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SMT SERIES USER MANUAL



SOLAR INVERTER

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1 Symbols

	Failure to observe warnings indicated in this manual may result in injury.
	Recyclable materials
	Danger of high voltage & electric shock
	This side up - The package must always have the arrows point up
	Don't touch, hot surface!
	No more than six (6) identical packages be stacked on each other.
	Special disposal instructions
	Fragile
	Keep Dry
	Refer to operation instructions
	Wait at least 5 min after disconnecting the inverter before touching internal parts
	CE mark.

2 Safety Measures & Warning

This manual contains important instructions for SMT series inverter that must be followed during inverter installation.

The SMT series for three MPPT, Three-Phase solar inverter without transformer, consisting of: GW12KLV-MT, GW15KLV-MT, GW20KLV-MT, GW25K-MT, GW29.9K-MT, GW30K-MT and GW36K-MT model types.

SMT Series have been designed and tested strictly according to international safety regulations. As electrical and electronic equipment, safety instructions related to them must be complied with during installation, commissioning and operation. Incorrect or improper work may result in damage to:

1. The life and well-being of the operator or third parties.
2. The inverter and other properties that belong to the operator or a third party.

The following safety instructions must be read and adhered to prior to any work and at all times. All detailed work-related safety warnings and notes will be specified at the critical points in the corresponding chapter.

All installation and electrical work must be performed only by qualified and licensed personnel that have been specially trained.

- Completely read through and understood the manual and related documents.
- Be familiar with safety requirements for electrical systems.

The inverter must be installed and maintained by professionals in compliance with local electrical standards, regulations and the requirements of local power authorities or companies.

- Improper handling of this device poses a risk of injury.
- Always follow the instructions contained in the manual when moving or positioning the inverter.
- The weight of the equipment can cause injuries, serious wounds or bruises if improperly handled.
- Please install equipment in a place beyond children's reach.
- Prior to installing and maintaining the inverter, it is crucial to make certain that the inverter is not electrically connected.
- Before maintaining the inverter, first disconnect the connection between the AC grid and the inverter. Then, disconnect the DC input from the inverter. Wait at least 5 min after these disconnections in case of electric shock.
- All cables must be firmly attached, undamaged, properly insulated and adequately dimensioned.
- The temperatures of some parts of the inverter may exceed 60 °C during operation. To avoid

being burned, do not touch the inverter during operation. Let it cool before touching it.

- Opening the front cover of the inverter without permission is not allowed. Users should not touch or replace any components of the inverter except the DC / AC connectors. The manufacturer will not bear any responsibilities or consequences caused by unauthorized actions that lead to injury or damage.
- Static electricity can damage electronic components. Appropriate methods must be adopted to prevent such damages to the inverter. Otherwise, the inverter may be damaged, and the warranty will be voided.
- Ensure that the output voltage of the proposed PV array is lower than the maximum rated input voltage of the inverter. Otherwise, the inverter may be damaged, and the warranty will be voided.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- When exposed to sunlight, the PV array will generate a very high voltage that can cause electrical shock hazard. Please strictly follow the instructions we provide.
- PV modules should have an IEC61730 class-A rating.
- Prohibit inserting or pulling the AC or DC terminals when the inverter is operational. Otherwise, the inverter will be destroyed.

Only DC connectors provided by the Manufacturer are permitted for use. Otherwise, the inverter may be damaged, and the warranty will be voided.

- The inverter can exclude the possibility of DC residual currents to 6 mA in the system, where an external RCD is required in addition to the built-in RCMU. A type-A RCD must be used to avoid tripping.
- The default photovoltaic module is not grounded.
- It is recommended to add a fuse when there are more than two PV string inputs into one MPPT.



The IP65 machine is completely sealed until use. Please install it within one day after unpacking, otherwise please block the unconnected port and do not open it to ensure that the machine is not exposed to water, moisture and dust.

To our inverter product, GOODWE provides a standard manufacturer's warranty, which comes with the product and a prepaid warranty extension solution to our customer. You can find the details about the terms and solutions from the below link.

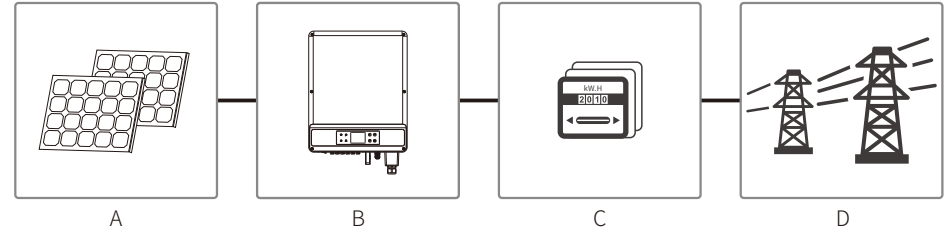
<https://en.goodwe.com/warranty.asp>

3 Product Introduction

3.1 Intended Usage

The SMT series is a Four MPPT, three-phase transformer-less grid-connected inverter that is a crucial unit between the PV string and the utility grid in the PV power system.

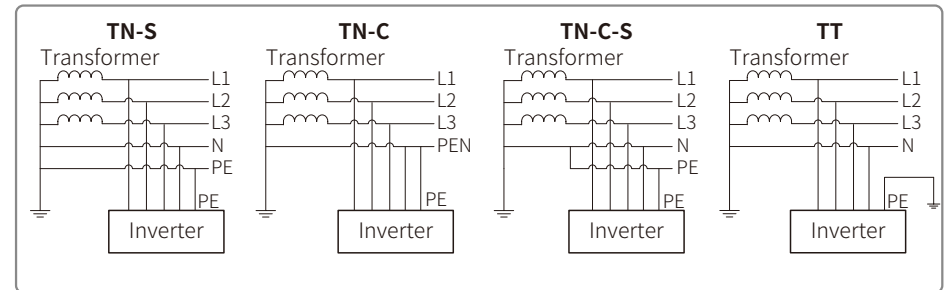
The inverter converts DC generated by the PV module into AC, which conforms to parameters of the local utility grid and is fed into the utility grid. The intended usage of the inverter is illustrated in the below figure.



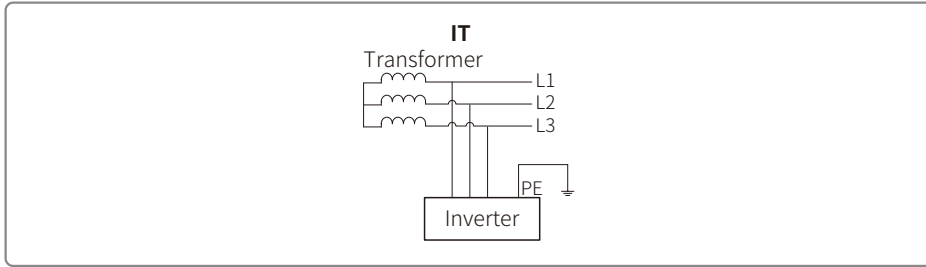
The inverter cannot be connected to the PV module, because the positive or negative terminal should be grounded, except when a transformer has been used between the inverter and the grid.

Item	Description	Note
A	PV string	Monocrystalline silicon, polycrystalline silicon and others.
B	Inverter	MT Series
C	Meter device	Meter cupboard with distributed generation system
D	Utility grid	TN-S, TN-C, TN-C-S, TT, IT (different Model types with different types of utility grid as below)

SMT series GW12KLV-MT, GW15KLV-MT, GW20KLV-MT, GW25K-MT, GW29.9K-MT, GW30K-MT and GW36K-MT support four different types (TN-S, TN-C, TN-C-S, TT) of grid. please refer to the below figure.

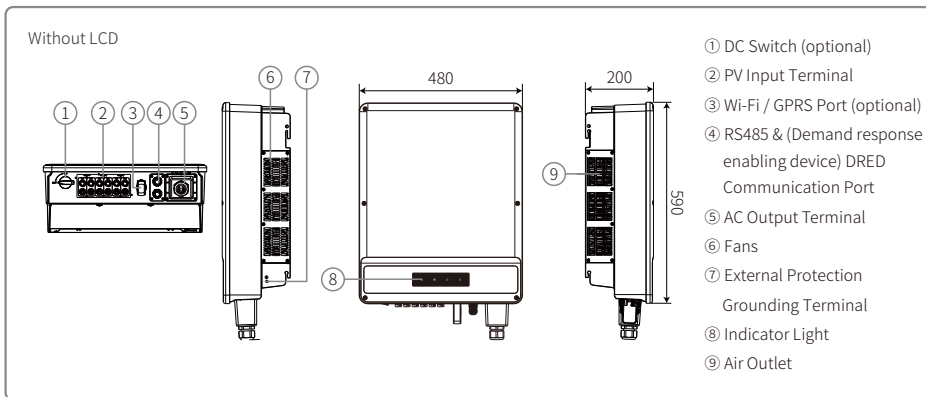
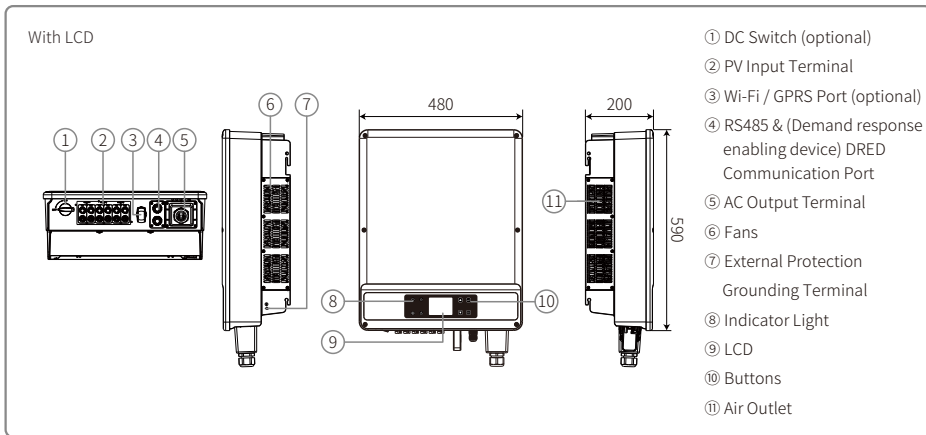


When neutral wire of inverter is not connected to grid, ‘Delta Grid’ should be selected in grid type (IT) setting page.



3.2 Inverter Overview

SMT series inverter illustration.



Note: The figures are shown here for reference only, actual product you receive may differ.

Item	Name	Description
1	DC Switch (Optional)	During normal operation, it is in the ‘ON’ state. It can shut down the inverter after it is disconnected from the grid by the AC breaker.
2	PV Input Terminal	For PV string connection
3	Wi-Fi / GPRS Port (Optional)	Wi-Fi/GPRS for connection
4	RS485 & DRED Communication Port	For RS485 and DRED Communication
5	AC output Terminal	For AC cable connection
6	Fans	There are three fans to perform controlled forced-air cooling.
7	External Protection Grounding Terminal	Second protection earth terminals as specified in EN50178.
8	Indicator Light	Display the state of the inverter
9	LCD	Inverter operation data viewing and parameter configuration.
10	Buttons	For configuration and viewing parameters.
11	Air Outlet	Exit of hot air during the inverter operation.

3.2.2 DC Switch

The DC switch is designed so that the DC input can be disconnected safely.

The inverter works automatically when the input and output meet requirements. Rotating the DC switch to the ‘OFF’ position will immediately cut off the flow of DC current. Rotate the DC switch to the ‘ON’ position before starting the inverter.

3.3 Technical Description

3.3.1 Principle Description

PV string voltage is transmitted to the DC BUS via the BOOST circuit.

The SMT series is equipped with three MPPTs for six DC inputs to ensure that the maximum power is utilized even in different PV installation condition.

The DC / AC converter circuit converts DC power into AC power, which can be fed into the utility grid. Protective circuits are designed to protect inverter and human safety.

DC switch is integrated to allow for a safe disconnection from the DC input. The inverter provides a standard interface RS485, Wi-Fi / GPRS (optional) for communications. Inverters also provide a running recode data display with parameter configuration via LCD panel. For the main block diagram, please refer to ‘7.2 Block Diagram’.

3.3.2 Function Description

Inverter functions can be grouped as follows:

1. Conversion function

Inverter converts DC power into AC power, which conforms to the grid requirement of its installation country.

2. Data storage and display

Inverter stores the running information and fault records and displays them on the LCD screen.

3. Parameter configuration

Inverter provides various parameter configurations for optional operation.

4. Communication interface

Inverter provides standard RS485 & DRED communication interface. Wi-Fi (optional) can be provided.

5. Protection functions

- > Insulation resistance to ground surveillance.
- > Input voltage monitor
- > Residual current monitoring unit
- > Anti-islanding protection
- > PV array string fault monitoring
- > DC switch
- > DC SPD
- > AC SPD
- > SPD fault monitoring
- > AC over current protection
- > Insulation monitoring

3.4 Package

3.4.1 Unpacking and Inspection

The unit is thoroughly tested and strictly inspected prior to delivery. Damage may occur during shipping.

1. Check the package for any visible damage upon receipt.
2. Check the inner contents for damage after unpacking.
3. Check the Package list and it is shown as below:



[1] Positive & Negative DC plug: 6 pairs.

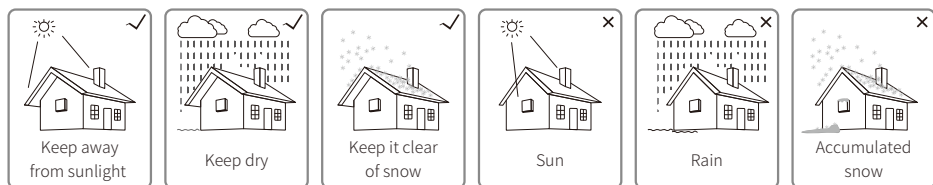
[2] For Wi-Fi communication or inverter without LCD

[3] For system configuration of inverter without LCD

4 Installation

4.1 Mounting Instructions

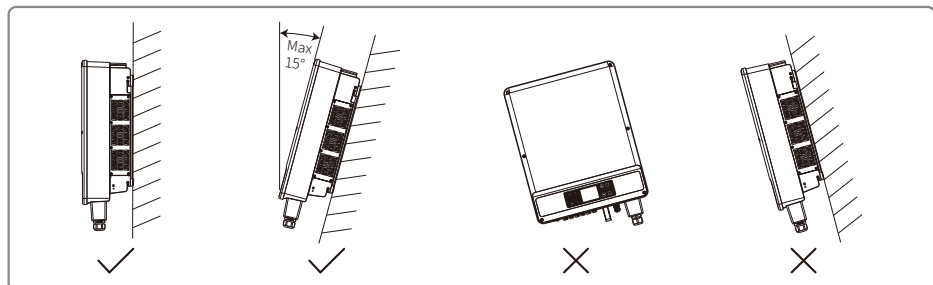
1. In order to achieve optimal performance, the ambient temperature should be lower than 45°C.
2. For easy maintenance, we suggest installing the inverter at eye level.
3. Inverters should not be installed near flammable or explosive items. Strong electromagnetic forces should be kept away from installation site.
4. Product label and warning symbols should be placed at a location that is easy to read by the users.
5. Be sure to install the inverter at a place where it is protected from direct sunlight, rain and snow.



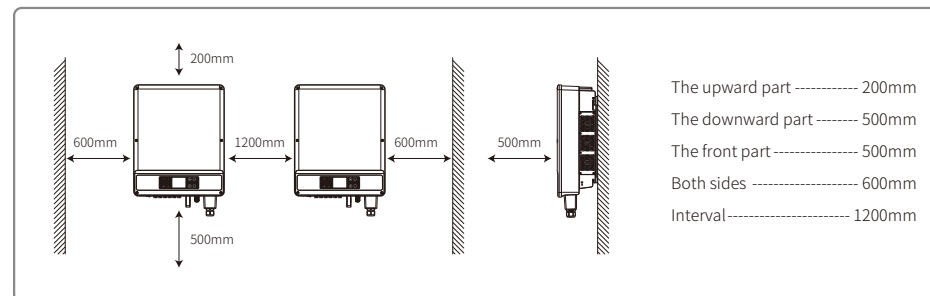
4.2 Equipment Installation

4.2.1 Select the Installation Location

1. Take the bearing capacity of the wall into account. The wall (e.g. concrete and metal) should be strong enough to hold the weight of the inverter for a long period of time.
2. Install the unit where it is accessible to service or do the electrical connection.
3. Do not install the unit on the wall of flammable material.
4. Ensure the installation location is well ventilated.
5. Inverters should not be installed near flammable or explosive items. Any strong electromagnetic forces should be kept away from installation site.
6. Install the unit at eye level to for convenient operation and maintenance.
7. Install the unit vertically or tilted backwards of no more than 15°. The wiring area should face downwards. Horizontal installation requires an elevation of more than 250mm.

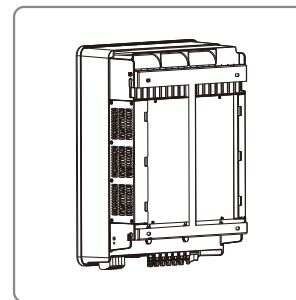
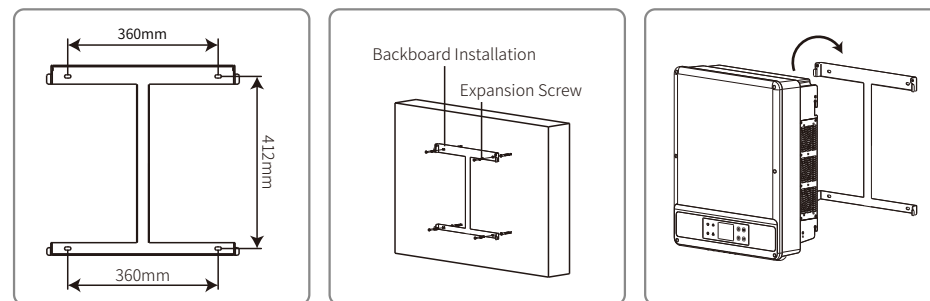


To ensure heat dissipation and convenient disassembly, the minimum clearance around the inverter should not be less than the following values:



4.2.2 Mounting Procedure

1. Use the wall-mounting bracket as a template and drill 6 holes on the wall: 13mm diameter and 65mm deep.
2. Fix the wall-mounting bracket to the wall with using the expansion bolts in accessory bag.
3. Carry the inverter with the handles on both sides of the inverter chassis.
4. Place the inverter on the wall-mounting bracket as illustrated.

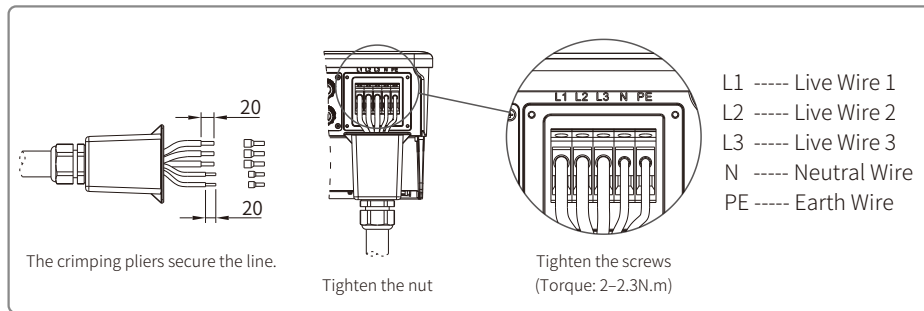


Note: Two mounting holes in the middle of the wall-mounting bracket are only used for single column installation; other environments may not be used.

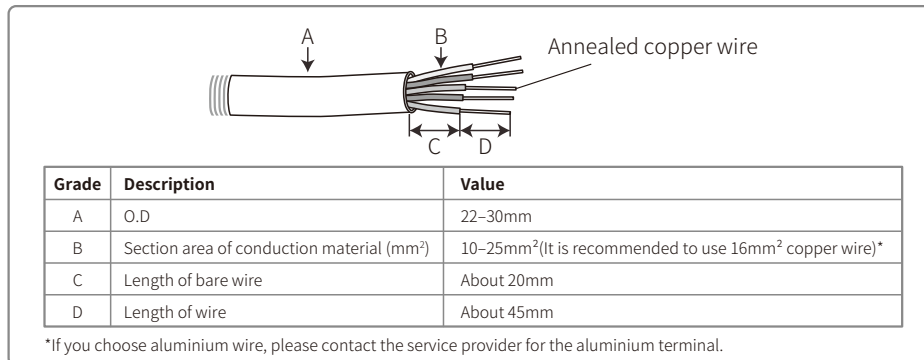
4.3 Electrical Connection

4.3.1 Connection to Grid (AC Side Connection)

1. Measure the voltage and frequency of the grid-connected access point and ensure it meets the grid connection standard of the inverter.
2. It is recommended to add a breaker or fuse to the AC side. The specification should be more than 1.25 times that of the rated of AC output current.
3. The PE line of inverter should be connected to the earth. Ensure that the impedance between the neutral wire and earth wire is less than 10Ω .
4. Disconnect the breaker or fuse between the inverter and the utility.
5. Connect the inverter to the grid as follows:
 - The wiring installation method on the AC output side is shown in the below figure.
 - Fix (Torque: 1.2–2N.m) the connector of AC cable to the corresponding terminals.
 - Neutral conductor should be blue; line conductor should be black or brown (preferred); protective earth bonding line should be yellow-green.
 - The AC line construction shall be such that, if the cord should slip in its anchorage, placing a strain on conductors, the protective earthing conductor will be the last to take the strain.



AC cable illustration:



4.3.2 AC Circuit Breaker and Residual Current Device

An independent three- or four-pole circuit breaker for each inverter must be installed at the output side to ensure that the inverter can be securely disconnected from the grid.

Inverter Model	Output Current	Recommended Nominal Current of AC Breaker
GW12KLV-MT	31.5A	>40A
GW15KLV-MT	40A	>50A
GW20KLV-MT	54.5A	>68A
GW25K-MT	40A	>50A
GW29.9K-MT	43.3A	>55A
GW30K-MT	48A	>60A
GW36K-MT	53.3A	>66A

⚠ Note: It is not allowed for several inverters to use the same circuit breaker. It is not allowed to connect loads between inverter and circuit breaker.

The internal integrated residual current detection device (RCD) of the inverter can detect external leakage current in real time. When a leakage current value exceeds the limit value, the inverter will be disconnected from the grid as soon as possible. If an external RCD is installed, the action current should be 500 mA or higher.

4.3.3 Earth Terminal Connection

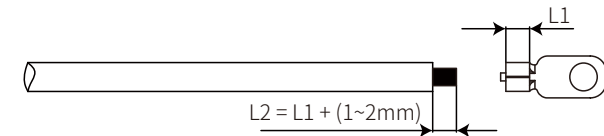
The inverter is equipped with an earth terminal according to the requirement of EN 50178.

All non-current carrying exposed metal parts of the equipment and other enclosures in the PV power system must be grounded.

Please follow the steps below to connect 'PE' cable to the ground.

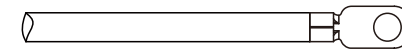
Step 1

Strip the wire insulation sheet of a suitable length with a wire stripper.



Step 2

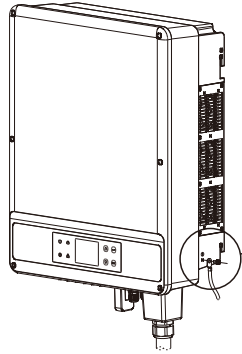
Insert the stripped wire into the terminal and compress it tightly using crimping pliers.



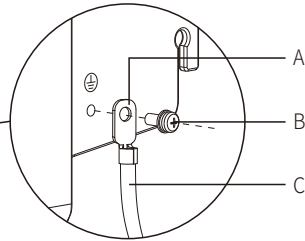
Step 3

Fix the earth wire on the machine.

To improve the corrosion resistance of the terminal, it is recommended to apply silica gel on the earth terminal for corrosion protection after the grounding cable assembly is completed.



NO.	Name	Explanation
A	Cold-pressed terminal	
B	Screw	M5*12
C	Green & Yellow Cable	10~16mm ²



4.3.4 Connecting Inverter to PV Panel



Caution

Ensure the DC switch is turned off before connecting the PV string to the inverter.

Ensure the PV string polarity confirms with the DC connector. Otherwise, it will damage the inverter.

Ensure the maximum open-circuit voltage (Voc) of each PV string does not exceed the maximum input voltage of the inverter under any condition (1100V).

Ensure that the maximum short circuit current of each DC input is less than the inverter's allowable limit.

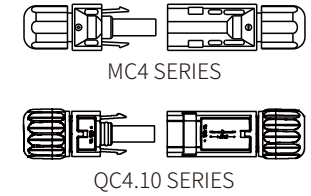
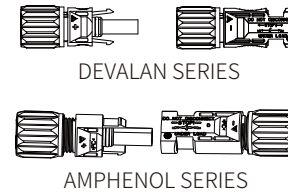
Do not connect positive or negative pole of PV string to the earth (PE terminal). Otherwise, it will destroy the inverter.

Positive wire shall be red, negative wire shall be black.

The minimum insulation resistance to ground of the PV panels must exceed 33.7kΩ. There is a risk of shock if the required minimum resistance is not met.

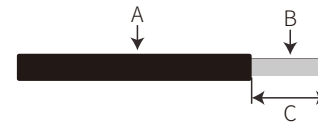
The SMT series has three PV input areas: PV1 input, PV2 input and PV3 input. Each has an MPPT tracker. Therefore, the three PV inputs can differ, including the type of module, the numbers of connecting PV strings and the orientation angles of PV modules.

There are four types of DC connectors: DEVALAN, MC4, AMPHENDL H4 and QC4.10 series.



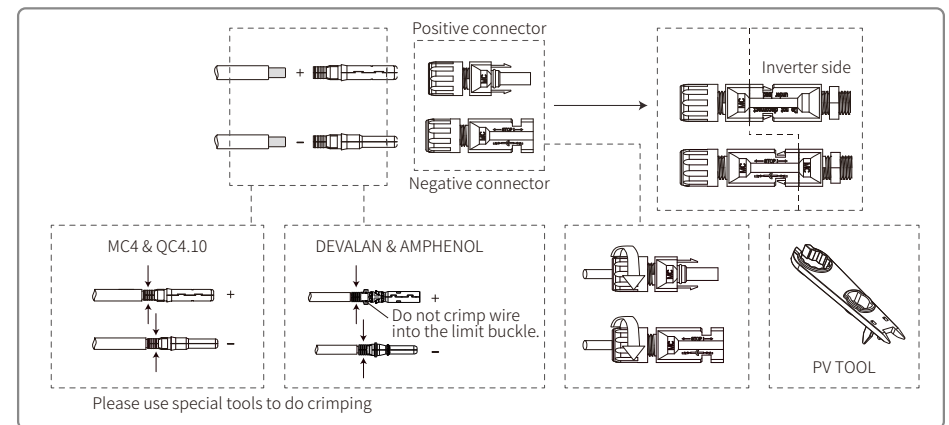
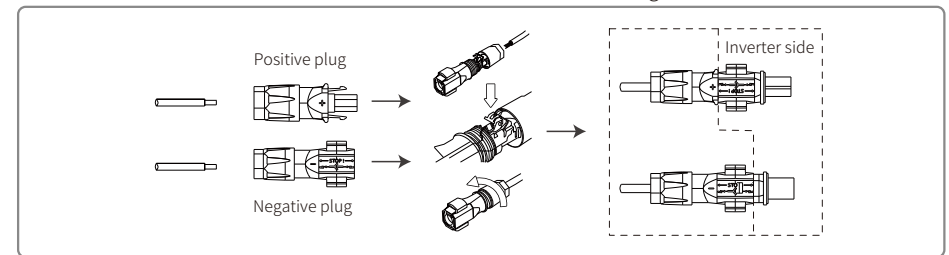
Note: The actual DC connector used is as shown in the accessory box.

DC cable specification:

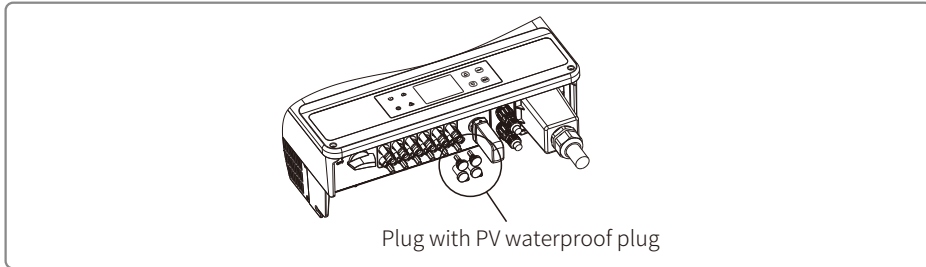


Label	Description	Value
A	External diameter of wire stock	4~5 mm
B	Cross-sectional area of conductor material	2.5~4 mm ²
C	Length of bare wire	About 7 mm

The installation method of the DC connector is shown in the two figures below.



To better dustproof and waterproof the internal inverter, all DC connectors provided by accessory bag should be connected to the inverter. If only some of the DC connectors are used, the DC connectors without connections should be blocked with a non-conductive insulator.

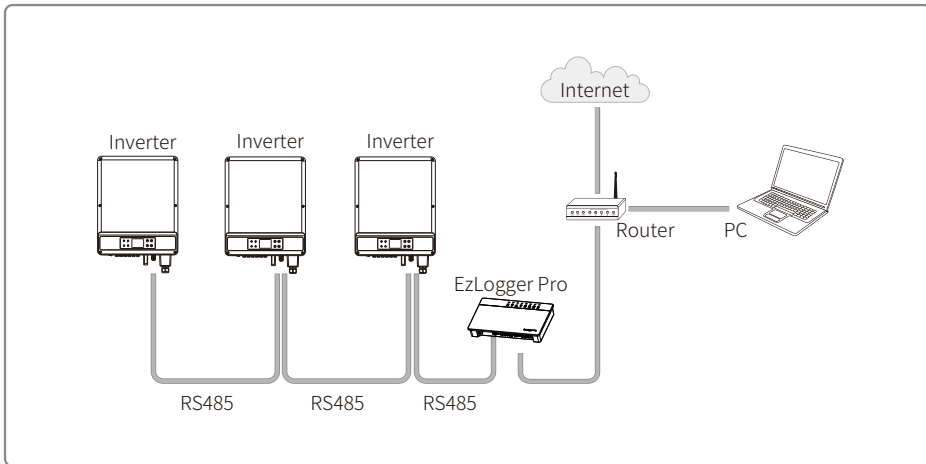


4.4 Communication Connection

Inverter operation data can be transferred via RS485 or Wi-Fi module to a PC using monitoring software or a data logger device, such as EzLogger Pro. RS485 is the standard communication choice for the inverter. The Wi-Fi module can be used optionally for communication.

4.4.1 RS485 / DRED / Remote Shutdown Communication

The communication cable must be separated from other power cables to prevent communication interference. For RS485 connections, please refer to the figure below.

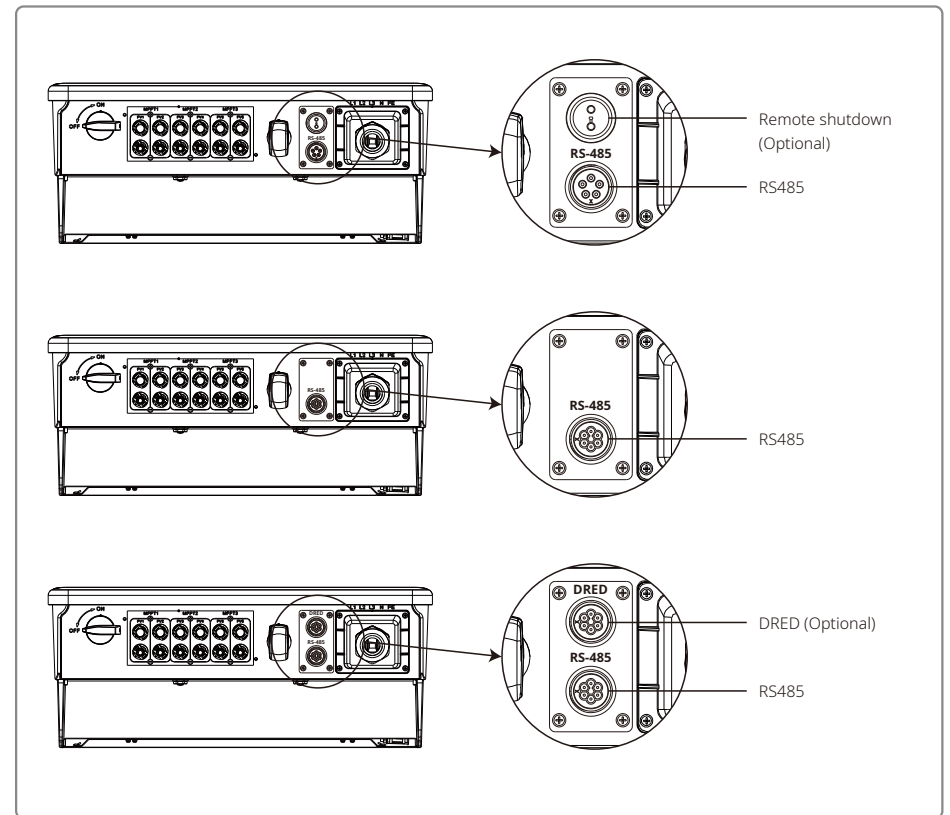


The RS485 port of inverter is used to connect the EzLogger Pro, and the total length of connecting cable should not exceed 1000m.

DRED is only for Australian and New Zealand installations, in compliance with Australian and New Zealand safety requirements. DRED is not provided by the manufacturer. DRM function is achieved by Ezlogger Pro or DRED COM port. Please connect the Ezlogger Pro to the RS485 port. For detailed DRED connection instructions, refer to the Ezlogger Pro manual.

Remote shutdown is only for European installations, in compliance with European safety requirements. A remote shutdown device is not provided by manufacturer.

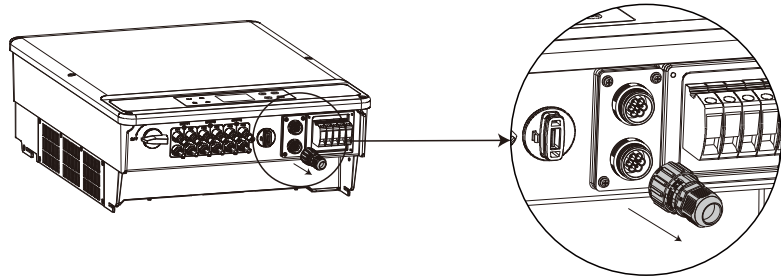
DRED should be connected to the COM port with 6-Pin and remote shutdown to the COM port with 2-Pin as illustrated below.



Please follow the steps below to complete the connection.

Step 1

Unplug the terminal.

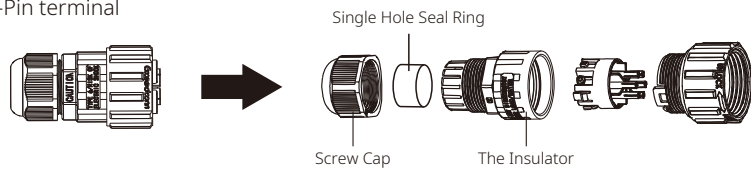


Step 2

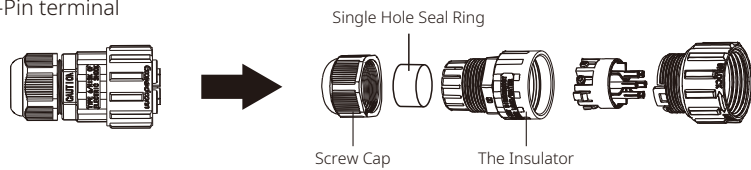
Dismount the terminal.

Note: There is an 2-Pin terminal in the accessory box.

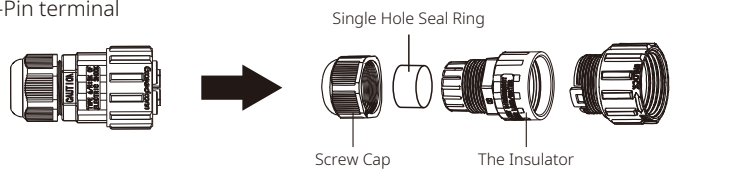
For 6-Pin terminal



For 5-Pin terminal



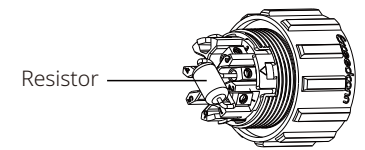
For 2-Pin terminal



Step 3

Dismantle the resistor or shortcircuit cable.

Note: The figure shown is 6-Pin terminal.



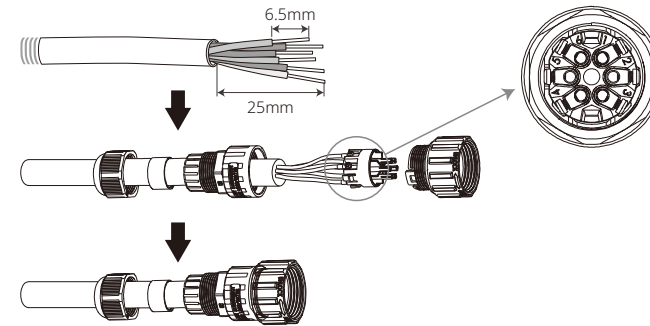
Step 4

Put the cable through the plate.

Different cable and connection method should be applied for different functions. Please follow the connection steps in accordance to the function in need.

Connection of DRED

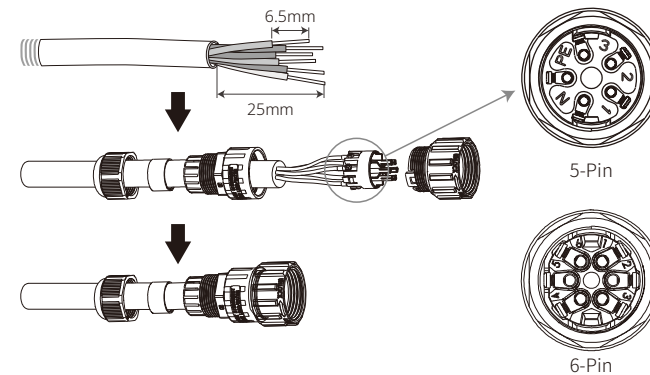
Please connect the cables in order as shown in the right table.



NO.	Function
1	DRM1/5
2	DRM2/6
3	DRM3/7
4	DRM4/8
5	REFGen
6	Com/DRM0

Connection of RS485

Please connect the cables in order as shown in the right table.

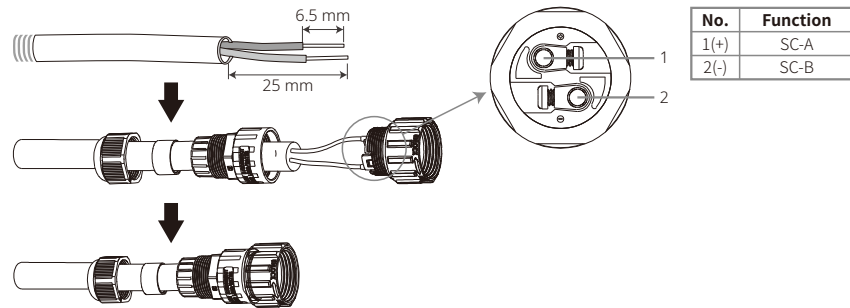


5-Pin	
No.	Function
1	485-A1
2	485-B1
3	485-A1
4(PE)	485-B1
5(N)	GND

6-Pin	
No.	Function
1	485-A1
2	485-B1
3	485-A1
4	485-B1
5	485-A2(Reserved)
6	485-B2(Reserved)

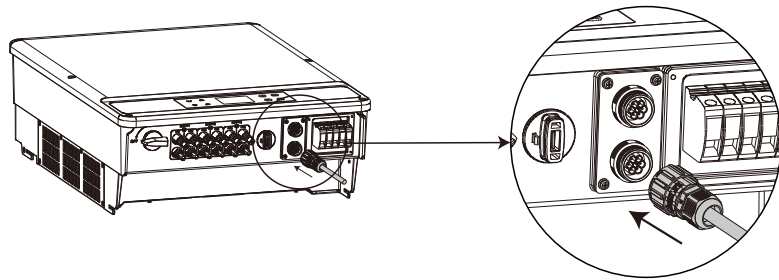
Connection of Remote shutdown.

Please connect the cables in order as shown in the right table.



Step 5

Connect the terminal to the right position onto the inverter.



Caution

Cable requirements of RS485 communication: shielded twisted-pair cable or shielded twisted-pair.

Ethernet cable 120Ω termination resistor is controlled via dip switch. 'ON' means connected and 'OFF' means disconnected, illustrated as the above figure.

Selection mode of terminal resistance dial switch with 120Ω.

- When single inverter is in communication mode, dial the terminal resistance dial switch to the 'ON' state (default is 'OFF') next to the RS485 communication port. Ensure that the RS485 terminal is set to 120Ω and single-point ground the shielding layer of the communication, as shown in the last figure.
- If multiple inverters are in communication, connect all inverters in a daisy chain through the RS485 communication cable. For the device at the end of daisy chain, dial the terminal resistance

dial switch to the 'ON' state (default is OFF) and single-point ground the shielding layer of the communication line.

As shown in Figures 4.4.1-3, waterproof covers should be removed first if remote shutdown function and RS485 communication are needed. To enable the remote shutdown function, the short-circuit pin should be removed and cables for remote shutdown function should be connected. Please do not remove the short-circuit pin or waterproof cover if the remote shutdown function is not required. The inverters with an RS485 port or both RS485 & DRED ports are slightly different, as shown in Figure 4.4.1-4.

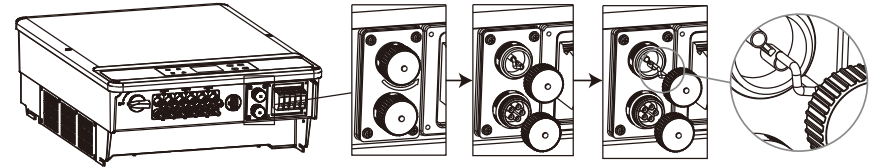


Figure 4.4.1-3

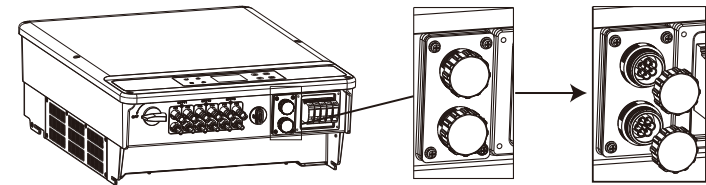


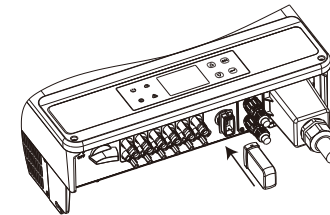
Figure 4.4.1-4

4.4.2 Wi-Fi Communication

The Wi-Fi Communication function is only enabled by the Wi-Fi Module. For detailed configuration instructions, refer to 'Wi-Fi Configuration Instruction' in the accessory box.

After the configurations are completed, please register on the website: www.goodwe.com.

The Wi-Fi module installation of the SMT series is shown in the below figure.



Note: The name and password of the Wi-Fi cannot use symbols; only use Arabic numerals or uppercase / lowercase letters.

4.4.2 Earth Fault Alarm

The inverter complies with IEC62109-2 13.9. When an earth fault occurs, the buzzer in EzLogger Pro will ring for 1 min and an LED will light for 1 min. The alarm will ring again in half an hour unless the fault is resolved.

4.4.4 SEMS Portal

The SEMS Portal is an online monitoring system. After completing the installation of the communication connection, access www.semsportal.com or download the App by scanning the QR code to monitor your PV plant and device.

Please contact the after-sales for more operation options of the SEMS Portal.



SEMS Portal App

5 System Operation

5.1 LCD Panel And LED

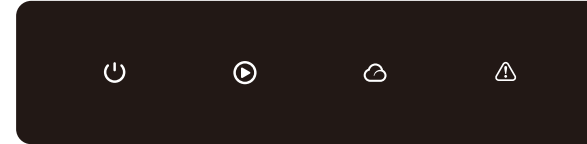
As a human-computer interaction interface, the LCD display panel comprises LED indicators, buttons and an LCD display on the front panel of the inverter.

The LED screen indicates the working status of the inverter.

Buttons and the LCD are used for configuration and viewing parameters.



LED panel is shown as below.



Green / green /green / red light respectively corresponds to: / / /

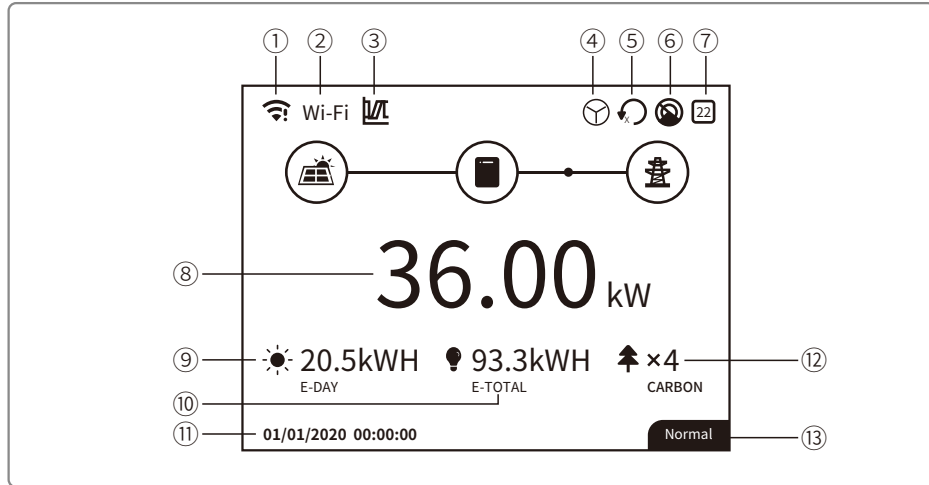
Indicator	Status	Explanation
		ON = Equipment powered-on
		OFF = Equipment powered-off
		ON = Inverter is feeding power
		OFF = Inverter is not feeding power
		Single Slow Flash = Self check before grid connects
		Single Flash = Connecting / active
		On = Wireless connected / active
		Blink 1 = Wireless system resetting
		Blink 2 = Wireless router problem
		Blink 4 = Wireless server problem
		Blink = RS485 Connected
		OFF = Wireless not active
		On = Fault occurred
		OFF = No fault



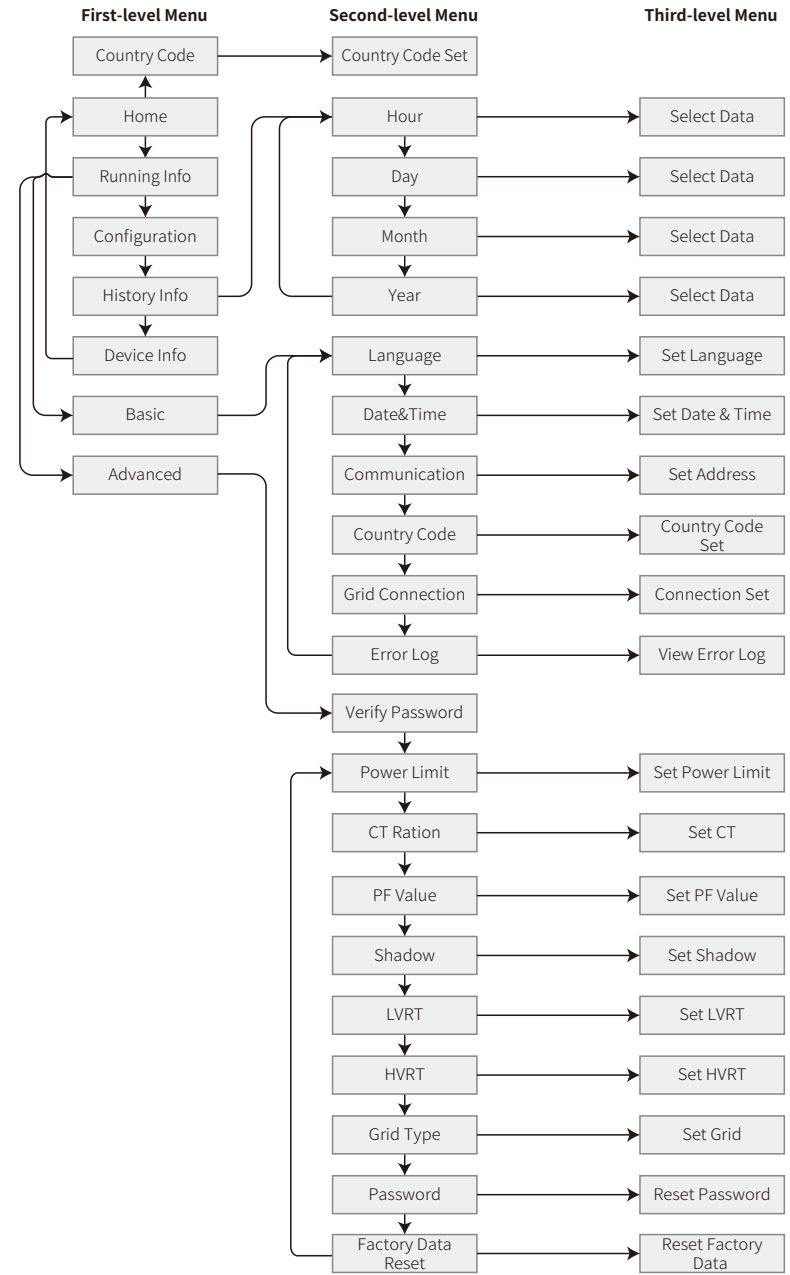
NOTE:

Download SolarGo App from Google Play Store or Apple App Store to complete the system operation if the inverter has no screen. You can also scan the QR code to download it.

5.3 User Interface Introduction



- ①: Communication information icon:GPRS and Wi-Fi show the signal strength, RS485 shows the communication address.
- ②: Communication icon: The method of communication. These include GPRS, Wi-Fi LAN and RS485.
- ③: LVRT / HVRT icon: The icon indicates that the system LVRT / HVRT function is on
- ④: Grid Type icon: The icon indicates that the system has selected Delta Grid / Star Grid
- ⑤: Power limit icon: The power-limit icon indicates that the Power-limit function is on
- ⑥: Shadow scan: The icon indicates that the shadow-scan function is on
- ⑦: Safety icon:The number represents the safety country number
- ⑧: Real-time power
- ⑨: E-day: Daily generation
- ⑩: E-Total: Total generation
- ⑪: System date and time
- ⑫: System status information
- ⑬: Carbon: Energy conservation and emission reduction



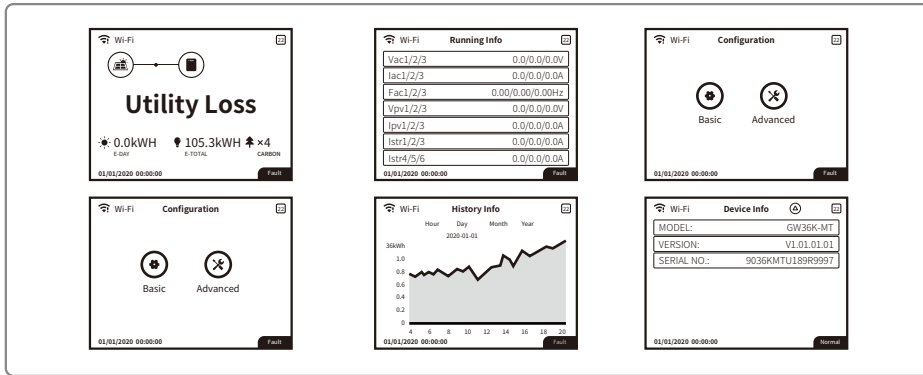
5.3.1 Overview of Menu Architecture

The display menu has a total of three levels. Use the 'Up' 'Down' 'enter' 'ESC' button to operate the menu. The 'enter' button has two operating methods: long press (greater than 3 s) and short press. In summary, it has 5 buttons in total for operating the menu.

Press the 'Enter' / 'ESC' to enter/exit the each menu level; use the 'Up' / 'Down' to select the item and change the parameters; and long-press the 'Enter' (greater than 3s) to set the parameters.

5.3.2 First-level Menu

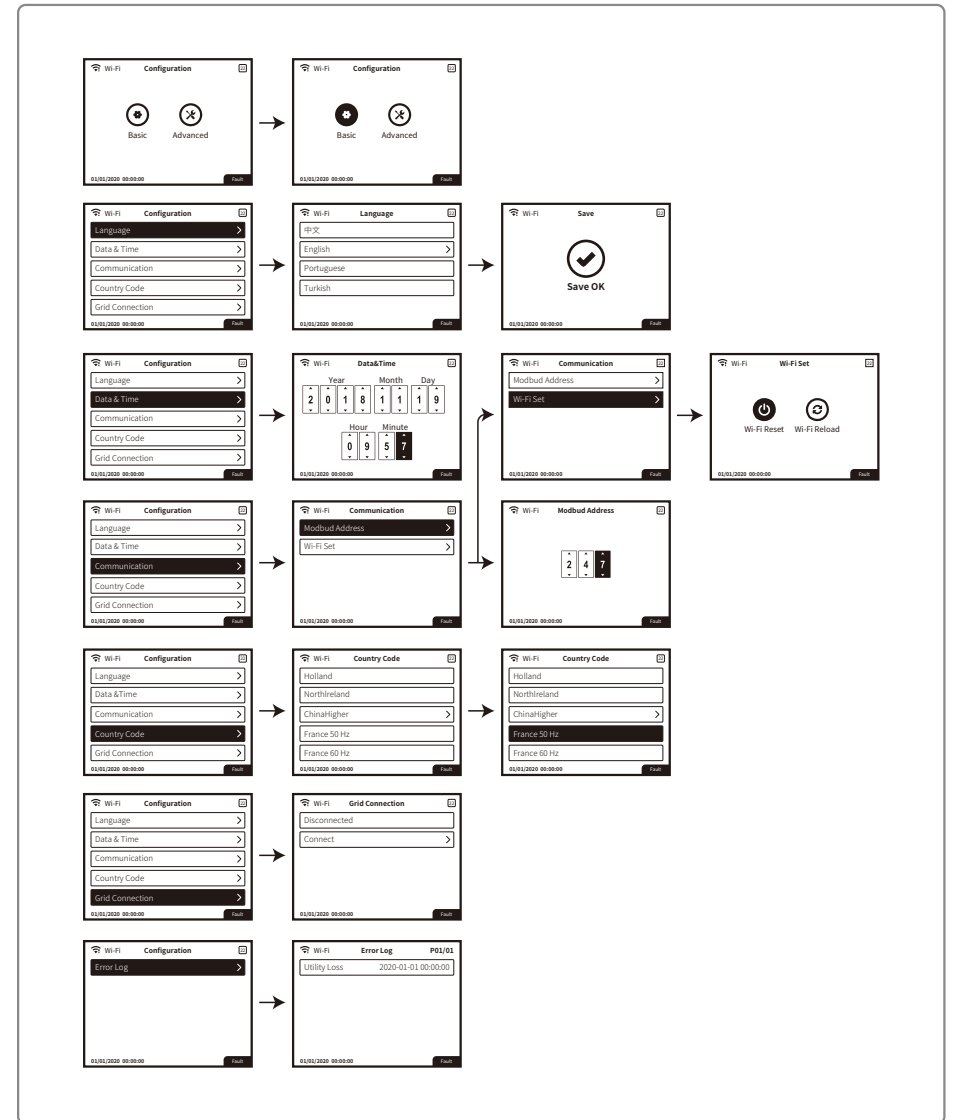
The first-level menu interface through the up- and down-button cycle. In the historical information, configuration and advanced settings interface, pressing the 'enter' button will enter the second-level menu. To enter this menu, select the item from the up and down buttons. Press 'enter' to enter 'project setup' menu. Go to the third-level menu, change the setting contents by pressing the up and down buttons. Press the 'enter' button to set the contents. If country safety setting is not selected (shows 'Configure Safety' on the display at the home page), press any button to enter the country safety setting page.



5.4 System Configuration

5.4.1 Basic Settings

Basic Settings is mainly used to set commonly used parameters, including language settings, time settings, communication settings and safety settings for projects. These parameters can be set by using the App.

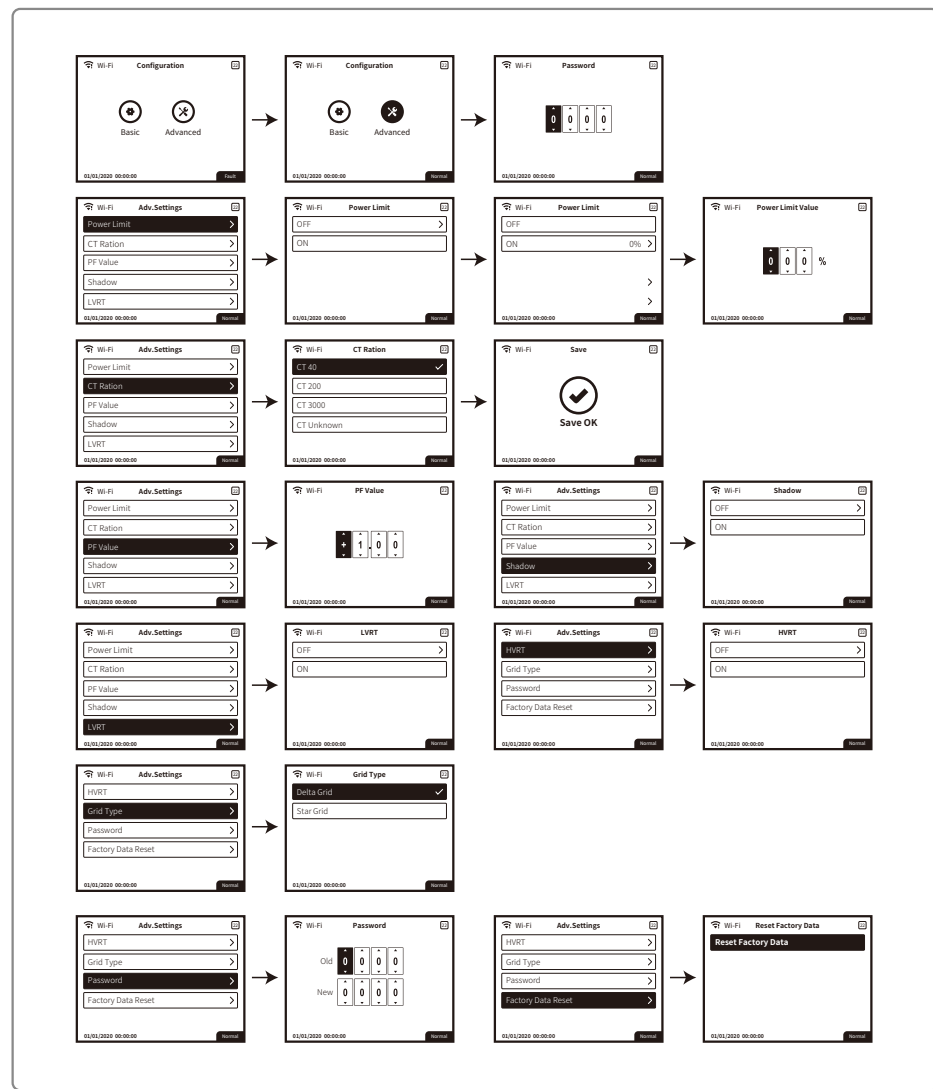


5.4.2 Advanced Settings

User must enter password to operate advanced settings because permission is required.

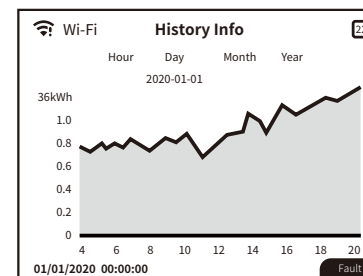
Note: Initial password: '1111'

Advanced Settings include nine settings: 1. Power limit; 2. CT ratio; 3. Power factor; 4. Shadow scanning; 5. Low pressure crossing; 6. High pressure crossing; 7. Type of power grid; 8. Reset the password; and 9. Recovery parameters.



5.4.3 History Information

The history information mainly includes information about the generating capacity of the equipment, the power generation information mainly includes the amount of electricity generation, daily power generation, monthly power generation and annual power generation information.



5.4 Error Message

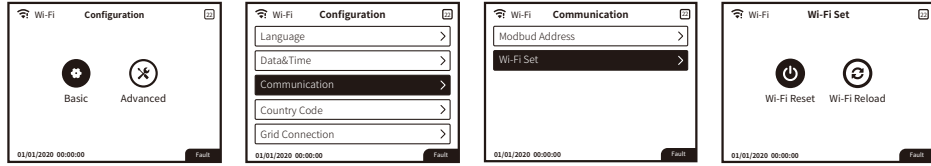
An error message will be displayed on the LCD if a fault occurs.

Error Code	Error message	Description
01	SPI Failure	Internal communication failure
02	EEPROM R / W Failure	Memory chip failure
03	Fac Failure	Grid frequency out of range
07, 25	Relay Check Failure	Relay self-checking failure
13	DC Injection High	Overhigh DC injection
14	Isolation Failure	Ground insulation impedance is too low
15	Vac Failure	Grid voltage out of range
16	EFan Fault	External fan failure
17	PV Over Voltage	Overvoltage at DC input
19	Over Temperature	Overtemperature on the case
20	IFan Fault	Internal fan failure
21	DC Bus High	Overhigh BUS voltage
22	Ground I Failure	Overhigh ground leakage current
23	Utility Loss	Grid disconnection / fault
30	Ref 1.5V Failure	1.5V reference voltage failure
31, 24	AC HCT Failure	Output current sensor failure
32, 26	GFCI Failure	Detection circuit of ground leakage current failure
Others	Device Failure	Internal device failure

5.5 Wi-Fi Reset & Wi-Fi Reload

These functions are only available for Wi-Fi model inverters.

1. Press 'Up' / 'Down' to select 'Basic' and press 'Enter'.
2. Press 'Up' / 'Down' to select 'Communication' and press 'Enter'.
3. Press 'Up' / 'Down' to select 'Wi-Fi Set' and press 'Enter'.
4. Press 'Up' / 'Down' to select 'Wi-Fi Reset' / 'Wi-Fi Reload' and long press 'Enter'.



5.6 Precaution for Initial Start-up

1. Ensure the AC circuit is connected and that the AC breaker is turned off.
2. Ensure the DC cable between the inverter and the PV string is connected and that the PV voltage is normal.
3. Turn on the DC switch and set the safety settings according to local regulations.
4. Turn on the AC breaker and check to see that the inverter works normally.

5.7 Special Adjustable Setpoints

The inverter has a field in which the user can set functions, such as trip points, trip times, reconnect times, active and inactive QU curves and PU curves. It is adjustable through special software. If needed, please contact after-sales.

To obtain software manuals, you can download them from the official website or contact after-sales.

6 Troubleshooting

If the Inverter does not work properly, please refer to the following instructions before contacting your local service centre. If any problems arise, the red (FAULT) LED indicator on the front panel will light up and the LCD screen will display relevant information. Please refer to the following table for a list of error messages and associated solutions.

Type of fault		Troubleshooting
System Failure	Isolation Failure	<ol style="list-style-type: none"> 1. Check the impedance between Ground and PV (+) & PV (-). The impedance value must be greater than 100 kΩ. Ensure the inverter is grounded. 2. Contact local service office for help if the problem still persists.
	Ground I Failure	<ol style="list-style-type: none"> 1. The ground current is too high. 2. Unplug the inputs from the PV generator and check the peripheral AC system. 3. When the problem is cleared, reconnect the PV panel and check the Inverter status. 4. Contact local service office for help if the problem still persist.
	Vac Failure	<ol style="list-style-type: none"> 1. The PV Inverter will automatically restart within 5 min if the grid returns to normal. 2. Ensure grid voltage conforms with the specification. 3. Ensure neutral (N) wire and PE wire are connected well. 4. Contact local service office for help if the problem persists.
	Fac Failure	<ol style="list-style-type: none"> 1. Grid is not connected. 2. Check grid connection cables. 3. Check availability of grid.
	Utility Loss	<ol style="list-style-type: none"> 1. Not connect to the grid. 2. Check if the power grid is connected to cable. 3. Check the availability of power grid.
	PV Over Voltage	<ol style="list-style-type: none"> 1. Check if the PV open circuit voltage is higher or too close to the maximum input voltage or not. 2. If the problem persists when PV voltage is less than the maximum input voltage, contact local service office for help.
	Over Temperature	<ol style="list-style-type: none"> 1. The internal temperature is higher than the normal value specified. 2. Reduce ambient temperature. 3. Move the inverter to a cool place. 4. If the problem persists, contact the local service office for help.

Type of fault		Troubleshooting
Inverter Failure	Relay-Check Failure	<ol style="list-style-type: none"> Turn off DC switch of the inverter. Wait until the inverter's LCD light is off. Turn on the DC switch and ensure it is connected. If the problem persists, contact local service office for help.
	DCI Injection High	
	EEPROM R / W Failure	
	SCI Failure	
	SPI Failure	
	DC BUS High	
	BUS Unbalance	
	GFCI Failure	
	Ifan Fault	
	Efan Fault	
Others	Afan Fault	<ol style="list-style-type: none"> Turn off DC switch, take off DC connector, measure the voltage of PV array. Plug in DC connector and turn on DC switch. If PV array voltage is lower than 250V, please check the configuration of the inverter module. If voltage is higher than 250V, please contact local office.
	No display	
Others	Wi-Fi module fails to connect to network	<ol style="list-style-type: none"> If the Wi-Fi module fails to connect to the network after choosing the right router hotspot and entering the right passwords, it is possible that there are special characters not supported by the module in the hotspot password. Please modify the password to consist of only Arabic numerals or uppercase / lowercase letters. If the problem persists, contact the local service office for help.

Note:

When sunlight is insufficient, the PV Inverter may continuously start up and shut down automatically because of insufficient power generation by the PV panel.

Explanation of some faults:

Fault	Explanation
Device Failure	The device's self-check failed.
DC inject High	The DC current injection exceeds the threshold and triggers protection.
EEPROM R/W Failure	Error in reading/writing from/into the memory card data storage such as SN, generation.
Ref 1.5V Failure	The reference voltage limitation is exceeded, which leads to detection deviation of voltage and current.
AC HCT Failure	Error happens to AC current sensor.
IFan Fault	Internal fan failed.
Efan Fault	External fan failed
Afan Fault	All fans failed.

7 Technical Parameters & Block Diagram

7.1 Technical Parameters

Technical Data	GW12KLV-MT	GW15KLV-MT	GW20KLV-MT
PV String Input Data			
Max. DC Input Power (Wp)	15600	19500	26000
Max. DC Input Voltage (V)	800	800	800
MPPT Range (V)	200-650	200-650	200-650
Start-up Voltage (V)	180	180	180
Nominal DC Input Voltage (V)	370	370	370
Max. Input Current (A)	25/25/25	25/25/25	25/25/25
Max. Short Current (A)	31.3/31.3/31.3	31.3/31.3/31.3	31.3/31.3/31.3
No. of MPP Trackers	3	3	3
No. of Input Strings Per MPP Tracker	2/2/2	2/2/2	2/2/2
AC Output Data			
Nominal Output Power (W)	12000	15000	20700
Max. Output Power (W)	208VAC	11300	14400
	220VAC	12000	15000
	240VAC	13100	16600
Max. Output Apparent Power (VA)	13100	16600	22600
Nominal Output Voltage (V)	150-300	150-300	150-300
Nominal Output Frequency (Hz)	50/60	50/60	50/60
Max. Output Current (A)	31.5	40	54.5
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)		
Output THDi (@Nominal Output)	<3%	<3%	<3%
Efficiency			
Max. Efficiency	98.7%	98.7%	98.8%
European Efficiency	>98.4%	>98.5%	>98.5%
Protection			
Anti-islanding Protection	Integrated		
Input Reverse Polarity Protection	Integrated		
Insulation Resistor Detection	Integrated		
DC Surge Protection	Type III (Type II optional)		
AC Surge Protection	Type III (Type II optional)		
Residual Current Monitoring Unit	Integrated		
Output Over Current Protection	Integrated		
Output Short Protection	Integrated		
Output Over Voltage Protection	Integrated		
AFCI	Optional		
Terminal Temperature Detection	Optional		
General Data			
Operating Temperature Range (°C)	-30~60		
Relative Humidity	0~100%		
Operating Altitude (m)	≤3000		
Cooling	Fan Cooling		
User Interface	LCD & LED or APP & LED		
Communication	RS485 or Wi-Fi or GPRS or PLC		
Weight (kg)	40		
Size (Width*Height*Depth mm)	480*590*200		
Protection Degree	IP65		
Night Self Consumption (W)	<1		
Topology	Transformerless		
Certifications & Standards			
Grid Regulation	Visit homepage to achieve information.		
Safety Regulation			
EMC			

Technical Data	GW25K-MT	GW29.9K-MT	GW30K-MT	GW36K-MT
PV String Input Data				
Max. DC Input Power (Wp)	32500	39000	39000	42900
Max. DC Input Voltage (V)	1100	1100	1100	1100
MPPT Range (V)	200-950	200-950	200-950	200-950
Start-up Voltage (V)	180	180	180	180
Nominal DC Input Voltage (V)	600	600	600	600
Max. Input Current (A)	25/25/25	25/25/25	25/25/25	25/25/25
Max. Short Current (A)	31.3/31.3/31.3	31.3/31.3/31.3	31.3/31.3/31.3	31.3/31.3/31.3
No. of MPP Trackers	3	3	3	3
No. of Input Strings Per MPP Tracker	2/2/2	2/2/2	2/2/2	2/2/2
AC Output Data				
Nominal Output Power (W)	25000	29900	30000	36000 [1]
Max. Output Apparent Power (VA)	27500	29900	33000	36000
Max. Output Apparent Power (VA)	27500	29900	33000	36000
Nominal Output Voltage (V)	400, 3L/N/PE or 3L/PE	400, 3L/N/PE or 3L/PE	400, 3L/N/PE or 3L/PE	400, 3L/N/PE or 3L/PE
Nominal Output Frequency (Hz)	50/60	50/60	50/60	50/60
Max. Output Current (A)	40	43.3	48	53.3
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)			
Output THDi (@Nominal Output)	<3%	<3%	<3%	<3%
Efficiency				
Max. Efficiency	98.70%	98.80%	98.80%	98.80%
European Efficiency	>98.4%	>98.5%	>98.5%	>98.5%
Protection				
Anti-islanding Protection	Integrated			
Input Reverse Polarity Protection	Integrated			
PV String Current Monitoring	Integrated			
Anti-PID Function For Module	Optional			
Insulation Resistor Detection	Integrated			
DC Surge Protection	Type III (Type II optional)			
AC Surge Protection	Type III (Type II optional)			
Residual Current Monitoring Unit	Integrated			
Output Over Current Protection	Integrated			
Output Short Protection	Integrated			
Output Over Voltage Protection	Integrated			
AFCI	Optional			
Terminal Temperature Detection	Optional			
General Data				
Operating Temperature Range (°C)	-30~60			
Relative Humidity	0~100%			
Operating Altitude (m)	≤3000			
Cooling	Fan Cooling			
User Interface	LCD & LED or APP & LED			
Communication	RS485 or Wi-Fi or GPRS or PLC			
Weight (kg)	40			
Size (Width*Height*Depth mm)	480*590*200			
Protection Degree	IP65			
Night Self Consumption (W)	<1			
Topology	Transformerless			
Certifications & Standards				
Grid Regulation	Visit homepage to achieve information.			
Safety Regulation				
EMC				

[1]: 33kW for Italy, 36kW for other country.

Note:

Overvoltage Category Definition

Category I: applies to equipment connected to a circuit where measures have been taken to reduce transient overvoltage to a low level.

Category II: applies to equipment not permanently connected to the installation. This includes appliances, portable tools and other plug-connected equipment.

Category III: applies to fixed downstream equipment, including the main distribution board. This includes switchgear and other equipment in an industrial installation.

Category IV: applies to equipment permanently connected at the origin of an installation (upstream of the main distribution board). This includes electricity meters, primary overcurrent protection equipment and other equipment connected directly to outdoor open lines.

Moisture-location Category Definition

Moisture parameters	Level		
	3K3	4K2	4K4H
Temperature Range	0~+40°C	-33~+40°C	-20~+55°C
Humidity Range	5%~85%	15%~100%	4%~100%

Environment Category Definition

Outdoor: the ambient air temperature is -20~50 °C. Relative humidity range is 4~100%, applied to PD3.

Indoor unconditioned: the ambient air temperature is -20~50 °C. Relative humidity range is 5~95%, applied to PD3.

Indoor conditioned: the ambient air temperature is 0~40 °C. Relative humidity range is 5~85%, applied to PD2.

Pollution Degree Definition

Pollution degree 1: No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.

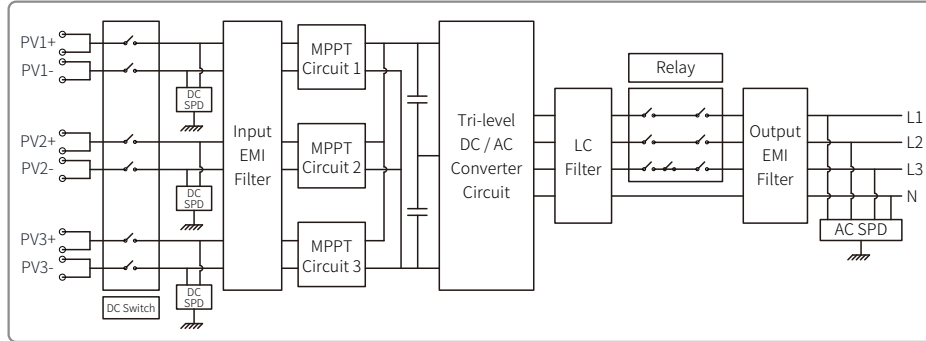
Pollution degree 2: Normally only non-conductive pollution occurs. However, a temporary conductivity occasionally caused by condensation must be expected.

Pollution degree 3: Conductive pollution occurs, or dry, non-conductive pollution becomes conductive because of condensation, which is expected.

Pollution degree 4: Persistent conductive pollution occurs, including pollution cause by conductive dust, rain and snow.

7.2 Block Diagram

SMT series main circuit is shown in the below figure:



8 Caution

Regular maintenance ensures a long operating life and optimal efficiency of the entire PV plant.

Caution: Prior to maintenance, please disconnect the AC breaker first and then disconnect DC breaker. Wait 5 min until the residual voltage has been released.

8.1 Clearing the Fan

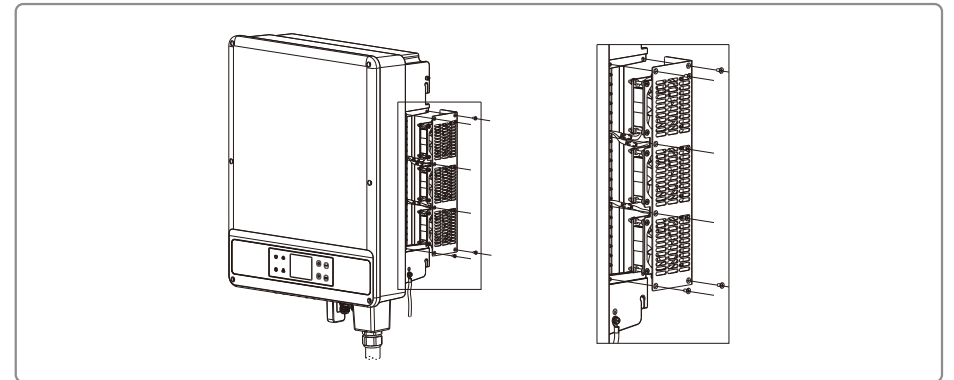
The SMT series inverter is equipped with three fans on its left side. The fan intakes and handle covers should be cleaned yearly with a vacuum cleaner. For more thorough cleaning, completely remove the fans.

Disconnect the AC breaker first. Then, disconnect the DC breaker.

Wait 5 min until the residual voltage has been released, and the fans are no longer turning.

Disassemble the fans (refer to the below figure).

1. Loosen the five screws using a crosshead screwdriver, then remove the fans from the cabinet about 50mm slowly.
2. Open the lockers of the three fan connectors and remove them from their housings. Remove the fans.
 - Clean the ventilation grid and the fan with a soft brush, a cloth or compressed air.
 - Reassemble the fans into the cabinet
 - Please use a towel to clean the heat sink once per year.



8.2 Checking the DC Switch

DC switch does not require any maintenance.

It is recommended, though not compulsory, to:

- Check the DC switch regularly.
- Activate the DC switch 10 times in a row once per year.

Operating the switch will clean the contacts and will extend the life of the DC switch.

Boot order:

1. Turn on the breaker on AC side.
2. Turn on the DC switch.
3. Turn on the breaker on DC side.

Caution: if there is no switch, step 2 is not required.

Shutdown order:

1. Turn off the breaker on AC side.
2. Turn off the DC switch.
3. Turn off the breaker on DC side.

Caution: if there is no switch, step 2 is not required.

8.3 Checking the Electrical Connection

1. Check to see if the AC or DC wire is loose.
2. Check to see if the earth wire is reliably grounded .
3. Check to see if the waterproof covers of RS485 / Wi-Fi port are fastened.

Caution: Maintenance cycle is once every half year.

4. Please a use torque wrench to tighten the AC terminal wiring connection once per year.

Caution: Maintenance cycle lasts half a year.

