



Growatt 2500MTL

Growatt 3000MTL

Installation & Operation Manual

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1.1 Validity

This installation guide contains installation, commissioning, communication, trouble shooting and information of Growatt MTL series inverters:

Growatt 2500MTL

Growatt 3000MTL

With this installation guide, users are able to install and operate the Growatt MTL inverters easily. This manual does not cover any details concerning about equipments connected to the Growatt MTL. Store this manual where accessible at all times.

1.2 Target Group

This manual is for qualified personnel who have received training and have demonstrated skills and knowledge in the construction and operation of this device. Qualified Personnel are trained to deal with the dangers and hazards involved in installing electric devices.

Notes: For possible changes in this manual, Growatt New Energy Co., Ltd accepts no responsibilities to inform the users.

1.3 Product Overview

The Growatt MTL series inverters are grid-tied inverters which convert DC current generated by PV modules into AC current and feed it into the public grid. The Growatt MTL series inverters are multi-string inverters with multi-MPP trackers, which meant they are able to connect to different PV module arrays.

Inverters Overview:

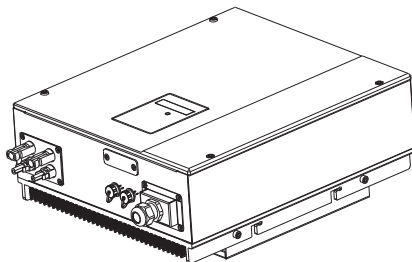


Fig 1.1

Front and Bottom Overview:

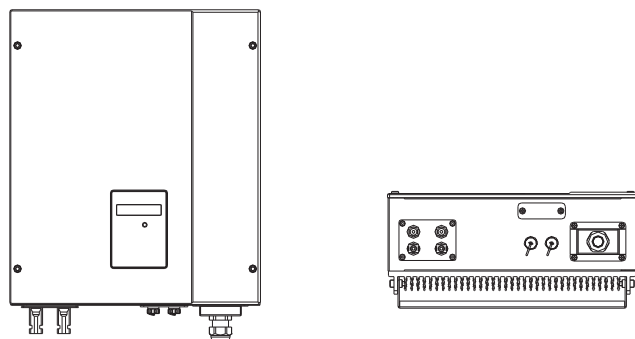


Fig 1.2

Grid-tied PV System Overview:

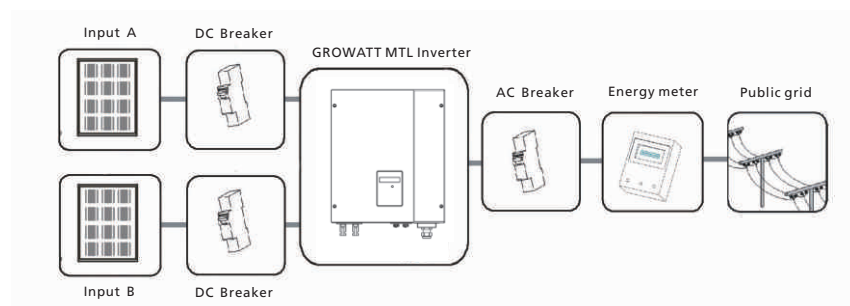


Fig 1.3

As the drawing shown above, a complete Grid-tied PV system consists of PV modules, PV inverters, distribution, grid and other components. Moreover, PV inverters always act as key components.

When designing a PV system contains Growatt MTL series inverters or any other Growatt inverters, the system designing software Shine Design (please download from Growatt FTP. <ftp://113.106.58.169>, user name: ftpguest, password: ftpguest) will provide adequate supports.

Notes: If PV modules of the PV system require POSITIVE or NEGATIVE GROUND, or the capacity relative to ground of the modules is large, please contact Growatt New Energy for technical support before installation.

1.4 Safety

Growatt MTL is designed for global consumers, and is in accordance with most of the safety standards of various countries and regions.

CE / TUV, EN50178, EN61000-6-2, EN61000-3-2, EN61000-6-3, EN61000-3-3, VDE0126-1-1, IEC-62109, G83, VDE-AR-N4105, CEI 0-21, AS4777, AS/NZS3100

Below is the brief introduction of GFCI function and isolation function.

GFCI function

GFCI is short for Ground-Fault Circuit Interrupter which is used for preventing from being electric shock.

The inverter is equipped with integrated RCD (Residual Current Protective Device) and RCM (Residual Current Operated Monitor). The current sensor will detect the volume of the leakage current and compare it with the pre-set value. If the leakage current is above the permitted range, the RCD will disconnect the inverter from the AC load.

PV Isolation Detection

The ISO function is a protection mechanism.

The inverter measures the resistances between both the positive pole and negative pole of PV panel and earth.

Either of the measured values is lower than the limit, the PV inverter will not connect to grid, the output relay will stay open, and show 'PV isolation low'. The limited value is determined by the standards. The firmware setting of our PV inverters is 5Mohm.

The simplified principle of the isolation resistance measurement is described as Image1 and Image2.

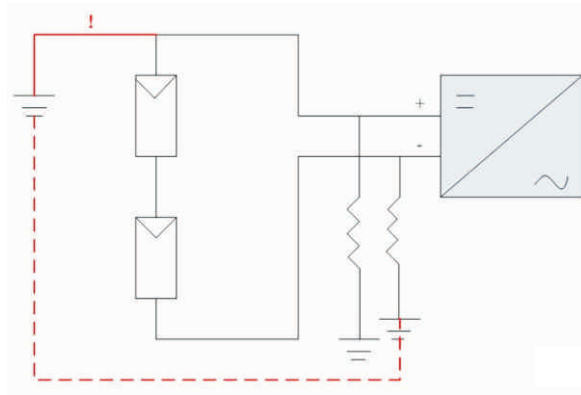


Image1

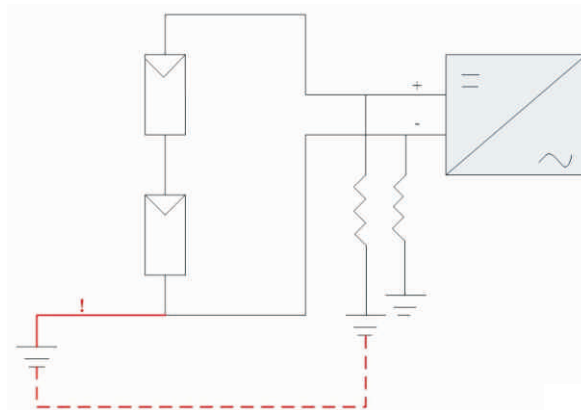


Image2

DANGER!

Danger to life due to high voltages in the inverter!

All work on the inverter may be carried out by qualified personnel only.

The appliance is not to be used by children or persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.

Children should be supervised to ensure that they do not play with the appliance.

CAUTION!

Possible damage to health as a result of the effects of radiation!

Do not stay closer than 20 cm to the inverter for any length of time.

Grounding the PV generator

Comply with the local requirements for grounding the PV modules and the PV generator.

Growatt recommends connecting the generator frame and other electrically conductive surfaces in a manner which ensures continuous conduction and ground these in order to have optimal protection of the system and personnel.

CAUTION!

Possible damage to the PV modules as a result of Identification of String Failure!

The Growatt MTL Inverter is equipped with a system which recognizes total failure of individual strings or part-strings.

Notes: Operation and installation is required to be in compliance with the local laws and regulation.

2 Unpacking

2.1 Unpacking and Inspection

Before opening the packing box of Growatt MTL, please note that whether there are any visible external damages.
Once open the packing box, please check the delivery for completeness and for any visible external damages of the inverter. If there are anything damaged or missing, please contact your dealer. Complete delivery should contain items as follow:

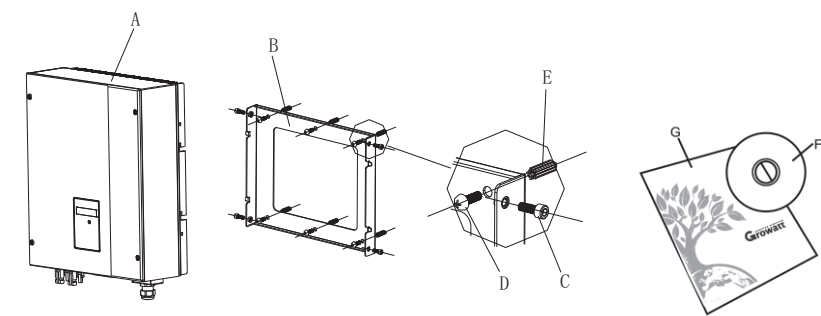


Fig 2.1

Item	Number	Description
A	1	Growatt MTL inverter
B	1	Mounting frame
C	4	Mounting screws
D	6	Safety-lock screws
E	6	Mounting frame screw sleeves
F,G	1	Installation & Operation Manual

Notes: Though the packaging box of Growatt MTL is durable, please treat the packing box softly and avoid disposing the packing box.

2.2 Information of Label

The label contains information as below:

- The inverter type/model (Model Name);
- The certificates and approvals (Certificate Number and Logos at the bottom of the label);
- Specifications of the inverter (From U_{DCmax} to Operation Ambient Temperature).

GROWATT PV Grid Inverter	
Model Name	*****
U _{DC max}	***V
I _{DC max}	**A/**A
U _{DC range}	***V~***V
V _{AC norm}	***V
f _{AC norm}	**Hz
P _{AC norm}	***W
I _{AC norm}	**A
PF	1.0
Protection Degree	IP65
Operation Ambient Temperature	-30~+60°C
IEC62109	N4105
CE	G83

GROWATT PV Grid Inverter	
Model Name	*****
Certificate Number	*****
U _{DC max}	***V
I _{DC max}	**A/**A
U _{DC range}	***V~***V
V _{AC norm}	***V
f _{AC norm}	**Hz
P _{AC norm}	***W
I _{AC norm}	**A
PF	1.0
Protection Degree	IP65
Operation Ambient Temperature	-30~+60°C
AS 4777 & AS 3100	
CE	

Fig 2.2

Mounting 3

3.1 Selecting Mounting Location

This is guidance for installer to choose a suitable installation location, to avoid potential damages to devices and operators.

A The wall selected to install the inverter must be strong and firm enough to support and bear the weight of the inverter for a long period time. (Refer to Chapter 10 Specifications).

B The location selected must be suitable for dimensions of Growatt MTL. (Refer to 3.2 Dimensions and Required Clearances).

C Do not install the inverter on structures constructed of flammable or thermolabile materials.

D Never install the inverter in environment of little or no air flow, or environment of dust. That may derate the efficiency of heat dissipation, which will derate the conversion efficiency of inverters.

E The Ingress Protection rate (IP level) is IP65 which means Growatt MTL can be installed both indoors and outdoors.

F Do not expose the inverter to direct sunlight, in order to avoid the power and efficiency derating caused by excessive heating.

G The humidity of location should be within 0~95% and without condensation.

H The ambient temperature of installation should be within -30°C +60°C.

I The installation location must be freely and safely to get for operators or electricians at all times.

J Vertically installation and make sure the connection of inverter is downward. Never install horizontal and avoids forward and sideways tilt, refer to drawing below.

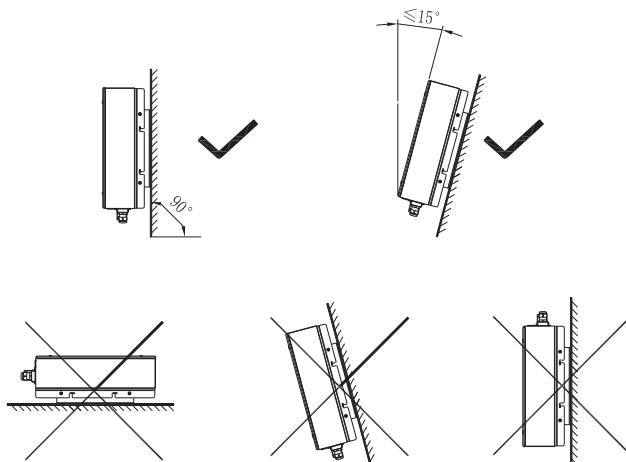


Fig 3.1

K Notice the minimum clearances of the inverter. (Refer to 3.2 Dimensions and Required Clearances).

L Do not install Growatt MTL near television antenna or any other antennas and antenna cables, for possible interferences of inverter or cables.

M Do not install Growatt MTL in living area, the noise caused by inverter might affect on daily life.

N For security reasons, DO NOT install Growatt MTL in place where the children can reach.

3.2 Dimensions and Required Clearances

Dimensions and weight :

Types	Height(H)	Width(W)	Depth(D)	Weight/kg
2500MTL	152	360	421	15.6
3000MTL	152	360	421	15.6

Table 3.1

However, additional clearances are required to guarantee running and operation of Growatt MTL inverters. Especially when several inverters are installed together, the clearances between inverters and objects are necessary.

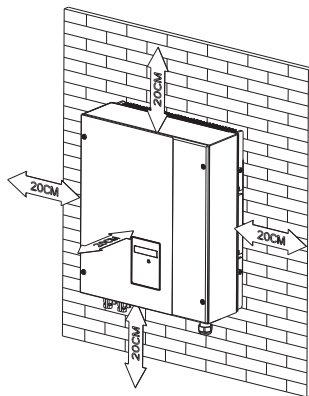


Fig 3.2

3.3 Mounting the Bracket

To install Growatt MTL on the wall, installers should mount the bracket to the wall firmly as the first step.

Overview of the Bracket:

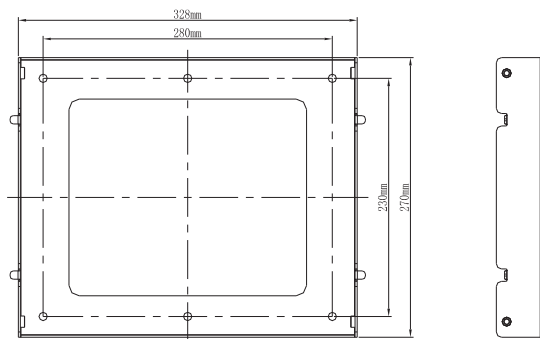


Fig 3.3

Steps:

- Drill holes for screws while using the mounting frame as Fig 3.4. 4 holes for Growatt 2500MTL/3000MTL.
- Fix the mounting frame on the wall as Fig 3.4.

Notes: Never mount Growatt MTL on the bracket before you are sure that the mounting frame is really firmly mounted on the wall after carefully checking.

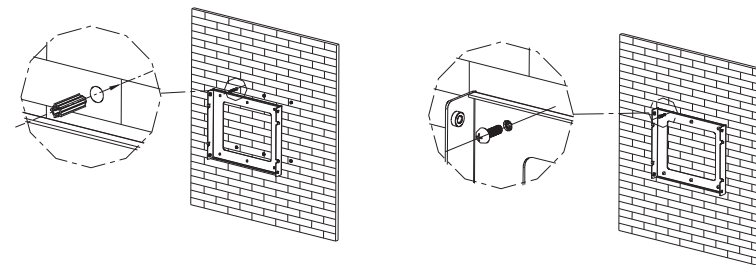


Fig 3.4

3.4 Mounting Growatt MTL

After the bracket is firmly mounted on the wall, then install Growatt MTL onto the bracket.

- Rise up the Growatt MTL a little higher than the bracket. During the process please maintain the balance of Growatt MTL.
- Hang Growatt MTL onto the bracket through the match hooks on bracket and the back of Growatt MTL.

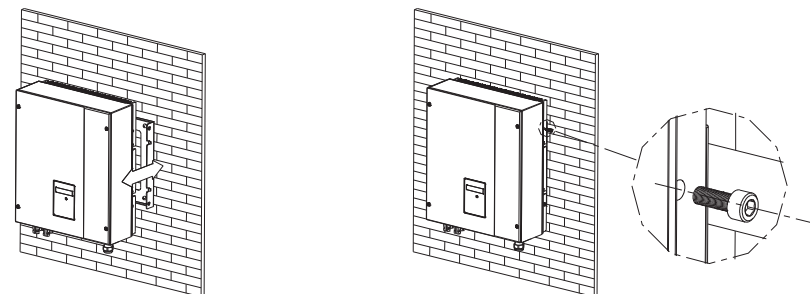


Fig 3.5

4 Electrical Connections

4.1 Wiring AC Output

- Measure the public grid voltage and frequency (Voltage: 230 Vac; Frequency: 50Hz/60Hz; in single phase).
- Open the breaker or fuse between the PV inverter and utility.
- Connect cables to relative bolts shown in figure below, specifications of cables must meet the requirements shown in the table follows;

Cable requirements:

Model	_ (mm)	Area(mm²)	AWG no.
2500MTL	_2.05	3.332	12
3000MTL	_2.05	3.332	12

Table 4.1

Assemble the connector as figures shown below;

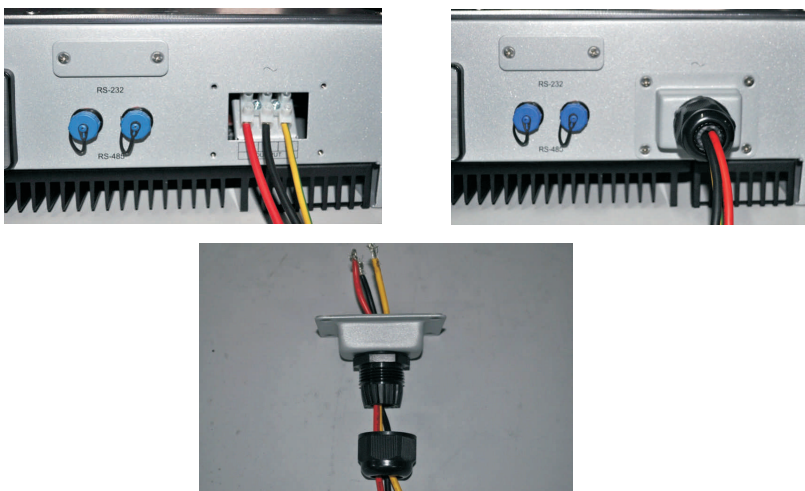


Fig 4.1

Notes: The connector must be screwed firmly. Before you operate and wire the AC output, please make sure that the AC breaker has been turned off (open).

4.2 Wiring DC Input

- The open circuit voltage of each sting should never exceed 500 Vdc.
- The diagram drawing of DC side is shown as Fig 4.2, note that the connectors are in paired (male and female connectors). The connectors for PV arrays and inverters are MC (multi-connector) connectors;
- Connect the positive and negative terminal from the PV panels to positive and negative terminal on the PV inverter. The maximum string currents are varying from different inverter types;

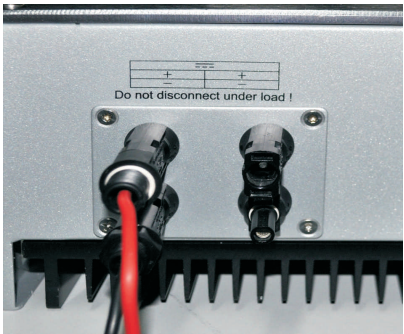


Fig 4.2

Type	Max. current
2500MTL	10A/10A
3000MTL	10A/10A

Table 4.2

Cable requirements:

Model	_ (mm)	Area(mm²)	AWG no.
2500MTL	_2.05	3.332	12
3000MTL	_2.05	3.332	12

Table 4.3

Notes: Under no circumstances could the total circuit current exceed the Max. Current.

Notes: To reduce the risk of electric shock, avoid touching the live components and treat the terminal carefully.

5 Country Selecting and Commissioning

5.1 Country Selecting

When the PV panels are connected and their output voltage is greater than 100Vdc but the AC grid is not yet connected, inverter will start up automatically. If it is the first time to power on the inverter after installation, you may need to select a specific country*. Otherwise, the interface will stay at the 'Please Select' interface all the time. There are eleven options to select, as the list below.

* If you have ordered the inverter with specific country settings, the parameters have been preset in factory and you don't need to operate this step any more.

Country/Regulation Name	options
VDE0126-1-1	// 0
Germany	// 1
UK_G83	// 2
Italy	// 3
France	// 4
Denmark	// 5
Belgium	// 6
Spain	// 7
Greece	// 8
Turkey	// 9
Hungary	// 10

Note: If the country you want to select is not in the above list, please directly select VDE0126-1-1.

Please finish the country selecting according to the following steps:

A The LCD will quickly switch to and stay at the 'Please select' interface after power on, as Fig 5-1-1.

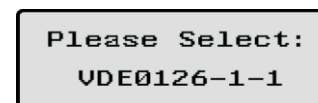


Fig 5-1-1

B Single knock on the LCD, countries will vary from one to another along the above list order. Fig 5-5-2 acts as an example, and Germany is the second selection.

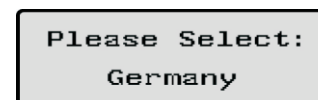


Fig 5-1-2

C When you need to select any of these countries, you can Double knock to enter the next interface. Here we select Italy as an example, as Fig 5-1-3.

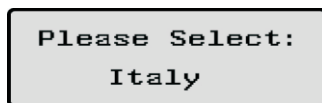


Fig 5-1-3

D When the country arrives at Italy, Double knock to enter the two options 'YES' and 'NO', and the cursor stays at 'NO' in default, as Fig 5-1-4.



Fig 5-1-4

E Single knock to select 'YES', as Fig 5-1-5.

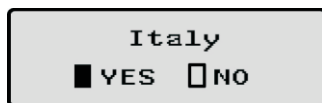


Fig 5-1-5

F Double knock to confirm your selection, LCD will display 'Select OK' with the country name in the below, as Fig 5-1-6.

Note: if you still single knock at the interface as Fig 5-1-5, the cursor will go to 'NO' again as Fig 5-1-4, then if you double knock, the display will switch to the interface as Fig 5-1-3.

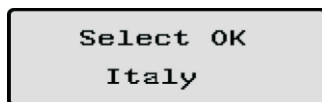


Fig 5-1-6

G When the selection is successful, the inverter will reboot automatically.

Note: If you have selected and confirmed an unwanted country neglectful, please contact Growatt for specific software to clear and reset again.

5.2 Commissioning

- ▶ After the inverter reboot, LCD will produce the following messages in order: 'Ser NO: xxx'->'xxxxx'->'FW version'->'Waiting'->'No AC connection', the display repeats 'NO Utility' and LED will be red.
- ▶ Close the AC breaker or fuse between PV-Inverter and grid. Turn on the DC switch. The normal operating sequence begins.
- ▶ Under normal operating conditions the LCD displays 'Power: xxx.x W'. That is the power fed to the grid. The LED turns green.
- ▶ This completes the check.

Operation Modes 6

6.1 Waiting Mode

- When the PV voltage is higher than 100V, Inverter will be powered up, and enters "waiting" mode.
- In this mode, inverter will check the system parameters. If the system is normal, and PV voltage is higher than 150Vdc, the inverter will attempt to connect to grid.

6.2 Normal Mode

In this mode, Growatt MTL works normally and LED turns green.

- Whenever the DC voltage is higher than 150 Vdc, Growatt MTL inverter converts DC Power generated by PV panels into AC power and feed it into grid;
- Whenever the DC voltage is lower than 120 Vdc, Growatt MTL inverter will work in waiting state and attempt to connect the grid. In waiting state Growatt MTL consumes just enough power generated by PV panels to monitor the internal system status;

Notes: The inverter starts up automatically when DC power from PV panels is sufficient (100 Vdc).

6.3 Fault Mode

The internal intelligent controller can continuously monitor and adjust the system status. If Growatt MTL finds any unexpected conditions such as system fault and inverter fault, the fault messages will be displayed on LCD screen. In fault mode the LED turns red.

Notes: Detailed fault information refers to Chapter 9.2 ERROR messages display on LCD. ■

6.4 Shutdown Mode

Growatt MTL automatically stop running during periods of little or no sunlight. In shutdown mode Growatt MTL won't take any power from the grid or panels, and LCD and LED turns off.

Notes: If the PV string DC voltage is too low (≤ 70 Vdc), the inverter will also turn to Shutdown Mode.

7.1 LCD display

Starting-up display sequence: once the PV power is sufficient, Growatt MTL will display the following information sequentially:

Model: xxxxxx
 SerNo: xxxxxxxxxx
 FW Version: x.x.x
 Connect in: xxS
 Connect : OK
 Power: xxxx.xW

Fig 7.1

The first line of LCD display shows different status of the inverter as Table 7.1.

The First Line of LCD

STATUS	DISPLAY CONTENT	REMARK
Waiting	Waiting	When the input voltage is between 100V and 150V during start up, inverter will display waiting.
	Standby	When the input voltage falls to 100V, inverter will display standby. (The inverter will shut down when input voltage is lower than 70V).
	Connect in xxS	System checking
	Reconnect in xxS	System checking
Normal	Connect OK	Connecting to the grid
	Power: xxxx.xW	Inverter output power in normal mode.

STATUS	DISPLAY CONTENT	REMARK
Fault	Error: xxx	System fault
Auto Test	Auto Testing	Protecting function
Programming	Programming	Firmware update

Table 7.1

Notes: In fault mode, there can be different error messages displayed in the LCD due to different faults. Please refer to Chapter 9 for reference.

The first line of LCD display can be changed by knock on the LCD screen. The second line automatically changes in the interval of 2 or 4 seconds as Table 7.2.

The Second Line of LCD

CYCLE DISPLAY	DISPLAY TIME/S	REMARK
Power : 2013.4W model: P1U1M3S3	2	Model number of the inverter
Power : 2016.8W FW Version: H.1.0	2	Firmware version of the inverter
Power : 2012.8W SerNO: DK00000000	2	Serial number, which is also shown on the label of the inverter
Power : 2009.6W Etoday: 7.1kWh	4	Energy generated today. For accurate energy to get the FIT payment, please refer to your meter

CYCLE DISPLAY	DISPLAY TIME/S	REMARK
Power : 2017.0W Eall : 90KWH	4	Total generated energy since installation. For accurate energy to get the FIT payment, please refer to your meter
Power : 2123.4W Ppv: 786 1488W	4	PV input power
Power : 2103.4W PV: 310/313 B: 370V	4	PV voltage (PV) and Bus voltage (B)
Power : 2016.2W AC: 230V F: 50.0Hz	4	Grid voltage (AC) and frequency (F)
Enable auto test Power : 2021.8W Enable Auto Test	4	Enable auto test function
Set Language Power : 2019.5W Set Language	4	Set display language
Set contrast Power : 2008.2W Set LCD Contrast	4	Set LCD contrast
Set COM Address Power : 2019.5W COM Address: Move	4	Set communication address

Table 7.2

7.2 LCD control

To save power, the LCD display's background light will turn off automatically in 10 seconds. Single knock will turn on the background light. The display on the inverter can be controlled by knocking the sound control panel in front of it.



Fig 7.2

7.3 Parameters Setting

Users can use sound control function to change the display language and luminance of the display, enable auto-test function and choose utility model.

Note: Single knock
 Double knock

Language setting

make the current display become bright → to “set language” → enter “language: English” → to select the language. After setting, you need to wait a few seconds until the display becomes dark, then the setting will be saved.

Set luminance of LCD display

make the display become bright → to “set LCD contrast” → enter “LCD contrast 2” → to select the luminance. You also need to wait a few seconds after selecting. When the display becomes dark, the change is saved.

Set communication address

make the display become bright → to “COM Address: xx” → change the address to set model → to set address. After selecting, you need to wait a few seconds until the display becomes dark, then the change is saved.

Run auto test function

make the display become bright → to “Enable Auto test” → enter “Waiting to start” → start auto test. and then waiting several minutes for the test result.

Communication 8

8.1 ShineNet

ShineNet is a monitoring software applied to monitor Growatt inverters via RS232 port or Bluetooth module. With the special designed functions and friendly compact UI, it can comprehensively meet users' requirements for system monitoring and bring unprecedented user experience.

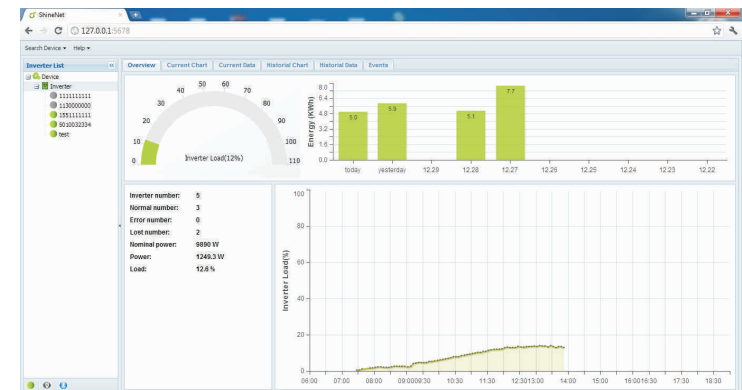


Fig 8.1

Features:

- Monitor and record current data and of inverters.
- Record historical data.
- Monitor and record event information of inverter.
- Connect computer and inverter via RS232 and RS485 port (wire connection) or Bluetooth module (wireless connection).
- Remote access available for local area network.

Notes: Users are able to monitor the inverter after the setting of software. Detailed information about setting and functions refer to the ShineNET Manual.

Notes: you can download the ShineNet YN2.0 from: <ftp://113.106.58.169>, the user name is ftpguest and Password is ftpguest

8.2 ShineVision

ShineVision is a wireless monitoring device, which consists of a power monitor and a number of transmitters, and one shinevision can monitoring 1 to 6 inverters. The transmitters transmit the running data collected from photovoltaic inverters to the monitor and display the data onto the monitor screen, including data of generated energy, the gross generated energy and the generation income obtained from the above-mentioned data through some simple calculations, indoor temperature, date and time, as well as CO2 emissions.



Fig 8.2

Features:

- Monitor and transmitter communicate via wireless communication technology.
- External transmitter, with IP65 waterproof and dustproof.
- A monitor can simultaneously communicate with six transmitters.
- Communication distance between monitor and transmitter : 30 meter.
- Power supply option: built-in battery slot, an external DC power supply.
- Easy installation, and convenient to use it.

Notes: The Monitor should be kept indoor. For detailed information, please refer to ShineVision Manual.

8.3 ShinePano

It is the latest intelligent monitoring master, specially designed for solar power plant. Using stable Linux operating system with high-speed CPU, it can smartly present solar system status through friendly user interface on 8-inch large color touch screen.



Fig 8.3

Features:

- A multi-functional and high-performance communication data logger; Keep user informed of the system's status at any time.
- Massive storage with flexible parameters setting, system information management, error prompt and record.
- Collects data and uploads information over the internet in near real-time to Growatt Shine Server platform.
- Connect with inverter: RS485 and Zigbee (Wireless module).
- 8 inches touch screen(*option): support hand writing and USB mouse.

8.4 ShineWebBox

It is a cost-effective and compact monitoring device, specially designed for solar power plant. Using stable Linux operating system with high-speed CPU, it can smartly record your system features. ShineWebBox Provides local storage, easy wireless and TCP/IP configuration, and presents plant data over Internet.



Fig 8.4

Features:

- A multi-functional and high-performance communication data logger; Keep user informed of the system's status at any time.
- Massive storage with flexible parameters setting, system information management, error prompt and record.
- Collects data and uploads information over the internet in near real-time to Growatt Shine Server platform.

Trouble Shooting 9

Our quality control program assures that every inverter is manufactured to accurate specifications and is thoroughly tested before leaving our factory. If you have difficulty in the operation of your inverter, please read through the following information to correct the problem.

9.1 General question

For General question, please visit www.ginverter.com, and find the Q&A column.

9.2 Error Messages displayed on LCD

An error message will be displayed on the LCD screen when a fault occurs. The faults consist of system fault and inverter fault.

You may be advised to contact Growatt in some situation, please provide the following information.

Information concerning the inverter:

- Serial number
- Model number
- Error message on LCD
- Short description of the problem
- Grid voltage
- DC input voltage
- Can you reproduce the failure? If yes, how?
- Has this problem occurred in the past?
- What was the ambient condition when the problem occurred?

Information concerning the PV panels:

- Manufacturer name and model number of the PV panel
- Output power of the panel
- Number of panels in each string

9.2.1 System fault

System fault (system faults are mainly caused by system instead of inverter, please check the items as instructed below before replacing inverter).

Error message	Description	Suggestion
No AC Connection	No utility grid connected or utility grid power failure.	1.Check AC wiring, especially the ground wire. 2.Contact Growatt.
AC V Outrange	Utility grid voltage is out of permissible range.	1.Check grid voltage. 2.If the error message still exists despite the grid voltage being within the tolerable range, contact Growatt.

Error message	Description	Suggestion
AC F Outrange	Utility grid frequency out of permissible range.	1.Check grid frequency. 2.If the error message is displayed despite the grid frequency being within the tolerable range, contact Growatt.
PV Isolation Low	Insulation problem	1.Check if panel enclosure ground properly. 2.Check if inverter ground properly. 3.Check if the DC breaker gets wet. 4.If the error message is displayed despite the above checking passed, contact Growatt.
Output High DCI	Output current DC offset too high	1.Restart inverter. 2.If error message still exists, contact Growatt.
Residual I High	Leakage current too high	1.Restart inverter. 2.If error message still exists, contact Growatt.
PV Voltage High	The DC input voltage is exceeding the maximum tolerable value.	Disconnect the DC wire immediately.
Auto Test Failed	Auto test didn't passed	Reboot inverter.

Fuse type: 20A/250VAC (Growatt 2500MTL and Growatt 3000MTL)

9.2.1 Inverter fault

Error code	Meanings	Suggestion
Error: 100	2.5V reference voltage fault	Contact Growatt.

Error code	Meanings	Suggestion
Error: 101	Communication fault Slave processor can't receive data from Master processor.	1.Restart inverter 2.If error message still exists, contact Growatt.
Error: 102	Consistent fault. Data received by Master and Slave processor are different. The reason can be utility grid voltage or frequency change frequently.	1.Restart inverter. 2.If error message appears frequently or error message still exists after replacement, check utility grid. If you require help, contact Growatt. 3.If error message still exists, contact Growatt.
Error: 116	EEPROM fault	Contact Growatt.
Error: 117	Relay fault	Contact Growatt.
Error: 118	Init model fault	Contact Growatt.
Error: 119	GFCI Device Damage	Contact Growatt.
Error: 120	HCT fault	Contact Growatt
Error: 121	Communication fault. Master processor can't receive data from Slave processor.	1.Restart the inverter 2.If error message still exists, contact Growatt.
Error: 122	Bus voltage fault	Contact Growatt
Error: 123	Auto Test Fail	Restart inverter.

	Growatt 2500MTL	Growatt 3000MTL
Input Data		
Max. DC power	2700W	3200W
Max. DC voltage	500V	500V
Start voltage	150V	150V
DC nominal voltage	360V	360V
PV voltage range	100V - 500V	100V - 500V
Number of MPP trackers /strings per MPP tracker	2 / 2	2 / 2
Max. input current / per string	2*10A/10A	2*10A/10A
Output (AC)		
Nominal AC output power	2500W	3000W
Max. AC power	2500W	3000W
Nominal output current	10.8A	13A
Max. output current	12.5A	15A
AC nominal voltage; range	220V/230V/240V; 180Vac-280Vac	220V/230V/240V; 180Vac-280Vac
AC grid frequency; range	50,60HZ;±5 Hz	50,60HZ;±5 Hz
Phase shift (cosφ)	1.0	1.0
THDI	<3%	<3%
AC connection	Single phase	Single phase
Efficiency		
Max. efficiency	97.5%	97.5%
Euro - eta	97%	97%
MPPT efficiency	99.5%	99.5%
Protection Devices		
DC reverse polarity protection	yes	yes
AC short-circuit protection	yes	yes
Ground fault monitoring Grid monitoring	yes	yes
Integrated all-pole sensitive leakage current monitoring unit	yes	yes

	Growatt 2500MTL	Growatt 3000MTL
General Data		
Dimensions (W / H / D) in mm	360 / 421 / 152	360 / 421 / 152
Operating temperature range	-30 °C ... +60 °C	-30 °C ... +60 °C
Continuous full output power temperature range	-30 °C ... +45 °C	-30 °C ... +45 °C
Noise emission (typical)	≤25 dB(A)	≤25 dB(A)
Consumption: operating (standby)/ night	< 5W / < 0.5 W	< 5W / < 0.5 W
Topology	transformerless	transformerless
Cooling concept	No fan	No fan
Installation: Indoors / Outdoors	yes / yes	yes / yes
Altitude	Up to 2000m without power derating	Up to 2000m without power derating
Features		
DC connection: (MC3/MC4/H4)	yes	yes
AC connection: Terminals	yes	yes
LCD display	yes	yes
Interfaces: RS485/RS232/Bluetooth/Rf/ZigBee	yes / yes / opt / opt / opt	yes / yes / opt / opt / opt
Warranty: 5 years / 10 years	yes / opt	yes / opt
Certificates and Approvals		
	CE / TUV, EN50178, EN61000-6-2, EN61000-3-2, EN61000-6-3, EN61000-3-3, VDE0126-1-1, IEC-62109, G83, VDE-AR-N4105, CEI 0-21, AS4777, AS/NZS3100	

Applies solely to the following products: Growatt1500, Growatt2000, Growatt3000, Growatt4400, Growatt5000, Sungold1500, Sungold2000, Sungold3000, Sungold5000, Growatt2500MTL, Growatt3000MTL, Growatt3600MTL, Growatt4200MTL, Growatt5000MTL, Growatt2000HF, Growatt2500HF, Growatt3000HF, Growatt10000UE, Growatt12000UE, Growatt18000UE, and Growatt 20000UE.

For the above named products, you receive a Growatt factory warranty valid for 5 years from the date of installation and no more than five and a half years from the delivery date from Growatt New Energy Co., Ltd.

This warranty includes all defects of design, components and manufacturing.

Excluded from warranty are damages due to:

- Breaking the product seal (opening the casing) without proper approval.
- Transport damage.
- Incorrect installation or commissioning.
- Failure to observe the user manual, the installation guide, and the maintenance regulations.
- Unauthorized Modifications, changes, or attempted repairs.
- Incorrect use or inappropriate operation.
- Insufficient ventilation of the device.
- Failure to observe the applicable safety regulations.
- Force majeure (e.g., lightning, over voltage, storm, fire).

Warranty condition

If a device becomes defective during the agreed Growatt factory warranty period and provided that it will not be impossible or unreasonable, the device will be, as selected by Growatt:

- repaired by Growatt, or
- repaired on-site, or

- exchanged for a replacement device of equivalent value according to model and age.

In the latter case, the remainder of the warranty entitlement will be transferred to the replacement device. In this case, you do not receive a new certificate since your entitlement is documented at Growatt.

Excessiveness in the meaning above exists in particular if the cost of the measures for Growatt would be unreasonable.

- in view of the value that the device would have without the defect,
- taking into account the significance of the defect, and
- after consideration of alternative workaround possibilities that Growatt customers could revert to without significant inconvenience.

Contact 12

If you have technical problems concerning our products, contact your installer or Growatt. During inquiring, please provide below information:

1. Inverter type
2. Modules information
3. Communication method
4. Serial number of Inverters
5. Error code of Inverters
6. Display of inverters