrence of PV short circuit or reverse connection, it is necessary to check whether there is a historical PV short circuit warning or historical PV reverse connection warning, and if there is, it is necessary for the maintenance personnel to check the corresponding PV situation.After checking that there are no faults you can manually close the disconnect switch and clear this warning via the APP interface clear history faults operation.
134	PV IGBT Short Circuit Warning	Causes are possibly as follows: 1.An overcurrent occurs causing the disconnect switch to trip;	Contact the dealer or the after-sales service.Maintenance personnel need to follow the historical PV short circuit warning sub-code to check whether there is any fault in the short-circuited Boost hardware and external strings; after checking there is no fault, the warning can be cleared by clearing the historical fault operation through the APP interface.

No.	Fault	Cause	Troubleshooting Suggestions:
135	PV String Reversed Warning (String 1~16)	Causes are possibly as follows: 1.The PV reverse connection has occurred causing the disconnecting switch to trip;	Contact the dealer or the after-sales service.Maintenance personnel need to follow the historical PV reverse connection warning subcode to check whether the corresponding string is reverse connected and whether there is pressure difference in the PV panel configuration; after the check is complete and there is no fault, the warning can be cleared by clearing the historical fault operation through the APP interface.
136	PV String Reversed Warning（String 17~32）	Causes are possibly as follows: 1.The PV reverse connection has occurred causing the disconnecting switch to trip;	Contact the dealer or the after-sales service.Maintenance personnel need to follow the historical PV reverse connection warning subcode to check whether the corresponding string is reverse connected and whether there is pressure difference in the PV panel configuration; after the check is complete and there is no fault, the warning can be cleared by clearing the historical fault operation through the APP interface.

No.	Fault	Cause	Troubleshooting Suggestions:
137	Flash R/W Error Flash R/W Error	Causes are possibly as follows: Flash content has changed; flash life is exhausted;	1.Upgrade the latest version of the program. 2.Contact the dealer or the after-sales service.
138	Meter Comm Loss	This warning may be reported after enabling the anti-backflow function.Possible causes: 1.Meter not connected; 2.The communication wire connecting the meter to the inverter is wired incorrectly.	Check the wiring of the meter and connect the meter correctly, if the fault still exists after checking, contact the dealer or the after-sales service.
139	PV Type Identification Failure	PV panel recognizes hardware anomaly	Contact the dealer or the after-sales service.
140	PV String Mismatch	PV string mismatches.Two sets of string open-circuit voltages under the same MPPT have different configurations.	Check the open-circuit voltage of the two strings, and configure the strings with the same open-circuit voltage under the same MPPT, as long time string mismatch is a potential safety hazard.
141	CT Loss	CT Loss	Check whether the CT wiring is correct;
142	CT Reversed	CT Reversed	Check whether the CT wiring is correct;
143	PE Loss	Ground wire not connected.	Check the ground wire.

No.	Fault	Cause	Troubleshooting Suggestions:
144	PV String Terminal Overtemperature (String 1~8)	37176 Register PV Terminal Temperature Alarm Subcode 1 has a set position.	
145	PV String Terminal Overtemperature (String 9~16)	37177 Register PV Terminal Temperature Alarm Subcode 2 has a set position.	
146	PV String Terminal Overtemperature (String 17~20)	37178 Register PV Terminal Temperature Alarm Subcode 3 has a set position.	
147	PV String Reversed Warning (String 33~48)	Causes are possibly as follows: 1.The PV reverse connection has occurred causing the disconnecting switch to trip;	Contact the distributor or after-sales service center; Maintenance personnel need to follow the historical PV reverse connection warning subcode to check whether the corresponding string is reverse connected and whether there is pressure difference in the PV panel configuration; after the check is complete and there is no fault, the warning can be cleared by clearing the historical fault operation through the APP interface.
148	Battery 1 low voltage	Battery voltage below set value.	
149	Battery 2 low voltage	Battery voltage below set value.	

No.	Fault	Cause	Troubleshooting Suggestions:
150	Low battery supply voltage	Battery not charging, voltage below shutdown voltage	

9.5 Routine Maintenance

⚠DANGER

Power off the inverter before operations and maintenance. Otherwise, the inverter may be damaged or electric shocks may occur.

Maintaining Item	Maintaining Method	Maintaining Period
System Clean	Check the heat sink, air intake, and air outlet for foreign matter or dust.	Once 6-12 months
Fan	Check the fan for proper working status, low noise, and intact appearance.	Once a year
DC Switch	Turn the DC switch on and off ten consecutive times to make sure that it is working properly.	Once a year
Electrical Connection	Check whether the cables are securely connected. Check whether the cables are broken, or whether there is any exposed copper core.	Once 6-12 months
Sealing	Check whether all the terminals and ports are properly sealed. Reseal the cable hole if it is not sealed or too big.	Once a year

10 Technical Parameters

Technical Data	GW60K-SMT-G20	GW35K-SMT-L-G20	GW37.5K-SMT-L-G20
Input			
Max. Input Power (kW)	90	63	75
Max. Input Voltage (V)	1100*[1]	900	900
MPPT Operating Voltage Range (V)*[2]	160~1000	160~900	160~900
MPPT Voltage Range at Nominal Power (V)	500~860	280~650	280~650
Start-up Voltage (V)	180	180	180
Nominal Input Voltage (V)	600	370	370
Max. Input Currt per MPPT (A)	42	42	42
Max. Short Circuit Currt per MPPT (A)	52.5	52.5	52.5
Max. Backfeed Currt to The Array (A)	0	0	0

Technical Data	GW60K-SMT-G20	GW35K-SMT-L-G20	GW37.5K-SMT-L-G20
Number of MPP Trackers	4	4	4
Number of Strings per MPPT	2	2	2
Output			
Nominal Output Power (kW)	60	35	37.5
Nominal Output Appart Power (kVA)	60	35	37.5
Max. AC Active Power (kW)	66*[3]	38.5*[4]	37.5
Max. AC Appart Power (kVA)	66*[3]	38.5*[4]	37.5
Nominal Power at 40℃ (kW)	60	/	37.5
Max. Power at 40℃ (Including AC Overload) (kW)	60	/	37.5
Nominal Output Voltage (V)	220/380, 230/400, 3L/N/PE or 3L/PE	127/220, 3L/N/PE or 3L/PE	

Technical Data	GW60K-SMT-G20	GW35K-SMT-L-G20	GW37.5K-SMT-L-G20
Output Voltage Range (V)	323~456	176-279	161-279
Nominal AC Grid Frequcy (Hz)	50/60	50/60	50/60
AC Grid Frequcy Range (Hz)	45~55 / 55~65	45~55/55~65	45~55/55~65
Max. Output Currt (A)	100.0@220V, 95.7@230V	101	98.4
Max. Output Fault Currt (Peak and Duration) (A)	190, 1μs	190, 1μs	190, 1μs
Inrush Currt (Peak and Duration)(A)	30, 5ms	30, 5ms	30, 5ms
Nominal Output Currt (A)	91.0@220V, 87.0@230V	91.9	98.4
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)		
Max. Total Harmonic Distortion	<3%	<3%	<3%
Maximum Output Overcurrt Protection (A)	180	180	180

Technical Data	GW60K-SMT-G20	GW35K-SMT-L-G20	GW37.5K-SMT-L-G20
Efficicy			
Max. Efficicy	98.80%	98.40%	98.40%
European Efficicy	98.30%	98.00%	98.00%
Protection			
PV String Currt Monitoring	Integrated	Integrated	Integrated
PV Insulation Resistance Detection	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated
PV 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

Technical Data	GW60K-SMT-G20	GW35K-SMT-L-G20	GW37.5K-SMT-L-G20
DC Surge Protection	Type II (Type I+II optional)		
AC Surge Protection	Type II	Type II	Type II
AFCI	Optional*[5]	Optional	Optional*[5]
Emergcy Power Off	Optional	/	/
Rapid Shutdown	Optional	Optional	Optional
Remote Shutdown	Optional*[5]	Optional	Optional*[5]
PID Recovery	Optional	Optional	Optional
Power Supply at Night	Optional	Optional	Optional
I-V Curve Scan	Optional	Optional	Optional
General Data			
Operating Temperature Range (℃)	-30 ~ +60	-30 ~ +60	-30 ~ +60
Storage Temperature (℃)	-40 ~ +70	-40 ~ +70	-40 ~ +70
Relative Humidity	0~100%	0~100%	0~100%
Max. Operating Altitude (m)	4000	4000	4000

Technical Data	GW60K-SMT-G20	GW35K-SMT-L-G20	GW37.5K-SMT-L-G20
Cooling Method	Smart Fan Cooling		
User Interface	LED, LCD (Optional), APP		
Communication	RS485, WiFi+LAN+Bluetooth		RS485, WiFi+Bluetooth(Brazil), WiFi+LAN+Bluetooth
Communication Protocols	Modbus-RTU(SunSpec Compliant), Modbus-TCP		
Weight (kg)	42	42	42
Dimsion (W×H×D mm)	685*545*225	685*545*225	685*545*225
Noise Emission (dB)	<50	<50	<50
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, C5 (Optional)	C4, C5 (Optional)	C4, C5 (Optional)
DC Connector	MC4 (4~6mm^2)	MC4 (4~6mm^2)	MC4 (4~6mm^2)
AC Connector	OT/DT terminal (Max. 70mm^2)		

Technical Data	GW60K-SMT-G20	GW35K-SMT-L-G20	GW37.5K-SMT-L-G20
Environmtal Category	4K4H	4K4H	4K4H
Pollution Degree	III	III	III
Overvoltage Category	DC II / AC III	DC II / AC III	DC II / AC III
Protective Class	I	I	I
The Decisive Voltage Class (DVC)	PV: C	PV: C	PV: C
	AC: C	AC: C	AC: C
	com: A	com: A	com: A
Mounting Method	Wall Mounted	Wall Mounted	Wall Mounted
Active Anti-islanding Method	AFDPF + AQDPF	AFDPF + AQDPF	AFDPF + AQDPF
Country of Manufacture	China	China	China

1. When the input voltage ranges from 1000V to 1100V, the inverter will enter the standby state. When the input voltage returns to the MPPT operating voltage range, the inverter will resume normal operating state.
2. Please refer to the user manual for the MPPT Voltage Range at Nominal Power.
3. For Brazil, Max. AC Active Power & Max. AC Appart Power: 60kW/kVA.
4. For Brazil, Max. AC Active Power & Max. AC Appart Power: 35kW/kVA.
5. For Brazil: Integrated.

11 Glossary of Terms

Overvoltage levels:

Overvoltage I: Devices connected to the circuit which can limit instantaneous overvoltage to a relatively low level.
Overvoltage II: Energy-consuming devices powered by fixed power distribution equipment. The devices include appliances, portable tools, and other household and similar equipment. Overvoltage III is also applicable if there are special requirements for the reliability and applicability of the equipment.
Overvoltage III: Devices apply to fixed distribution equipment. The reliability and applicability of the equipment have to meet special requirements. The devices include switches in the fixed power distribution equipment and industrial equipment permanently connected to fixed power distribution equipment.
Overvoltage IV: Devices apply to the power distribution equipment, such as measuring instruments and prepositioned overcurrent protection devices, etc.

Humidity Levels:

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

Environmental levels:

Outdoor inverter: The ambient temperature range is -25°C~+60°C, suitable for an environment with pollution of level 3;
Indoor type II inverter: The ambient temperature range is -25°C - +40°C, suitable for an environment with pollution of level 3;
Indoor type I inverter: The ambient temperature range is 0°C - +40°C, suitable for an environment with pollution of level 2;

Pollution levels:

Pollution level 1: No pollution or dry and non-conductive pollution only;
Pollution level 2: Usually non-conductive pollution only, but there may be temporary conductive pollution caused by condensation;
Pollution level 3: Conductive pollution or non-conductive pollution turns to conductive pollution due to condensation;
Pollution level 4: Persistent conductive pollution, such as pollution caused by conductive dust or rain and snow.

12 Obtain Related Product Manuals

Document Name	Official Website Link
WiFi+LAN Kit-20&WiFi Kit-20	WiFi+LAN Kit-20 & WiFi Kit-20 Quick Installation Guide
EzLogger3000C User Manual	EzLogger3000C User Manual
GMK330 & GMK360 & GM330 Quick Installation Guide	GW_GMK330 GMK360 GM330_Quick Installation Guide

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