V1.1-2026-02-06

# 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 product labels otherwise specified. All descriptions in the manual are for guidance only.

# About This Manual

This document describes the product information, installation, electrical connection, commissioning, troubleshooting, and maintenance of the inverter. Read through this manual before installing and operating the products to understand product safety information and familiarize yourself with functions and features of the product. This manual is subject to update without notice. For more product details and latest documents, visit https://en.goodwe.com/.

## Applicable Model

This manual applies to the listed inverters below:

| No. | 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 | |

## Target Audience

Only for use by professionals who are familiar with local regulations and standards, electrical systems, and who have received professional training and are knowledgeable about this product.

## Symbol Definition

To make better use of this manual, the following symbols are used to highlight important information. Please read the symbols and explanations carefully.

**⚠DANGER**

A situation with high potential danger, which will result in death or serious injury if not avoided.

**⚠WARNING**

A situation with moderate potential danger, which may result in death or serious injury if not avoided.

**⚠CAUTION**

A situation with low potential danger, which may result in moderate or minor injury to personnel if not avoided.

**NOTICE**

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

Table of Contents

# 1 Safety Precautions

**⚠WARNING**

The products are designed and tested strictly to comply with related safety rules. Follow all the safety instructions and cautions before any operations. Improper operation might cause personal injury or property damage as the products are electrical equipment.

## 1.1 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 product labels otherwise specified. All descriptions in the manual are for guidance only.
- Read through this document before installation to learn about the product and the precautions.
- All operations should be performed by trained and knowledgeable technicians who are familiar with local standards and safety regulations.
- Use insulating tools and wear personal protective equipment (PPE) when operating the equipment to ensure personal safety. Wear anti-static gloves, wrist strips, and cloths when touching electronic devices to protect the equipment from damage.
- Strictly follow the installation, operation, and configuration instructions in this document or the user manual. The manufacturer shall not be liable for equipment damage or personal injury if you do not follow the instructions. For more warranty details, please visit: https://www.goodwe.com/support-service/warranty-related.

## 1.2 DC Side

**⚠DANGER**

- Connect the inverter DC cables using the delivered DC connectors. The manufacturer shall not be liable for the equipment damage if DC connectors of other models 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 60K: When the input voltage ranges from 1000V to 1100V, the inverter will enter standby mode. 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 the PV Module frames and the bracket system are securely grounded.
- Ensure the DC cables are connected tightly, securely and correctly.
- PV modules used with inverters must comply with IEC 61730 Class A standard.
- The PV String connected to the same MPPT must use the same model and the same number of PV modules.
- To maximize the Inverter power Efficiency generation, ensure that the maximum Power point voltage of the series-connected PV modules falls within the MPPT Voltage Range at Nominal Power range of the Inverter.
- Ensure that the input current of each MPPT is less than or equal to the Max. Input Current per MPPT of the inverter.
- Please ensure that the connected PV strings are evenly distributed across all MPPT channels.

## 1.3 AC Side

**⚠WARNING**

- The inverter shall not be connected to the grid until grid connection permission is obtained.
- The voltage and frequency at the connecting point should meet the on-grid requirements.
- Additional protective devices like circuit breakers or fuses are recommended on the AC side. Specification of the protective device should be at least 1.25 times the rated AC output rated current.
- You are recommended to use copper cables as PE cables. If you prefer aluminum cables, remember to use copper to aluminum adapter terminals.

## 1.4 Inverter

**⚠DANGER**

- Do not apply mechanical load to bottom terminals, otherwise the terminals may be damaged.
- All labels and warning marks should be visible after the installation. Do not cover, scrawl, or damage any label on the equipment.

The warning labels on the inverter enclosure are as follows:

| No. | Symbol | Description |
|---|---|---|
| 1 |  | Potential risks exist during the operation of the devices. Wear proper PPE during operations. |
| 2 |  | High voltage hazard. High voltage exist during the operation of the devices. Disconnect all incoming power and turn off the product before working on it. |
| 3 |  | High-temperature hazard. Do not touch the product under operation to avoid being burnt. |
| 4 |  | Delayed discharge. Wait 5 minutes after power off until the components are completely discharged. |
| 5 |  | Read through the user manual before any operations. |
| 6 |  | Do not dispose of the System as household waste. Deal with it in compliance with local laws and regulations, or send it back to the manufacturer. |
| 7 |  | Protective Grounding Connection Point. |
| 8 |  | CE Mark. |

# 1.5 EU Declaration of Conformity

## 1.5.1 Equipment with Wireless Communication Modules

The equipment with wireless communication modules sold in the European market meets the requirements of the following directives:

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

### 1.5.2 Equipment without Wireless Communication Modules

The equipment without wireless communication modules sold in the European market meets the requirements of the following directives:

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

## 1.6 Personal Requirements

**NOTICE**

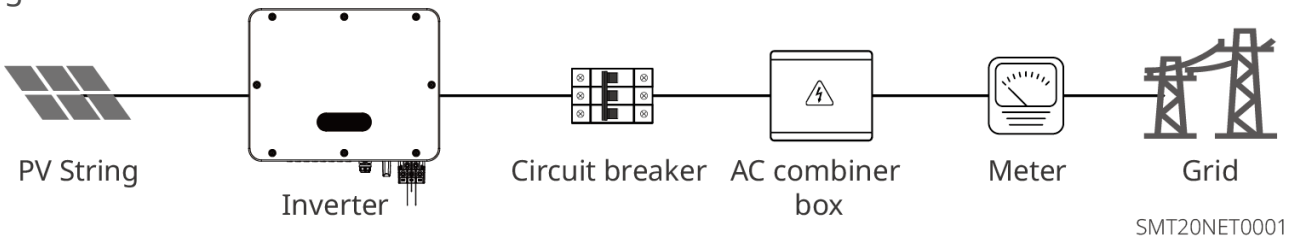
To ensure the safety, compliance, and efficiency throughout the transportation, installation, wiring, operation, and maintenance of the equipment, the work must be carried out by professionals or qualified personnel.

1. Professionals or qualified personnel include:
   - Personnel who have mastered the equipment's working principles, system structure, and knowledge of relevant risks and hazards, and have received professional operation training or possess rich practical experience.
   - Personnel who have received relevant technical and safety training, have certain operational experience, can be aware of potential dangers that specific operations may pose to themselves, and are able to take protective measures to minimize risks to themselves and others.
   - Qualified electrical technicians who meet the regulatory requirements of the country/region where they are located.
   - Personnel who hold a degree in electrical engineering/an advanced diploma in an electrical discipline or equivalent qualification/a professional qualification in the electrical field, and have at least 2/3/4 years of experience in testing and supervising in accordance with electrical equipment safety standards.
2. Personnel engaged in special tasks such as electrical operations, working at heights, and operation of special equipment must hold valid qualification certificates as required by the location of the equipment.
3. Operation of medium-voltage equipment must be performed by certified high-voltage electricians.
4. Replacement of the equipment and its components is only permitted to be carried out by authorized personnel.

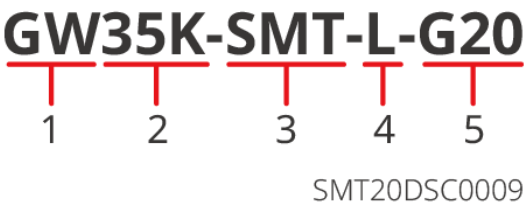
# 2 Product Introduction

## 2.1 Application Scenario

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:

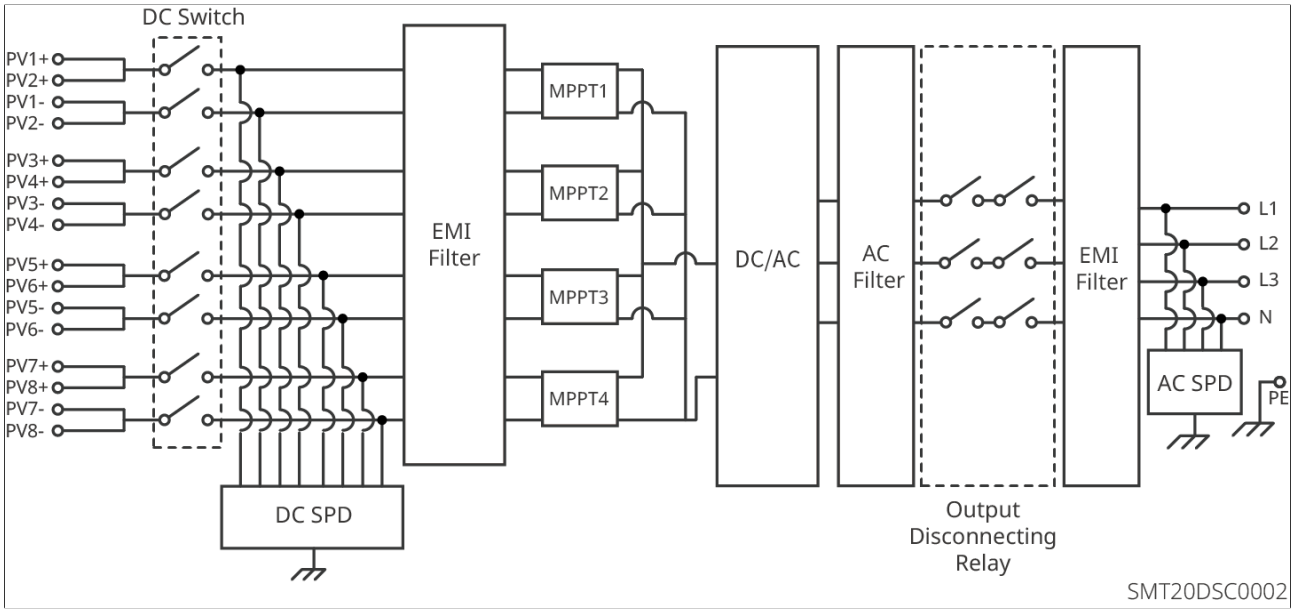



### Model Description




| No. | Description | Instruction |
|---|---|---|
| 1 | Brand Code | GW: GoodWe |
| 2 | Nominal Power | 35K: the nominal power is 35kW |
| 3 | Series Name | SMT: SMT series |
| 4 | Low voltage | L: Low Voltage version |
| 5 | Version Code | G20: Second-generation product |

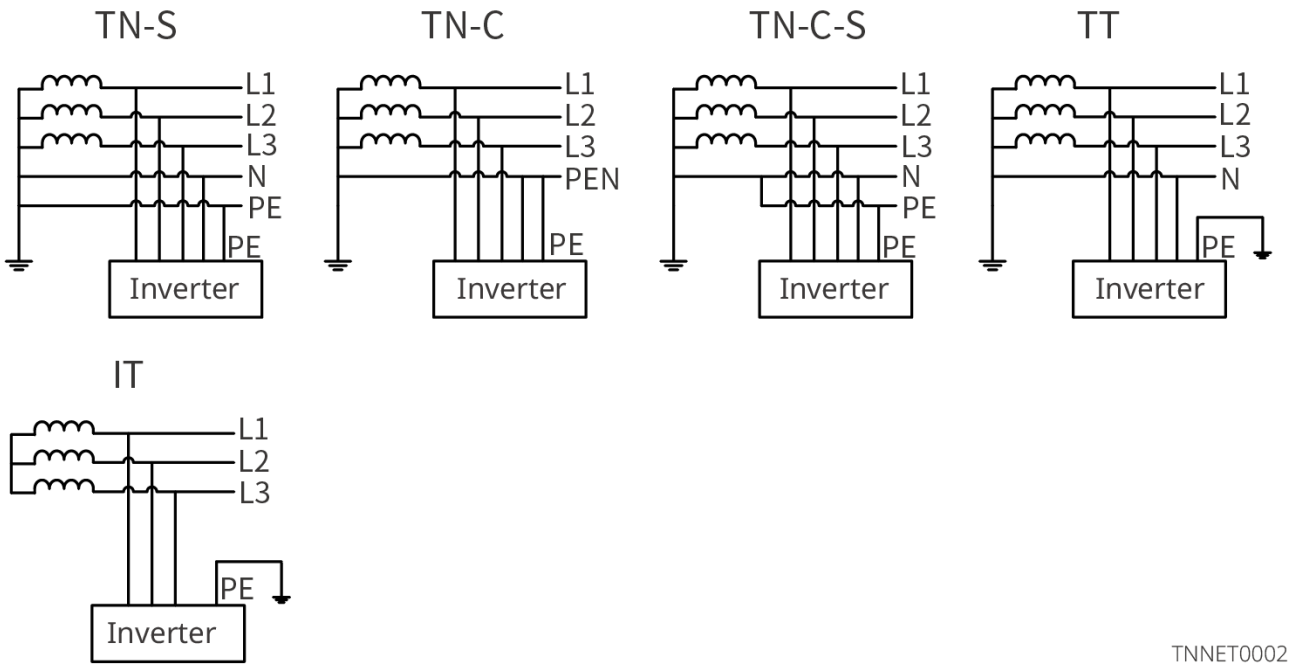
## 2.2 Circuit Diagram




## 2.3 Supported Grid Types

**NOTICE**

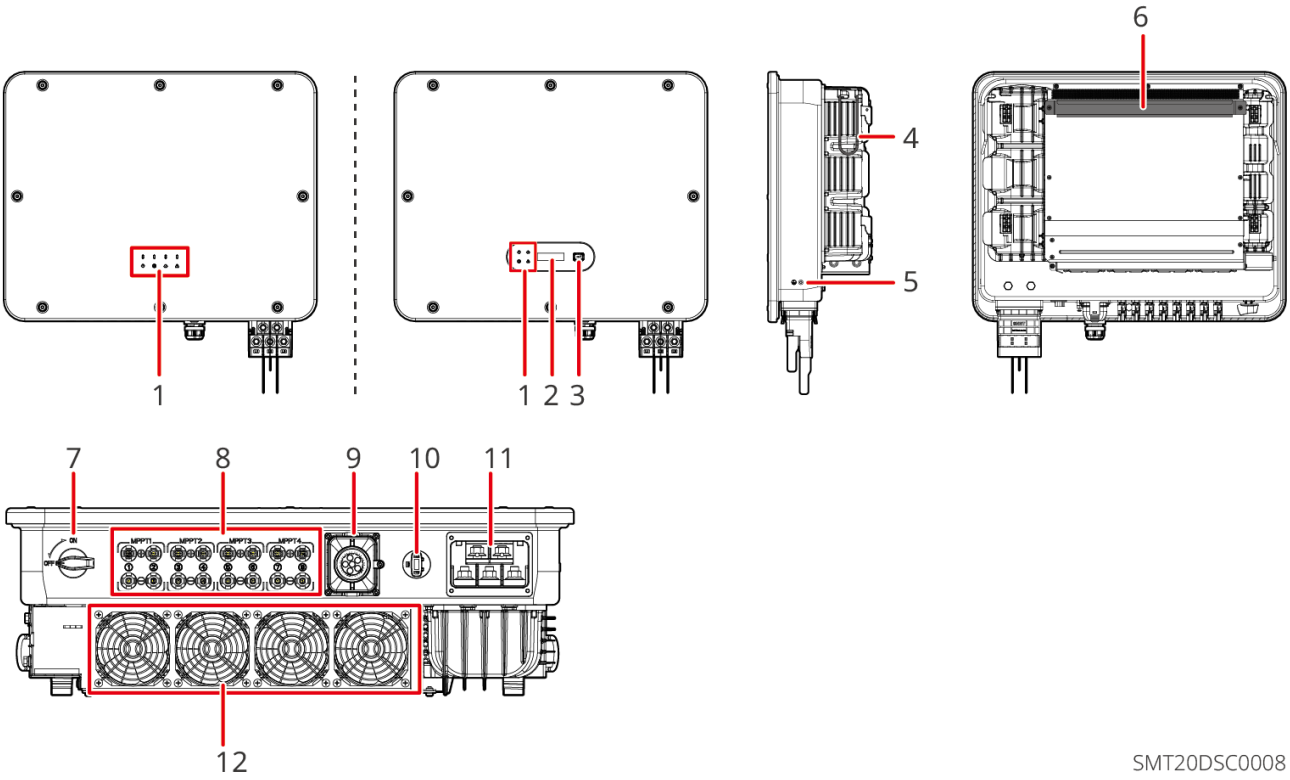
- For the TT grid type with neutral wire, the N to ground voltage must be less than 20V.
- For power grids connected to the neutral wire, the voltage between N and earth must be less than 10V.




## 2.4 Appearance&Dimensions

There may be differences in the appearance and color of the product, and it refer to the actual situation.

### 2.4.1 Appearance Description

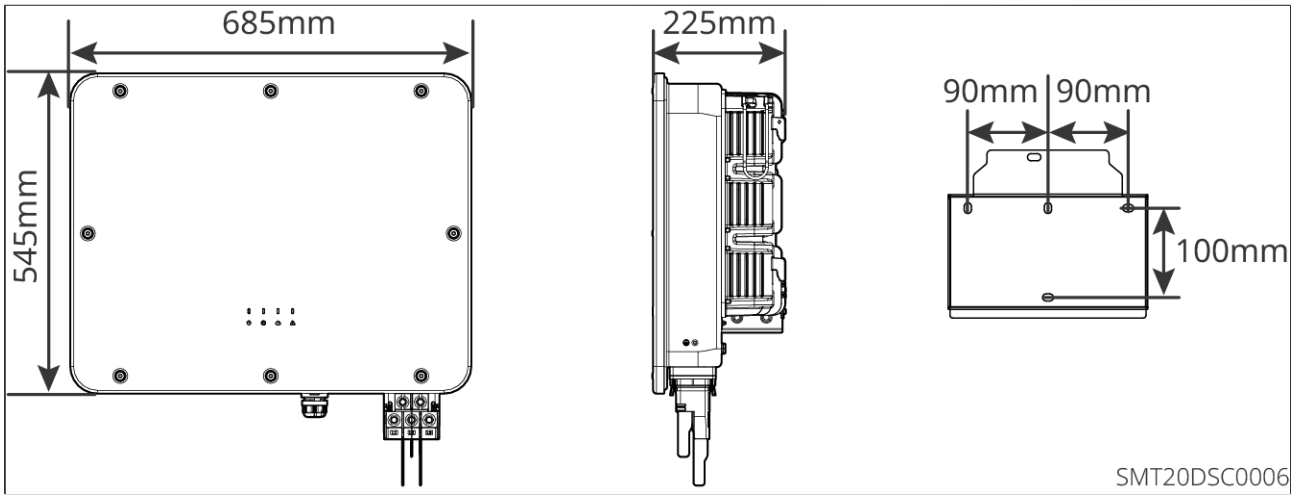



SMT20DSC0008

| No. | Component | Description |
|---|---|---|
| 1 | Indicators(Without screen) | Indicating the working status of the inverter and the SOC of the battery |
| | Indicators(With screen) | |
| 2 | LCD (optional) | To check the parameters of the inverter |
| 3 | Button (optional) | To control contents displayed on the screen. |
| 4 | Handle | Used to move the inverter |
| 5 | Protective grounding point | To Connect the PE Cable |
| 6 | Mountings | Used to mount the inverter on the mounting plate |
| 7 | DC Switch | Controlling the connection or disconnection of DC input MPPT1-4 |

| No. | Component | Description |
|---|---|---|
| 8 | PV input terminal | 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 the AC Cable |
| 12 | Fan | Used for cooling the device. |

### 2.4.2 Dimensions



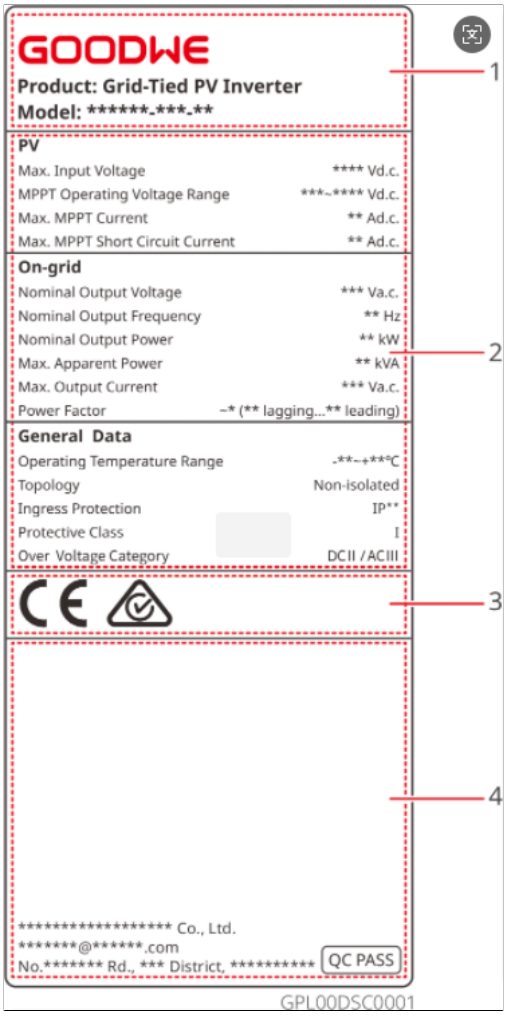

### 2.4.3 Indicator Description

| Indicator | Status | Description |
|---|---|---|
| Power | ▬ | On: Equipment Power On |
| | — | Power Off: The equipment is power off. |
| | ▬ | On: THE INVERTER IS FEEDING POWER |

| | | |
|---|---|---|
| Running | | Power Off: THE INVERTER IS NOT FEEDING POWER |
| | | SINGLE SLOW BLINKING SELF CHECK BEFORE CONNECTING TO THE GRID |
| | | SINGLE FAST BLINKING CONNECTING TO THE GRID |
| Communication | | On: WIRELESS IS CONNECTED/ACTIVE |
| | | Blinks 1 time: WIRELESS SYSTEM IS RESETTING |
| | | Blinks 2 times: WIRELESS IS NOT CONNECTED TO ROUTER OR BASE STATION |
| | | Blinks 4 times: NOT CONNECTED TO MONITORING SERVER |
| | | Blinks: RS485 communication normal |
| | | Power Off: WIRELESS IS RESTORING FACTORY DEFAULT SETTING |
| Fault | | On: System Failure |
| | | Power Off: No Fault |

### 2.4.4 Nameplate Description

The nameplates are for reference only. The actual product may differ.




| 1 | 2 | 3 | 4 |
|---|---|---|---|
| GW trademark, product type, and product model | Technical Parameters | Product Safety Symbols and Certification Marks | Contact Details, No. information |

## 2.5 Features

### AFCI

The inverter is integrated with an AFCI (Arc-Fault Circuit Interrupter) protection device used to detect arc faults and rapidly disconnect the circuit to avoid electrical fires.
Reason to occur electric arcs:

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

Troubleshooting:

- The inverter has integrated AFCI function, and meets the IEC 63027 standard.
- When the inverter detects an electric arc, users can find the time of the fault and the detailed phenomenon through SolarGo App.
- After the inverter triggers the AFCI alarm, it will shut down for protection, and automatically reconnect to the grid to resume operation once the alarm is cleared.
  - Automatic reconnection: The alarm can be cleared automatically after 5 minutes, if the inverter triggers the AFCI alarm for less than 5 times within 24 hours, and the inverter will reconnect to the grid to resume operation.
  - Manual reconnection: The alarm must be cleared manually before the inverter can reconnect to the grid to resume operation, if the inverter triggers the 5th AFCI alarm within 24 hours. For more details, refer to the SolarGo App User Manual.

| Model | Label | Description |
| --- | --- | --- |
| GW60K-SMT-G20 | F-I-AFPE-1-4-2 | F (Full coverage): Full coverage inverter PV input port<br>I (Integrated): AFPE (Arc Fault Protection Equipment) integrated in the inverter: combines two arc detection functions of AFD and AFI<br>1: A pair of PV input ports (PV+, PV-) connected to a string of PV input strings<br>4: The number of PV input ports detected by one arc detection sensor<br>2: The quantity of arc detection sensors. |
| GW35K-SMT-L-G20 | | |
| GW37.5K-SMT-L-G20 | | |

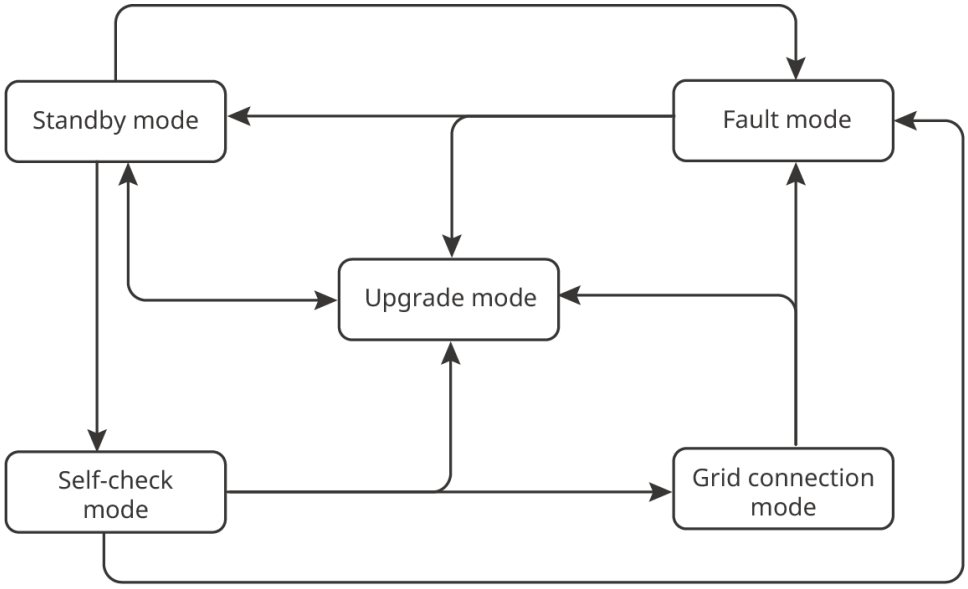
**NOTICE**

- 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 defauIt at the factory. If you need to use it, please enable the "Arc Detection" ffunction through the "Advanced Settings" interface on the SolarGo App.

## PID Restoration (Optional)

During the operation of a PV panel, a potential difference exists between its output electrodes and grounded frame. Over time, this causes reduced power generation efficiency, known as Potential Induced Degradation (PID).
The PID function of this device works by increasing the voltage difference between the photovoltaic (PV) panel and its frame to create a positive voltage difference (referred to as positive voltage elevation). This achieves the effect of PID suppression and is applicable to P-type PV panels as well as N-type PV panels that require positive voltage elevation to suppress the PID effect. For N-type solar panels that require negative voltage reduction to suppress the PID effect, it is recommended to disable this function. Please consult the module supplier to confirm whether the N-type module belongs to the type that requires positive pressure elevation for PID suppression.

## 2.6 Operation Mode of Inverters




| No. | Operating Mode | Description |
|---|---|---|
| 1 | Standby Mode | Standby stage after the machine is powered on.<br>• When the conditions are met, enter self-check mode.<br>• If a fault occurs, the inverter enters fault mode.<br>• If an upgrade request is received, enter upgrade mode. |
| 2 | Self-check Mode | Before the inverter starts, it continuously performs self-checks, initialization, etc.<br>• If the conditions are met, the on-grid mode is activated and the inverter starts grid connection operation.<br>• If an upgrade request is received, enter upgrade mode.<br>• If the self-check fails, the device enters fault mode. |

| No. | Operating Mode | Description |
| --- | --- | --- |
| 3 | On-grid Mode | The inverter is normal and in the on-grid mode.<br>• If a fault is detected, the system enters fault mode.<br>• If an upgrade request is received, enter upgrade mode. |
| 4 | Fault Mode | If a fault is detected, the inverter enters fault mode and waits until the fault is cleared before entering standby mode. After the standby mode ends, the inverter detects the operating status and then enters the next operating mode. |
| 5 | Upgrade Mode | The inverter enters this state when the program is updated. When the program update is complete, enter standby mode. After the standby mode ends, the inverter detects the operating status and then enters the next operating mode. |

# 3 Check and Storage

## 3.1 Check Before Receiving

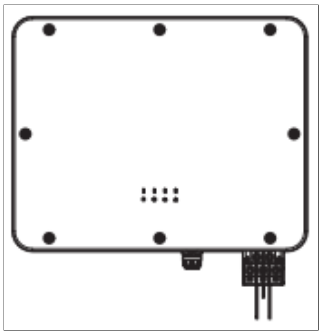
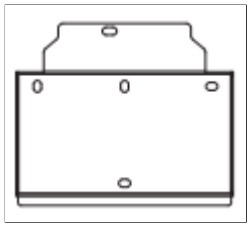
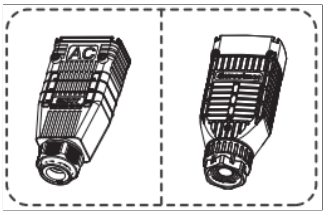
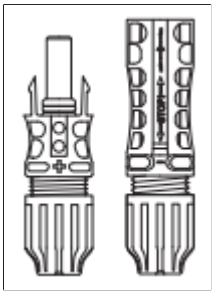
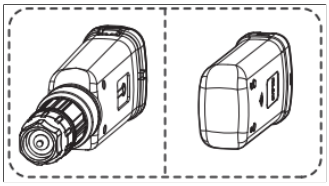
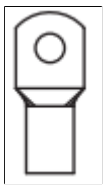
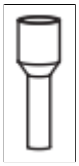
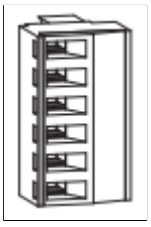
Check the following items before receiving the product:

1. Check the outer packing box for damage, such as deformation, holes, cracks, and other signs that may cause damage to the equipment inside the package. 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 product model is not what you requested, do not unpack the product and contact the supplier.
3. Check the deliverables for correct model, quantity and intact appearance. Contact the supplier as soon as possible if any damage is found.

## 3.2 Deliverables

**NOTICE**

- Electrical Connections, please use the delivered DC connectors. The manufacturer shall not be liable for the damage if other incompatible connectors are used.
- 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 represents the quantity of delivered accessories varies depending on the specific inverter model.

| Deliverables | Quantity | Deliverables | Quantity |
|---|---|---|---|
|  | Inverter x 1 |  | Mounting plate x 1 |
|  | Expansion bolt x 4 |  | AC Protection cover x 1 |
|  | Positive PV connectors x 8<br>Negative PV connectors x 8 |  | Smart dongle x1 |
|  | Grounding terminal x 1 |  | PIN terminals x N |
|  | 6Pin terminals x N |  | 2Pin terminals x N |

| Deliverables | Quantity | Deliverables | Quantity |
| --- | --- | --- | --- |
|  | DC connector wrench x 1 |  | Document x 1 |

## 3.3 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. The height and direction of the stacking equipment should follow the instructions on the packing box.
4. The equipment must be stacked with caution to prevent them from falling.
5. If the inverter has been stored for more than two years or has not been in operation for more than six months after installation, it is recommended to be inspected and tested by professionals before being put into use.
6. To ensure good electrical performance of the internal electronic components of the inverter, it is recommended to power it on every 6 months during storage. If it has not been powered on for more than 6 months, it is recommended to be inspected and tested by professionals before being put into use.

# 4 Installation

## 4.1 Installation Requirements

### Installation Environment Requirements

1. Do not install the equipment in a place near flammable, explosive, or corrosive materials.
2. The mounting bracket is sturdy and reliable, capable of supporting the weight of the inverter.
3. The installation space must meet the device's ventilation and heat dissipation and the operating space requirements.
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 inverter in a sheltered place to avoid direct sunlight, rain, and snow. Build a sunshade if it is needed.
6. The installation site should be out of the reach of children and away from areas that are easily accessible. High temperatures may exist on the surface of the equipment during operation to prevent burns.
7. Install the equipment at a height that is convenient for operation and maintenance, ensure that the device indicators, all labels are easy to view, and the terminal blocks are easy to operate.
8. The altitude to install the equipment shall be lower than the maximum working altitude 4000m.
9. The inverter is easy to be corroded when installed in salt-affected areas. A salt-affected area refers to the region within 1000 meters offshore or affected by the sea breeze. The area prone to the sea breeze varies depending on weather conditions (e.g. typhoon, monsoon) or terrain (such as dams and hills).
10. Install the equipment away from electromagnetic interference. If there is any radio or wireless communication equipment below 30MHz near the equipment, you have to:

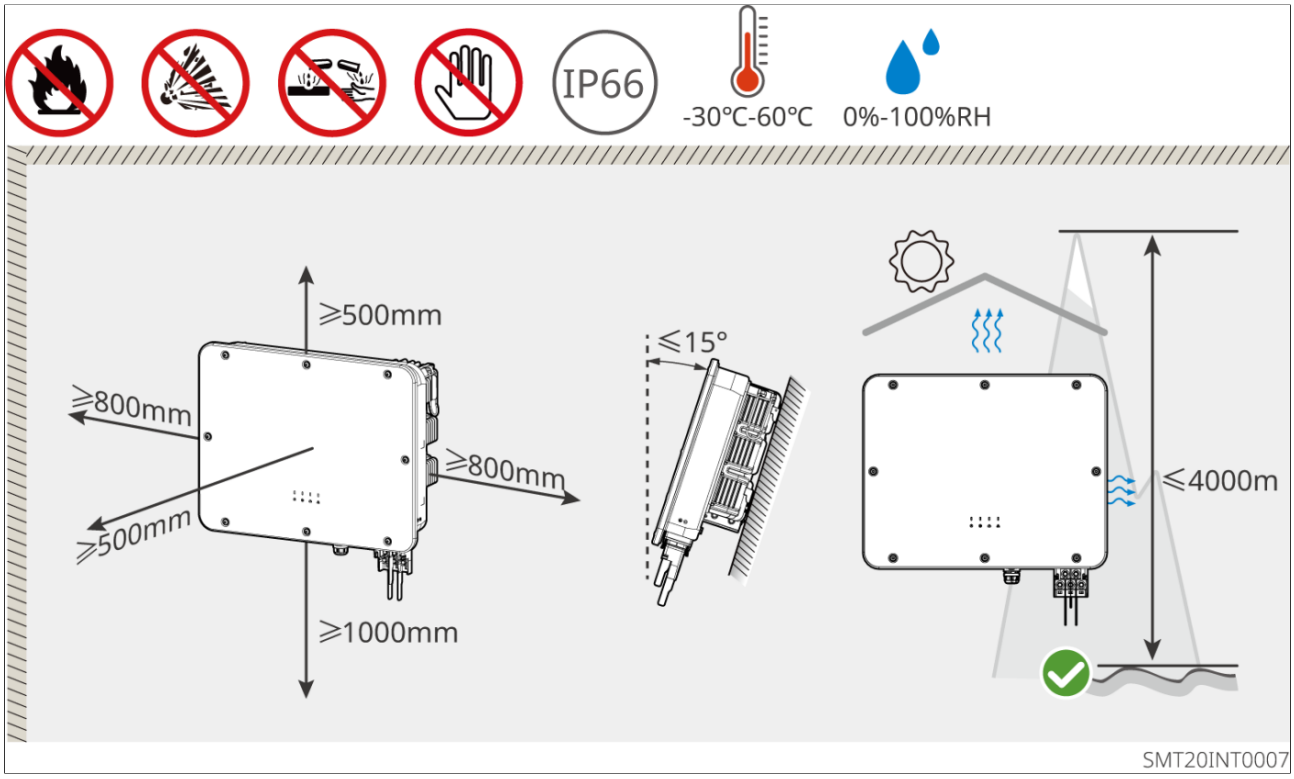
- Add a low pass EMI filter or a multi winding ferrite core to the DC input cable or AC output cable of the inverter.
- Install the inverter at least 30m far away from the wireless equipment.

## Installation 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.
- Do not install the product on the support with poor sound insulation to avoid the noise generated by the working product, which may annoy the residents nearby.

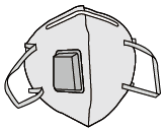
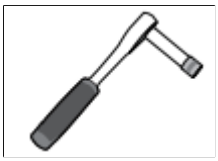
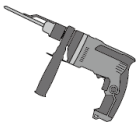
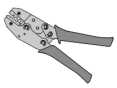
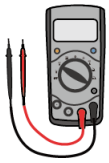
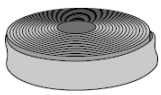
## Installation Angle Requirements

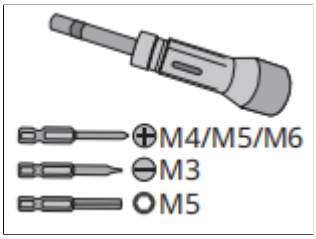
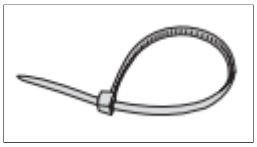
- Install the inverter vertically or at a maximum back tilt of 15 degrees.
- Do not install the inverter upside down, forward tilt, back forward tilt, or horizontally.




## Installation Tool

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

| Tool Type | Description | Tool Type | Description |
|---|---|---|---|
|  | Safety gloves |  | Dust mask |
|  | Goggles |  | Safety shoes |
|  | Socket wrench (M8) |  | Impact drill |
|  | Diagonal pliers |  | Heat gun |
|  | Wire stripper |  | DC terminal crimping tool |
|  | Rubber hammer |  | Marker |
|  | Multimeter |  | Heat shrink tube |

| Tool Type | Description | Tool Type | Description |
|---|---|---|---|
|  | Vacuum cleaner |  | Level ruler |
|  | Torque wrench Torque screwdriver (Slotted head: M2 Phillips head: M5) |  | Cable tie |

# 4.2 Inverter Installation

## 4.2.1 Inverter Handling

**⚠CAUTION**

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

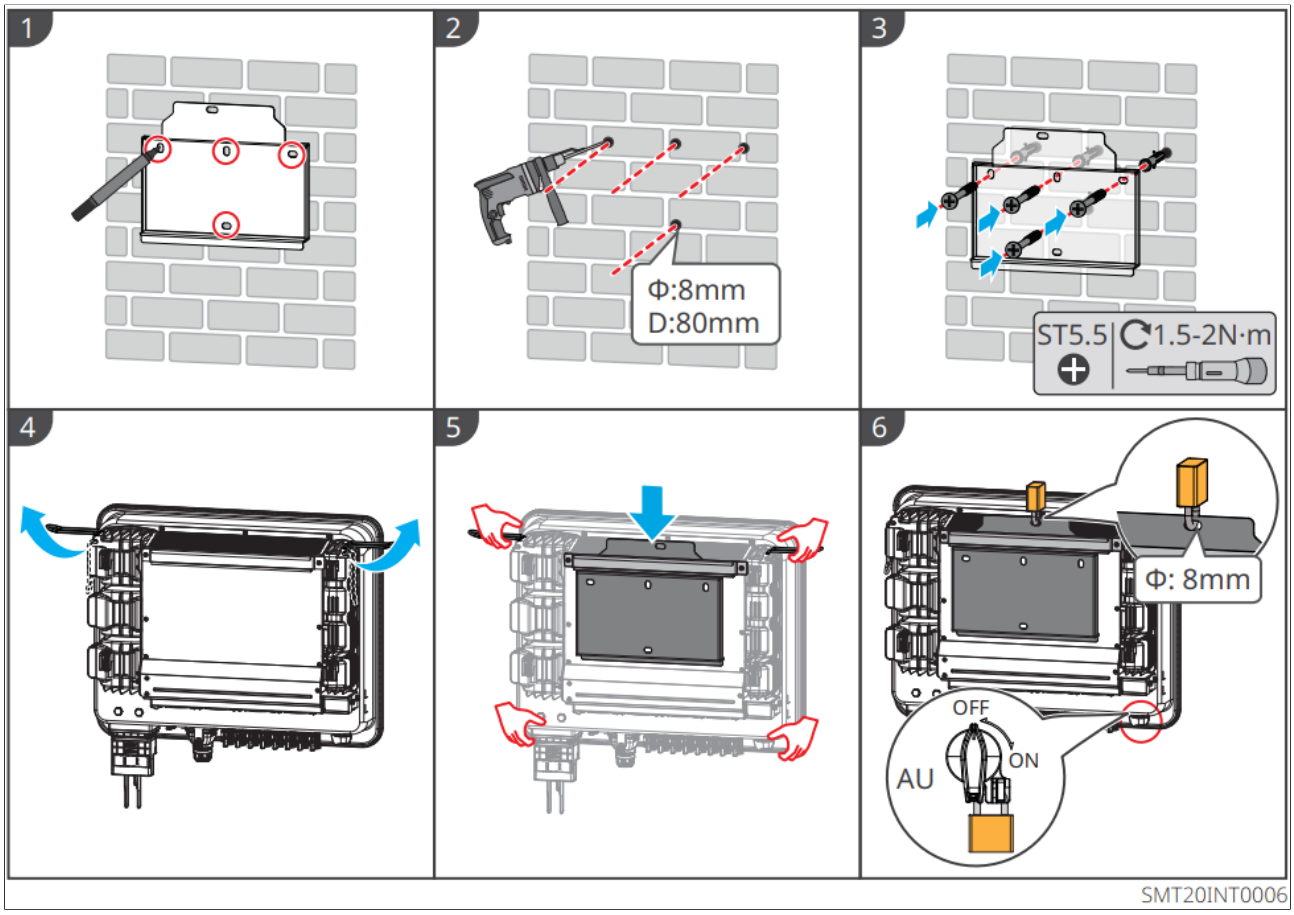
1. Consider the weight of the equipment before moving it. Assign enough personnel to move the equipment to avoid personal injury.
2. Wear safety gloves to avoid personal injury.
3. Keep the equipment in balance to avoid its falling down during moving.

## 4.2.2 Inverter Installation

**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.
- Avoid the water pipes and cables buried in the wall when drilling holes.
- If a bracket is required for installing the inverter, please prepare the bracket by yourself and secure it properly.
- Please contact the after-sales service center, If handles or lifting rings are required.
- The appearance of graphics in this document is only for reference. There may be differences in the appearance of different models. The actual product prevails.

**Step 1**: Put the mounting plate on the wall horizontally and mark positions for drilling holes.
**Step 2**: Drill holes to a depth of 80mm using the hammer drill. The diameter of the drill bit should be 8mm.
**Step 3**: Secure the mounting plate using the expansion bolts.
**Step 4**: Install the or lifting rings on both sides of the inverter handles.
**Step 5**: The installer should carry the inverter by holding the handles andang it on the back plate.
**Step 6**: (Optional) Turn on 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

# 5 Electrical Connections

## 5.1 Safety Precautions

**⚠DANGER**

- Disconnect the DC switch and the AC output switch of the inverter to power off the inverter before any electrical connections. Do not work with power on. Otherwise, an electric shock may occur.
- All operations, cables and parts specification during the electrical connection shall be in compliance with local laws and regulations.
- If the cable bears too much tension, the connection may be poor. Reserve a certain length of the cable before connecting it to the Inverter cable port.

**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 shall meet local laws and regulations.
- The appearance of graphics in this document is only for reference. There may be differences in the appearance of different models. The actual product prevails.

### Cable Specification Requirement

| Cable | Type | Cable Outer Diameter (mm) | Conductor Cross-Sectional Area ($^2$) |
|---|---|---|---|
| DC Cable | PV cable that meets 1100V standard | 4.7~6.4 | Recommended: 4 to 6 |

| Cable | Type | Cable Outer Diameter (mm) | Conductor Cross-Sectional Area ($^2$) | |
|---|---|---|---|---|
| AC Cable | Outdoor single-core/single conductor, four-core, five-core copper/aluminum cables | 22~42 | Copper Core: 25~ 70 | Aluminum Core: 35~ 70 |
| PE Cable | Outdoor Cable | 16~35 | | |
| Communication Cable | Outdoor Shielded Twisted-Pair Cable Meeting Local Standards | 4.5~7 | 0.2~0.5 | |

Note:

1. If aluminum cables are used, remember to connect copper to aluminum transition terminals.
2. Overall length of communication cable cannot exceed 1000m.
3. The values in this table are valid only when the external protective grounding conductor is made of the same metal as the phase conductor. Otherwise, the cross-sectional area of the external protective grounding conductor should be selected to ensure that its conductivity is equivalent to that specified in this table.

## RCD and AC circuit breaker Specification

Decide whether to install RCD (Residual Current Device) according to local laws and regulations. A type RCD shall be added to protect the equipment when the DC component of the leakage current exceeds limits. Recommended RCD specifications:

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

An AC circuit breaker shall be installed on the AC side to make sure that the inverter can safely disconnect the grid when an exception happens. Select the appropriate AC

circuit breaker in compliance with local laws and 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 | | |

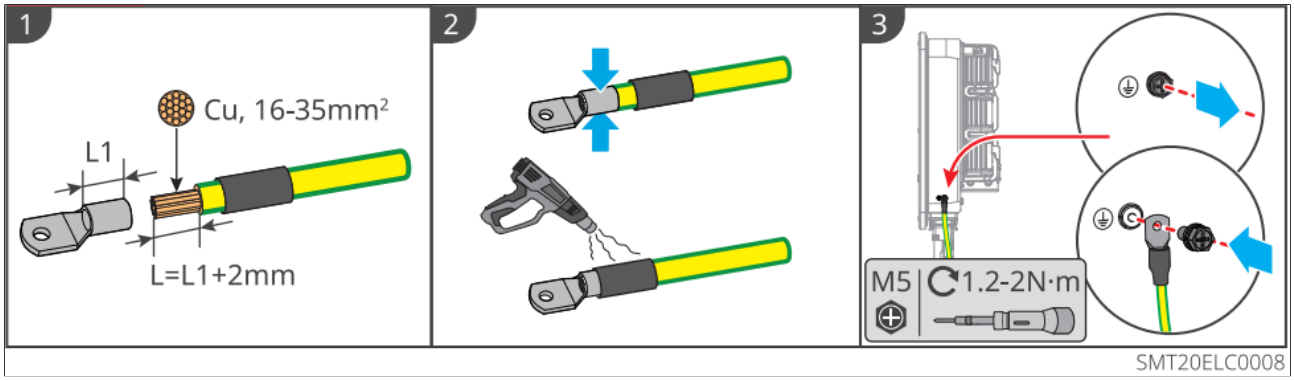
**NOTICE**

- Install one AC output circuit breaker for each inverter. Multiple inverters cannot share one AC circuit breaker.
- Do not connect any loads between the inverter and the AC circuit breaker directly linked to it.

## 5.2 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. Make sure that both of the two PE cables are securely connected.
- Make sure that all the groundings are tightly connected. When there are multiple inverters, make sure that all the grounding points on the enclosures are equal potential bonding.
- 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.
- PE cable and terminal should be prepared by customers according to the recommended specifications.
- Ground wires of other sizes that meet local standards and safety regulations can also be used for grounding connections. The manufacturer shall not be liable for the damage thereby.




## 5.3 Connecting the AC Output Cable

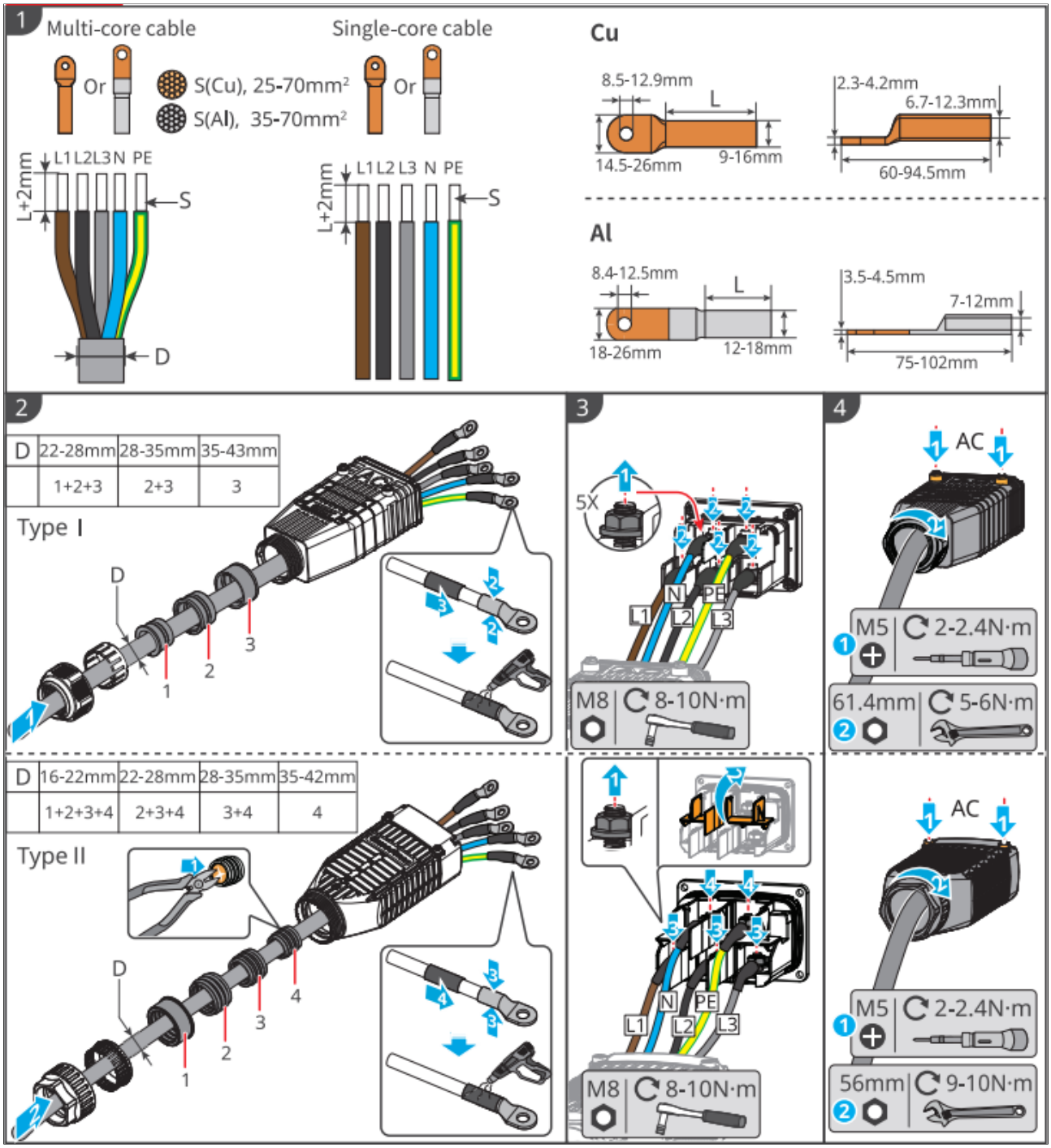
**⚠WARNING**

- When wiring, the AC output wires must be fully matched with the "L1", "L2", "L3", "N", and "PE" port of the AC terminal. Incorrect wire connection will cause damage to the inverter.
- Make sure that the whole cable cores are inserted into the AC terminal holes. No part of the cable core can be exposed.
- Make sure that the cables are connected securely. Otherwise, the terminal may be too hot to damage the inverter when the inverter is working.
- You are recommended to use copper cables as PE cables. If you prefer aluminum cables, remember to use copper to aluminum adapter terminals.
- The AC output terminal supports both three-phase four-wire and three-phase five-wire connection configurations; the actual wiring configuration should depend on the specific installation scenario. In this document, the three-phase five-wire configuration is described as an example.
- Ensure that extra length is reserved for the protective grounding conductor, so it will be the last conductor to bear stress if the AC output cables experience tension due to force majeure.

**NOTICE**

- The gland of the AC protective cover is suitable for single-strand multi-core cables. If multi-strand single-core cables are used, seal the AC protective cover with fireproof mastic.
- Please prepare fireproof mastic that complies with local environmental protection requirements.

**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 Cable.
**Step 4:** Install the Protective Cover.




## 5.4 Connecting the DC Input Cable

**⚠DANGER**

1. Do not connect the same PV string to multiple inverters at the same time. Otherwise, the inverters may be damaged.
2. The positive and negative poles of the PV string are prohibited from be 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 inverter DC cables using the delivered DC connectors.
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.
   - 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 60K: When the input voltage ranges from 1000V to 1100V, the inverter will enter standby mode. 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.

**NOTICE**

- The PV String connected to the same MPPT must use the same model and the same number of PV modules.
- To maximize the Inverter power Efficiency generation, ensure that the maximum Power point voltage of the series-connected PV modules falls within the MPPT Voltage Range at Nominal Power range of the Inverter.
- Please ensure that the connected PV strings are evenly distributed across all MPPT channels.

### PV String Connection Method

●: Connect a string of PV modules

●●: Connect two strings of PV modules

| PV String Numbers | MPPT1 | MPPT2 | MPPT3 | MPPT4 |
|---|---|---|---|---|
| 5 | ●● | ● | ● | ● |
| 6 | ●● | ●● | ● | ● |
| 7 | ●● | ●● | ●● | ● |
| 8 | ●● | ●● | ●● | ●● |

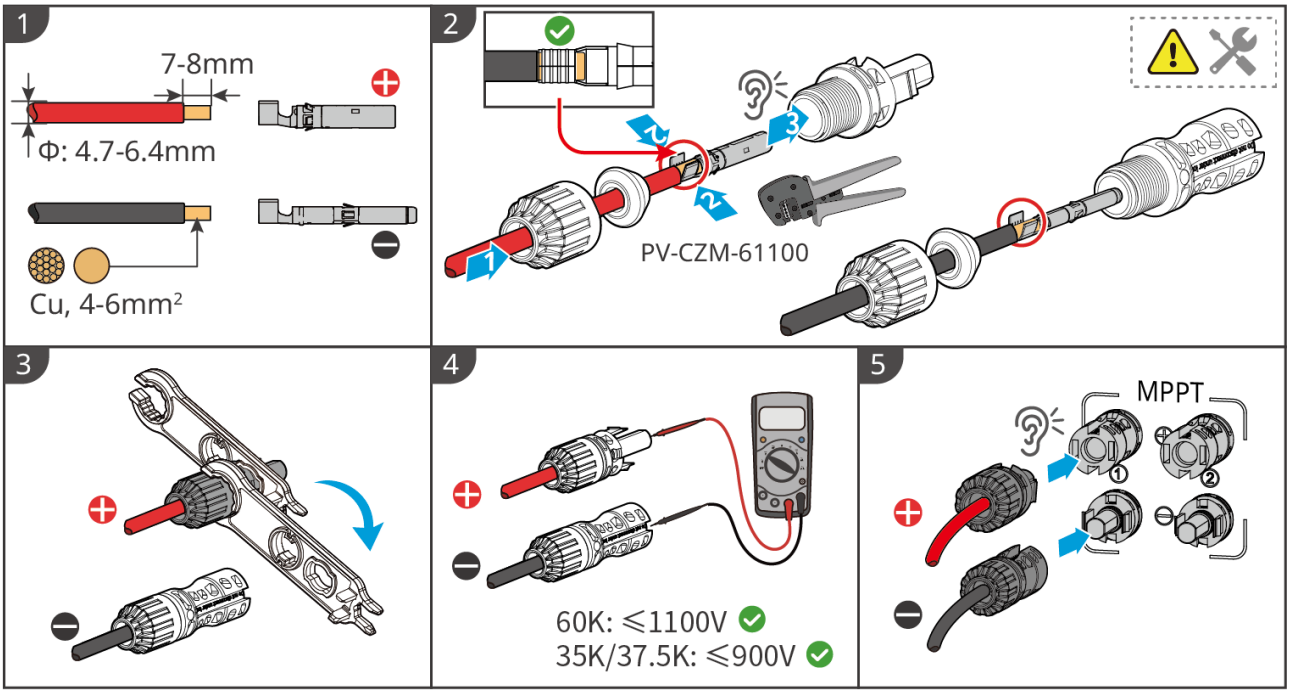
### Connection steps

**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 connectors.
**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

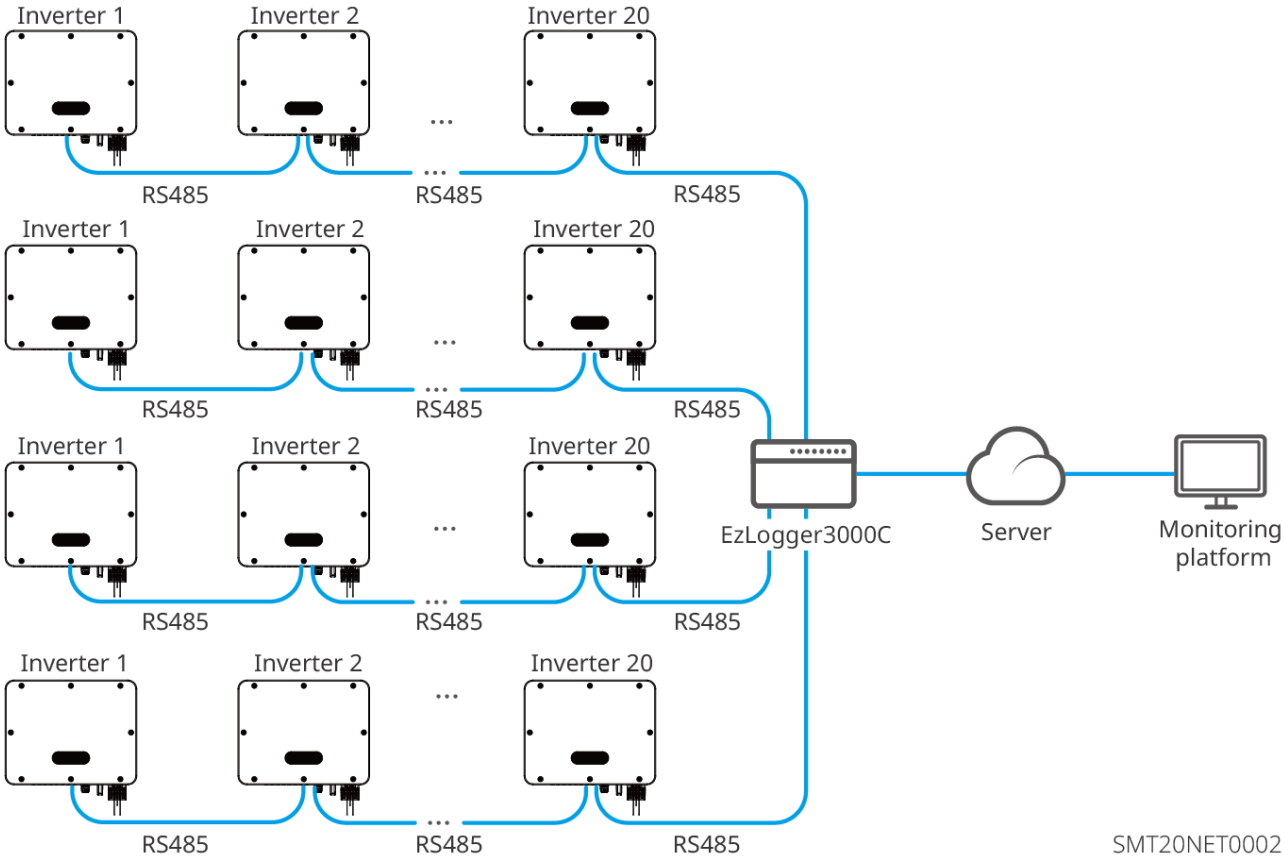
## 5.5 Communication Connection

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

### 5.5.1 RS485 Communication Networking

**NOTICE**

- When multiple inverters are connected to a data logger for RS485 networking, each COM port of the data logger can support a maximum of 20 inverters, and the total length of the RS485 cable for each COM port shall not exceed 1000m.
- Preferably use shielded communication cables, and ensure the shielding layer is grounded during wiring.




## 5.5.2 The On-grid Power Limit

When all loads in a photovoltaic system are unable to consume the electricity generated by the system, the remaining electricity is fed into the utility grid. In this case, devices such as smart meters and data loggers can be used to monitor the systenn's power generation and control the amount of electricity fed into the grid.

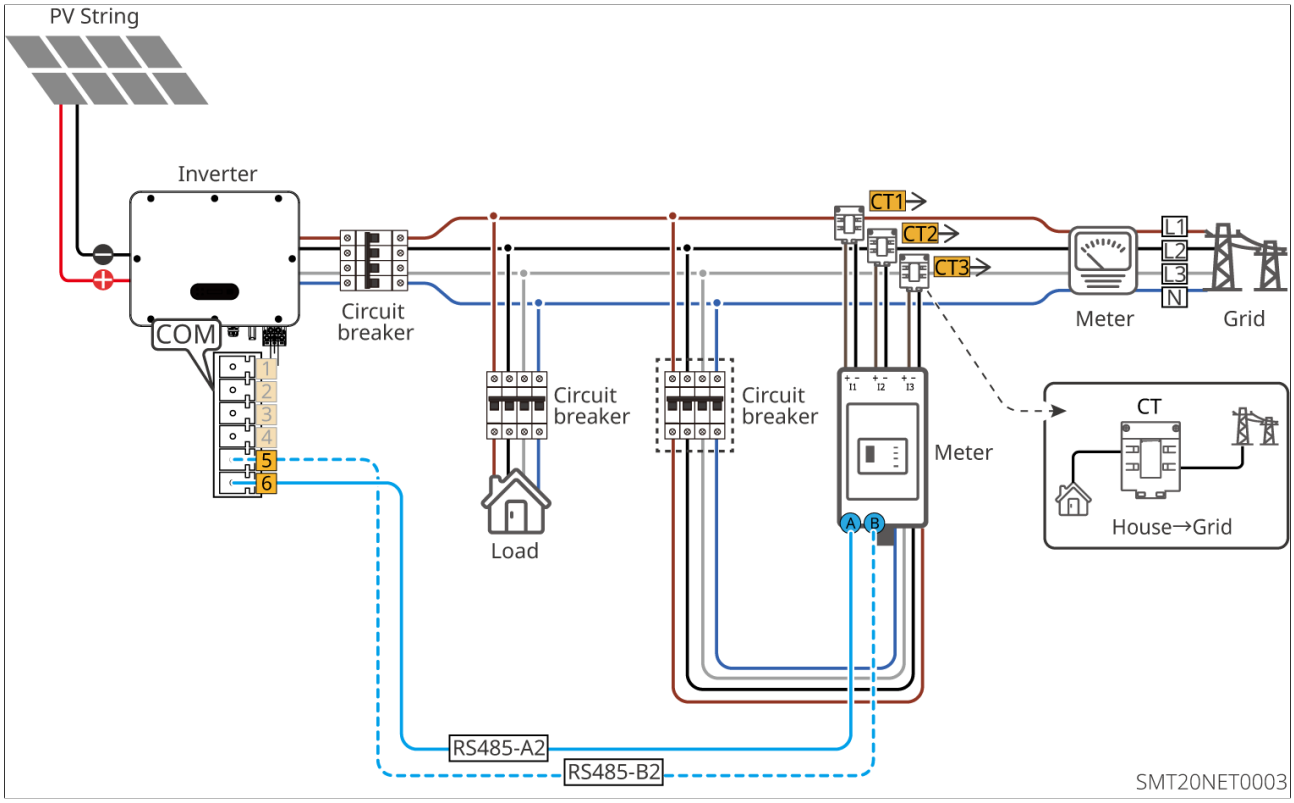
**⚠WARNING**

1. The place to snap fit the CT shall be near the grid connection point and the installation direction must be right. “-->” of CT refers that the inverter current flows to the Grid. The inverter will be triggered with an alarm if CT is installed reversely. It is unable to realize the power limit function.
2. The aperture of the CT should 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 specific CT wirings, please refer to the documents provided by the respective manufacturer, to ensure that the wiring direction is correct and CT is able to work properly.
4. CT shall be snap fitted on Cable L1, L2, L3. Do not fit it on Cable N.
5. CT Specification requirement:
   - Selecting nA/5A for the current transformation ratio specification of the CT. (nA: For primary current of the CT, n ranges from 200 to 5000.Set the current value depending on the actual needs. 5A: CT Secondary side output voltage.)
   - For the accuracy of the CT, it is recommended to select 0.5, 0.5s, 0.2, 0.2s to ensure that the current sampling error of the CT is <= 1%.
6. To ensure the current detection accuracy of the CT, it is recommended that the length of the CT cable should not exceed 30m and the current-carrying capacity of the cable be 6A.

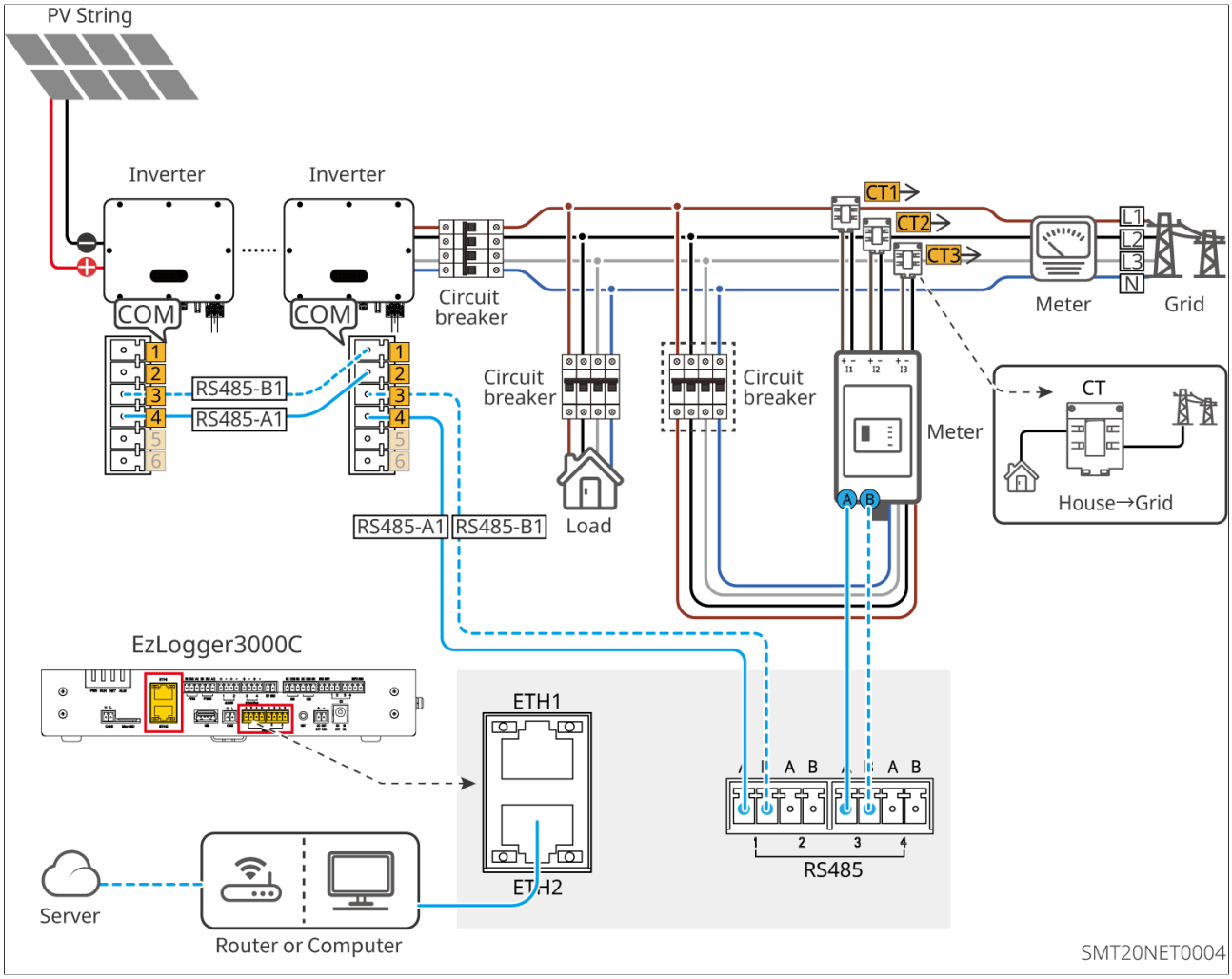
**NOTICE**

1. Ensure that the wiring and phase sequence of the smart meter are correct. Recommended cross-sectional area of the smart meter input power cable: 1mm$^2$(18AWG).
2. Only applicable to GM330：
   - Setting the CT ratio via SolarGo App. For example: set the CT ratio to 40 if a 200A/5A CT is selected.
   - 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.
   - Detailed steps, refer to SolarGo App User Manual.

## Single-unit Power LimitNetwork networking scheme(GM330)




## Multi inverters power limitation networking scheme (EzLogger3000C+GM330)

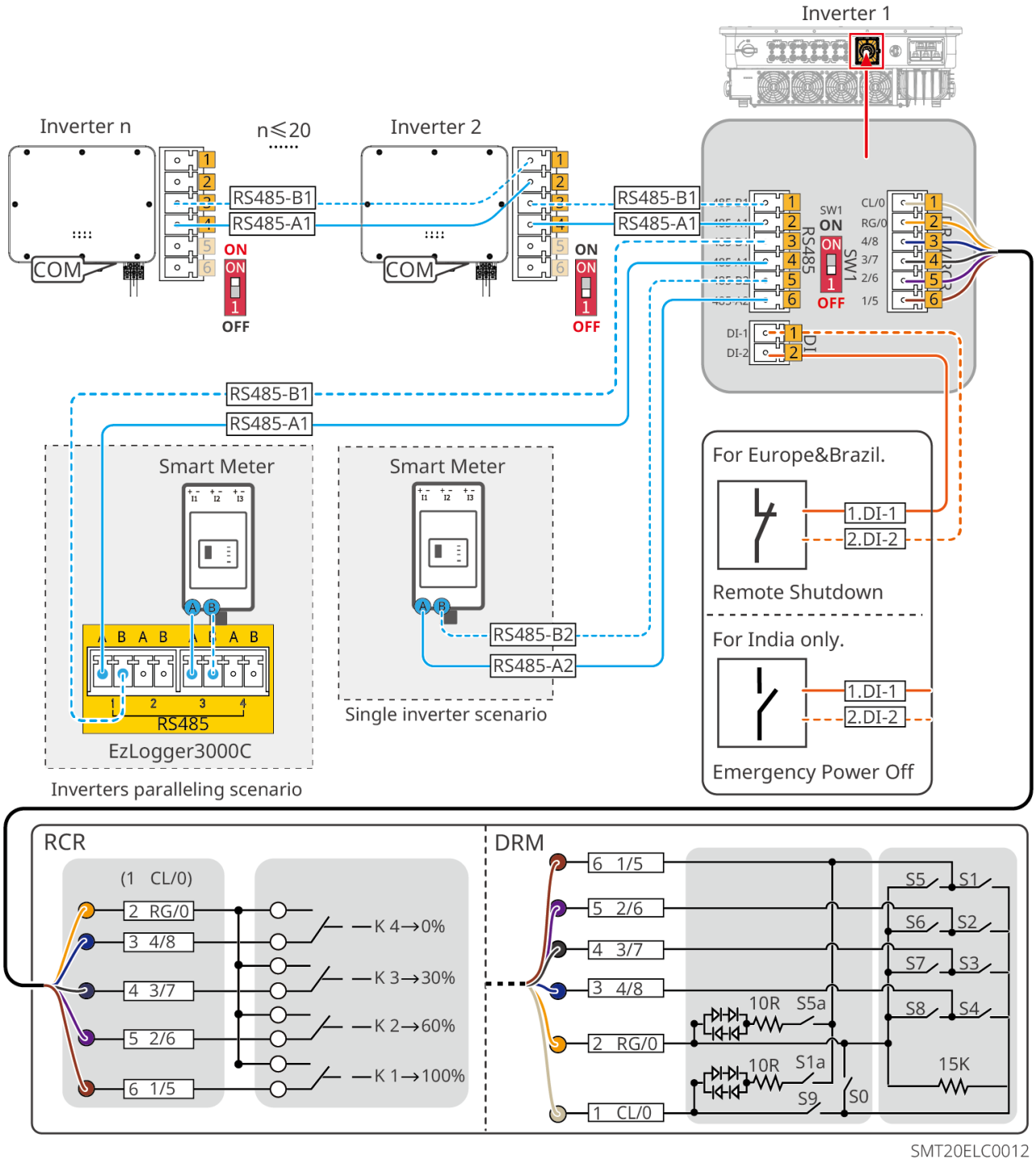



## 5.5.3 Connect the Communication Cable

**NOTICE**

When connecting the communication cable, make sure that the wiring port definition and the equipment are fully matched, and the cable alignment path should avoid interference sources, power cables, etc., so as not to affect signal reception.

### Communication Port



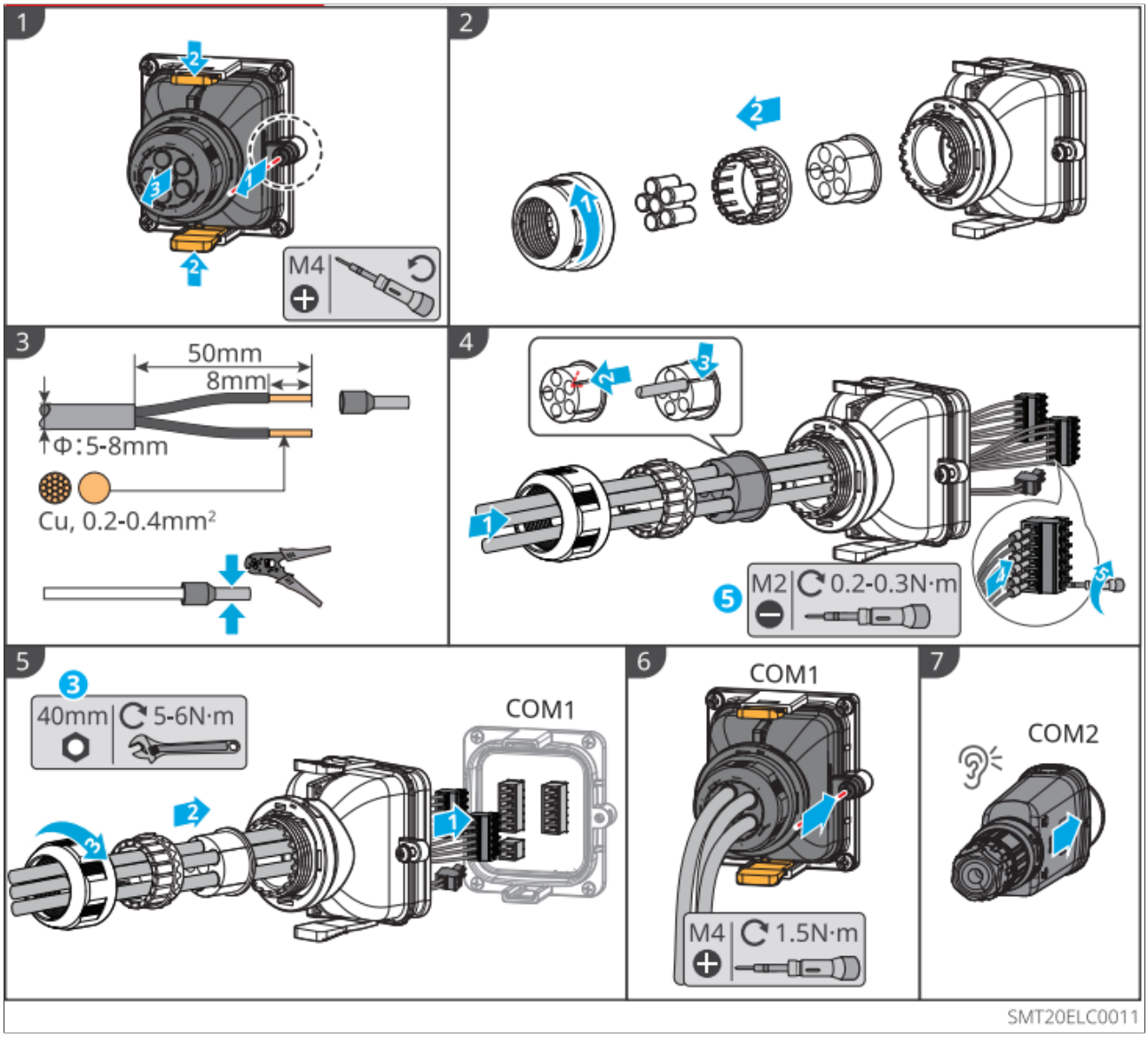

SMT20ELC0012

| Function | No. | Name | Description |
|---|---|---|---|
| RS485 | 1 | RS485-B1 | RS485 port for connecting multiple inverters or data loggers |
| | 2 | RS485-A1 | |

| Function | No. | 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 Shutdown | 1 | DI-1 | Inverter supports remote shutdown (Europe&Brazil) and emergency power-off (India only).<br>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<br>• 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 | |

**Connection steps**

**Step 1**: Disassemble the communication connector.
**Step 2**: Disassemble 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**: Installation 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

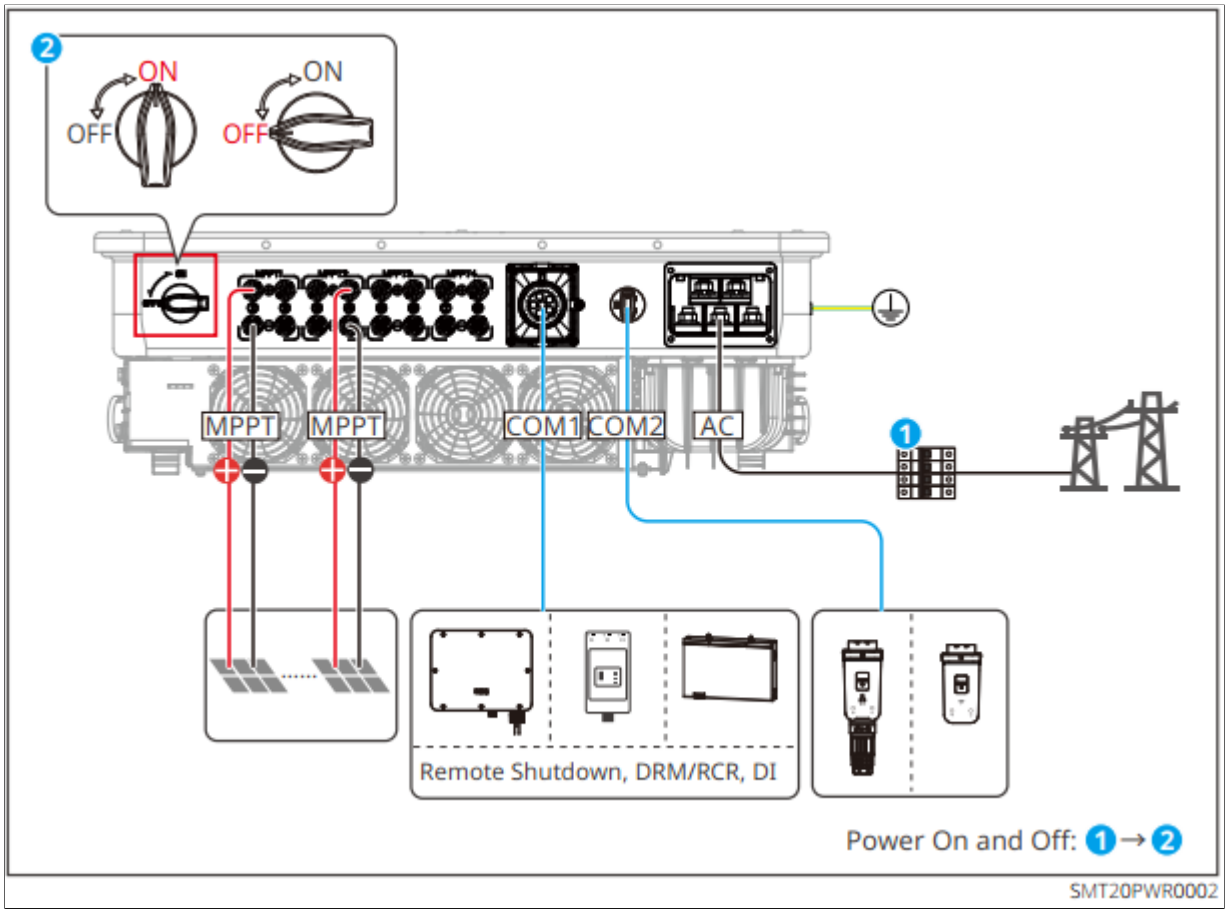
# 6 Equipment Commissioning

## 6.1 Check Before Power On

| No. | Check Item |
|---|---|
| 1 | The inverter shall be installed securely. The installation location shall allow easy operation and maintenance, the installation space shall facilitate ventilation and heat dissipation, and the installation environment shall be clean and tidy. |
| 2 | The PE, DC input, AC output, communication cables are connected correctly and securely. |
| 3 | The cable binding shall comply with routing requirements, with reasonable distribution and no damage. |
| 4 | Unused ports and terminals are sealed. |
| 5 | The voltage and frequency at the connection point meet the inverter grid connection requirements. |

## 6.2 Equipment Power On

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


2
ON
OFF
ON
OFF
MPPT
MPPT
COM1
COM2
AC
1
Remote Shutdown, DRM/RCR, DI
Power On and Off: 1 → 2
SMT20PWR0002

# 7 System Commissioning

## 7.1 Setting Inverter Parameters via LCD

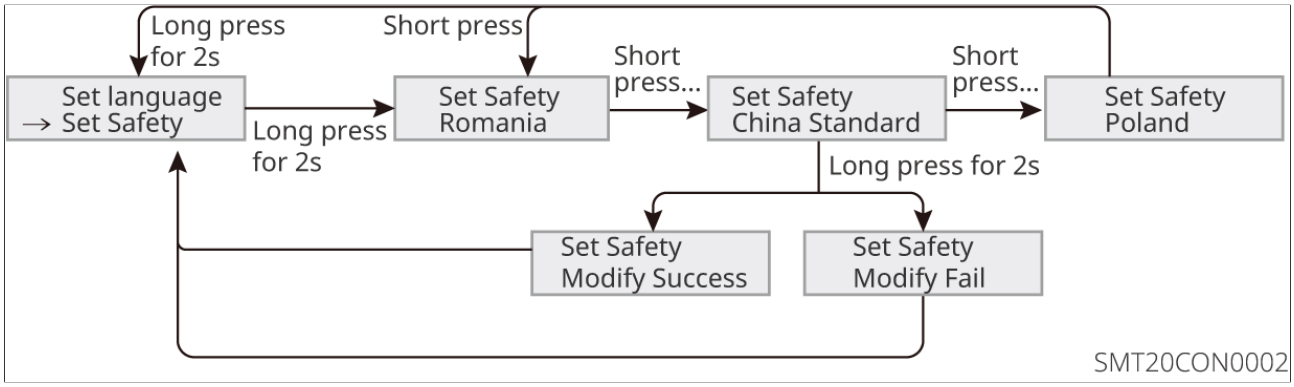
**NOTICE**

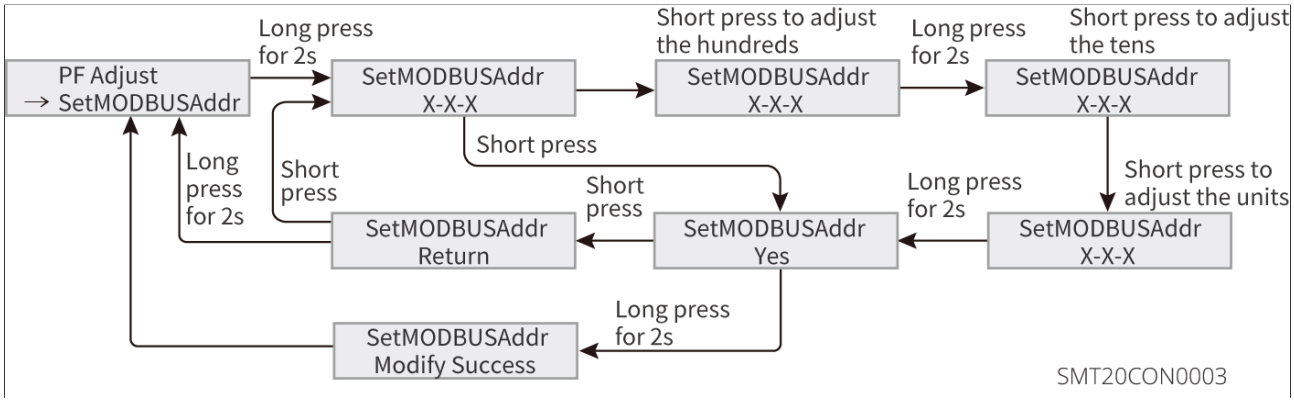
- The interface images in this manual correspond to the inverter software version V1.01.01. The interfaces are for reference only, the actual product shall prevail.
- The names, ranges, and default values of parameters may be changed or adjusted in the future; please refer to the actual display for details.
- Power parameters of the inverter shall be set by qualified professionals to prevent the generating capacity from being influenced by wrong parameters.

### LCD and Button Description

- Stop pressing the button for a period on any page, the LCD will get dark and go back to the initial page.
- Short press the button to switch menu or adjust parameter values.
- Long press the button to enter the submenu. After adjusting the parameter values, long press to successfully set the parameter; enter the next submenu.

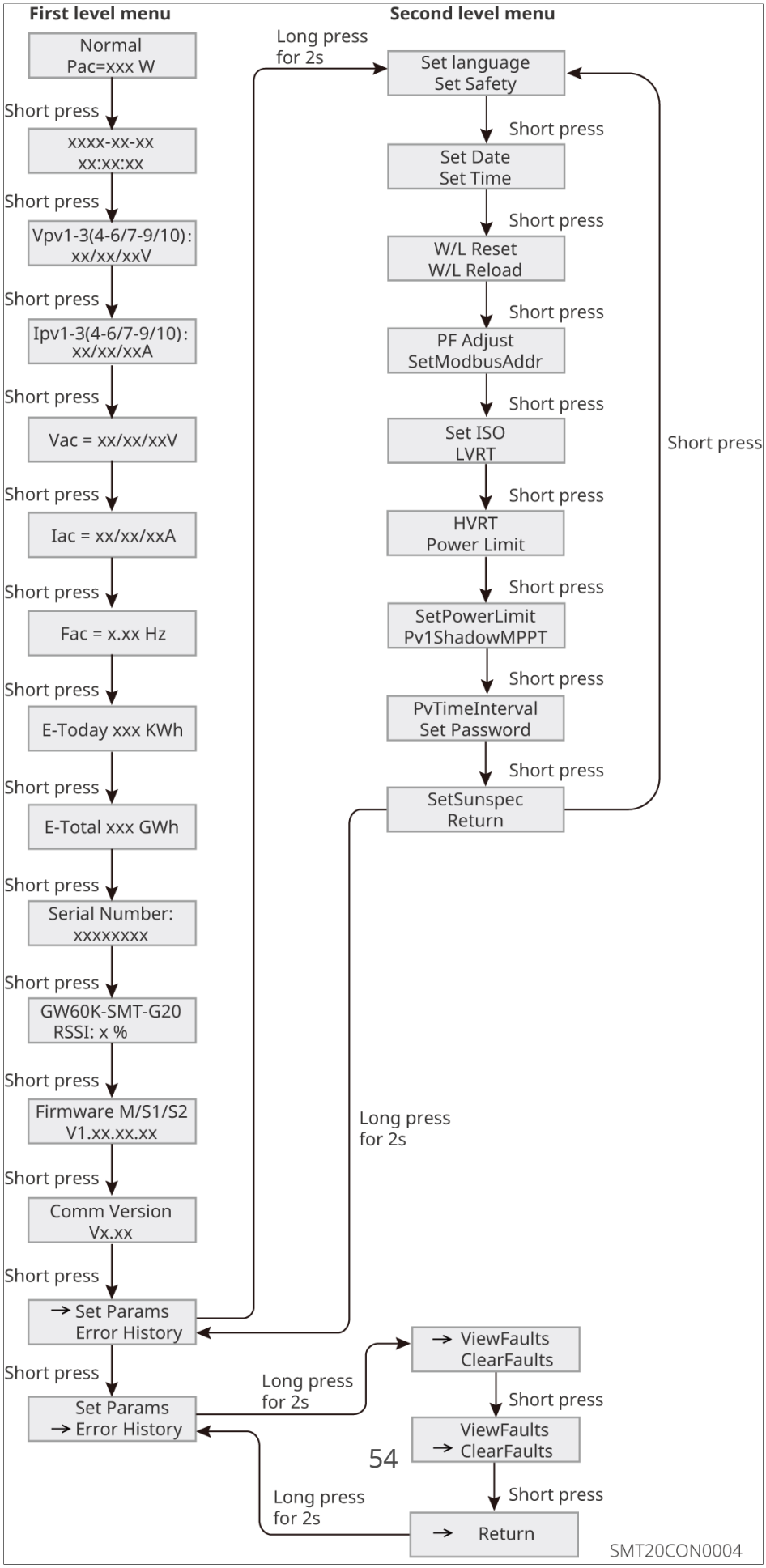
### Example:






### 7.1.1 LCD Menu Overview

This part describes the menu structure, allowing you to view inverter information and to set parameters more conveniently.


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
→ Return
Long press
for 2s
SMT20CON0004

### 7.1.2 Inverter Parameter Introduction

| Parameters | Discription |
|---|---|
| Connected to the grid Power= 0W | Home page. Indicates the real-time power of the inverter. |
| Date 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. |
| Vpv2= xxx V | Check the DC input current of the inverter. |
| Vac | Check the voltage of the utility grid. |
| Iac | Check the AC output current of the inverter. |
| Fac | Check the frequency of the utility grid. |
| E-Today | Check the system's power generation for the current day. |
| E-Total | Check the total power generation of the system. |
| Serial Number | Check the serial number of the inverter. |
| RSSI: GW60K-SMT-G20 | Check the signal strength of the Smart Dongle (xx%). |
| Firmware M/S | Check the firmware version. |
| Comm Version | Check the ARM software version of the inverter. |
| Setting the safety regulations | Set the safety country/region in compliance with the local grid standard and application scenario of the inverter. |
| Setting the date | Set time according to the actual time in the country/region where the inverter is located. |
| Set the System Time | |
| W/L Reset | Power off and restart the Smart Dongle. |

| Parameters | Discription |
| --- | --- |
| W/L Reloading | Restore the factory settings of the Smart Dongle. Reconfigure the Smart Dongle network parameters after restoring the factory settings. |
| PF Adjustment | Set the power factor of the inverter according to the actual situation. |
| Set Modbus Address | Set the actual Modbus address. |
| Set ISO | Indicates PV- PE resistance threshold value. When the detected value is under the set value, the IOS fault occurs. |
| LVRT | After being activated, the inverter will stay connected with the utility grid after a short-term utility grid low voltage exception occurs. |
| HVRT | After being activated, the inverter will stay connected with the utility grid after a short-term utility grid high voltage exception occurs. |
| Power Limit | Set the power fed back into the utility grid according to the actual situation. |
| Set Power Limit | |
| Shadow MPPT | Enable the shadow scan function if the PV panels are shadowed. |
| Set Password | The password can be adjusted. Please record the new password and if you lose the password, please contact the after-sales service center. After changing your password, please remember it. If you forget your password, please contact the GOODWE after-sales service center for assistance. |
| Set Sunspec | Set the Sunspec based on the actual communication method. |
| View Faults | Check historical alarm records of the inverter. |
| Clear Faults | Clear historical alarm records of the inverter. |

## 7.2 Setting Inverter Parameters via App

SolarGo App is a mobile application that enables communication with the inverter via Bluetooth and WiFi. 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. Equipment maintenance.

For more details, refer to the SolarGo App User Manual. Get the user manual from the official site or by scanning the QR code below.

SolarGo App

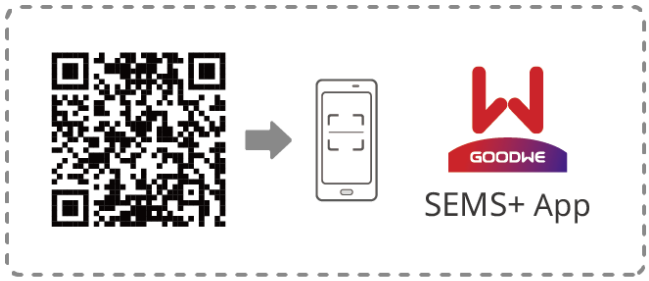
SolarGo App User Manual

## 7.3 Monitoring the power station via SEMS+

SEMS+ is a monitoring platform that can communicate with devices via WiFi, LAN or 4G. Commonly used functions are as follows:

1. Managing Organizations or user information.
2. Adding and monitoring information of power station.
3. Equipment maintenance.

Scan the QR code below to download and install the App.




SEMS0164

For more details, refer to the SEMS+ User Manual. Get the user manual from the official site or by scanning the QR code below.

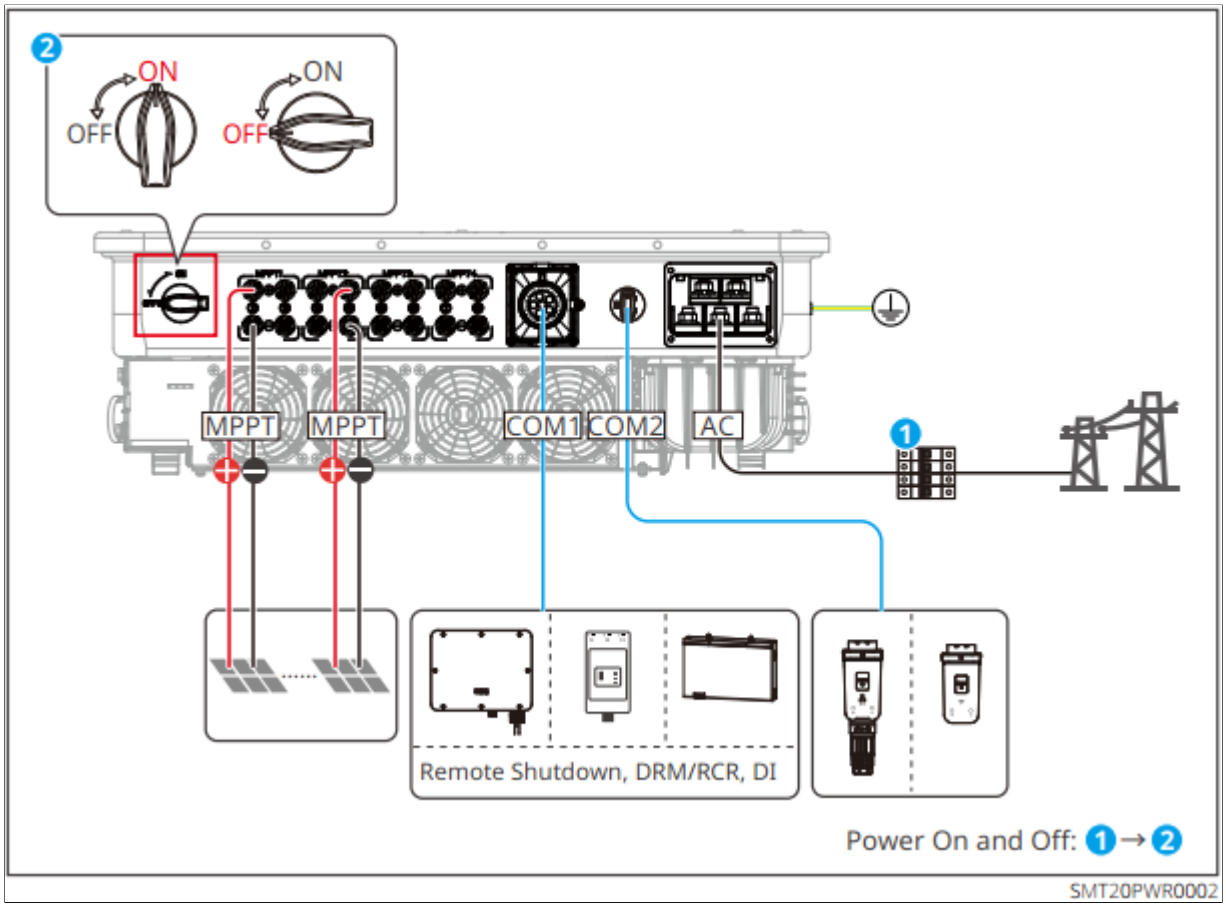
# 8 System Maintenance

## 8.1 Power Off the Inverter

**⚠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, its internal components require a certain amount of time to discharge. Please wait until the device is fully discharged in accordance with the time requirement indicated on the label.

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




## 8.2 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, 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 bracket.
**Step 4**:Store the inverter properly. If the inverter needs to be used later, ensure that the storage conditions meet the requirements.

## 8.3 Disposing of the Inverter

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

## 8.4 Fault Information and Troubleshooting

Perform troubleshooting according to the following methods. Contact the after-sales service if these methods do not work.
When contacting the after-sales service center, please collect the following information to facilitate the quick resolution of the problem.

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. Grid situation

### 8.4.1 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 |
| --- | --- | --- |
| 1 | Unable to connect to the wireless signal of the Smart Dongle. | 1. Unable to connect to the wireless signal of the Smart Dongle.<br>2. Ensure that the SolarGo app has been updated to the latest version.<br>3. Ensure the smart communication stick is powered properly, with its blue indicator light in a blinking or steady-on state.<br>4. Ensure the smart device is within the communication range of the Smart Dongle.<br>5. Refresh the App's device list again.<br>6. Restart the inverter. |
| 2 | Unable to connect to the wireless signal of the Smart Dongle. | 1. Unable to connect to the wireless signal of the Smart Dongle.<br>2. Restart the inverter or the communication stick, and attempt to reconnect to the wireless signal of the Smart Dongle.<br>3. Ensure Bluetooth pairing has been completed successfully. |
| 3 | The router SSID cannot be found. | 1. Place the router close to the Smart Dongle, or add a WiFi range extender to boost the WiFi signal.<br>2. Reduce the number of devices connected to the router. |
| 4 | After all configurations are completed, the Smart Dongle fails to connect to the router. | 1. Restart the inverter.<br>2. Check whether the network name (SSID), encryption method, and password in the WiFi configuration are the same as those of the router.<br>3. Restart the router.<br>4. Place the router close to the Smart Dongle, or add a WiFi range extender to boost the WiFi signal. |

| No | Fault | Solutions |
| --- | --- | --- |
| 5 | After all configurations are completed, the Smart Dongle fails to connect to the router. | Restart the inverter. |

### 8.4.2 Inverter Troubleshooting

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

| No. | Fault | Causes | 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.<br>2. If it occurs frequently, please check if the grid voltage is within the allowable range.<br>• Contact the local power company if the grid voltage exceeds the permissible range.<br>• 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.<br>3. Check whether the AC breaker and the output cables are connected securely and correctly if the problem persists. |

| No. | Fault | Causes | 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.<br>2. If it occurs frequently, please check if the grid voltage is within the allowable range.<br>• Contact the local power company if the grid voltage exceeds the permissible range.<br>• 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.<br>3. Check whether the AC breaker and the output cables are connected securely and correctly if the problem persists. |

| No. | Fault | Causes | Troubleshooting Suggestions |
| --- | --- | --- | --- |
| 4 | Grid Overvoltage Rapid Protection | The fault is triggered when 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.<br>2. If it occurs frequently, please check if the grid voltage is within the allowable range.<br>• Contact the local power company if the grid voltage exceeds the permissible range.<br>• 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.<br>3. Check whether the AC breaker and the output cables are connected securely and correctly if the problem persists. |

| No. | Fault | Causes | 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 the grid is normal.<br>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.<br>• Contact the local power company if the grid voltage exceeds the permissible range.<br>• If the grid voltage is within the allowable range, please modify the 10min overvoltage protection value with the consent of the local power operator. |

| No. | Fault | Causes | 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.<br>2. If the problem occurs frequently, check whether the grid frequency is within the permissible range.<br>• Contact the local power company if the grid frequency exceeds the permissible range.<br>• 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 | Causes | 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.<br>2. If the problem occurs frequently, check whether the grid frequency is within the permissible range.<br>• Contact the local power company if the grid frequency exceeds the permissible range.<br>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 | Causes | Troubleshooting Suggestions |
| --- | --- | --- | --- |
| 8 | Grid Frequency Unstable Protection | 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.<br>2. If the problem occurs frequently, check whether the grid frequency is within the permissible range.<br>• Contact the local power company if the grid frequency exceeds the permissible range.<br>• Contact the dealer or the after-sales service if the grid frequency is within the permissible range. |

| No. | Fault | Causes | Troubleshooting Suggestions |
| --- | --- | --- | --- |
| 9 | Grid Phase Unstable Protection | 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.<br>2. If the problem occurs frequently, check whether the grid frequency is within the permissible range.<br>• Contact the local power company if the grid frequency exceeds the permissible range.<br>• Contact the dealer or the after-sales service if the grid frequency is within the permissible range. |

| No. | Fault | Causes | 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.<br>2. If the problem occurs frequently, check whether the grid frequency is within the permissible range.<br>• Contact the local power company if the grid frequency exceeds the permissible range.<br>• 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 | Causes | 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.<br>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.<br>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 | Grid Phase Loss Protection | 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 | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 16 | Grid Phase Sequence Abnormal | Inverter-Grid Connection Abnormality: Incorrect Phase Sequence Wiring | 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.<br>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) | Neutral Loss in Split-Phase Power Grid | 1. The alarm is automatically cleared after the grid power supply is restored.<br>2. Check whether the AC cable is connected and the AC breaker is on. |
| 19 | EMS/Forced Off-Grid | EMSIssue a forced off-grid command, but the off-grid function is not enabled. | Enable off-grid function |

| No. | Fault | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 20 | GFCI Protection (30mA) | The input insulation impedance to the ground becomes low when the inverter is working. | 1. If occurs occasionally, it may be caused by a cable exception. The inverter will recover automatically after the problem is solved.<br>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 to the ground becomes low when the inverter is working. | 1. If occurs occasionally, it may be caused by a cable exception. The inverter will recover automatically after the problem is solved.<br>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 to the ground becomes low when the inverter is working. | 1. If occurs occasionally, it may be caused by a cable exception. The inverter will recover automatically after the problem is solved.<br>2. Check whether the impedance between the PV string and PE is too low if the problem occurs frequently or persists. |

| No. | Fault | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 23 | GFCI Protection (300mA) | The input insulation impedance to the ground becomes low when the inverter is working. | 1. If occurs occasionally, it may be caused by a cable exception. The inverter will recover automatically after the problem is solved.<br>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.<br>2. If this alarm 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.<br>2. If this alarm occurs frequently and the PV station cannot work properly, contact the dealer or the after-sales service. |

| No. | Fault | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 26 | Low Insulation Resistance | 1. The PV string is short-circuited to PE.<br>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.<br>2. Check whether the PE cable is connected correctly.<br>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.<br>2. When the output of the 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.<br>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 | Low resistance or short circuit between the output phase cable and PE. | Detect output phase line to PE impedance, identify locations with low impedance and repair them. |

| No. | Fault | Causes | 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.<br>2. If this alarm occurs frequently and the PV station cannot work properly, contact the dealer or th 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.<br>2. If this alarm 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.<br>2. If this alarm occurs frequently and the PV station cannot work properly, contact the dealer or the after-sales service. |

| No. | Fault | Causes | 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, turn on 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;<br>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. | Judgment is based on the actual model and the detection enable bit, some models do not support the peripheral will not be detected. |

| No. | Fault | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 36 | Back-up Output Overload Fault | 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.<br>2. If the problem occurs frequently, contact the dealer or the after-sales service. |
| 38 | On-grid PWM Sync Fault<br>On-grid PWM Sync Fault | Abnormal occurrence in carrier synchronization on-grid | 1. Check if the synchronization line connection is normal.<br>2. Check whether the master-slave settings are normal;<br>3. Disconnect the AC output side switch and the DC input side switch. After 5 minutes, turn on 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;<br>2. Check whether the Box communication wiring is correct; |

| No. | Fault | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 40 | Generator Failure | 1. This fault will always be displayed when the generator is not connected.<br>2. During generator operation, failure to meet generator safety regulations will trigger this fault. | 1. Ignore the fault when the generator is not connected.<br>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.<br>3. The fault will not affect the normal operation of the off-grid mode.<br>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 STScorresponds 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 | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 43 | Export Limit Protection | 1. Inverter fault reporting and grid disconnection.<br>2 Meter communication instability<br>3 Reverse flow conditions occur | 1. Check if there are any other error messages in inverter. If so, perform targeted troubleshooting<br>2. Check if meter connection is normal.<br>3. If this alarm 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 | The parallel communication cable is not firmly connected or the parallel IO chip is damaged. | Check if the parallel communication cable is firmly connected, then inspect 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 the parallel communication cable is connected correctly and |
| 48 | Parallel Grid Line Reversed | Some machines have grid wires reversed from others. | Rewire the grid. |
| 49 | Parallel Back-up Line Reversed | Some machines have backup wires reversed from others. | Reconnect the backup Cable |
| 50 | Inverter Soft Start Failure | Inverter Soft Start Failure During Off-Grid Cold Start | Check if the inverter module of the equipment is damaged |

| No. | Fault | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 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, turn on 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, turn on 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, turn on 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 | Causes | 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, turn on 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:<br>1. Relay abnormality (short-circuited)<br>2. The relay sampling circuit is abnormal.<br>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, turn on 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 (short-circuited)<br>2. The relay sampling circuit is abnormal.<br>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, turn on 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 | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 58 | AFCI Failure (String 17~32) | 1. The DC side connection terminal is loose;<br>2. The DC side connection terminals are falsely connected;<br>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;<br>2. Check whether the DC side terminal is securely connected. |
| 59 | AFCI Failure (String 33~48) | 1. The DC side connection terminal is loose;<br>2. The DC side connection terminals are falsely connected;<br>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;<br>2. Check whether the DC side terminal is securely connected. |
| 60 | Flash R/W Abnormal | Causes are possibly as follows:<br>Flash content has changed; flash life is exhausted; | 1. Upgrade the latest version of the program.<br>2. Contact the dealer or the after-sales service. |

| No. | Fault | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 61 | AFCI Failure (String 1~16) | 1. The DC side connection terminal is loose;<br>2. The DC side connection terminals are falsely connected;<br>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;<br>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, turn on 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:<br>1. The inverter is installed in a place with poor ventilation.<br>2. The ambient temperature is too high.<br>3. A fault occurs in the internal fan of the inverter. | |

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

| No. | Fault | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 66 | Boost Module Overtemperature | Boost module temperature is too high, causes are possibly as follows:<br>1. The inverter is installed in a place with poor ventilation.<br>2. The ambient temperature is too high.<br>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:<br>1. The inverter is installed in a place with poor ventilation.<br>2. The ambient temperature is too high.<br>3. A fault occurs in the internal fan of the inverter. | |

| No. | Fault | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 68 | Relay Failure 2 | Relay abnormal, reasons are as follows:<br>1. Relay abnormality (short-circuited)<br>2. The relay sampling circuit is abnormal.<br>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, turn on 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:<br>1, IGBT short circuit<br>2. The inverter sampling circuit is abnormal. | Disconnect the AC output side switch and the DC input side switch. After 5 minutes, turn on 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.<br>2. The drive circuit is abnormal.<br>3. IGBT | Disconnect the AC output side switch and the DC input side switch. After 5 minutes, turn on 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 | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 71 | NTC Abnormal | Abnormal NTC temperature sensor | Disconnect the AC output side switch and the DC input side switch. After 5 minutes, turn on 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, turn on 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, turn on 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, turn on 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 | Causes | 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, turn on 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, turn on 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, turn on 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, turn on 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 | Causes | 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, turn on 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, turn on 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, turn on 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 (Secondary CPU1) BUS / Overvoltage (Slave CPU 1) | | |
| 88 | P-BUS Overvoltage (Slave CPU 1) | | |
| 89 | N-BUS Overvoltage (Slave CPU 1) | | |

| No. | Fault | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 90 | BUS Overvoltage (Slave CPU 2) | Causes are possibly as follows:<br>1. The PV voltage is too high;<br>2. Inverter BUS Voltage Sampling Abnormality;<br>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;<br>2. Inverter drive circuit abnormality causes failure to turn on;<br>3. PV voltage is too high;<br>4.Mos voltage sampling anomaly. | Disconnect the AC output side switch and the DC input side switch. After 5 minutes, turn on the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or GoodWe after-sales service center. |
| 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. |

| No. | Fault | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 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, turn on 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.<br>2. Battery voltage sampling hardware failure.<br>3. Dcrly relay failure. | Disconnect the AC output side switch and the DC input side switch. After 5 minutes, turn on the AC output side switch and the DC input side switch. If fault persists, please contact the dealer or GoodWe after-sales service center. |
| 99 | PV Input Overvoltage | The PV input voltage is too high. Causes are possibly as follows:<br>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. |

| No. | Fault | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 100 | PV Continuous Hardware Overcurrent | 1. The PV configuration is not proper.<br>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 PV configuration is not proper.<br>2. The hardware is damaged. | |
| 102 | FlyCap Software Overvoltage | FlyCap overvoltage. Causes are possibly as follows:<br>1. The PV voltage is too high;<br>2. Inverter BUS Voltage Sampling Abnormality | 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:<br>1. The PV voltage is too high;<br>2. Inverter BUS Voltage Sampling Abnormality | |
| 104 | FlyCap Undervoltage | FlyCap undervoltage. Causes are possibly as follows:<br>1. PV Energy deficit;<br>2. Inverter BUS Voltage Sampling Abnormality | |

| No. | Fault | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 105 | FlyCap Precharge Failure | FlyCap pre-charge failure. Causes are possibly as follows:<br>1. PV Energy deficit;<br>2. Inverter BUS Voltage Sampling Abnormality | |
| 106 | FlyCap Precharge Abnormal | 1. Unreasonable control loop parameters<br>2. The hardware is damaged. | |
| 107 | PV String Overcurrent (String 1~16) | Causes are possibly as follows:<br>1. String overcurrent.<br>2. String current sensor abnormality. | |
| 108 | PV String Overcurrent (String 17~32) | Same as above | |
| 109 | PV String Reversed (String 1~16) | The PV strings are connected reversely. | Check whether PV strings are connected reversely |

| No. | Fault | Causes | 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 disconnected |
| 112 | PV String Loss (String 17~32) | String fuse disconnected (if applicable). | Check if the fuse is disconnected |

| No. | Fault | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 113 | PV Input Mode Error | There are three modes of PV access modes, taking the four-way MPPT as an example:<br>1. Parallel mode: i.e.AAAAmode(homogenous mode)，PV1-PV4homogenous4wayPVconnected to the same PV panel.<br>2. Partial parallel mode: i.e.AACCmode, PV1andPV2are connected in the same source,PV3andPV4are connected in the same source.<br>3. Independent mode: i.e.ABCDmode(nonhomologous)，PV1、PV2、PV3、PV4are connected independently, and each of the four-way PV is connected to a photovoltaic panel.<br>This fault is reported if the actual access mode of the PV does | Check that the PV access mode is set correctly (ABCD, AACC, AAAA) and reset the PV access mode in the correct way.<br>1. Confirm that the actual access to each PV is properly connected.<br>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.<br>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.<br>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 | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| | | not match the PV 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 disconnected<br>Same as above |
| 116 | PV String Overcurrent (String 33~48) | Causes are possibly as follows:<br>1. String overcurrent.<br>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 | Causes | 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 reversely. | Check the battery and machine terminals for positive and negative consistency |

| No. | Fault | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 124 | BAT 2 Reversed | Battery 2 positive and negative are connected reversely. | 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:<br>1. The inverter is installed in a place with poor ventilation.<br>2. The ambient temperature is too high.<br>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, turn on 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 | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 130 | Internal Fan Abnormal | Internal fan abnormality. Causes are possibly as follows:<br>1, Abnormal fan power supply;<br>2, Mechanical Fault (blocking);<br>3. Fan aging damage. | Disconnect the AC output side switch and the DC input side switch. After 5 minutes, turn on 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:<br>1. Abnormal fan power supply;<br>2. Mechanical Fault (blocking);<br>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 | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 133 | Trip-Switch Trip Warning | Causes are possibly as follows:<br>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:<br>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 | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 135 | PV String Reversed Warning(String 1~16) | Causes are possibly as follows:<br>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:<br>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 | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 137 | Flash R/W Error | Causes are possibly as follows:<br>Flash content has changed; flash life is exhausted; | 1. Upgrade the latest version of the program.<br>2. Contact the dealer or the after-sales service. |
| 138 | Meter Comm Loss | This warning may be reported after enabling the anti-backflow function.<br>Possible causes:<br>1 Meter not connected;<br>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 Alarm PE Loss | Ground wire not connected. | Check the ground wire |

| No. | Fault | Causes | 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:<br>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 | Causes | Troubleshooting Suggestions |
|---|---|---|---|
| 150 | Low battery supply voltage. | Battery not charging, voltage below shutdown voltage | |

## 8.5 Routine Maintenance

**⚠DANGER**

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

| Maintenance Content | Maintenance Method | Maintenance Cycle |
|---|---|---|
| System Cleaning | Check whether the heat sinks and air inlets/outlets are free of foreign objects and dust. | Once every 6 months to once a year |
| 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 Connections | Check whether electrical connections are loose, and whether the cable appearance is damaged or has exposed copper. | Once every 6 months to once a year |
| Sealing | Check whether the sealing of the equipment's cable entry holes meets the requirements; if there are excessively large gaps or unblocked areas, re-seal them. | Once a year |

# 9 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)* | 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 Current per MPPT (A) | 42 | 42 | 42 |
| Max. Short Circuit Current per MPPT (A) | 52.5 | 52.5 | 52.5 |
| Max. Backfeed Current 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 Apparent Power (kVA) | 60 | 35 | 37.5 |
| Max. AC Active Power (kW) | 66*[3] | 38.5*[4] | 37.5 |
| Max. AC Apparent 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 Frequency (Hz) | 50/60 | 50/60 | 50/60 |
| AC Grid Frequency Range (Hz) | 45~55/55~65 | 45~55/55~65 | 45~55/55~65 |
| Max. Output Current (A) | 100.0@220V, 95.7@230V | 101 | 98.4 |
| Max. Output Fault Current (Peak and Duration) (A) | 190, 1μs | 190, 1μs | 190, 1μs |
| Inrush Current (Peak and Duration) (A) | 30, 5ms | 30, 5ms | 30, 5ms |
| Nominal Output Current (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 Overcurrent Protection (A) | 180 | 180 | 180 |

| Technical Data | GW60K-SMT-G20 | GW35K-SMT-L-G20 | GW37.5K-SMT-L-G20 |
|---|---|---|---|
| **Efficiency** | | | |
| Max. Efficiency | 98.80% | 98.40% | 98.40% |
| European Efficiency | 98.30% | 98.00% | 98.00% |
| **Protection** | | | |
| PV String Current 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 |
| Emergency 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 |
| Dimension (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. 70 mm$^2$) | | |

| Technical Data | GW60K-SMT-G20 | GW35K-SMT-L-G20 | GW37.5K-SMT-L-G20 |
|---|---|---|---|
| Environmental Category | 4K4H | 4K4H | 4K4H |
| Pollution Degree | III | III | III |
| Overvoltage Category | DC II / AC III | DC II / AC III | DC II / AC III |
| Protective Class | I | I | I |
| The Decisive Voltage Class (DVC) | PV: C | 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 Apparent Power: 60kW/kVA.
4. For Brazil, Max. AC Active Power & Max. AC Apparent Power: 35kW/kVA.
5. For Brazil: Integrated.

# 10 Explanation of Terms

**Overvoltage Category Definition**

**Overvoltage Category I**: Connects to equipment connected to a circuit where measures have been taken to reduce transient overvoltage to a low level.
**Overvoltage Category II**: Energy-consuming equipment powered by fixed power distribution devices. Such equipments include appliances, portable tools, and other household and similar loads. If there are special requirements for the reliability and applicability of such equipment, Voltage Category III shall be adopted.
**Overvoltage Category III**: For equipment in fixed electrical distribution installations, the reliability and applicability of the equipment must comply with special requirements. Such equipments include switchgear in fixed power distribution devices and industrial equipment permanently connected to fixed power distribution devices;
**Overvoltage Category IV**: Applied to the upstream equipment in the power supply of the distribution device, including measuring instruments and upstream over-current protection devices.

**Humid Scenarios Category Definition**

| Environment Parameters | Level | | |
|---|---|---|---|
| | 3K3 | 4K2 | 4K4H |
| Temperature Range | 0~+40℃ | -33~+40℃ | -33~+40℃ |
| Humid Range | 5%~85% | 15%~100% | 4%~100% |

**Environmental Category Definition:**

**Outdoor Inverter:** The ambient air temperature range is -25 to +60℃, and it is suitable for environments with pollution degree3;
**IndoorType II Inverter:** The ambient air temperature range is -25 to +40℃, and it is suitable for environments with pollution degree3;
**IndoorType I Inverter:** The ambient air temperature range is 0 to +40℃, and it is suitable for environments with pollution degree2;

**Pollution Class Category Definition**

**Pollution Degree 1:** No pollution or only dry non-conductive pollution;
**Pollution Degree 2:** In general, there is only non-conductive pollution, but the transient conductive pollution caused by occasional condensation must be taken into account;
**Pollution Degree 3:** There is conductive pollution, or the non-conductive pollution becomes conductive pollution due to condensation;
**Pollution Degree 4:** Persistent conductive pollution, such as pollution caused by conductive dust or rain and snow.

# 11 Obtaining of Relevant Manuals

| Name of the Document | Official Web 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 | Quick Installation Guide for GW_GMK330 GMK360 GM330 |

# 12 Contact Details

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