Official Website

Company Wechat

GoodWe(China)
No.189 Kunlunshan Rd., SND,
Suzhou, 215163, China
T: 400 998 1212
service.chn@goodwe.com.cn
www.goodwe.com.cn

GoodWe(Australia)
19 Fairleigh Street, Glenroy,
VIC, 3046, Australia
T: +613 9324 0559
service.au@goodwe.com.cn
www.goodwe.de

GoodWe(Netherlands)
Zevenwouden 194 ,
3524 CX Utrecht, the Netherlands
T: +316 1988 6498
service.nl@goodwe.com.cn
www.goodwe.com.cn

GoodWe(UK)
46 Foyle Road London
N17 ONL United Kingdom
T:+ 44 (0)333 358 3184
service@goodwe.co.uk
www.goodwe.com.cn

Note: The information above is subject to change without prior notice, details refer to www.goodwe.com.cn.

340-00014-00

GOODWE
your solar engine

MT Series User Manual

GOODWE
your solar engine

SOLAR INVERTER

1 Safety and warning 01

2 Product introduction 021

2.1 Intended usage 02
2.2 Inverter Overview 03
2.3 Technical description 05
2.4 Package 06

3 Mounting 08

3.1 Mounting instruction 08
3.2 Equipment Installation 08
3.3 Electrical Connection 10
3.4 Communication connection 13

4 System Operation 15

4.1 User Interface and Controls 15
4.2 WiFi Reset & WiFi Reload 21
4.3 system operation 21
4.4 Error code 22

5 Troubleshooting 22

5.1 Overvoltage category definition 24
5.2 Moisture location category definition 24
5.3 Environment category definition 24
5.4 Pollution degree definition 24

6 Technical parameters and block diagram

6.1Technical parameters 25
6.2Block Diagram 26

7 Maintenance 27

7.1 Clearing the FAN 27
7.2 Checking the DC Switch 28
7.3 Checking the Electrical Connection 29
7.4 Fuse Replacement 29

8 Relevant Certification 29

	There is a risk of injury due to improperly handle the device.		Component of product can be recycled
	Danger of high voltage and electric shock.		This surface is upward, and it should not be tilted and upended.
	Danger of hot surface! Do not touch the hot surface when the device is running.		No more than four (4) identical packages be stacked on each other
	Product should not be posed as normal house hold waste.		The package/product should be handled carefully and never be tipped over or slung.
	CE mark.		Keep Dry
	This symbol indicates that you should wait at least 5mins after disconnecting the inverter from the utility grid and from the PV panel before touching any inner live parts.		

1 Safety and warning

This manual contains important instructions for MT series inverter that shall be followed during installation and maintenance of the inverter.

The MT series for Four-MPPT, Three-Phase solar inverter without transformer, which consists of GW50K-MT, GW60K-MT, GW65KHV-MT and GW75KHV-MT model type.

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

1. The life and well-being of the operator or a third party.
2. The inverter and other properties that belong to the operator or a third party, Therefore the flowing safety instructions must be read and always kept in mind prior to any work. All detailed work-related safety warnings and notes will be specified at the critical points in corresponding chapter.

All installation and electrical work must only be performed by qualified personnel. They have:

- Been trained specially;
- Already 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.

- There is a risk of injury due to improperly handing device.
- 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 bruise if improperly handled.
- Please install it in the place beyond children's reach.
- Prior to installing and maintaining the inverter, it is crucial to make certain that the inverter in not electrically connected.

- Before maintaining the inverter, disconnect the connection between the AC grid and the inverter firstly, and then disconnect the connection between the DC input and the inverter, you should wait at least 5mins after these disconnection in case of electric shock.
- All cables must be firmly attached, undamaged, properly insulated, and adequately dimensioned.
- The temperature of some parts of the inverter may exceed 60℃ during operation. To avoid being burnt, do not touch the inverter during operation. Let it cool before touching it.
- Without permission, It is not allowed to open the front cover of the inverter. Users should not touch/replace any components of the inverter except the DC/AC connectors. GOODWE will not bear any consequences caused by unauthorized actions which will lead to potential injury to people and damage to inverters.
- Static electricity may damage electronic components. Appropriate method must be adopted to prevent such damage to the inverter; otherwise the inverter may be damaged and the warranty will be annulled.
- 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 annulled.
- 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 very high voltage which can cause electrical shock hazard. Please strictly follow the instruction we provided.
- PV modules should have an IEC61730 class A rating.
- Prohibit inserting or pulling the AC or DC terminals when the inverter is working. Or the inverter will be destroyed.

Only DC connectors provided by GoodWe are permitted to use, otherwise the inverter may be damaged and the warranty will be annulled.

2 Product introduction

2.1 Intended usage

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

Inverter is dedicated to converting directing current generated by the PV modular into alternating current, which conforms to parameters to local utility grid and fed it into the utility grid. The intended usage of inverter is illustrated in figure 2.1-1.

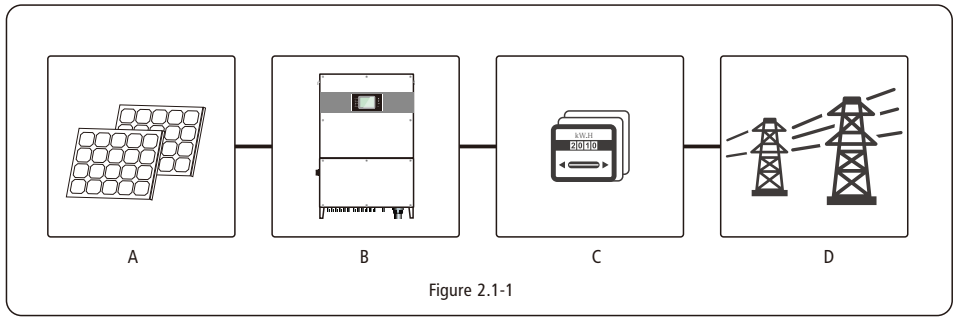


Figure 2.1-1

The inverter cannot be connected to the PV module that the positive or negative terminal of which should be grounded, Excepting a transformer has been used between inverter and grid.

Item	Description	Note
A	PV string	Monocrystalline silicon, polycrystalline silicon and else.
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)

Note:

MT series GW50K-MT and GW60K-MT support four different types of grid. please refer to Figure 2.1-2

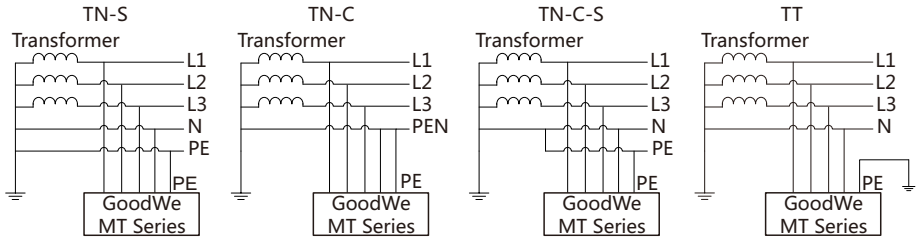


Figure 2.1-2

Note：

For TT grid structure, RMS voltage between neutral wire and earth wire must be less than 20V.

GW65KHV-DT and GW75KHV-DT support IT grid type. Please refer to Figure 2.1-3.

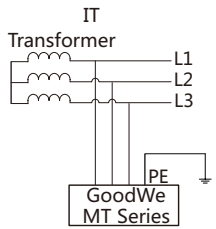


Figure 2.1-3

2.2 Inverter Overview

2.2.1 Inverter Overview

MT Series inverter illustration.

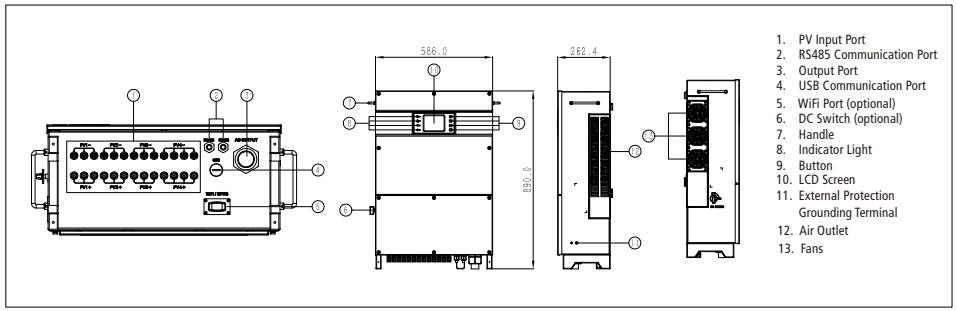


Image shown here is for reference only, actual product you receiver may differ.

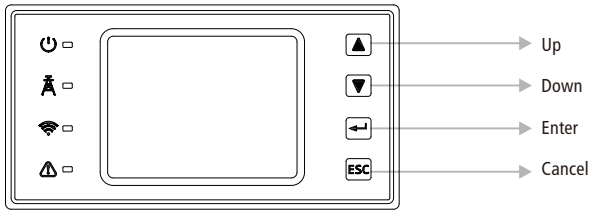
Item	Name	Description
1	PV Input terminal	For PV string connection
2	RS485 Communication Port	For RS485 Communication
3	AC output port	For AC cable connection
4	USB Communication Port	For USB cable connection
5	WiFi Port (optional)	For WiFi connection
6	DC Switch(optional)	During normal operation it is in "on" state, it can shut down the inverter after it is disconnected from the grid by the AC breaker.
7	Handle	The handles are designed for holding the unit, when transporting, installing or servicing.
8	LED indicator light	Display the state of the inverter
9	Button	For configuration and viewing parameters
10	LCD display screen	Inverter operation data viewing and parameter configuration.
11	External protection Grounding Terminal	Second protection earth terminals as specified in EN50178
12	Air Outlet	Exit of hot air during the inverter operation
13	Fans	There are three Fans to perform controlled force-air cooling.

2.2.2 LCD panel

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

LED indicates the working status of the inverter.

Buttons and LCD are used for configuration and viewing parameters.



Yellow / green / green / red light respectively correspond to: ⏻ / 🗼 / 📶 / ⚠

INDICATOR	STATUS	EXPLANATION
⏻		ON:EQUIPMENT POWER-ON
		OFF:EQUIPMENT POWER-OFF
🗼		ON=INVERTER IS FEEDING POWER
		OFF=INVERTER IS NOT FEEDING POWER
		SINGLE SLOW FLASH=SELF CHECK BEFORE GRID CONNECT
		SINGLE FLASH=WILL CONNECT WITH GRID
📶		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

2.2.3 DC Switch

The DC switch is designed for safely disconnecting DC input if required.

The inverter works automatically when the input and output meet the requirements. Rotating the DC switch to "OFF" position will immediately cut off the flow of DC current.

Rotate the DC switch to "ON" position before starting the inverter.

2.3 Technical description

2.3.1 principle description

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

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

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

DC switch is integrated for safely disconnect the DC input. The inverter provides standard interface RS485, USB, WIFI(optional) for communication. Inverters also provide running recode data display, parameter configuration via LCD panel.

The main block diagram please refer to chapter 6.2.

2.3.2 Function description

Inverter functions can be grouped as following.

- Conversion function

Inverter converts direct current power into alternating current power, which conforms to the grid requirement of its installation country.

- Data storage and display

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

- Parameter configuration

Inverter provides various parameter configurations for optional operation.

- Communication interface

Inverter provides standard RS485 communication interface, also USB, WIFI(optional) can be provided.

- Protection functions

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

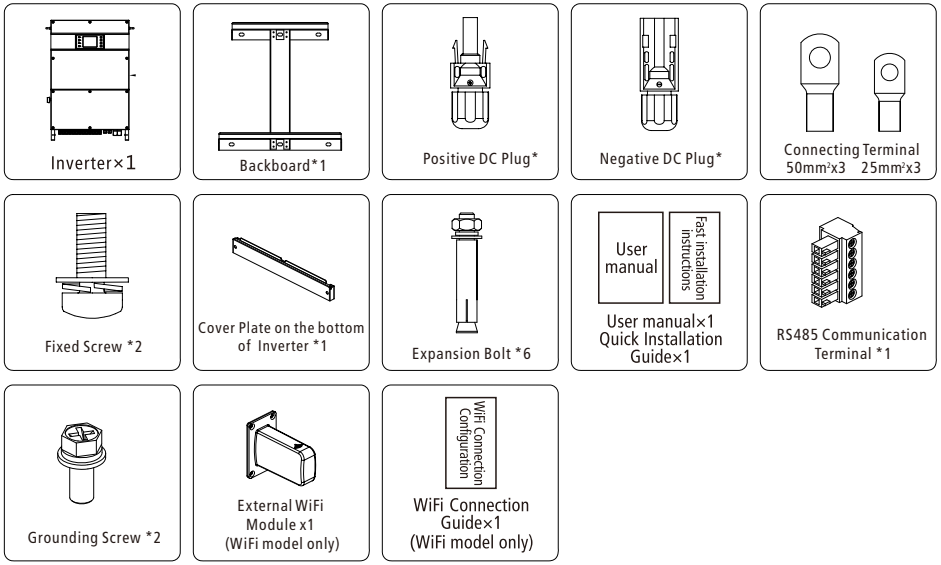
2.4 Package

2.4.1 Unpacking and inspection

The unit is thoroughly tested and strictly inspected before delivery. Damage still be occur during shipping.

1. Check the packing for any visible damage upon receiving.
2. Check the inner contents for damage after unpacking.
3. Check the package list below.

Package list



*Positive DC Plug : 50KW 10 pairs, 60/65KW 12 pairs, 75KW 13 pairs.

*Negative DC Plug : 50KW 10 pairs, 60/65KW 12 pairs, 75KW 13 pairs.

2.4.2 Identify the inverter

A nameplate is attached to one side of the inverter. It provide information on type inverter, along with the most important specifications, marks of certifications, website and serial number, which is available and identified by Goodwe.

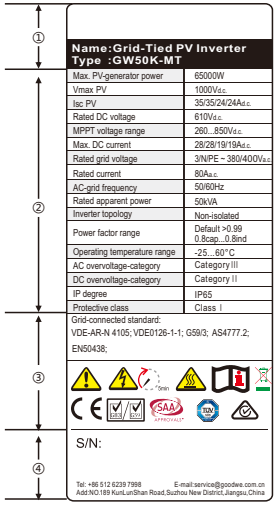


Image shown here is for reference only, actual product you receive may differ.

Item	Description
1	Logo and inverter type
2	Technical data of inverter
3	Marks of certification institution of inverter
4	S/N No. and Company name, website and origin

3 Mounting

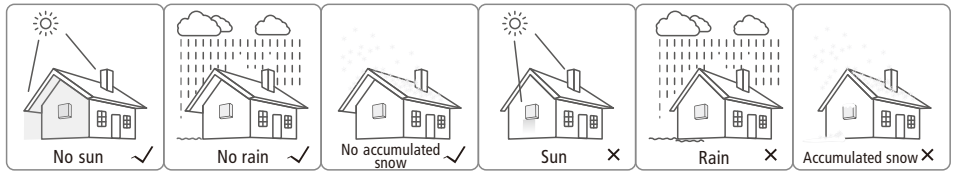
3.1 Mounting instruction

In order to achieve optimal performance, the ambient temperature should be kept lower than 45 °C.

For the convenience of checking the LCD display and possible maintenance activities, please install the inverter at eye level.

Product label and warning symbol shall be clearly visible after installation.

Please do not install inverter under direct sunlight, rain and snow.



3.2 Equipment Installation

3.2.1Selecting the installation location

Take the load capacity of the wall into account. The wall (such as concrete wall and metal structure)should be strong enough to hold the weight of the inverter over a long time.

Install the unit where is accessible to install, electrical connect or service.

Do not install the unit on the wall of flammable material.

Make sure the installation location is well ventilated.

Inverters should NOT be installed near inflammable or explosive items. Any strong electro-magnetic equipment should be kept away from installation site.

Installation the unit at eye level for easily buttons operation and display Read

Carry out the installation vertically or tilt backward no more than 15 degrees, no lateral tilt, and wiring area should be downward, which is shown in Figure 3.2.1-1.

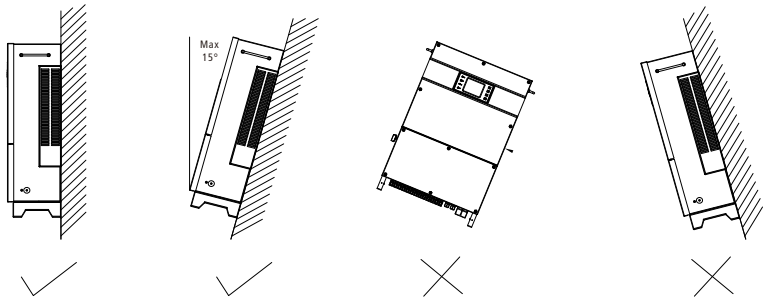
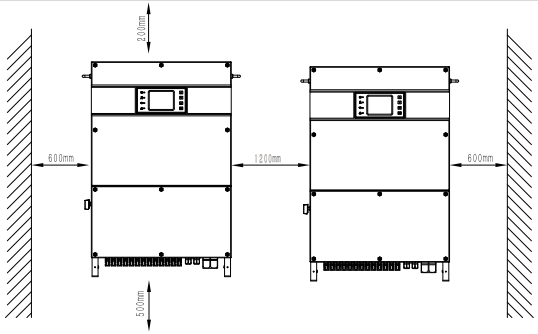


Figure 3.2.1-1

To ensure the good heat dissipation and convenient disassembly, the minimum clearance around the inverter should not be less than the following values, which are shown in figure 3.2.1-2



The Upward part---------200mm
The downward part---------500mm
The front part----------500mm
Both sides-------------1200mm

Figure 3.2.1-2

3.2.2 Mounting Procedure

(1) Use the wall-mounted bracket as a template and drill 6 holes on the wall, 13 mm in diameter and 65 mm deep. The inverter sizes of MT series please refer to Figure 3.2.2-1.
(2) Fix the wall mounting bracket on the wall with six expansion bolts in accessory bag.
(3) Carry the inverter with the handles on both sides of the inverter of MT series, which is shown in Figure 3.2.2-3.
(4) Place the inverter on the wall-mounted bracket as illustrated in Figure 3.2.2-4 , 3.2.2-5

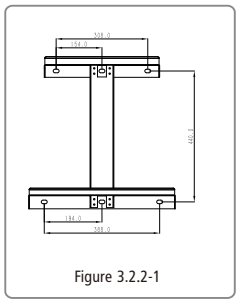


Figure 3.2.2-1

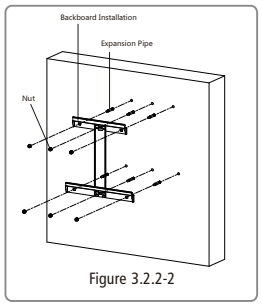


Figure 3.2.2-2

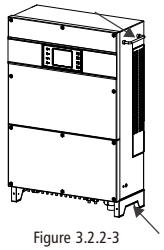


Figure 3.2.2-3

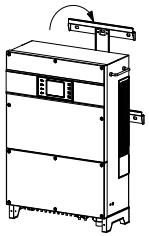


Figure 3.2.2-4

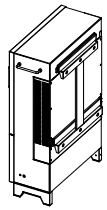


Figure 3.2.2-5

3.3 Electrical Connection

3.3.1 Connection to Grid (AC Side Connection)

(1) Measure the voltage and frequency of grid-connected access point, and make sure it is accordance with the grid-connected standard of inverter.
(2) It is recommended to add breaker or fuse to AC side, the specification should be more than 1.25 times of rated of AC output current.
(3) The PE line of inverter should be connected to the earth, make sure that the impedance between the neutral wire and earth wire is less than 10 ohm.
(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 Figure 3.3.1-1.

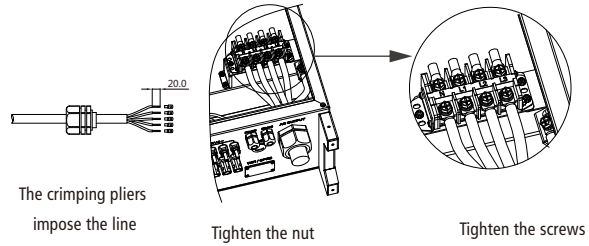
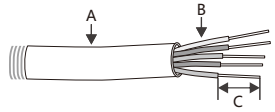


Figure 3.3.1-1

Note: There is no need to connect the Neutral wire to the inverter for GW65KHV-MT and GW75KHV-MT products.

AC cable illustration please refer to Figure 3.3.1-2.



Grade	Description	Value
A	O.D	30~38mm
B	Section area of conduction material (mm2)	25~75mm²(It is recommended to use 50mm² copper wire)
C	Length of Bare wire	About 20mm

Figure 3.3.1-2

3.3.2 AC circuit breaker and residual current protection 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.

The output current of GW50K-MT and GW65KHV-MT is 80A, so we recommend that the nominal current of the AC breaker is 100A.

The output current of GW60K-MT and GW75KHV-MT is 90A, so we recommend that the nominal current of the AC breaker is 120A.

Note: It's not allowed for several inverter to use the same circuit breaker.
It's not allowed to connect loads between inverter and circuit breaker.

The internal integrated residual current detection device (RCD)of inverter can detect external leakage current in real time, when detecting the 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 500mA or higher.

3.3.3 Earth terminal connection

The inverter is equipped with 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 should be grounded.

Please connect 'PE' cable to ground .

1. Strip the wire insulation sheet of a suitable length with a wire stripper, illustrated as Figure 3.3.3-1.

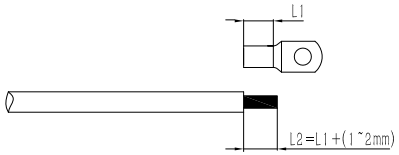


Figure 3.3.3-1

2. Insert the stripped wire into the terminal and compress it tightly by crimping pliers, illustrated as Figure 3.3.3-2.

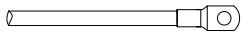
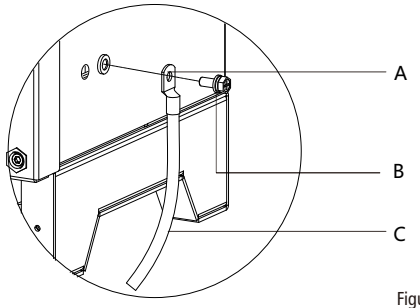


Figure 3.3.3-2

3. Fix the earth wire on the machine, illustrated as Figure 3.3.3-3.



NO.	Name	Explanation
A	Cold-pressed terminal	
B	Screw	M6*14
C	Yellow and green line	The maximum is 25mm²

Figure 3.3.3-3

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

3.3.4 Connecting inverter to PV panel

Caution

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

Make sure PV string polarity confirms with DC connector, otherwise, it will cause damage to inverter.

Make sure the maximum open circuit voltage (Voc) of each PV string does not exceed the maximum input voltage of the inverter under any condition(1000V).

Make sure that the maximum short circuit current of each DC input is less than the inverter allowable limit.

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

The MT series has four PV input area PV1 input, PV2 input, PV3 input, PV4 input, each with MPP tracker. The four PV input works independently, therefore the four PV input can be different with each other, including different type of modular, different numbers of connecting PV strings, different orientation angel of PV modular.

The installation method of DC connector is shown in Figure 3.3.4-1 or Figure 3.3.4-2.

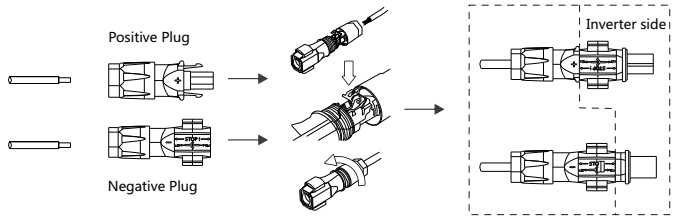


Figure 3.3.4-1

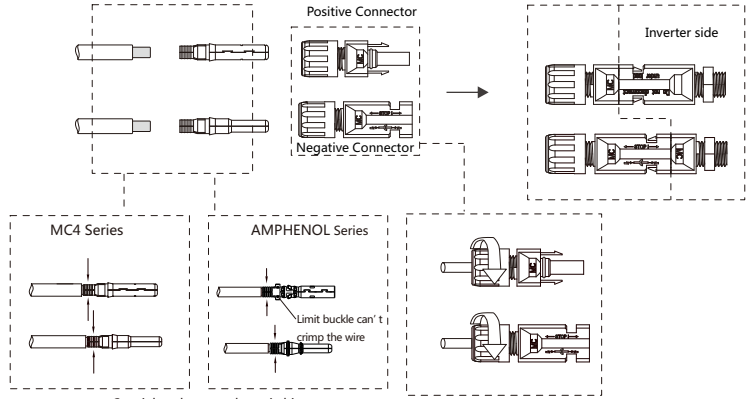


Figure 3.3.4-2

DC Cable specification please refer to Figure 3.3.4-3.

Label	Description	Value
A	External diameter of wire stock	4~5mm
B	Cross-sectional area of conductor material	2.5~4mm²
C	Length of bare wire	About 7mm

Figure 3.3.4-3

In order to make the internal inverter better dustproof and waterproof, all the 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 connection should be blocked with non-conductive insulator.

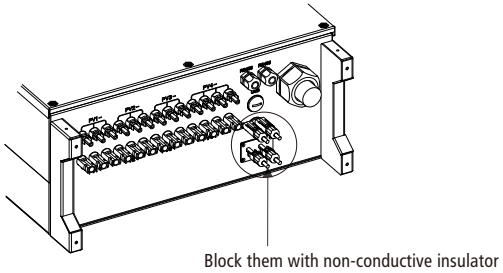


Figure 3.3.3-4

3.4 Communication connection

Inverter operation data can be transferred by USB, RS485, or WIFI Modular to a PC with monitoring software or to data logger device such as Ezlogger Pro. USB just used for service debug; RS485 is the standard communication choice for inverter, and WIFI modular can be used optionally for communication.

3.4.1 USB connection

USB cable must be connected according to the following steps, which are as shown in Figure 3.4.1-1.

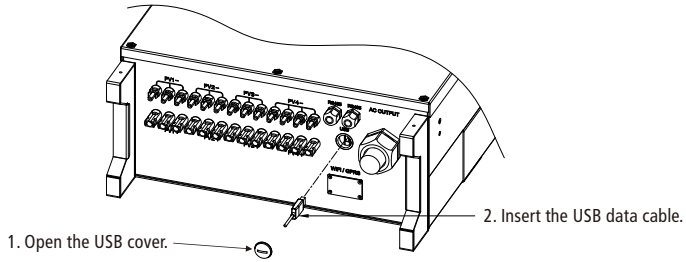


Figure 3.4.1-1

If you need to use USB monitoring, please download the monitoring software EzExplorer from the official website.

3.4.2 RS485 Communication

This function is only applies to the inverter with RS485 ports.
The RS485 port of inverter is used to connect the EzLogger Pro, and the total length of connecting cable should not exceed 1000m. Communication lines must be separated from other power lines to prevent the communication from being interfered. RS485 connection please refer to Figure 3.4.2-1.

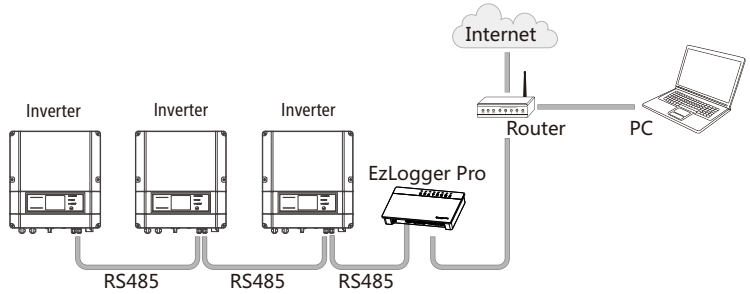


Figure 3.4.2-1

The connection steps of RS485 communication of MT series are as follows:

- Remove the waterproof kit of RS485 cover with screwdriver.
- Remove the screw cap of the cable gland.
- Remove the one-hole sealing ring.
- Insert the RS485 cable through the components as the followings: screw cap, one-hole sealing ring, insulation body and sheetmetal parts.
- Fasten the cable as Figure 3.4.4-2 shown.
- Connect the compressed cable to the built-in communication interface of inverter.
- Fasten the RS485 waterproof kit to inverter.
- Fasten the screw cap of the cable gland.

Wire Size	Function
1	485_TX+
2	485_TX-
3	PE(Earth)
4	PE(Earth)
5	485_TX+
6	485_TX-

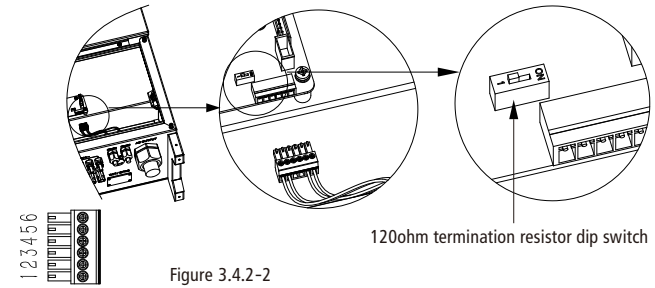


Figure 3.4.2-2

Caution

Cable requirements of RS485 communication: Shielded twisted-pair cable or shielded twisted-pair
Ethernet cable 120ohm termination resistor is controlled by dip switch. "ON" means connected, and "OFF" means disconnected, illustrated as Figure 3.4.2-2.
Selection mode of terminal resistance dial switch with 120ohm.

- When single inverter is in communication, dial the terminal resistance dial switch to ON state (The default is OFF) which is next to the RS485 communication port of inverter, so that the RS485 terminal is with 120ohm.and make the shielding layer of munication line single-point grounding, as shown inFigure 3.4.2-2.
- If multiple inverters are in communication, connect all the inverters in a daisy chain through the RS485 communication cable For device at the end of daisy chain, dial the terminal resistance dial switch to ON state (The default is OFF), and make the shielding layer of communication line single-point grounding.

3.4.3 WiFi Communication

This function is only applicable for WiFi model, for specific configurations, please refer to WiFi Connection Configurations in the attachment, and you can also refer to the description of "Demo Videos of Monitoring Installation" on the http://www.goodwe.com.cn/DownLoad.aspx website.

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

The WiFi module installation of MT series is shown in Figure 3.4.3-1.

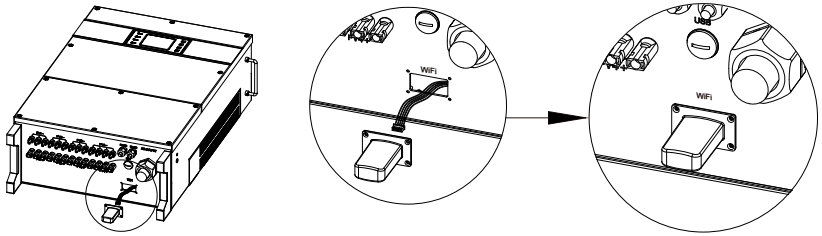
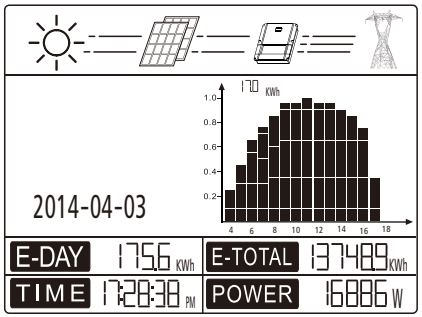


Figure3.4.3-1

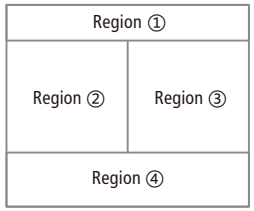
4 System Operation

4.1 User Interface and Controls

(1)The Figure of LCD display screen is shown as follow:



The display areas are divided as follows



(2) Display area

Area①——Flow of Power Generated:

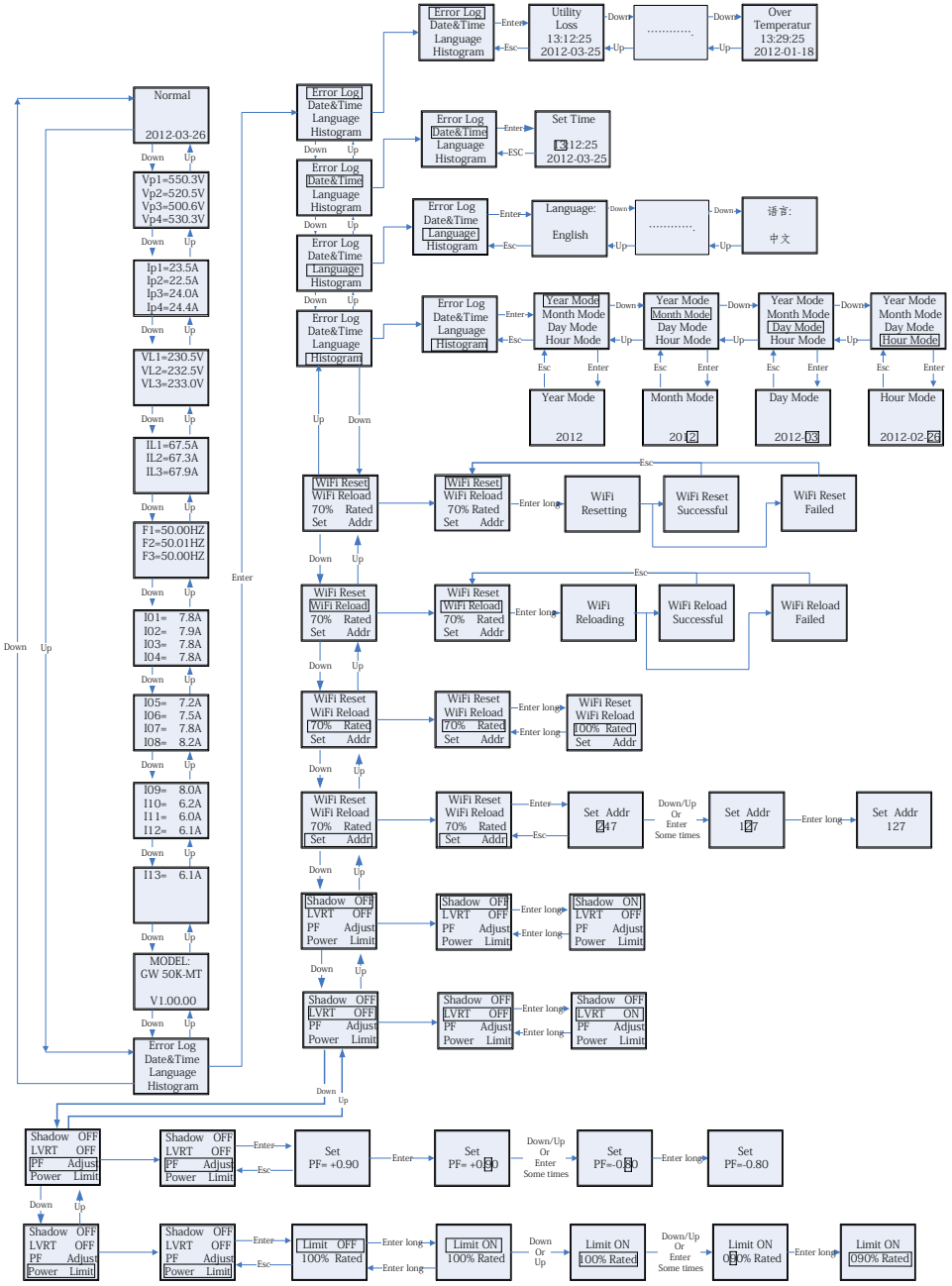
Area① indicates the flow of Power. Full line (—)between inverter and the grid means the grid is available but inverter is not yet feeding

power at the time. Flashing dashing lines (---) mean inverter is feeding power to grid. No line means grid is not available. Flashing dash lines between the sun, modules and inverter means there is energy from the sun to PV modules and then from PV modules to inverter.

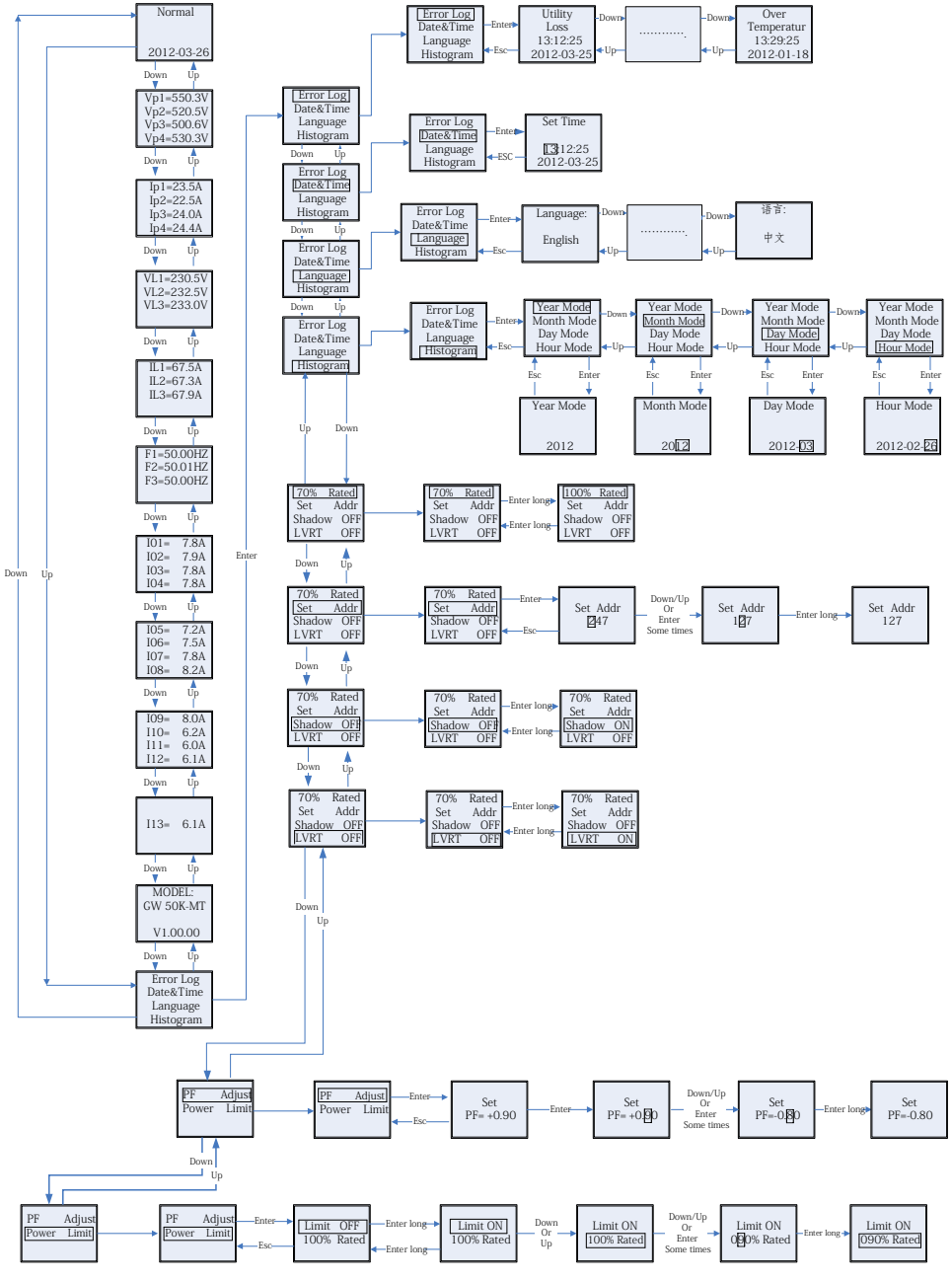
Area②——Status Information:

Area② displays inverter power generation status. Different inverter status like languages & time settings, error logs, historical power information etc could all be switched and displayed here through button operations. Area 2 has 3 levels of menu. Please refer to the diagram below.

Configuration for inverter equipped with WiFi



Configuration for inverter equipped with RS485



Area③——Histogram Display:

Area③ uses histogram to demonstrate the average power generation at each hour from 4:00am to 8:00pm on one day. Each columnar points 20 scale, the left top area shows the maximum rated power generation each hour for inverter.

This area can display information in different modes, There are 5 display modes in total: real-time mode, hour mode, day mode, month mode, year mode.

Real-time mode: display hourly power generation from 4:00am to 8:00pm;

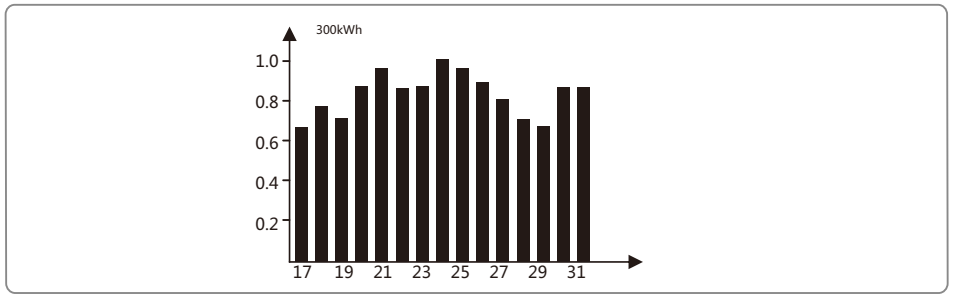
Hour mode: display the hourly power generation in a specific day from recent 14 days;

Day mode: display the daily power generation in a specific month from recent 6 months;

Month mode: display the monthly power generation for 12 months in specific year;

Year mode: display annual power generation for recent 10 years.

Take day mode for example:



300kWh means the maximum power generation of recent 16 days. The unit on the left corner sometimes turns to "MWh" from "kWh", it depends on Maximum power generation. 0.2~1.0 on the left is scare factor, which is fixed display content; 17~31 are based on current mode which shows the bar chart label.

Area④ Displays total power generation, daily power generation, real-time power generation and time information, described as follow:

Region	Description
E-TOTAL	The initial measurement unit of total generating capacity of inverter after leaving the factory is kWh, when the generating capacity is greater than 9999.9kWh, the measurement unit is MWh
E-DAY	Daily generating capacity of inverter
POWER	Real-time generating capacity power of inverter
TIME	Current time

(3) Use of the display and LCD display:

The buttons near the LCD screen are mainly used for inverter information display, setting of time, language selection and histogram information display.

The menu in LCD display area has three levels; In the level 1 menu, first 6 interfaces showing inverter status, model, PV voltage and current, grid voltage and current, line frequency. Pressing button "Enter" to lock current menu interfaces in order to observe specific parameter. In the meanwhile, backlight will turn on for 1 min; Press "Enter" to unlock the interface for information display, the backlight will be kept on for 30S and then switch back to default initial interface.

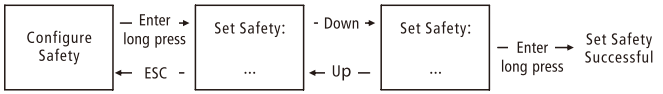
The last interface (including error Log, time and data, language setting and historical electricity generation) can be entered by pressing 'Enter' to according Level 2 menu.

In level 2 menu, move the cursor to the setting area through 'DOWN' and 'UP' key operation. For the level 2 menu which has three level menus, press 'ENTER' to get in and change the figures at cursor location through 'DOWN' and 'UP' key operation, in addition, the cursor location can be changed by pressing 'ENTER'.

In all levels of menu, it will automatically enter the first item of the level 1 menu if no action is taken within 30S, meanwhile, the modified data will be stored into internal memory.

(4) Menu introduction:

Long press 'ENTER' in the Configure Safety interface,there will be set safety interface .press 'Down' or 'Up' to choose the safety you need and then long press 'ENTER',the safety you need can be set.



When PV panel is feeding power to the inverter, the screen shows the first interface of level 1 menu. The interface displays current state of the system. It shows 'Waiting' in the initial state; it shows 'Normal' during power generation mode; if there is something wrong with the system, error message is shown. Error code can be refered to figure 4.4.

- Press any key once to turn on the LCD backlight when it is off; if the backlight is on, press 'DOWN' key to enter the next menu displaying data of Vpv and Ipv; press 'ENTER' to lock the current interface.
- In the level 1 menu, the displayed information can be switched through 'DOWN' and 'UP' key operation, there are 7 interfaces in total, which are circulatory. The level 2 menu can only be selected through 'ENTER' from the seventh interface.
- In the level 2 menu, short press 'Error Log' to enter the historical error message interface, press 'up' and 'down' to inquire the first 5 historical error message, press 'Esc' to return.
- In the level 2 menu, short press 'Date & Time' to enter the time setting interface, press 'up' and 'down' to change the data, short press 'Enter' to move cursor, long press 'Enter' to save the settings.
- In the level 2 menu, choose 'Language' and press 'Enter' to enter language setting interface, the LCD will flash, press 'up' or 'down' to change language, long press 'Enter' to save the settings, when it stops flashing, press 'Esc' to return.
- In the level 2 menu, choose 'Histogram', short press 'Enter' to enter the level 3 menu to inquire the historical power generation, in the level 3 menu, press 'up' or 'down' to inquire power generation data in Year Mode, Month Mode, Day Mode and Hour Mode, short press 'Enter' to show the historical power generation, press 'Esc' back to main menu.
- In the level 2, the Menu after 'Histogram' is communication selecting interface, if it is WiFi model, please choose 'WiFi Reset' or 'WiFi Reload' and long press 'Enter' will reset or reload the inverter WiFi modular. Wait for 20 seconds, operation result will show on display.
- In the level 2 menu, the Menu after 'Histogram' is communication selecting interface, if it is GPRS model, It shows as 'RSSI :XXX %'(000%~100%).it cannot be choose.
- In the level 2 menu, short press 'Set Addr' to get an added menu 'Set Addr: 247'. Press 'Down' to choose 'Set Addr: 247' and short press 'Enter' to enter Modbus address interface. Press 'Up' or 'Down' to set the address. long press 'Enter' to save the address.

⚠ This function is used for special requirements, please don't set it arbitrarily.

- In the level 2 menu, select the cursor of 'Shadow OFF' (if shadow mode has not been turned on), then long press 'Enter', it shows 'Shadow ON' and shadow mode has been successfully turned on.

⚠ This function is used for special requirements, please don't set it arbitrarily.

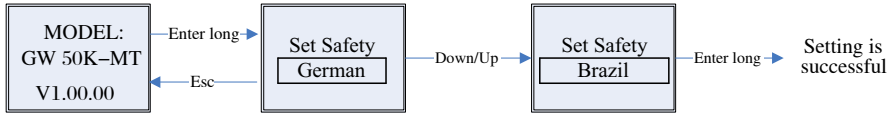
- In the second level menu, select the cursor of 'LVRT OFF' (If low LVRT mode has not been turn on"), long press the "Enter" key, and "LVRT ON" is showed, so that LVRT mode is successfully turned on.

⚠ This function is used for special requirements, please don't set it arbitrarily.

- When the output power limit has been set 100% rated ,In the level 2 menu, choose cursor '70% Rated', and long press 'Enter' for 4 seconds, it becomes '70% Rated' , then the output power will be limited to 70% rated. The same operation to change power limit from 70% rated to 100% rated. This function is only for using with VDE AR-N 4105 standard or in France and Germany , and only for service person. Misuse will cause the inverter power derating. This menu is not shown for other standards.

⚠ This function is used for special requirements, please don't set it arbitrarily.

- Long press 'ENTER' in the model type interface, there will be set safety interface. Press 'Down' or 'Up' to choose the safety you need and then long press 'ENTER', the chosen safety will be set. If there is no EXACTLY proper country code, please choose '50Hz Grid Default' or '60Hz Grid Default' accordingly.



(5)Operation of Display when start up.

When the input voltage reaches inverter turn-on voltage, LCD displays 'waiting'. If the grid is accessible, 'Checking xxx Sec'(The time is decided by the grid connection standards from different country) will be shown up in 5sec, During the counting, the inverter is self-checking, when it shows '00Sec' you can hear the sound from the motion of the relay, LCD displays 'Normal' afterwards. The instant power output will be shown at the right bottom of LCD.

4.2 WiFi Reset & WiFi Reload

1.Choose 'WiFi Reset ' in level 2, press 'Enter' for 2 seconds to reset inverter WiFi modular; wait for a while, operation result will show on display, the function can be applied when inverter is unable to connect to router or monitor server.
2.Choose 'WiFi Reload' in level 2, press 'enter' button for 2 seconds, The initial setting of WIFI modular will be reload. Wait for a while, operation result will show on display, the function can be applied when inverter is unable to connect to WiFi modular. Once WiFi modular restore initial setting, WiFi modular need be reset again.

Notice: This function is only applies to the inverter equipped with WiFi modular .

4.3 system operation

1. Make sure the AC circuit is connected and AC breaker is turned off.
2. Make sure the DC cable between inverter and PV string is connected, and the PV voltage is normal
3. Turn on the DC switch, and set safety according to the local regulation.
4. Turn on the AC breaker. Check the inverter work normal.

4.4 Error code

The error message in below diagram 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 exceed the inverter limit
07 , 25	Relay Check Failure	Relay self-checking failure
12	LCD Communication Failure	Communication error occurs between LCD DSP and the Master DSP.
13	DC Injection HIGH	The DC component of AC current exceed inverter limit
14	Isolation Failure	Insulation Resistance between the ground and the panel is too low
15	Vac Failure	Grid voltage exceed the inverter limit
16	External FAN Failure	External Fan Failure
17	PV OVER Voltage	PV Array voltage is exceed the inverter limit
19	OVER Temperature	Over temperature on the case
20	IFAN Fault	Internal FAN Failure
21	DC BUS HIGH	BUS voltage over high
22	Ground I Failure	Residual current protection
23	Utility Loss	Grid disconnection/fault
30	REF 1.5V Failure	1.5V reference voltage exceeds the limit
31 , 24	AC HCT Failure	AC current sensor failure
32 , 26	GFCI Failure	Leakage current detection circuit Failure。
Others	Device Failure	Internal Device Failure

5 Troubleshooting

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

Type of Fault		Trouble shooting
	Isolation Failure	1.Check the impedance between Ground and PV (+) & PV (-) , The impedance value must be greater than 100kΩ,make sure the inverter is earthed. 2.Contact local service office for help if the problem still exists.
System Fault	Ground I Failure	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 exists.
	Vac Failure	1. The PV Inverter will automatically restart within 5 minutes if the grid returns to normal. 2. Make sure grid voltage is in conformity with the specification. 3. Make sure Neutral (N) Wire and PE wire is connected well. 4. Contact local service office for help if the problem still exists.
	Fac Failure	1.Grid is not connected. 2.Check grid connection cables. 3.Check availability of grid
	Utility Loss	1. Not connect to the grid 2. Check that the power grid is connected to cable. 3. Check the availability of power grid.
Inverter Fault	PV over voltage	1. Check the PV open circuit voltage is higher or too close to the maximum input voltage or not. 2. If the problem still exists when PV voltage is less than the maximum input voltage, contact local service office for help.
	Over Temperature	1. The internal temperature is higher than normal value specified. 2. Reduce ambient temperature. 3. Move the inverter to a cool place. 4. If the problem still exists, contact local service office for help.
	Relay-Check Failure	1.Turn off DC switch of the inverter. 2.Wait till inverter LCD unlighted. 3.Turn on DC switch and make sure it connected. 4.If the problem still exists, contact local service office for help.
	DC Injection High	
	EEPROM R/W Failure	
	SCI Failure	
	SPI Failure	
	DC Bus High	
	BUS Unbalance	
	GFCI Failure	
	Ifan Fault	
	Efan Fault	
	Afan Fault	
	No display	1.Turn off DC switch, take off DC connector, measure the voltage of PV array. 2.Plug in DC connector, and turn on DC switch. 3 .If PV array voltage is lower than 250V , please check configuration of invert module. 4.If voltage is higher than 250V , please contact local office.

Notice: When sunlight is insufficient, the PV Inverter may continuously start up and shut down automatically due to insufficient power generated by the PV panel.

5.1 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. Examples are appliances, portable tools and other plug-connected equipment;
Category III: applies to fixed equipment downstream of and including, the main distribution board. Examples are 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). Example are electricity meters, primary overcurrent protection equipment and other equipment connected directly to outdoor open lines.

5.2 Moisture location category definition

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

5.3 Environment category definition

Outdoor : the ambient air temperature is -20~50°C, Relative humidity range is 4 % to 100 %, applied to PD3.
Indoor unconditioned: the ambient air temperature is -20~50°C, Relative humidity range is 5 % to 95%,applied to PD3.
Indoor conditioned: the ambient air temperature is 0~40°C, Relative humidity range is 5 % to 85%,applied to Pd2.

5.4 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. Occasionally, however, a temporary conductivity caused by condensation must be expected.
Pollution degree 3: Conductive pollution occurs, or, dry, non-conductive pollution occurs which becomes conductive due to condensation which is expected.
Pollution degree 4: Persistent conductive pollution occurs, for example, the pollution cause by conductive dust, rain and snow.

6 Technical parameters and block diagram

6.1 Technical parameters

Name		GW50K-MT	GW60K-MT	GW65KHV-MT	GW75KHV-MT
DC Input Data	Max. PV Power(W)	60000	75000	75000	80000
	Nominal DC Power(W)	51500	62000	67000	77000
	Max. DC voltage (V)	1000	1000	1000	1000
	MPPT voltage range (V)	260~850	260~850	260~850	260~850
	Starting voltage (V)	250	250	250	250
	Max. DC current (A)	28/28/19/19	28/28/28/28	28/28/28/28	28/28/28/36
	No. of DC connectors	10	12	12	13
	No. of MPPTs	4	4	4	4
AC Output Data	Norminal AC power(W)	50000	60000	65000	75000
	Max. AC power(W)	55000	64000	66480	75000
	Max. AC current(A)	80	90	80	90
	Norminal AC output	50/60Hz ; 400Vac	50/60Hz ; 400Vac	50/60Hz ; 480Vac	50/60Hz ; 480Vac
	AC output range	45~55Hz/55~65Hz; 310~480Vac		45~55Hz/55~65Hz; 422~528Vac	
	THDi	<3%	<3%	<3%	<3%
	Power factor	0.80leading…0.80lagging			
	Grid connection	3W/N/PE	3W/N/PE	3W/PE	3W/PE
Efficiency	Max. efficiency	98.7%	98.8%	98.8%	98.8%
	Euro efficiency	98.3%	98.5%	98.5%	98.5%
	MPPT adaptation efficiency	99.9%	99.9%	99.9%	99.9%
Protection	Residual current monitoring unit	Integrated	Integrated	Integrated	Integrated
	Anti-islanding protection	Integrated	Integrated	Integrated	Integrated
	PV array string fault monitoring	Integrated	Integrated	Integrated	Integrated
	DC fuse	Integrated	Integrated	Integrated	Integrated
	DC switch	Integrated (Optional)	Integrated (Optional)	Integrated (Optional)	Integrated (Optional)
	DC SPD	Type II	Type II	Type II	Type II
	AC SPD	Type II	Type II	Type II	Type II
	SPD fault monitoring	Integrated	Integrated	Integrated	Integrated
	AC over curent protection	Integrated	Integrated	Integrated	Integrated
	Insulation monitoring	Integrated	Integrated	Integrated	Integrated
General Data	Dimensions (WxHxD)	586*915*263mm	586*915*263mm	586*915*263mm	586*915*263mm
	Weight (kg)	66kg	67kg	67kg	67kg
	Mounting	Wall bracket	Wall bracket	Wall bracket	Wall bracket
	Ambient temperature range	-25~60℃	-25~60℃	-25~60℃	-25~60℃
	Relative humidity	0~95%	0~95%	0~95%	0~95%
	Max. perating altitude	4000m	4000m	4000m	4000m
	Protection degree	IP65	IP65	IP65	IP65

Name		GW50K-MT	GW60K-MT	GW65KHV-MT	GW75KHV-MT
General Data	Topology	Transformerless			
	Cooling	Fan cooling			
	Display	LCD			
	Communication	USB; RS485; WiFi			
	Standard warranty (years)	5/10/15/20/25 (Optional)			

6.2 Block Diagram

GW50K-MT main circuit is shown in Figure 6.2.1:

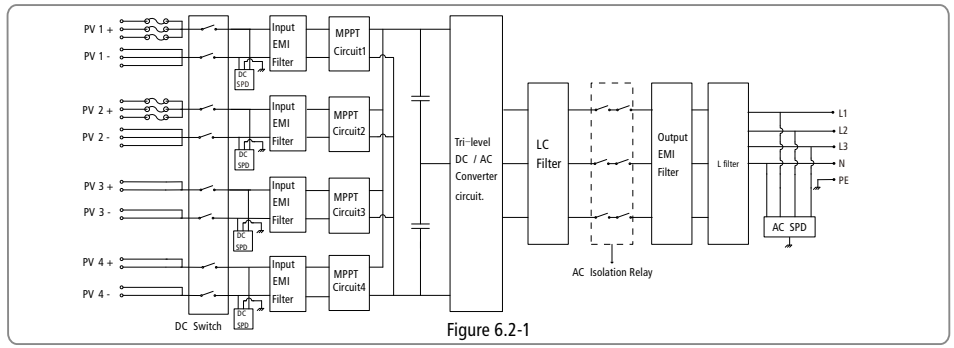


Figure 6.2-1

GW60K-MT main circuit is shown in Figure 6.2-2:

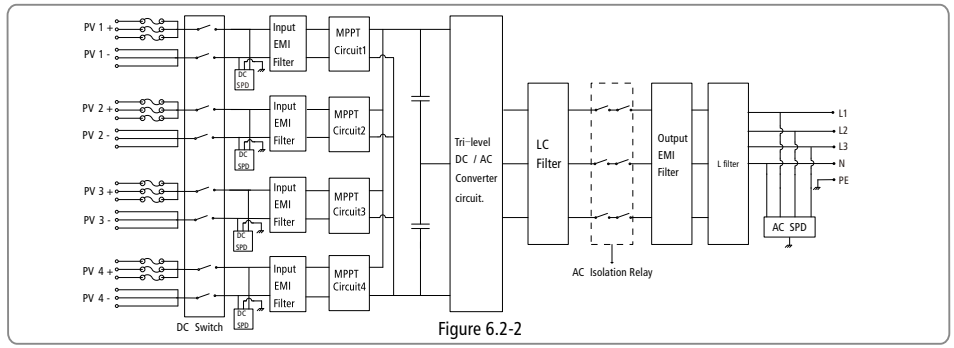


Figure 6.2-2

GW65KHV-MT main circuit is shown in Figure 6.2-3:

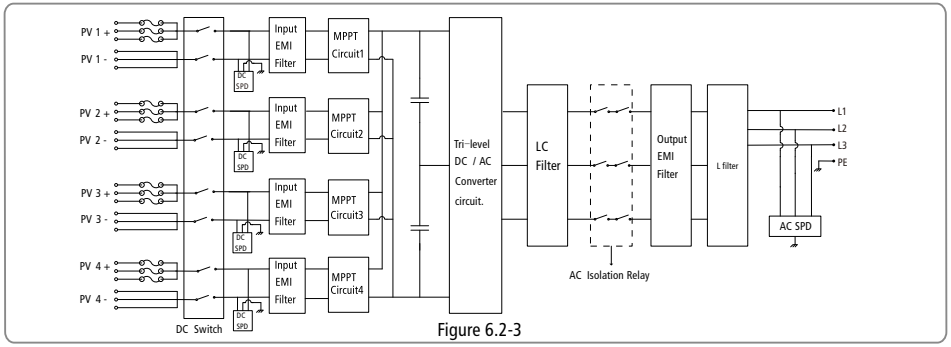


Figure 6.2-3

GW75KHV-MT main circuit is shown in Figure 6.2-4:

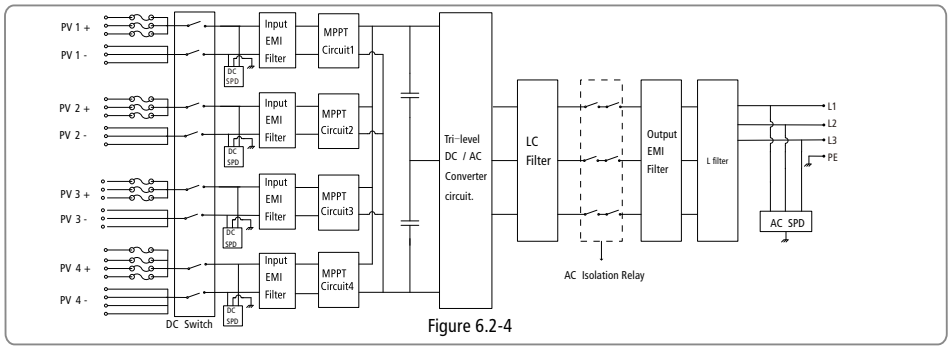


Figure 6.2-4

7 Maintenance

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

Caution: Before maintains please disconnect the AC breaker firstly and then disconnect DC breaker. Wait 5 minutes until the residual voltage has been released.

7.1 Clearing the FAN

MT 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 firstly and then disconnect DC breaker.
- Wait 5 minutes until the residual voltage has been released and the fans are no longer turning.
- Disassembly the fans (refer to Figure 7.1-1).

1)Loosen the five screws with a crosshead screwdriver, then remove the fans out the cabinet about 50mm slowly.

2)Open the lockers of the three fans connectors and remove them from housing, then take the fans away.

- Clean the ventilation grid and the fan with a soft brush, a paint brush, a cloth, or compressed air.
- Reassembly the out fans into cabinet.

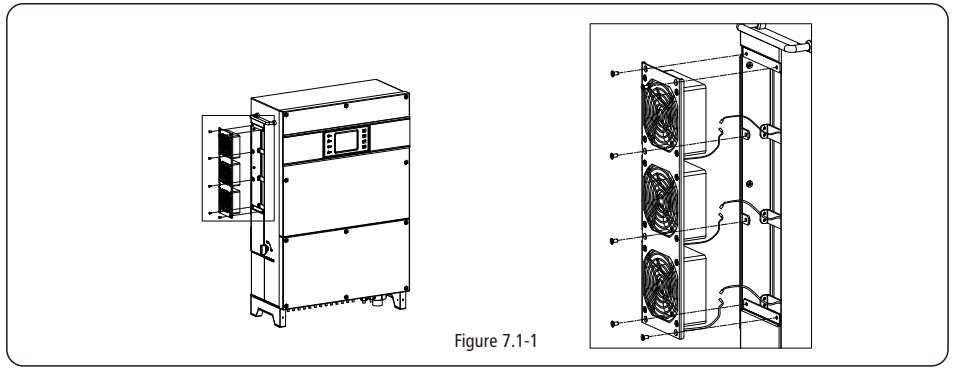


Figure 7.1-1

7.2 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 a 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, operate from step1 to step 3.

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, operate from step1 to step 3.

7.3 Checking the Electrical Connection

1. Check if the AC or DC wire is loose.
2. Check if the earth wire is reliable grounding.
3. Check if the waterproof covers of RS485 and USB port is fasten.

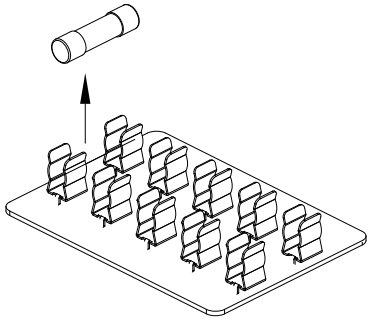
Caution: Maintenance cycle is once half a year.

7.4 Fuse Replacement

If the inverter fuses are broken, replace them in time, the steps are as follows:

1. Disconnect the circuit breaker on the AC side;
2. Rotate the DC switch to the "OFF" position;
3. Disconnect the front-end circuit breaker of PV input terminal or pull out the PV input terminal;
4. Wait for at least 10 minutes;
5. Open the junction box cover on the bottom of inverter;
6. Confirm that the fuses are broken;
7. Remove the broken fuses on vertical direction which is shown in the right figure, and don't remove fuses with prying method, etc;
8. Install the fuses of the same company and model to the corresponding fuse holders;

Install the junction box cover on the inverter.



8 Relevant Certification

PEA VDE-AR-N 4105 IEC62109-2 EN50438