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Growatt 10000UE

Growatt 12000UE

Growatt 18000UE

Growatt 20000UE

Installation & Operation Manual

Directory

1.1 Validity

This installation guide contains installation, commissioning, communication, trouble shooting. information of Growatt UE series inverters:

Growatt 10000UE
Growatt 12000UE
Growatt 18000UE
Growatt 20000UE

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

1.2 Target Group

This manual is for qualified persons such as PV system installers or electricians.

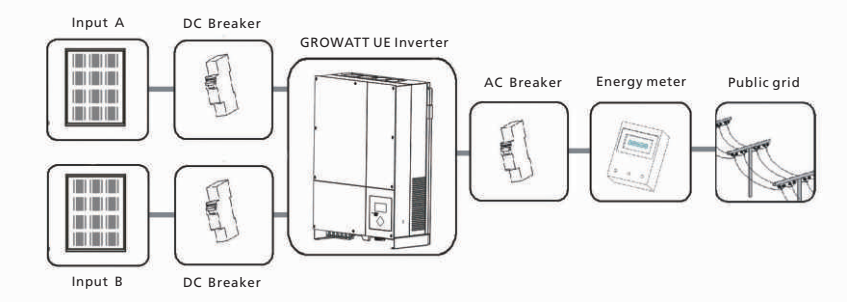
Notes: For possible changes in this manual, Growatt New Energy Co., Ltd accepts no responsibilities to inform the users.

1.3 Product Overview

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

Inverters Overview:

Grid-tied PV system Overview:



As drawings shown above, a complete Grid-tied PV system consists of PV modules, PV inverters, public grid and other components. Moreover, PV inverters always act as key components.
When design a PV system contains Growatt UE series inverters or any other Growatt inverters, the system designing software ShineDesign (download from site: www.ginverter.com) 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 UE is designed to use worldwide, hence the inverters meet different safety standards of variety countries and regions：

- VDE0126-1-1
- AS4777
- Dk5940

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!

Danger of burn injuries due to hot enclosure parts!

During operation, the upper lid of the enclosure and the enclosure body may become hot.
Only touch the lower enclosure lid during operation.

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!

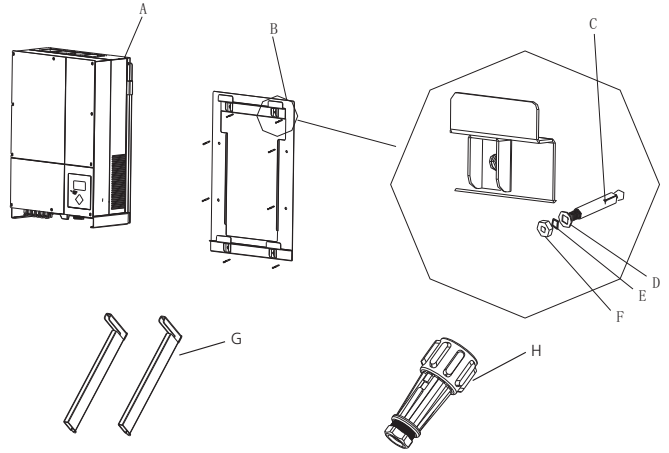
Possible damage the PV modules as a result of Identification of String Failure!

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

2 Unpacking

2.1 Unpacking and Inspection

Before opening the packing box of Growatt UE, 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 as follows:



Item	Number	Description
A	1	Growatt UE inverter
B	1	Mounting frame
C	6/8	Expansion bolt
D	6/8	Screw washer
E	6/8	Spring washer
F	6/8	Nut
G	2	Handle
H	1	AC connector
––	1	User manual (not shown in the picture)

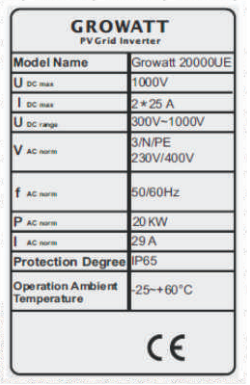
Hint: Number of C/D/E/F is 6 for Growatt 10000/12000UE, and 8 for Growatt 18000/20000UE.

Notes: Though the packaging box of Growatt UE is durable, please treat the packing box gently and avoid dispose 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.



3 Mounting

3.1 Selecting Mounting Location

This is guidance for installer to choose a suitable installation location, to avoid potential damages to device 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 inverters' dimension. (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, nor dust environment. That may derate the efficiency of the cooling fan of the inverter; hence derate the efficiency of PV inverter.The cooling fans and air grills should be cleaned every half or a year.

E The Ingress Protection rate is IP65 which means the inverter can be installed outdoors and indoors.

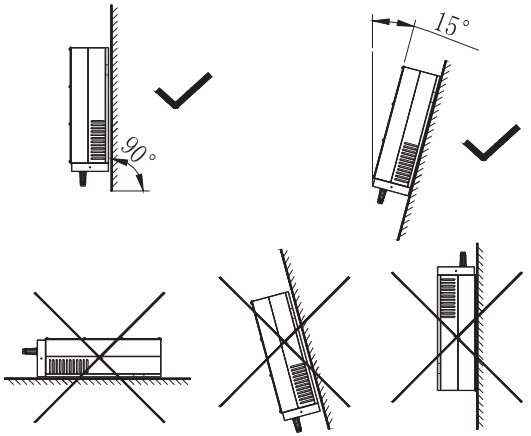
F Do not expose the inverter to direct sunlight, in order to avoid the power and efficiency derating caused by excessive heating.

G The humidity of the installation location should be 0~95% without condensation.

H The ambient temperature of the inverter should be -25℃~+60℃.

I The installation location must be freely and safely to get at all times.

J Vertically installation and make sure the connection of inverter must be downwards. Never install horizontal and avoids forward and sideways tilt.（Refer to drawings below)



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

L Do not install the inverter near television antenna or any other antennas and antenna cables.

M Do not install the inverter in living area, the noise caused by the machine may affect on daily life.

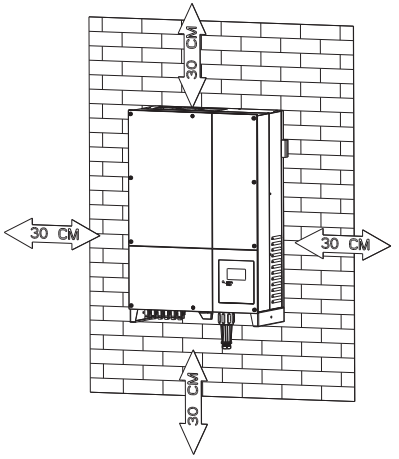
N For security reasons, DON'T install the inverter in place where the children can reach.

3.2 Dimensions and Required Clearances

Dimensions and weight :

Types	Height(H)	Width(W)	Depth(D)	Weight/kg
10000UE	740	440	235	41
12000UE	740	440	235	41
18000UE	740	520	235	60
20000UE	740	520	235	60

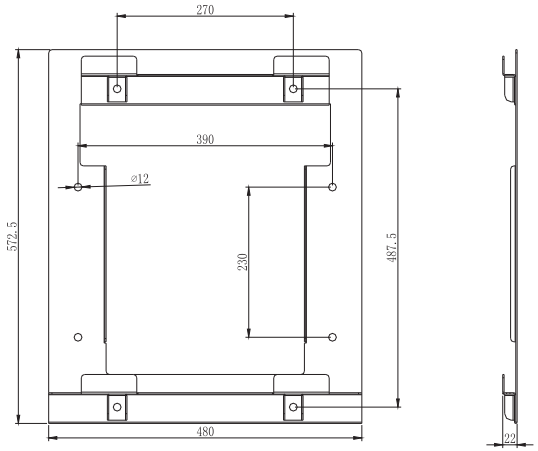
However, additional clearances are needed to guarantee running and operation of the inverters. Especially when several inverters are installed together, the clearances between the inverters and objects are necessary.



3.3 Mounting the Bracket

To mount the inverter on the wall, we should mount the bracket to the wall firmly first of all.

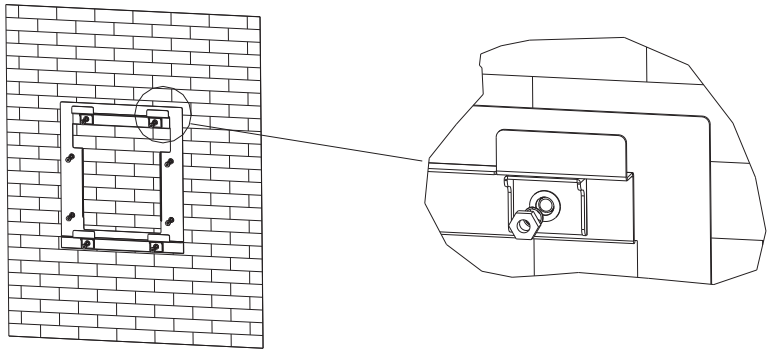
Overview of the Bracket:



Hint: Data units in mm

Steps:

- Drill holes for screws while use the mounting frame as template.6 holes for Growatt 10000/12000UE and 8 for Growatt 18000/20000UE.
- Fix the mounting frame on the wall as the figures shown below, combine as the screws as the Items overview picture shows (items C, D, E, F).

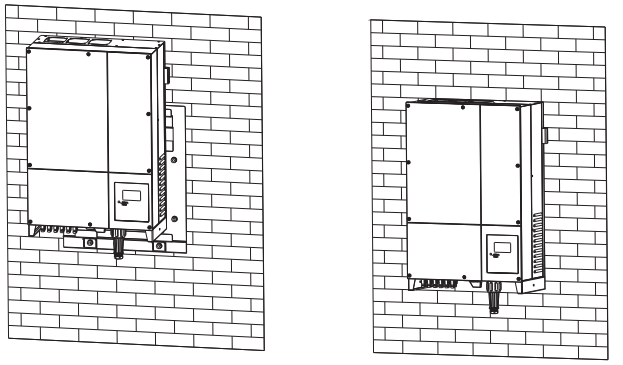


Notes: Never mount the inverter on the bracket unless you are sure that the mounting frame is really firmly mounted on the wall after carefully checking.

3.4 Mounting Inverter

After the bracket is firmly mounted on the wall, then mount the inverter on the bracket.

- Rise up the Growatt UE a little higher than the bracket. Considered the weight of Growatt UE, you need handles (items G shown in chapter 2.1) to hang on the inverter. During the process please maintain the balance of the Growatt UE.
- Hang the inverter on the bracket through the match hooks on bracket and the back of the inverter.



Electrical connections 4

4.1 Wiring AC Output

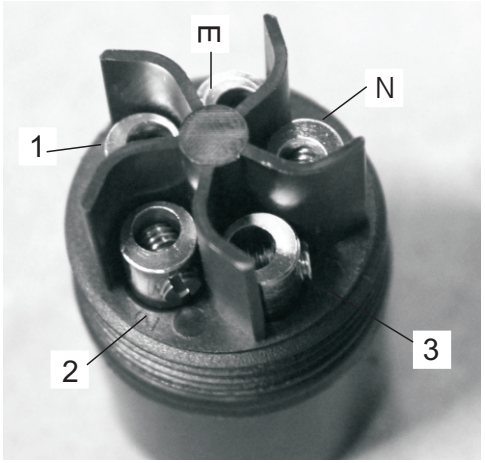
- Measure the public grid voltage and frequency (Voltage: 400Vac; Frequency: 50Hz/60Hz; in 3-Phase);
- Open the breaker or fuse between the PV inverter and utility; *
- Screw torsional force is 8 kg/cm;

* Specification of AC breaker: Growatt 10000UE/ 12000UE: 32A/400V
Growatt 18000UE/ 20000UE: 63A/400V

Cable requirements:

Model	_(mm)	Area(mm²)	AWG no.
10000UE	_2.05	3.332	12
12000UE	_2.05	3.332	12
18000UE	_2.59	5.260	10
20000UE	_2.59	5.260	10

The interface of the connector:



- Connect cables to relative bolts shown in figure above , specifications of cables must meet the requirements shown in the table above;
- Assemble the connector as figures shown below;

1

2

3

4

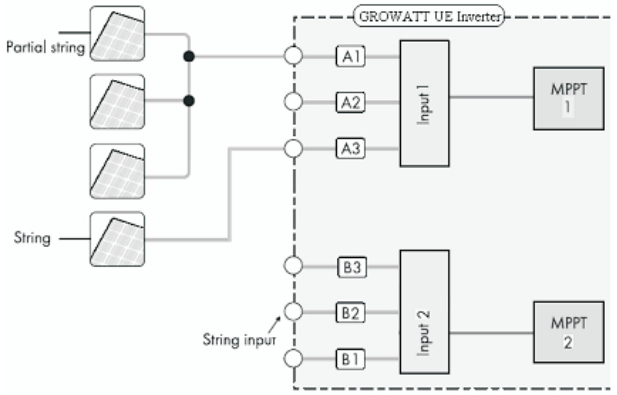
5

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

Notes: Detailed information of the connector refer to the manual of the connector in package.

4.2 Wiring DC Input

- The open circuit voltage of each string should never exceed 1000Vac, while the length must be less than 30m;
- The diagram drawing of DC side is shown as below, notice 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 terminals from the PV panels to positive and negative terminals on the PV inverter. The maximum string currents are varying from different inverter types

Type	Max. current
10000UE	15Adc
12000UE	17Adc
18000UE	23Adc
20000UE	25Adc

Cable requirements:

Model	_(mm)	Area(mm²)	AWG no.
10000UE	_2.05	3.332	12
12000UE	_2.05	3.332	12
18000UE	_2.05	3.332	12
20000UE	_2.05	3.332	12

Notes: Under any conditions the total circuit current should never exceed the Max. Current.

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

Commissioning 5

A

If the inverter is connected with PV panel arrays and the input voltage is higher than 300Vac, while the AC grid is not connected yet, LCD will display messages in order as below:

Company info → Basic info → State info

The LCD will repeat clue to No AC connection at State info and the LED turns red.
In State info, operate by knocks will change the LCD display:

State info →(knock) Input info →(knock) Output info →(knock) E_day power curve

B

Turn on the AC breaker or close the fuse between inverter and grid, the system will operate normally.

C

Under normal operating conditions, the LCD displays 'Power: xx.xx Kw' at State info, this is the power fed into grid. The LED turns green.

D

Finish commissioning.

Operation Modes 6

6.1 Normal Mode

In this mode, the inverter works normally and LED turns green.

- Whenever the DC voltage is higher than 350Vac, inverter converts power to grid as generated by the PV panels;
- Whenever the DC voltage is lower than 300Vac, the inverter will work in waiting state and attempt to connect the grid. In waiting state the inverter consumes just enough power generated by the PV panel to monitor the internal system status;

Notes: The inverter starts up automatically when DC power from the PV panel is sufficient.

6.2 Fault Mode

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

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

6.3 Shutdown Mode

Inverters automatically stop running during periods of little or no sunlight. In shutdown mode the inverters take no power from the grid and panel, and the LCD and LED turns off.

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

7 LCD display

In the lower right corner of inverter there is the LCD display. We can check inverter running status, historical generation data, etc, on the LCD screen. Items displayed can be changed by knock, you can also set some parameters by knock.

7.1 General LCD display

7.1.1 Power on display

When inverter is powered on, LCD background light will light automatically. Growatt Logo will appear immediately. The background light will last for 2 seconds. See Fig7.1 for reference.

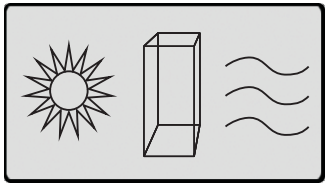


Fig7.1:Power on Growatt Logo

After displaying Growatt Logo for 2 seconds, LCD screen will switch to the second interface, display the figure of inverter, company name, inverter's power rating, etc. The second interface will last for 3 seconds. See Fig7.2 for reference.

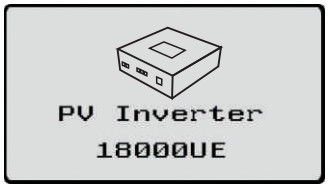


Fig 7.2:The second power on interface

After 3 seconds, it will switch to the third interface. See Fig7.3 for reference.

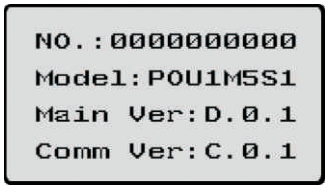


Fig7.3:The third power on interface

Here are explanation of items on Fig7.3:

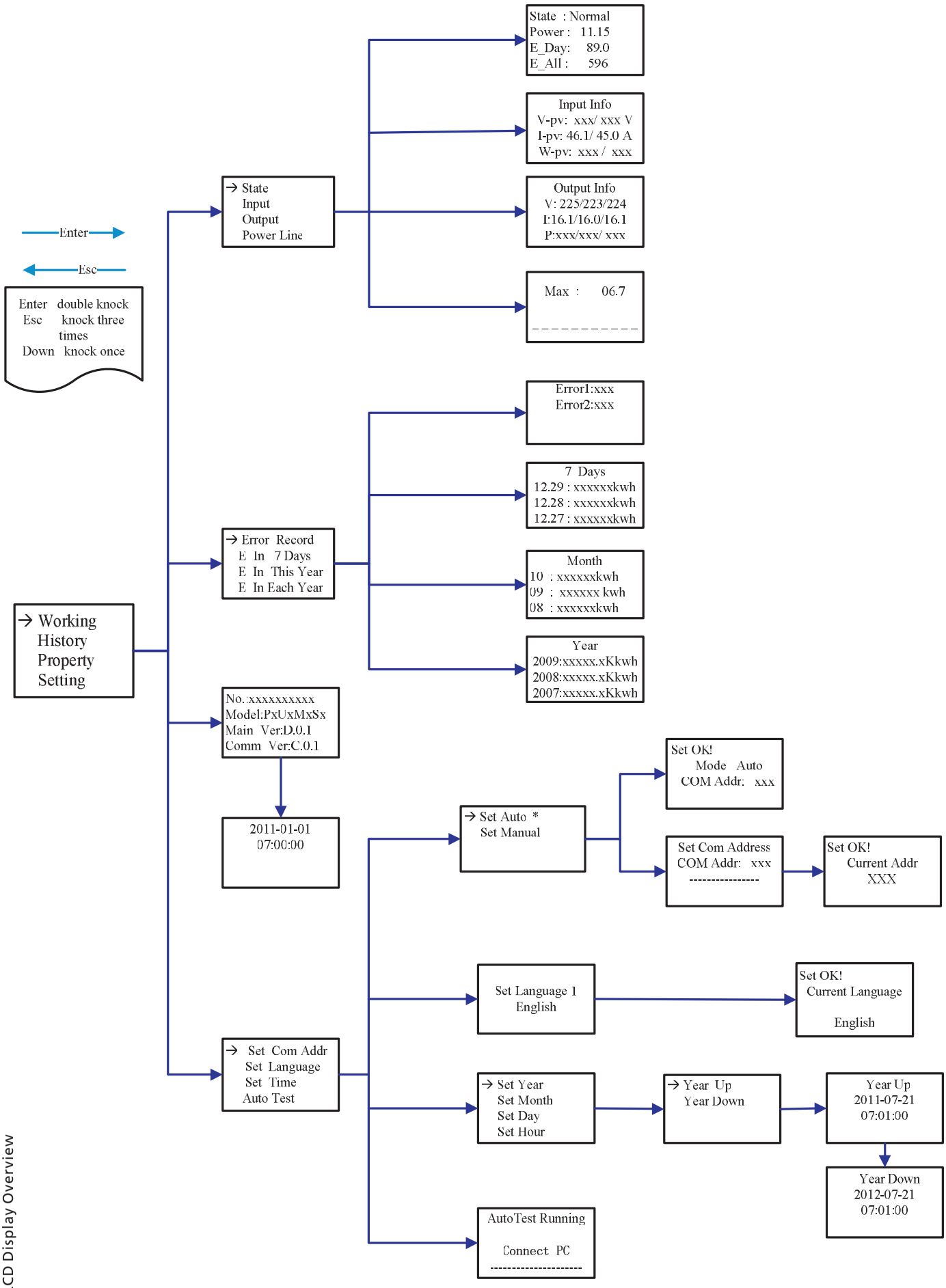
No. : serial number of this inverter.

Model:model name of this inverter.

Main Ver: firmware version of control board

Comm Ver: firmware version of communication board .

After displaying information of the third interface for 3 seconds, the background light will turn off.



LCD Display Overview

7.1.2 LCD Display when background light off

After the power on information is displayed automatically and the background light turns off, the LCD display will switch to the following Interface 1. There are 4 interfaces, which can be displayed in turn by single knock.

Interface 1: Running status. See Fig 7.4 as reference. The first line displays inverter's status description, for example, in faulty state it will display ERROR and followed with faulty codes, which is convenient to compare with error code list in manual. The second line displays inverter's states name; and the third line displays energy generated today, and the forth line displays the total energy generated since installation.

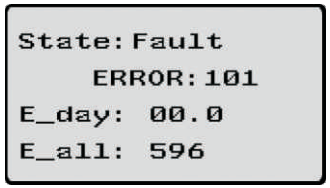


Fig7.4:Interface 1: Running status

Interface 2: Input information. See Fig7.5 for reference.

This interface displays parameters of PV input, including input voltage, current, and power of each MPP tracker.

V-pv: input voltage of MPPT1 and MPPT2

I-pv: input current of MPPT1 and MPPT2

W-pv: input power of MPPT1 and MPPT2

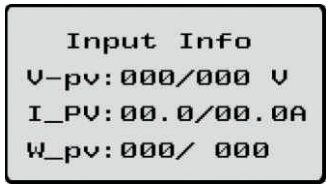


Fig7.5:Interface 2: Input information

Interface 3: Output information. See Fig7.6 for reference.

This interface displays output information of inverter, including output voltage of each phase, output current of each phase, and output power of each phase.

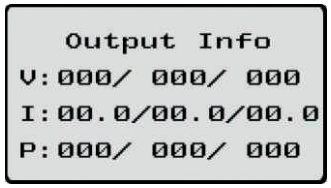


Fig7.6:Interface 3: Output information

V: output voltage of each phase

I: output current of each phase

P: output power of each phase

Interface 4: 24 hour' generation curve. See Fig7.7 for reference.

This interface shows the generated power of every hour this day.

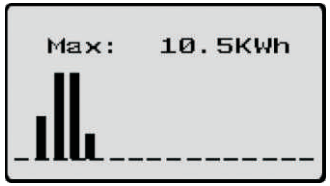


Fig7.7:Interface 4: 24 hour's generation curve

Max: maximum power of today

Power curve: today's power curve

7.1.3 Connecting messages

When inverter started to connect to grid, the following message will appear on LCD screen. See Fig7.8 for reference.

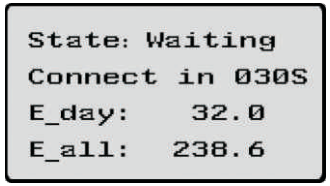


Fig7.8 Connect to gird interface

7.2 Operate by knock

7.2.1 Knock type and definition

The inverter can support three kinds of knock: single knock, double knock and thrice knock. Each kind of knock has different function. Refer to specified definition in Table 7.1.

Table 7.1 Knock definition list

Knock type	Definition
Single knock	KeyDown
Double knock	KeyEnter
Thrice knock	KeyEsc

7.2.2 Light background light and single knock to check running information

Before light the background light, the three types of knock functions the same, which is just lighting the background.: just light the background . Note that the background lighting will automatically turn off if there is no knock detected in 10 seconds.

During cloudy days or in the area of low light, it's inconvenient for users to check inverter running information such as status, input data, output data, energy generated. In this case user can light the background and check those data by single knock, a single knock will switch LCD screen to a following interface. The interface display on LCD screen will circle as follows: Fir7.4 -> Fig7.5 -> Fig 7.6 -> Fig7.7 -> Fig7.8, and then again Fig7.4.

7.3 Data checking and parameters setting

7.3.1 First level menu

It is a little bit different to enter the first level menu, note that using thrice knock to enter first level menu instead of double knock. Fig 7.9 is interface of first level menu.

Fig 7.9 First level menu

In this interface, a single knock will switch the index to next item, a double knock will enter the corresponding second level menu.

7.3.2 Second level menu

In first level menu, double knock will lead to next level menu.

The followings are second level menu interfaces for each first level menu items, shown in Fig 7.10

In second level menu, a single knock will switch the index to next item, a double knock will enter the corresponding third level menu. And a thrice knock will back to first level menu.

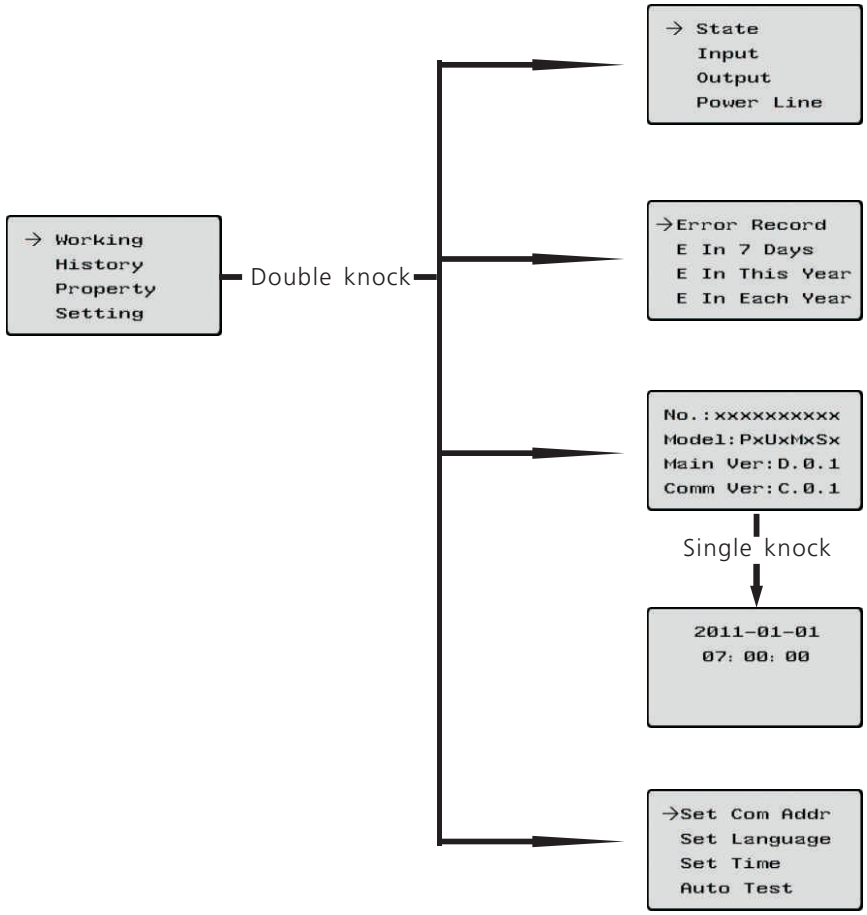


Fig 7.10 Second level menu for each first level menu items

7.3.3 Third level menu and explanations

7.3.3.1 Working information

The followings are third level menu interfaces for each second level menu items of working information, shown in Fig 7.11

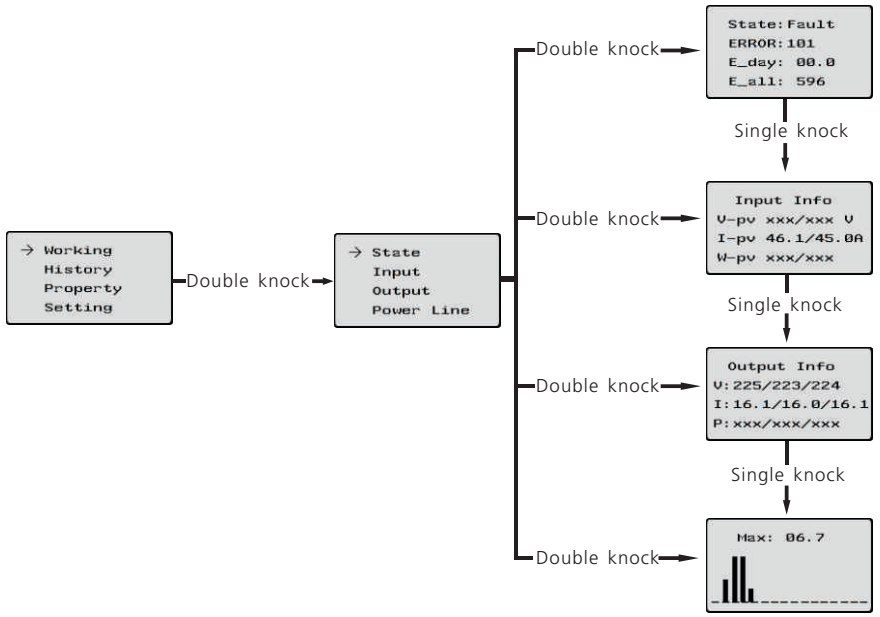


Fig 7.11 Third level menu interface of working information

Explanations of each items in third level menu interface of working information:
State information:

Table 7.2 Working information sub-items explanation

Second level menu	Third level items	Item explanation
State	State: Normal	Inverter running status
	Power: xxx.xx	AC gross output power
	E_day	Energy produced today
	E_all	Energy produced since installation
Input	Power: xxx.xx	Gross input power from PV panel
	V-pv xxx/xxx	PV input voltage for each MPP tracker
	I-pv xx.x/xx.x	PV input current for each MPP tracker
	W-pv xxx/xxx	PV input power for each MPP tracker

Second level menu	Third level items	Item explanation
Output	Power: xx.xx	AC output gross power
	V: xxx.xxx.xxx	AC output voltage for each phase
	I: xx.x/xx.x/xx.x	AC output current for each phase
	P: xxx/xxx/xxx	AC output power for each phase
Power line	Power: xx.x	AC output current power
	Max: xx.x	AC output maximum power
	Power curve	AC output power curve

7.3.3.2 Historical information

The followings are third level menu interfaces for each second level menu items of historical information, shown in Fig 7.12

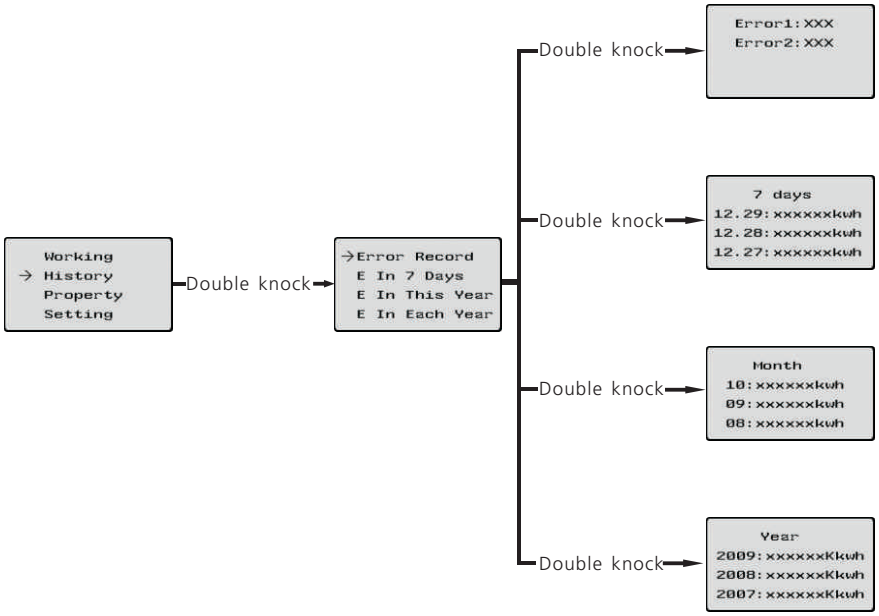


Fig 7.12 Third level menu interface of historical information

Explanation of each items in third level menu interface of working information:
State information:

Table 7.3 Historical information sub-items explanation

Second level menu	Third level items	Item explanation
Error Record	Error1: xxx	Display 4 latest error record.
	Error2: xxx	
	Error3: xxx	
	Error4: xxx	
E in 7Days	7 Days	Title indicate this is latest 7 days running data
	MM:DD: xxxx.x Kwh	Format is Month:Date, xxxx.x is energy generated in that day.
E in This Year	Month	Title indicate this is every month's running data in this year
	MM: xxxx.x Kwh	xxxx.x is energy generated in that month.
E in Each Year	Year	Title indicate this is latest 10 years running data
	20XX: xxxx.x Kwh	xxxx.x is energy generated in the corresponding year.

7.3.3.3 Property information

The followings are second level menu interfaces of property, shown in Fig 7.13

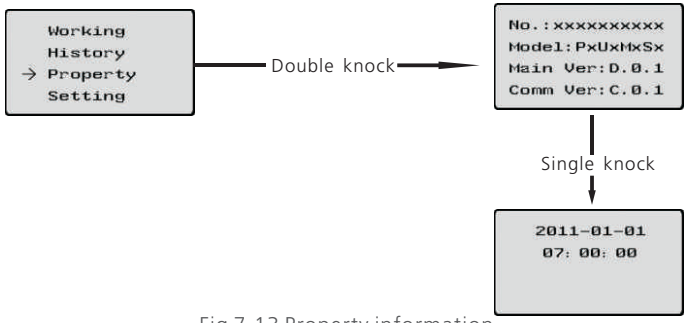


Fig 7.13 Property information

Explanation of each items in third level menu interface of working information:
State information:

Table 7.4 Property information

First level menu	Second level items	Item explanation
Property	No.:xxxxxxxxxx	Serial number of this inverter
	Model:PxUxMxSx	Odel name of this inverter
	Main Ver:D.0.1	
	Comm Ver:C.0.1	
	2011-01-01	Date time
	07:00:00	System time

7.3.4 Parameters set and auto test

The followings are setting information in second level menu and its sub-menus,shown in Fig 7.14

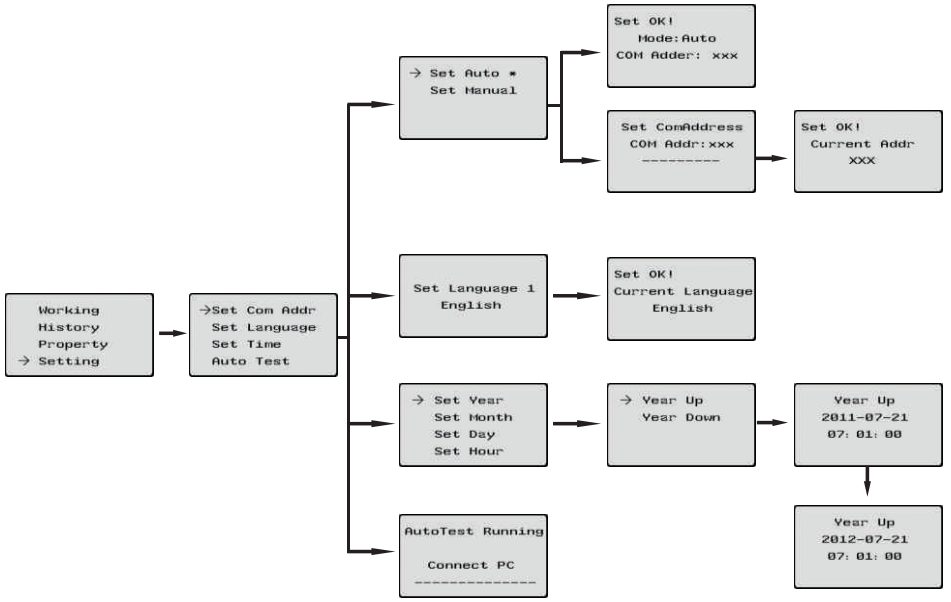


Fig 7.14 setting second level menu and its sub-menus

7.3.4.1 Set inverter's COM address

When communicating with monitoring software or device, the software or device may regard inverter's COM address as communication address (Also may use inverter's serial number as communication address).The COM address could be assigned random or fixed. The second level menu "Set COM address" of setting is to set inverter's COM address.

Set random COM address :
Setting->Set COM addr->Set Auto, then LCD screen will display "Set OK, Mode: Auto, COM addr: xxx", see Fig 7.14 for reference.

Set fixed COM address:
Setting->Set COM addr->Set Manual, then single knock to change value of fixed address, double knock will save changes, and LCD screen will display "Set Addr OK! Current Addr XXX", see Fig 7.14 for reference.

7.3.4.2 Set language

To change inverter's displaying language, please select Setting->Set language, then LCD screen will display current language type, single knock to change current language, double knock will save changes and displays "Set Language OK! Current Language English" see Fig 7.14 for reference.

Please note in order to prevent misoperation, system language won't be change in second level menu "Set language", but it will be only if user saves save the choice by double knock and LCD displays "Set OK!"

The inverter provides five languages: Italian, English, German, Spanish, and French. The number on Set language interface is sequence number of these five languages, the sequence number and its corresponding language are shown in Table 7.5

Table7.5 sequence number of languages

Language	Sequence Number
Italian	0
English	1
German	2
Spanish	3
French	4

7.3.4.3 Set inverter time

Inverter provides a system clock; user must set the system time after installation, as the historical statistic data for a period were based on the clock. User can set the following time parameters: year, month, day, hour, minute.

Set year: Setting->Set time->Set year->Year up or Year down->knock to change year. Thrice knock to exit and save changes.

Set month: Setting->Set time->Set month->Month up or Month down->knock to change month. Thrice knock to exit and save changes.

Set date: Setting->Set time->Set date->Date up or Date down->knock to change date. Thrice knock to exit and save changes.

Set hour: Setting->Set time->Set hour->Hour up or Hour down->knock to change Hour. Thrice knock to exit and save changes.

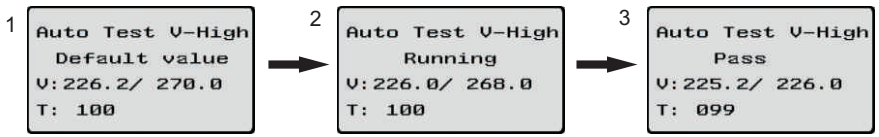
Set minute: Setting->Set time->Set minute->minute up or minute down->knock to change minute. Thrice knock to exit and save changes.

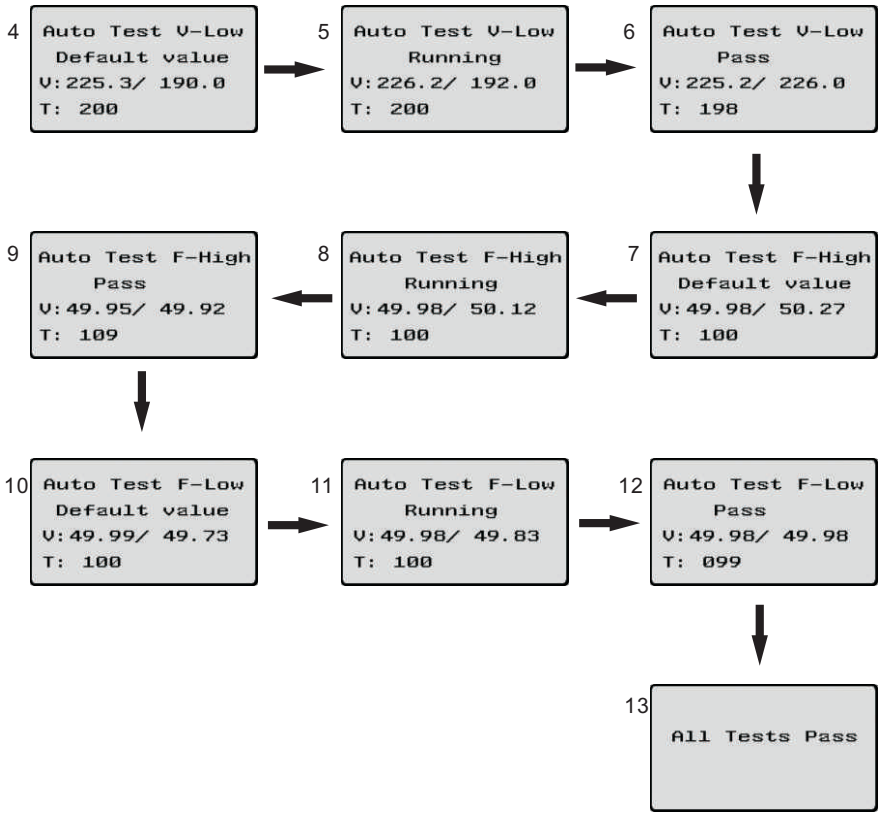
7.3.4.4 Auto test function

Auto test function is to check the inverter's protection when grid is abnormal, including over voltage, under voltage, over frequency, and under frequency.

To run auto test function please select Setting->Auto test, then double knock to start auto test function. It's required to connect inverter to computer and run a test software in computer.

Auto test procedure





7.4 Inverter faulty messages

When system fault or inverter error occurs, inverter will display faulty message or error code on LCD screen.

7.4.1 System fault

System fault is related to the solar system, it may be caused by PV panels wiring, AC wiring, or AC grid faults.

The followings are all system faulty messages displayed on inverter:

System fault message may display on LCD	Explanation and suggestion
Auto Test Failed	Auto test didn't pass
No AC Connection	No utility, no grid connected
PV Isolation Low	Insulation problem.
Residual I High	GFCI current high
Output High DCI	Output current DC offset too high
PV Voltage High	PV panel voltage too high
AC V Outrange	Grid voltage out of range
AC F Outrange	Grid frequency out of range

7.4.2 Error message

Inverter errors are problems come from interior inverter.

DISPLAY	OPERATION
Error: 100	Fan fault
Error: 101	Communication fault
Error: 103	EEPROM fault
Error: 104	Model Fault
Error: 109	Input Current Out of range
Error: 110	Output Current Out of range
Error: 117	Relay Fault
Error: 119	GFCI Fault
Error: 120	UHCT Fault
Error: 122	Bus voltage out of range

8.1ShineNet monitoring software

ShineNet is PC software designed to collect data from Growatt Inverters with strong analytical function. It has multi-communication channels and completed data analysis function. Users are able to monitor the status of Growatt inverters in real-time, browse and analysis the history data that has been recorded.

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

8.2 Bluetooth Module (opt)

Bluetooth module is an external device that can be plugged into inverter via RS232 port. Bluetooth RS232 Configuration is a parameter setting software of Bluetooth module to set configuration such as device name, flow control method, encryption password (pair code), etc.

Pic:

Notes: Before delivery, the Bluetooth module is set to the default configuration parameters:

Baud rate	9600 bps	Parity bit	None
Data bit	8	Stop bit	1
Flow control	None	Master/Slave devices	Slave device
Bind address	None	Pair code	1234

Hint: Pair code is encryption password.

Customers DON'T need to set the configuration again. Detailed information of configuration and operation refer to Bluetooth module Introduction.
This device is optional.

8.3 ShineLogger

ShineLogger is an inverter monitoring product of Growatt New Energy Co., Ltd. It can collect and analyze running data of inverter via Bluetooth connection, and display monitoring data on LCD screen; user can also browse data on computer as well. ShineLogger can monitor up to 4 inverters simultaneity.

ShineLogger has standard data communication interface, including RS232/RS485 serial port, USB port, and Bluetooth, it will be compatible with you existing systems smoothly.

Pic:

Notes: Indoor installation. Detailed information refers to ShineLogger Manual.

8.4 Shine GPRS collector

PV power station remote data acquisition unit (GPRS data collector) collects inverter operation data, including PV input voltage, PV input current, AC output voltage, AC output current, frequency, output power, etc. via RS-485/RS232 connection and send the above data to website via GPRS, so that users can check power station's real time status by login to website www.growatt.net, also can browse historical data in the past.

Pic:

Notes: To assure the regular running of collector, user should make sure the GSM signal is stability. Indoor installation only. Detailed information refers to Shine GPRS collector manual.

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
- Voc of the panel
- Vmp of the panel
- Imp of the panel
- Number of panels in each string

If it is necessary to replace the unit, please ship it in the original box.

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 I s 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.
AC F Outrange	Utility grid frequency out of permissible range.	1.Check firmware version (Please refer to LCD display section). If firmware version is below G.1.3, contact Growatt. 2.Check grid frequency. 3.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.Check the impedance of PV (+) & PV (-) between ground (must be more than 8 MΩ). If the error message is displayed despite the above checking passed, contact Growatt.
Residual I High	Leakage current too high	1.Restart inverter. 2.If error message still exists, contact Growatt.
Output High DCI	Output current DC offset 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.

9.2.1 Inverter fault

Error code	Meanings	Suggestion
Error: 100	For 18K/20K inverter: Problem with fan No.4. For 8K/10K inverter: Problem with No. 2 fan. Note: If there is problem with other fans, inverter continue running with warning on LCD showing: Fan Error.	1.Replace faulty fan. 2.If problem still exists after replacement, contact Growatt.
Error: 101	Communication board has not received data from control board for 10 seconds. Electromagnetic Interference cause communication problem.	1.Reboot inverter by cutting off DC supply, and Error message will disappear. 2.If the error 101 is often displayed, the environment Electromagnetic Interference is too strong. Contact Growatt.
Error: 103	EEPROM fault.	Contact Growatt.
Error: 104	Model setting fault. Reason can be Model and safety requirement have not been set correctly.	Contact Growatt..
Error: 109	Input current out of tolerable range or inverter's component is damaged.	1.Check input current is within the tolerable range. 2.If error message still exists despite the checking was passed, contact Growatt.
Error: 110	Inverter's component is damaged.	Contact Growatt.
Error: 117	Relay fault	Contact Growatt
Error: 119	GFCI fault.	Contact Growatt
Error: 120	Output current detection fault.	Contact Growatt
Error: 121	Control board has not received data from Communication board for 5S.	Electromagnetic Interference too strong, contact Growatt.
Error: 122	Bus voltage out of range.	1.Check if input voltage is within the voltage range. 2.If input voltage is around 1000V, reboot the inverter with lower input voltage. 3.If error message still exists, contact Growatt.

10 Specifications

	10000UE	12000UE	18000UE	20000UE
Input Data				
Max. DC power	10200W	12250W	18400W	20000W
Max. DC voltage	1000V	1000V	1000V	1000V
PV voltage range MPPT	400V-800V	400V-800V	400V-800V	400V-800V
Max. input current (input A/input B)	15A / 15A	17A / 17A	22A / 22A	25A / 25A
Number of MPP trackers	2	2	2	2
Max. number of parallel strings	2/2	2/2	2/2	2/2
DC Connections	MC4(optional MC3)	MC4(optional MC3)	MC4(optional MC3)	MC4(optional MC3)

	10000UE	12000UE	18000UE	20000UE
Output Data				
Max. AC power	10KVA	12KVA	18KVA	19.5KVA
Nominal output power	10KW	12KW	18KW	19.5KW
Max. output current (over 110%)	16A	19A	28.6A	32A
AC voltage range	3 / N / PE 230V / 400V	3 / N / PE 230V / 400V	3 / N / PE 230V / 400V	3 / N / PE 230V / 400V
AC grid frequency range	50 /60 Hz-6Hz / +5Hz	50 /60 Hz-6Hz / +5Hz	50 /60 Hz-6Hz / +5Hz	50 /60 Hz-6Hz / +5Hz
Phase shift (cos φ)	0.8leading-0.8laging	0.8leading-0.8laging	0.8leading-0.8laging	0.8leading-0.8laging
AC output THD	<3% (normal power output)	<3% (normal power output)	<3% (normal power output)	<3% (normal power output)
AC connection	Three phase	Three phase	Three phase	Three phase
Consumption(night)	<1W	<1W	<1W	<1W
Ground failure detection	Yes	Yes	Yes	Yes
Efficiency				
Max . efficiency	98%	98%	98%	98%
Euro-eta	97%	97%	97%	97%
General Data				
Dimensions (W / H / D) in mm	440/740/235	440/740/235	520/740/235	520/740/235
Weight	41 KG	41 KG	60 KG	60 KG
Ambient temperature range	–25°C..+60°C	–25°C..+60°C	–25°C..+60°C	–25°C..+60°C
Continuous full output power temperature range	–25°C..+45°C	–25°C..+45°C	–25°C..+45°C	–25°C..+45°C
Cooling concept	Fans	Fans	Fans	Fans
Installation: Indoors / Outdoors(IP 65)	yes/yes	yes/yes	yes/yes	yes/yes
Communication	RS232/Blue tooth /R485	RS232/Blue tooth /R485	RS232/Blue tooth /R485	RS232/Blue tooth /R485
LCD display	Yes(Alphanumeric 4 lines)	Yes(Alphanumeric 4 lines)	Yes(Alphanumeric 4 lines)	Yes(Alphanumeric 4 lines)
Isolation	Transformerless	Transformerless	Transformerless	Transformerless
Warranty: 5 years / 10 years	Yes / Opt	Yes / Opt	Yes / Opt	Yes / Opt
Certificates and approvals	TUV,UL,AS	TUV,UL,AS	TUV,UL,AS	TUV,UL,AS

This certificate represents a 5 year warranty for the Growatt inverter products listed below. Possession of this certificate validates a standard factory warranty of 5 years from the date of purchase.

Warranted products

This warranty is applicable solely to the following products:

Growatt 1500, Growatt 2000, Growatt 3000, Growatt 4000, Growatt 5000, Sungold 1500, Sungold 2000, Sungold 5000, Growatt 3600MTL, Growatt 4200MTL, Growatt 5000MTL Growatt 3600MTL-US, Growatt 4200MTL-US, Growatt 5000MTL-US Growatt 10000UE, Growatt 12000UE, Growatt 18000UE, Growatt 20000UE

Limited Product Warranty

（Applicable under normal application, installation, use and service conditions)
Growatt warrants the above listed products to be free from defects and/or failure specified for a period not exceeding five (5) years from the date of sale as shown in the Proof of Purchase to the Original purchaser.

The warranties described in these "Limited Warranties " are exclusive and are expressly in lieu of and exclude all other warranties, whether written, oral, express or implied, including but not limited to, warranties of merchantability and of fitness for a particular purpose, use ,or application, and all other obligations or liabilities on the part of GROWATT , unless such other obligations or liabilities are expressly agreed to it in writing signed and approved by GROWATT , GROWATT shall have no responsibility or liability whatsoever for damage or injury to persons or property, or for other loss or injury resulting from any cause whatsoever arising out of or related to the modules, including, without limitation, any defects in the modules or from use or installation. Under no circumstances shall GROWATT be liable for incidental , consequential or special damages howsoever caused; loss of use, loss of production, loss of revenues are therefore specifically and without limitation excluded to the extent legally permissible, GROWATT 's aggregate liability, if any, in damages or otherwise, shall not exceed the invoice as paid by the customer.

The "**Limited Product Warranties**" described above shall not apply to, and Growatt shall have no obligation of any kind whatsoever with respect to, any inverter which has been subjected to:

- Misuse, abuse, neglect or accident;
- Alteration, improper installation or application;
- Unauthorized modification or attempted repairs;
- Insufficient ventilation of the product;
- Transport damage;
- Breaking of the original manufacturers seal;
- Non-observance of Growatt installation and maintenance instruction;
- Failure to observe the applicable safety regulations
- Power failure surges, lighting, flood, fire, exposure to incorrect use, negligence, accident, force majeure, explosion, terrorist act, vandalism or damage caused by incorrect installation, modification or extreme weather conditions or other circumstances not reasonably attributable to Growatt.

The warranty shall also cease to apply if the product cannot be correctly identified as the product of Growatt. Warranty claims will not be honored if the type of serial number on the inverters have been altered, removed or rendered illegible.

Liability

The liability of Growatt in respect of any defects in its PV inverters shall be limited to compliance with the obligations as stated in these terms and conditions of warranty. Maximum liability shall be limited to the sale price of the product. Growatt shall accept no liability for loss of profit, resultant of indirect damage, any loss of electrical power and / or compensation of energy suppliers within the express meaning of that term.

The warranty rights as meant herein are not transferable or assignable to any third party excepting the named warranty holder.

12 Warranty conditions

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,

1. Shipped to a Growatt service center for repair, or

2. repaired on-site, or

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

The warranty shall not cover transportation costs in connection with the return of defective modules. The cost of the installation or reinstallation of the modules shall also be expressly excluded as are all other related logistical and process costs incurred by all parties in relation to this warranty claim.

13 Contact

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