



Installation & Operation Manual

Shenzhen Growatt New Energy Technology CO.,LTD

1st East & 3rd Floor, Jiayu Industrial Zone, Xibianling, Shangwu Village,
Shiyan, Baoan District, Shenzhen, P.R.China

T + 86 755 2747 1942

F + 86 755 2747 2131

E info@ginverter.com

W www.growatt.com

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Information on this Manual 1

1.1 Documents use

1.1.1 Validity

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

Growatt 4000UE
Growatt 5000UE
Growatt 6000UE

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.

1.1.2 Target Group

This manual is for qualified persons who will operate, maintenance, service and repaired inverters.

1.1.3 Storage of the manual


Store this manual where it will be accessible at all times. We assume no liability for any damage caused by failure to observe these instructions. For possible changes in this manual, SHENZHEN GROWATT NEW ENERGY TECHNOLOGY CO.,LTD accepts no responsibilities to inform the users.

1.1.4 Additional Information

For further information on special topics in the download area at www.ginverter.com

1.2 Symbols Used

The following types of safety instructions and general information appear in this document as described below:

Symbol	description
	Read the manual
 DANGER	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
 NOTICE	NOTICE indicates a situation which, if not avoided, could result in property damage.
 Information	Information that you must read and know to ensure optimal operation of the system.

1.3 Glossary

AC

Abbreviation for "Alternating Current"

DC

Abbreviation for "Direct Current"

Energy

Energy is measured in Wh (watt hours), kWh (kilowatt hours) or MWh (megawatt hours).

Power

Power is measured in W (watts), kW (kilowatts) or MW (megawatts). Power is an instantaneous value. It displays the power your inverter is currently feeding into the power distribution grid.

Power rate

Power rate is the ratio of current power feeding into the power distribution grid and the maximum power of the inverter that can feed into the power distribution grid.

Power Factor

Power factor is the ratio of true power or watts to apparent power.

PV

Abbreviation for photovoltaic

Wireless communication accessories (optional)

The external wireless communication technology is a radio technology that allows the inverter and other communication products to communicate with each other.

2.1 Intended Use

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.

Grid-tied PV system Overview:

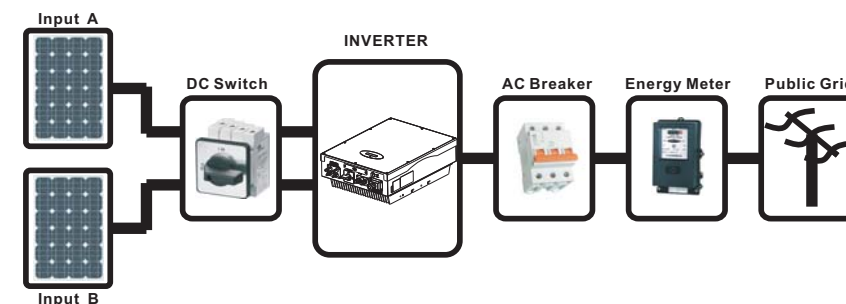


Fig1.1

The inverter may only be operated with a permanent connection to the public power grid. The inverter is not intended for mobile use. Any other or additional use is not considered as intended use. The manufacturer is not responsible for any damages resulting from unintended use. Damage caused by such unintended use is at the sole risk of the operator.

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.

PV modules Capacitive Discharge Currents

PV modules with large capacities relative to earth, such as thin-film PV modules with cells on a metallic substrate, may only be used if their coupling capacity does not exceed 470nF. During feed-in operation, a leakage current flows from the cells to earth, the size of which depends on the manner in which the PV modules are installed (e.g. foil on metal roof) and on the weather (rain, snow). This "normal" leakage current may not exceed 50mA due to the fact that the inverter would otherwise automatically disconnect from the electricity grid as a protective measure.

2.2 Safety Precautions

The GROWATT UE series Inverters is designed and tested according to international safety requirements; however, certain safety precautions must be observed when installing and operating this inverter. Read and follow all instructions, cautions and warnings in this installation manual. If questions arise, please contact Growatt's technical services at +86 755 2747 1942.

2.3 Assembly Warnings



WARNING

- The inverter may only be operated with a permanent connection to the public power grid. The inverter is not intended for mobile use. Any other or additional use is not considered the intended use. The manufacturer/supplier is not liable for damage caused by such unintended use. Damage caused by such unintended use is at the sole risk of the operator.
- Prior to installation, inspect the unit to ensure absence of any transport or handling damage, which could affect insulation integrity or safety clearances; failure to do so could result in safety hazards.
- Unauthorized removal of necessary protections, improper use, incorrect installation and operation may lead to serious safety, shock hazards or equipment damage. In order to minimize the potential of a shock hazard due to hazardous voltages, cover the entire solar array with dark material prior to connecting the array to any equipment.



CAUTION

- Grounding the PV modules: 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.

2.4 Electrical Connection Warnings



DANGER

- Some components in the inverter are live. Touching live components can result in serious injury or death.
- 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 are forbidden to play around the Growatt inverter.



WARNING

- Make all electrical connections (e.g. conductor termination, fuses, PE connection, etc.) in accordance with prevailing regulations. When working with the inverter powered on, adhere to all prevailing safety regulations to minimize risk of accidents.
- The Growatt UE series inverters may only be operated with PV generators (modules and cabling) with protective insulation. Do not connect any source other than PV modules to the Growatt UE series.
- Systems with inverters typically require additional control (e.g., switches, disconnects) or protective devices (e.g., fuse, circuit breaker) depending upon the prevailing safety rules.



CAUTION

- The Growatt inverter is to be used solely to feed solar energy converted photovoltaically into the public grid. The inverter is suitable for mounting indoors and outdoors.
- You can use the AC current generated as follows:

House grid:	Energy flows into the house grid. The consumers connected, for example, household devices or lighting, consume the energy. The energy left over is fed into the public grid. When the Growatt UE series inverters do not generate any energy, e.g., at night, the consumers which are connected are supplied by the public grid. The energy displayed on the LCD of inverter is for reference only. When energy is fed into the public grid, the energy meter spins backwards.
Public grid:	Energy is fed directly into the public grid. The Growatt UE series inverters need install a separate energy meter. The energy produced is compensated at a rate depending on the electric power company.

2.5 Operation Warnings



WARNING

- Ensure all covers and doors are closed and secure during operation.
- Although designed to meet all safety requirements, some parts and surfaces of Inverter are still hot during operation. To reduce the risk of injury, do not touch the heat sink at the back of the PV-Inverter or nearby surfaces while Inverter is operating.
- Incorrect sizing of the PV plant may result in voltages being present which could destroy the inverter. The inverter display will read the error message " PV Voltage High "
 - Turn the rotary switch of the DC Disconnect to the Off position immediately.
 - Contact installer.

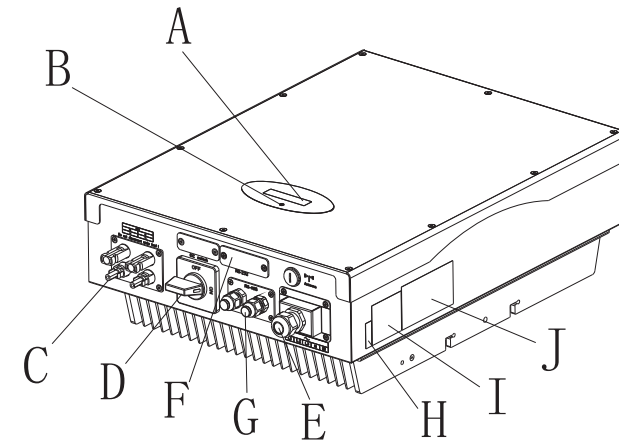
- All operations regarding transport, installation and start-up, including maintenance must be operated by qualified, trained personnel and in compliance with all prevailing codes and regulations.
- Anytime the inverter has been disconnected from the power network, use extreme caution as some components can retain charge sufficient to create a shock hazard; to minimize occurrence of such conditions, comply with all corresponding safety symbols and markings present on the unit and in this manual. In special cases, there may still be interference for the specified application area despite maintaining standardized emission limit values (e.g. when sensitive equipment is located at the setup location or when the setup location is near radio or television receivers). In this case, the operator is obliged to take proper action to rectify the situation.
- 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.




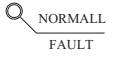
2.6 Symbols on the inverter

Symbol	Explanation
	Electrical voltage!
	Risk of burns!
	Point of connection for grounding protection.
	Operation after 5 minutes
	Direct Current (DC)
	Alternating Current (AC)
	CE mark. The inverter complies with the requirements of the applicable EC guidelines.

3.1 Growatt UE overview





Position	Description
A	LCD
B	LED
C	PV input terminals
D	Country setting switch
E	DC switch
F	Rs232 & DIP switch for RS485 configuration and External communication accessories power
G	RS485
H	AC output
I	Series Number
J	Warning label
K	Type label

Symbol	Description	Explanation	
	Tap symbol	Indicates display operation (see Section 6).	
	Inverter state symbol	Green/constant	Operation
		Red/constant	1、 Fault-- contact installer 2、 Standby module
		Red/flashing	1、 Fans Fault-- contact installer 2、 Software update

3.2 Type label

The type labels provide a unique identification of the inverter (The type of product, Device-specific characteristics, Certificates and approvals). The type labels are on the right-hand side of the enclosure.

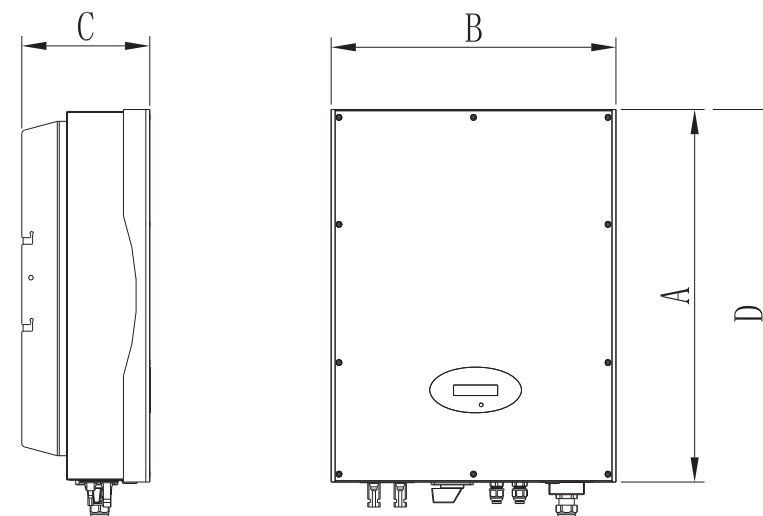
The Certificate Number is just for SAA.

GROWATT PV Grid Inverter	
Model Name	*****
Certificate Number	*****
Max.DC Voltage	*****
DC voltage range	*****
Max.input current per string	*****
Max.apparent power	*****
Nominal output current	*****
Nominal output voltage	*****
AC Frequency range	*****
Power Factor	*****
Safety Level	*****
Protection Degree	*****
Operation Ambient temperature	*****
  VDE AR-N1510 AR-N1510 AR-N1510 VDE 0120-1-1 IEC 62109	

More detail about the type label as the chart below:

Model Name	Growatt4000UE	Growatt5000UE	Growatt6000UE
Max DC voltage	800V	800V	800V
Max input current	9A / 9A	9A / 9A	10A / 10A
PV voltage range	140V-800V	140V-800V	140V-800V
AC Nominal voltage	230V	230V	230V
AC grid frequency;	50/60Hz	50/60Hz	50/60Hz
Nominal AC output power	4000W	5000W	6000W
AC normal output current	5.8A	7.3A	8.7A
Power factor	0.9leading- 0.9laging	0.9leading- 0.9laging	0.9leading- 0.9laging
Environmental Protection Rating	IP65	IP65	IP65
Operation Ambient temperature	-25...+60℃	-25...+60℃	-25...+60℃

3.3 Size and weight



	A(mm)	B(mm)	C(mm)	D(mm)	Weight(kg)
4000 UE	566	433	195	620	30
5000-6000 UE	566	433	195	620	32.5

3.4 Transportation

The inverter is thoroughly tested and inspected strictly before delivery. Our inverters leave our factory in proper electrical and mechanical condition. Special packaging ensures safe and careful transportation. However, transport damage may still occur. The shipping company is responsible in such cases. Thoroughly inspect the inverter upon delivery. Immediately notify the responsible shipping company if you discover any damage to the packaging which indicates that the inverter may have been damaged or if you discover any visible damage to the inverter. We will be glad to assist you, if required. When transporting the inverter, the original or equivalent packaging should to be used, and the maximum layers for original carton is four, as this ensures safe transport.

3.5 Storage of Inverter

If you want to storage the inverter in your warehouse, you should choose an appropriate location to store the inverter.

- The unit must be stored in original package and desiccant must be left in the package.
- The storage temperature should be always between -25°C and +60°C. And the storage relative humidity should be always between 0 and 95%.
- If there are lots of inverters need to be stored, the maximum layers for original carton is four.
- After long term storage, local installer or service department of GROWATT should perform a comprehensive test before installation



Information

After long term storage, the Real Time Clock of the inverter maybe not correct, it will cause the Energy produced today (E_{day}) error, you need to set the time and date, refer to 6.3.5 setting inverter time or 6.4.3 text line d) setting date and time.

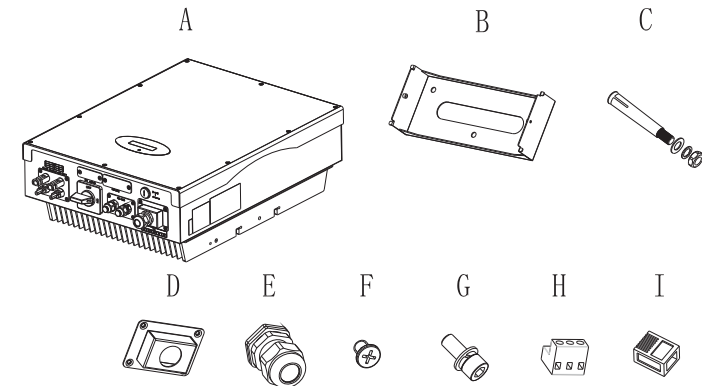
3.6 The advantage of the Growatt UE inverters

The features of UE inverter are below:

- Dual independent MPP trackers
- Integrated DC disconnect switch
- Bluetooth/ RF technology/ Zigbee/ Wifi
- Wide PV voltage range: 140V~800V
- The maximum efficiency is 97.8%
- IP65 environmental protection
- Easy to install

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	Inverter
B	1	Mounting frame
C	3	Expansion bolt
D	1	Shell
E	1	Cable gland for AC connection
F	4	M4 cross recessed countersunk head screws
G	3	M6 socket head cap screws
H*	2	RS 485 PLUG
I**	2	RJ 45 PLUG
--	1	Warranty(not show in the picture)
--	1	User manual (not show in the picture)

*For type 1 RS485

**For type 2 RS485



Information

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

5 Installation

5.1 Safety instruction



Danger to life due to fire or explosion

- Despite careful construction, electrical devices can cause fires.
- Do not install the inverter on easily flammable materials and where flammable materials are stored.



Risk of burns due to hot enclosure parts

- Mount the inverter in such a way that it cannot be touched inadvertently.

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

In special cases, there may still be interference for the specified application area despite maintaining standardized emission limit values (e.g. when sensitive equipment is located at the setup location or when the setup location is near radio or television receivers). In this case, the operator is obliged to take proper action to rectify the situation.



Never install the inverter near the sensitive equipment (e.g. Radios, telephone, television, etc)
Do not stay closer than 20 cm to the inverter for any length of time unless it is absolutely necessary.
Growatt assumes no responsibility for compliance to EMC regulations for the complete system

- All electrical installations shall be done in accordance with the local and national electrical codes. Do not remove the casing. Inverter contains no user serviceable parts. Refer servicing to qualified service personnel. All wiring and electrical installation should be conducted by a qualified service personnel.
- Carefully remove the unit from its packaging and inspect for external damage. If you find any imperfections, please contact your local dealer. Be sure that the inverters connect to the ground in order to protect property and personal safety.
- The inverter must only be operated with PV generator. Do not connect any other source to it.
- Both AC and DC voltage sources are terminated inside the PV Inverter. Please disconnect these circuits before servicing.
- This unit is designed to feed power to the public power grid (utility) only. Do not connect this unit to an AC source or generator. Connecting Inverter to external devices could result in serious damage to your equipment.

- When a photovoltaic panel is exposed to light, it generates a DC voltage. When connected to this equipment, a photovoltaic panel will charge the DC link capacitors.
- Energy stored in this equipment's DC link capacitors presents a risk of electric shock. Even after the unit is disconnected from the grid and photovoltaic panels, high voltages may still exist inside the PV-Inverter. Do not remove the casing until at least 5 minutes after disconnecting all power sources.
- Although designed to meet all safety requirements, some parts and surfaces of Inverter are still hot during operation. To reduce the risk of injury, do not touch the heat sink at the back of the PV-Inverter or nearby surfaces while Inverter is operating.

5.2 Selecting the Installation Location

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

- 1) 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 11 Specifications)
- 2) The location selected must be suitable for inverters' dimension. (Refer to 3.3 Dimensions and Fig.5.2 Required Clearances)
- 3) Do not install the inverter on structures constructed of flammable or thermo labile materials.
- 4) Never install the inverter in environment of little or no air flow, nor dust environment.
- 5) The Ingress Protection rate is IP65 which means the inverter can be installed outdoors and indoors.
- 6) Do not expose the inverter to direct sunlight, in order to avoid the power and efficiency derating caused by excessive heating.
- 7) The humidity of the installation location should be 0~95% without condensation.
- 8) The ambient temperature of the inverter should be -25℃~+60℃.
- 9) The installation location must be freely and safely to get at all times.
- 10) 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)

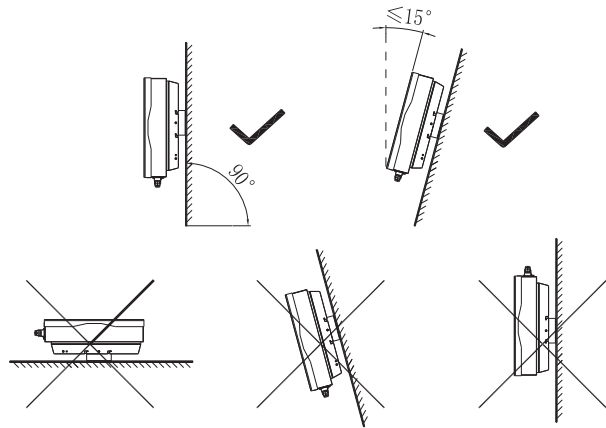


Fig5.1

11) Notice the minimum clearances of the inverter. (Refer to 3.3 Dimensions and Fig.5.2 Required Clearances).

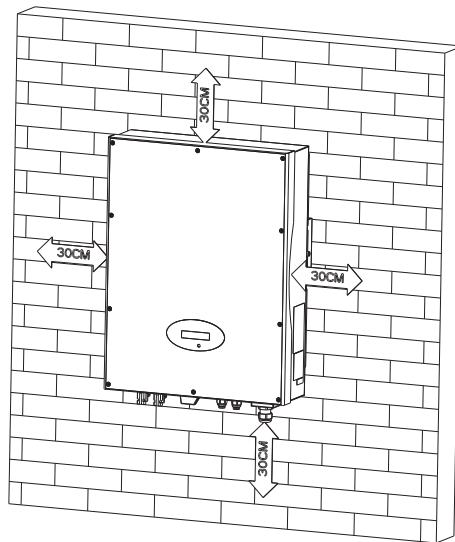


Fig5.2

- 12) Do not install the inverter near television antenna or any other antennas and antenna cables.
- 13) Do not install the inverter in living area, the noise caused by the machine may affect on daily life.
- 14) For security reasons, don't install the inverter in place where the children can reach.

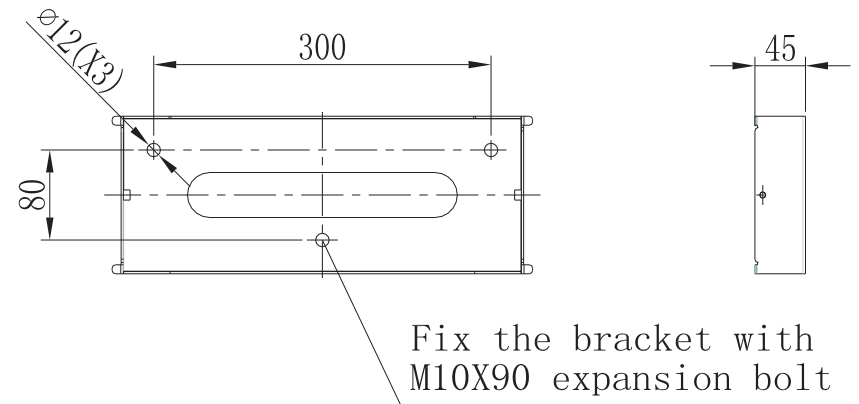
5.3 Installation guide

5.3.1 Mounting the Bracket



In order to avoid electrical shock or other injury, inspect existing electronic or plumbing installations before drilling holes.

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



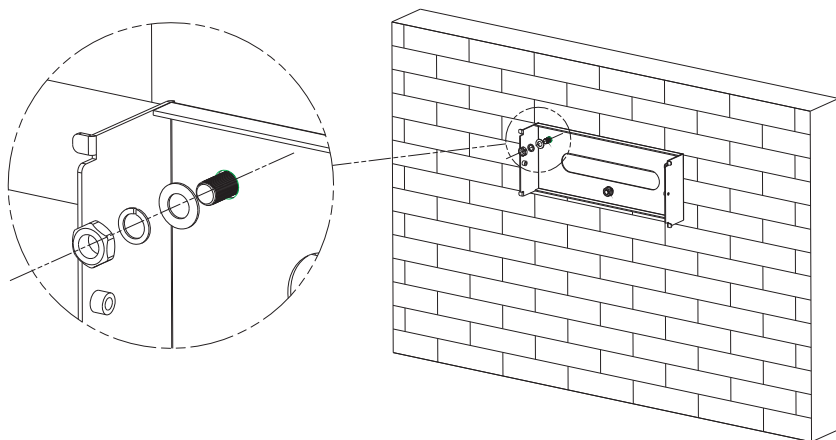
Bracket of Growatt 4000UE-6000UE

Fig5.3

Hint: Data units in mm

Steps:

- Use the bracket as a drilling template and mark the positions where you need to drill holes.
- Drill three holes for screws, fasten the bracket against the wall with expansion bolts.
- Fix the mounting frame on the wall as the figures shown below, combine as the screws as the Items Fig 4.1 shows (items C)



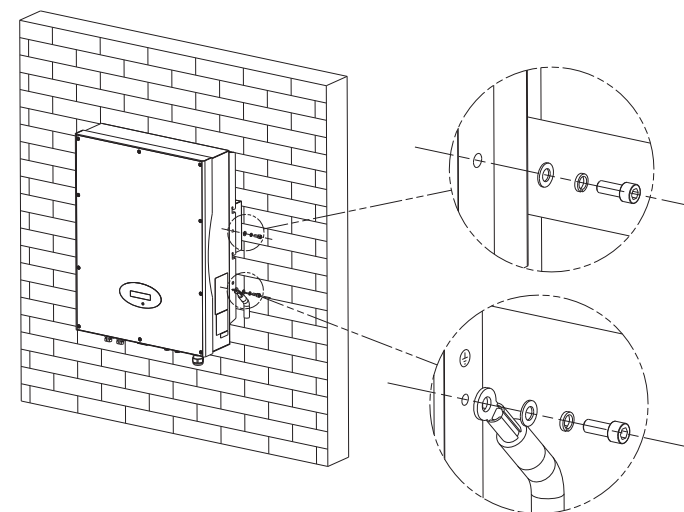
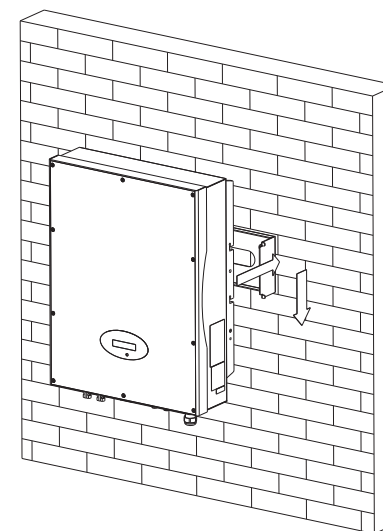
5.3.2 Mounting Inverter



Falling equipment can cause serious or even fatal injury, 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.

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. Considering the weight of Growatt UE, you need 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.
- After confirming the inverter is fixed reliably, fasten two M6 socket head cap screws on the left and right side firmly to prevent the inverter from being lifted off from the bracket.



- Connecting a Second Protective Conductor
if it is requirement, the earth terminal can be used to connect a second protective conductor or as equipotential bonding. This prevents touch current if the original protective conductor fails.
- Recommend awning installation, the purpose is to extend the inverter service life and reduce the power derating of the inverter. The dimension of the awning, refer to Fig 5.6.

5.3.3 Installation layout

Information

Avoid exposing inverter to direct sunlight, rain or snow to extend the inverter service life despite the IP65 protection degree. Exposure to the sunlight may cause additional internal heating which will cause power derating.

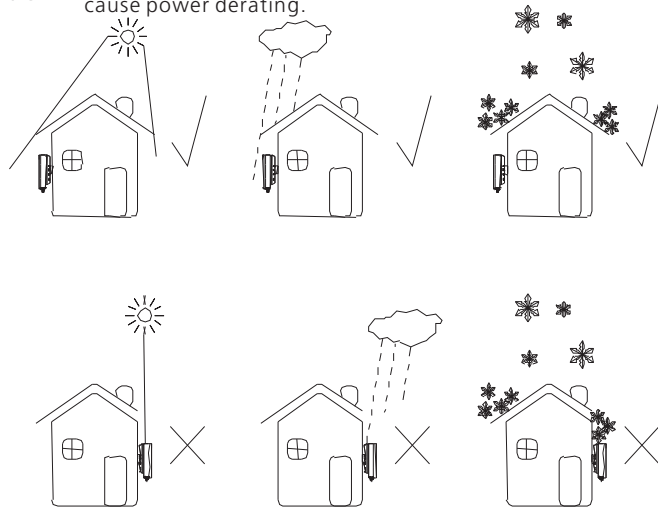


Fig 5.4

More than one inverter need to be installed, the dimensions below should be considered.

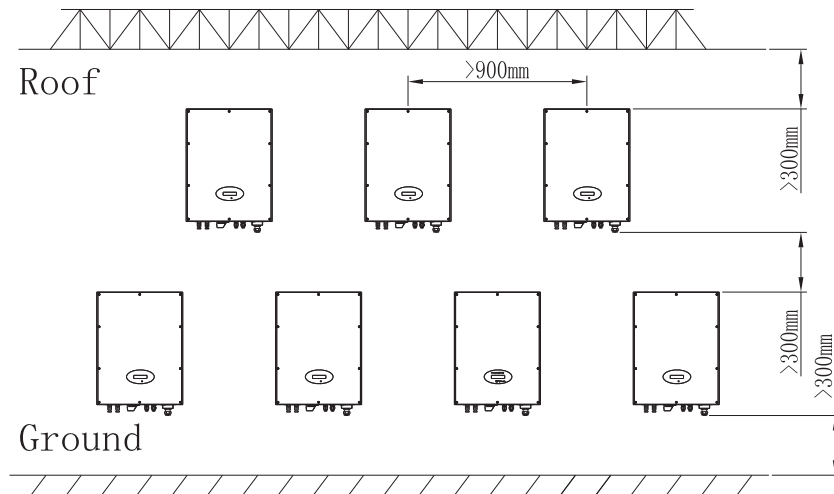
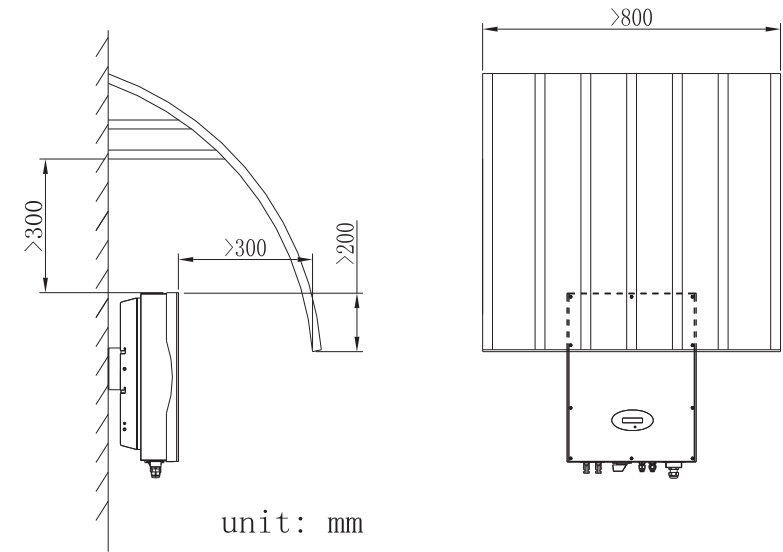


Fig 5.5



unit: mm

Fig 5.6

5.4 Electrical Connections

5.4.1 Safety



Danger to life due to lethal voltages!
High voltages which may cause electric shocks are present in the conductive parts of the inverter. Prior to performing any work on the inverter, disconnect the inverter on the AC and DC sides



Danger of damage to electronic components due to electrostatic discharge.
Take appropriate ESD precautions when replacing and installing the inverter.

5.4.2 Wiring AC Output

Conditions for the AC Connection

You must comply with the connection requirements of your utility operator.
All usages must comply with the regulations.

Residual-current protective device

The inverter is equipped with an integrated universal residual-current monitoring unit.
If the network operator stipulates a residual-current protective device, you must use a residual-current protective device that triggers in the event of a residual-current of 100 mA or more.

Connection of a second protective conductor

In some installation countries, a second protective conductor is required to prevent a touch current in the event of a malfunction in the original protective conductor.
For installation countries falling within the scope of validity of the IEC standard 62109, you must install the protective conductor on the AC terminal with a conductor cross-section of at least 10 mm²Cu.
Or install a second protective conductor on the earth terminal with the same cross-section as the original protective conductor on the AC terminal

Load disconnection unit

You must install a separate three-phase miniature circuit-breaker or other load disconnection unit for each inverter in order to ensure that the inverter can be safely disconnected under load.

- Measure the public grid voltage and frequency (Voltage: 400Vac; Frequency: 50Hz/60Hz; in 3-Phase);
- Open the breaker between the PV inverter and utility;
Specification of AC breaker: Growatt 4000UE: 10A/400V
Growatt 5000UE/ 6000UE: 16A/400V


Cable requirements:

Conductor Cross section	Diameter(mm)	Area(mm²)	(AWG)
	2.05~2.59	4~6	12~10

Conductor Cross section	Max. cable length(m)		
	Growatt 4000UE	Growatt 5000UE	Growatt 6000UE
4.0 mm²	25.4m	20.3m	16.9m
6.0 mm²	40.4	32.4	27

We recommend to connection fuses in series on the output side. The current of fuse see below.

Model	Fuse current
4000UE	10A
5000UE/6000UE	15A

1. The AC side terminals of the inverter are like the following figure, it is clear to confirm that 'L1, L2, L3' represents three live line output, "N" represents neutral line and is  grounding line.
2. Connect five standard cables into relevant terminals. The five cables should be put through the protection shell, as Fig. 5.7.
3. Fasten the protection shell onto the bottom of the inverter, make sure the four screws are tightened, the completed appearance is like the below figure.

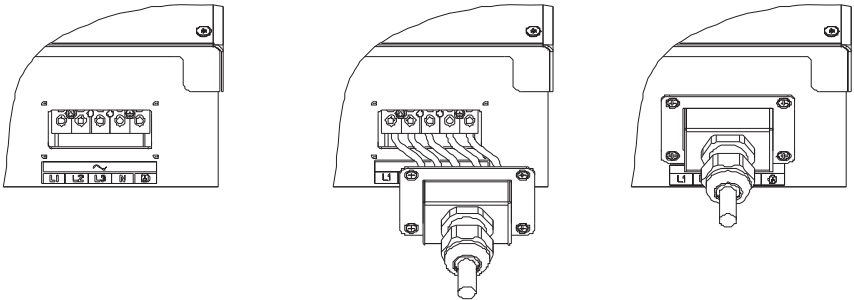


Fig 5.7

5.4.3 Wiring DC Input



Danger to life due to lethal voltages!
Before connecting the PV array, ensure that the DC switch and AC breaker are disconnect from the inverter. NEVER connect or disconnect the DC connectors under load.

Improper operation during the wiring process can cause fatal injury to operator or unrecoverable damage to the inverter. Only qualified personnel can perform the wiring work.



Risk of damage to the inverter.
If the voltage of the PV modules exceeds the maximum input voltage of the inverter, it can be destroyed by the overvoltage. This will void all warranty claims.
Do not connect strings to the inverter that have an open-circuit voltage greater than the maximum input voltage of the inverter.

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



Information

The PV modules should have an IEC61730 Class A rating*. Please use the same brand male and female PV connectors. Under any conditions the total circuit current should never exceed the Max. Current.



Excessive voltages can destroy the measuring device
Only use measuring devices with a DC input voltage range up to at least 800 Vdc.

- 1 Check the connection cables of the PV modules for correct polarity and make sure that the maximum input voltage of the inverter is not exceeded.
- 2 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 H4 (AMPHENOL) connectors;

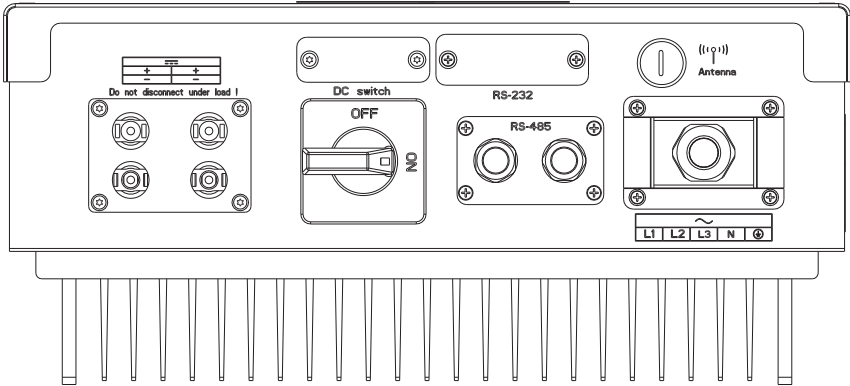


Fig 5.8

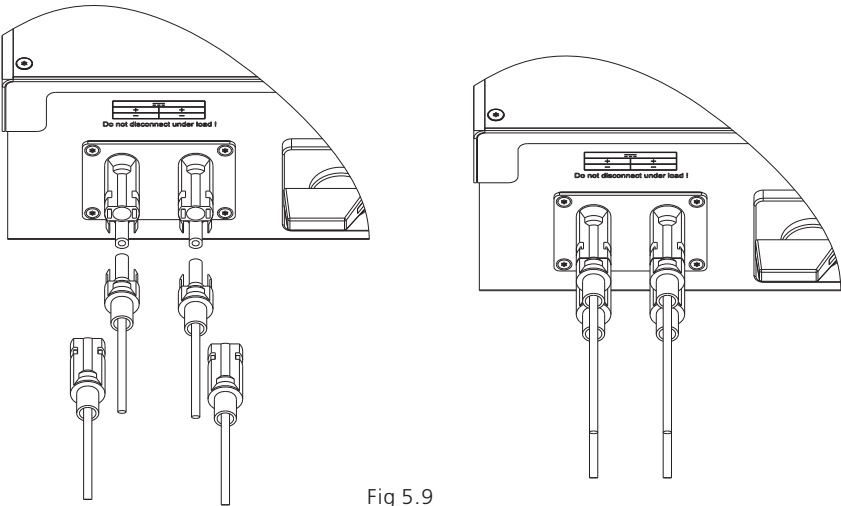


Fig 5.9

- 3 Check the assembled DC connectors for correct polarity and connect them to the inverter.
- 4 The maximum string currents are varying from different inverter types.

Model	Max.current
4000UE	9A
5000UE	9A
6000UE	10A

5 In order to seal the inverter, all unneeded DC inputs must be closed with sealing plugs:
Cable requirements:

Mode	Diameter(mm)	Area(mm²)	AWG
4000UE	1.63-2.05	2.5-4	14-12
5000UE	1.63-2.05	2.5-4	14-12
6000UE	1.63-2.05	2.5-4	14-12

5.4.4 Grounding

AC Grounding

The Growatt UE must be connected to the AC grounding conductor of the power distribution grid via the ground terminal (PE).

PV Grounding

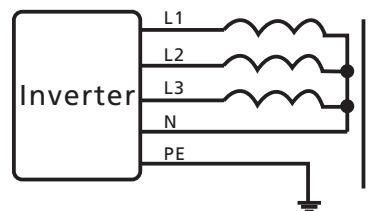
The grounding conductor in the framework of the PV array must be connected to the PV grounding conductor and the DC grounding conductor. The cross-section of the grounding conductor corresponds to the cross-section of the largest conductor in the DC system.

DC Grounding Conductor

A DC grounding conductor may be required by the Authority Having Jurisdiction (AHJ). Use the terminal block for the PV grounding conductor and DC grounding conductor.

Ground kit

If PV modules of the PV system require POSITIVE or NEGATIVE to connect to GROUND, the output of inverter should connect to grid with an isolating transformer. The connection method is below:

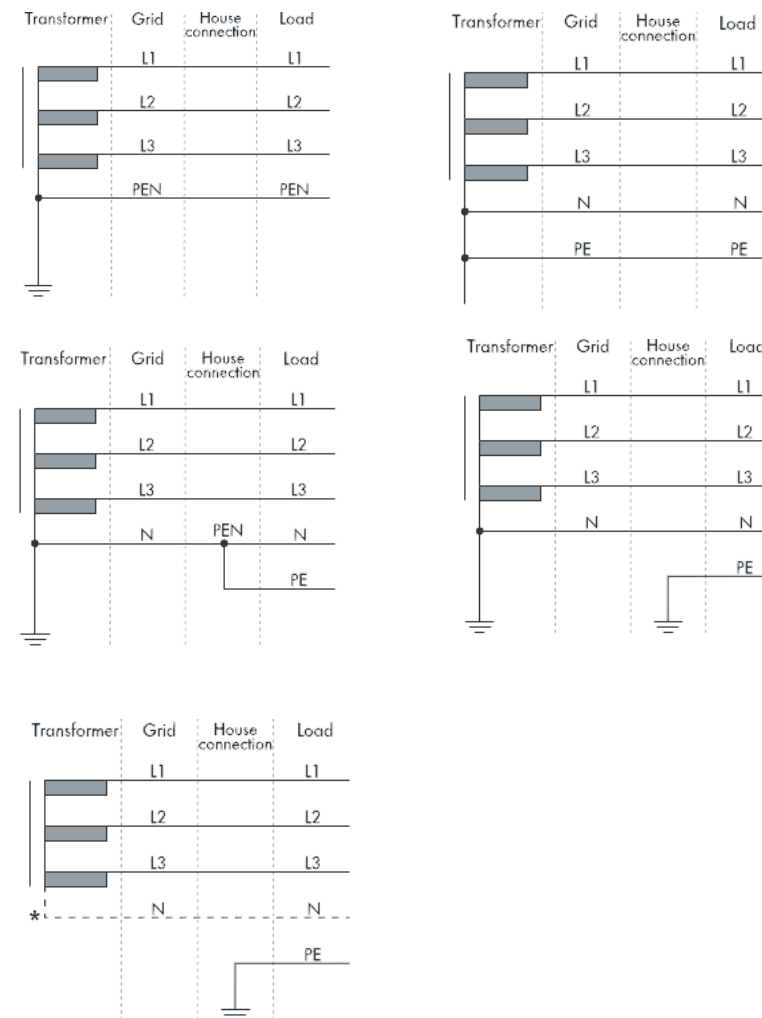


N of transformer should not be connected to PE.

5.5 Grid Type

5.5.1 Common grid type

Based on the local GRID standards, it may select different connection types. In the following you will find an overview of the most common type of grid structure.





If the output of inverter was connected to grid with an isolation transformer, and the inverter display PV Isolation Low error when you start-up the inverter, please set the parameter "Enable Neutral" via Growatt software "Shinebus".

5.5.2 Compatibility Table

Grid type	Grid type	TN-C grid	TN-S grid	TN-C-S grid	TT grid	IT grid
Grid type						
Growatt 4000UE	yes (N and PE of inverter both should connect to PEN of grid.)	yes	yes	yes, if UN-PE < 30V	no	
Growatt 5000UE	yes (N and PE of inverter both should connect to PEN of grid.)	yes	yes	yes, if UN-PE < 30V	no	
Growatt 6000UE	yes (N and PE of inverter both should connect to PEN of grid.)	yes	yes	yes, if UN-PE < 30V	no	

Commissioning 6

6.1 Commission the Inverter

- 1) Remove all covers from the PV array.
- 2) Check the PV and AC voltage.
- 3) Plug in the PV input.
- 4) Turn the DC Disconnect to position "I".
- 5) If the inverter is connected with PV panel arrays and the input voltage is higher than 300Vdc, 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 display "AC V outrange" at State info and the LED turns red.
 - Please check all information on the LCD, operate by knocks you will see the different parameters.
 - Single knock to Light the backlight → State info (single knock) Input info → (single knock) Output info

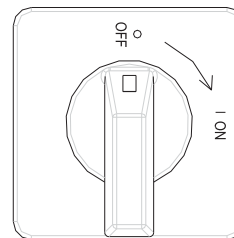


Fig 6.1

- 6) Turn on the AC breaker between inverter and grid, the system will operate automatically.
- 7) Under normal operating conditions, the LCD displays 'Power: xx.xx Kw' at State info, this is the power feed into grid. The LED turns green.
- 8) Check the time and date of inverter as follow: Single knock to Light the backlight → State info (Thrice knock) → Inverter info (single knock) → System Time(double knock), if they are not correct, please set them, refer to 6.3.5setting inverter time or 6.4.3 text line d) setting date and time.

6.2 Operation Modes

Normal Mode

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

- Whenever the DC voltage is higher than 200Vdc, inverter converts power to grid
 - Whenever the DC voltage is lower than 180Vdc, the inverter will work in waiting status and attempt to connect the grid. In waiting state the inverter consumes just power generated by the PV panel to monitor the internal system.
- Notes: The inverter starts up automatically when DC power from the PV panel is sufficient.

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: a) Detailed fault information refers to Chapter 9 Trouble shooting.
b) When PV Isolation error occurred in SAA safety standard, the buzzer will give an alarm every fifteen seconds.

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, the LCD and LED turns off.

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

Derating mode

When AC frequency is higher than 50.3Hz(settable), the inverter will derate its output power according to the rule.

When user set the output limit command to the inverter, the inverter will also limit the output according to the setting.

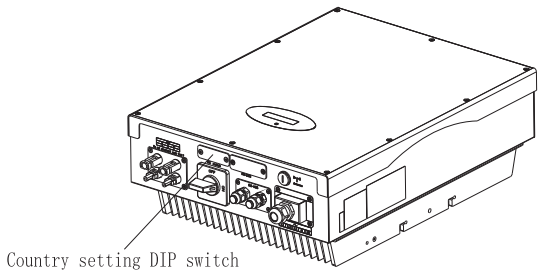
In this derating mode, the LCD will show "DERATING".

6.3 Country Setting and LCD Display

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

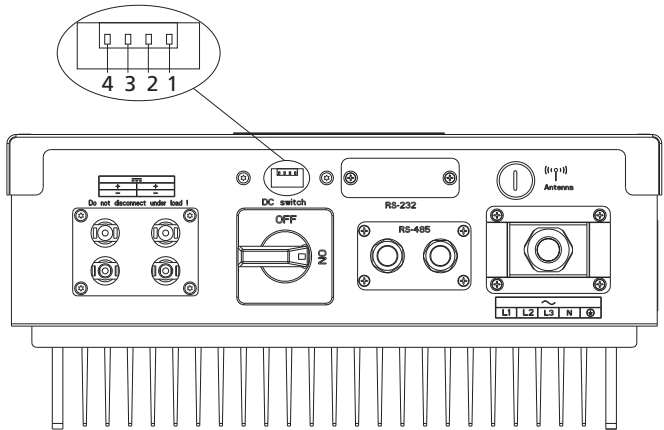
6.3.1 Location of the country setting DIP switch

The DIP switch is located on the left of the RS232 interface at the bottom of the inverter, as the figure below.



To reduce the risk of electric shock, before selecting country, please turn off DC input and AC grid, than unscrew the dam-board of the DIP switch by appropriate tool.

The internal structure of the DIP switch is as the following figure:



The internal structure of the DIP switch is as the following figure:

6.3.2 DIP switch option corresponding to the country



DANGER

When you setting the DIP, you must turn off the AC breaker and DC switch.



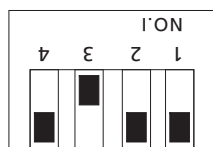
Information

- After setting the DIP, please power on the inverter and check the model display. If the last character of the model name is corresponding to the country safety standard as the above table, it means your setting is successful.
- You should change the time displayed on the LCD of inverter to your local time after inverter starts up.
If the country is set incorrectly, please shut down the inverter and set again.

When the cables of AC side and DC side are all well connected, before commissioning, the country safety standard must be selected by the DIP switch. The DIP switch is composed of four-digit binary number PINS. The different combination of the four PINS can represent different inverter's model, which is corresponding to the local grid standard. Each small white PIN has two statuses, when set upward to 'ON', its value turns to '1', when set downward, its value turns to '0'. Concerning the matching of the PIN status and the country safety standard, please refer to the table below:

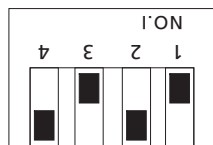
Growatt 4000-6000UE switch to country table 6.3.1

DIP switch status	Country	Model display
	VDE 0126	GTXXXXXXX1
	AS4777	GTXXXXXXX3



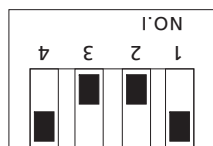
CEI 0-21

GTXXXXXXX4



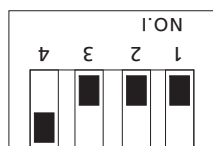
Spain

GTXXXXXXX5



Greece

GTXXXXXXX6



VDE-AR-N 4105

GTXXXXXXX7



UK_G83

GTXXXXXXX8



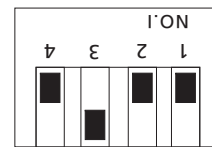
Ireland

GTXXXXXXX9



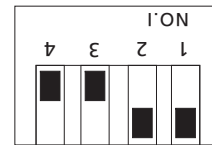
CGC

GTXXXXXXXA



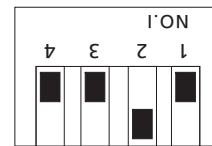
Denmark

GTXXXXXXXB



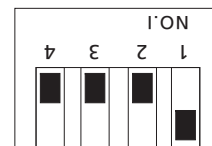
UK_G59

GTXXXXXXXC



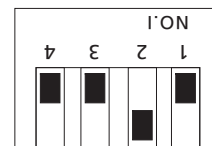
Belgium

GTXXXXXXXD



Reserved

GTXXXXXXXE



Reserved

GTXXXXXXXF

6.3.3 Operate by knock

Power on display

After inverter restarts, Growatt Logo will appear immediately. The background light will last for 2 seconds. See Fig6.3.1 for reference.

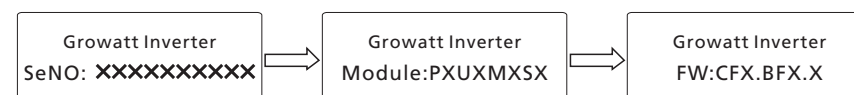


Fig 6.3.1 Power on display

6.3.4 Operate by knock

Knock type and definition

The inverter can support four kinds of knock: single knock, double knock, third Knock, Knock four times. Each kind of knock has different function. Refer to specified definition in Table 6.3.2.

Table 6.3.2 Knock definition list

Knock type	Definition
Single knock	Down
Double knock	Enter
Knock four times	Exit the setting

Light backlight and single knock to check running information

Before light the backlight, the four types of knock functions are the same, which is just lighting the backlight. 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 backlight and check those data by single knock, a single knock will switch LCD screen to a following interface.

6.3.5 Data checking and parameters setting

Cycle display

It is a cycling display bit, note that using signal knock to enter next page instead of double knock. Fig 6.3.4 is the interface of the first page.

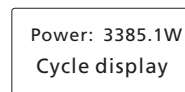


Fig 6.3.4 First page

In current interface, a single knock will switch the index to next page.

Display by knocking

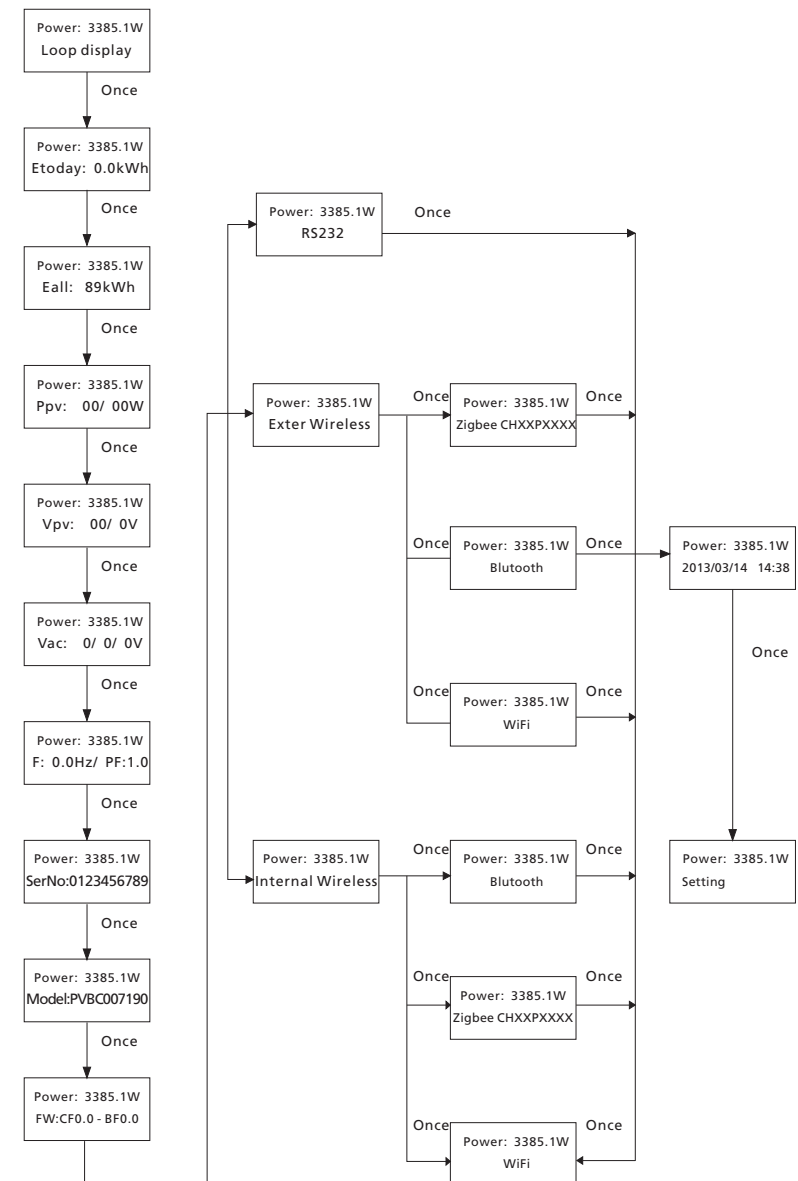


Fig 6.3.5 menu for checking data

On the first page, single knock will lead to next page.
The followings are two another interfaces. It displays power today. Single knock, go down next page. The text is all power. It is a cycling display. Cycle display->Etoday->...->setting. It will go back cycle display when single knock in the setting page.

The first line of LCD:

STATUS	DISPLAY	REMARK
Wait Status	Standby	PV voltage low
	Waiting	Initial waiting
	Connect in xxS	System checking
	Reconnect in xxS	System checking
Inverter Status	Connect OK	Connect to Grid
	Power: xxxx.xW	Inverter watt at working
Fault Status	Error: xxx	System Fault
Program Status	Error: xxx	Update Software

The second line of LCD:

SerNo.	CYCLE DISPLAY	DISPLAY TIME/S	REMARK
1	Etoday: xx.x KWh	4	The energy today
2	Eall: xxx.x KWh	4	The total energy
3	Tall: xx.x h	4	The total work time
4	PV: xx/xxx. B: xxx	4	The PV1 & PV2 voltage
5	AC: xxxV F: xx.xHz	4	The AC voltage and frequency
6	SerNo: xxxxxxxxxx	4	The serial number
7	Module: PX UX MX SX	4	The inverter module
8	FW version: x.x.x	4	The software version
8	Setting	4	The setting page

Parameters setting

Fig 6.3.8 is the setting information. Single knock, the Text will display the setting.
Double knock, the Text will display "input123: 000". Single knock to go back Setting page. Double knock the enclosure lid ready to input password. Single knock to change value of first, double knock enter into next position. Konck three times when the bit was "123", it will go into Setting options.

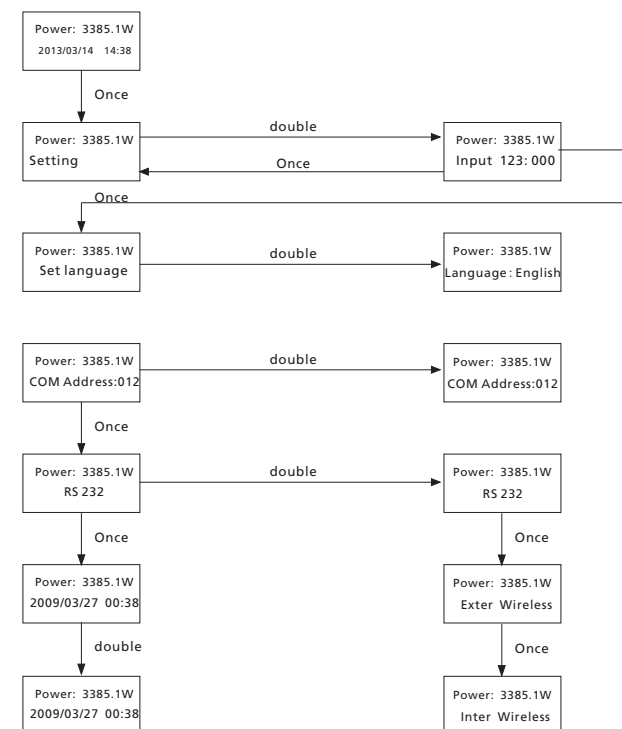


Fig 6.3.6 setting second level menu and its sub-menus

setting 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, knock three times will save changes and displays "Set Language OK! Current Language English" see Fig 6.3.6 for reference. Knock four times to exit setting.

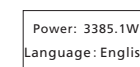


Fig 6.3.7 current language

Please note in order to prevent disoperation, system language won't be change in second level menu "Set language", but it will be only if user saves save the choice by knock three times 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 6.3.3.

Table6.3.3 sequence number of languages

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

Setting 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. The second level menu "Set COM Addr" of setting is to set inverter's COM address.

Setting COM address:

Input password->Setting language->Set COM addr-> is the current address of inverter."Double knock the enclosure lid ready to input COM addr. Single knock to change COM Addr. Knock three times to save COM Addr. See Fig 6.3.6 for reference. Knock four times to exit setting.

Power: 3385.1W
COM Address:012

Fig 6.3.8 current COM Addr

Setting communication way

The inverter can support three kinds of communication: RS232, Extern Wireless, Inter Wireless.

Communication ways:

Kinds	Ways	Communication module
RS232	RS232	RS232 interface
	Zigbee	Zigbee module outside the inverter
	Wifi	Wifi module outside the inverter
Exter Wireless	Bluetooth	Bluetooth module outside the inverter
	Zigbee	Zigbee module inside the inverter
	Wifi	Wifi module inside the inverter
Inter Wireless	Bluetooth	Bluetooth module inside the inverter

The Extern Wireless have three ways of communication: Zigbee, Wifi, Bluetooth. The Intern Wireless have three ways of communication: Zigbee, wifi, Bluetooth. Input password->Setting language->RS232-> is the current way of communication. Double knock the way of communication will flicker. Single knock to change the way. Knock three times to save communication way. If the communication way is Exter Wireless or Inter Wireless, It will have three kinds of communication. It is a cycling display. a single knock will display next way. Knock three times to save way.

Setting RS232

Input password->Setting language >RS232. Knock three times to save RS232. Knock four times to exit the setting.

Setting Zigbee of extern wireless

Input password->Setting language >intern Wireless->Zigbee->channel->is set the channel of extern Zigbee. Double knock the enclosure lid ready to input the Channel. Single knock to change value of first, double knock enter into next position. Knock three times to save the channel. Knock four times to exit the setting. Knock four times to exit the setting.

Input password->Setting->Extern Wireless->Zigbee->channel->PIN->is set the PIN of extern Zigbee. Double knock the enclosure lid ready to input the PIN. Single knock to change value of first, double knock enter into next position. Knock three times to save the PIN. Knock four times to exit the setting.

Setting Wifi of extern wireless

Input password->Setting->Extern Wireless->>wifi. Knock three times to save RS232. Knock four times to exit the setting.

Setting Bluetooth of extern wireless

Input password->Setting->Extern Wireless->Bluetooth. Knock three times to save RS232 .Knock four times to exit the setting.

Setting Zigbee of Intern wireless

Input password->Setting->intern Wireless->Zigbee->channel->is set the channel of intern Zigbee. Double knock the enclosure lid ready to input the Channel. Single knock to change value of first, double knock enter into next position. Knock three times to save the channel. Knock four times to exit the setting.
Input password->Setting->intern Wireless->Zigbee->channel->PIN->is set the PIN of intern Zigbee. Double knock the enclosure lid ready to input the PIN. Single knock to change value of first, double knock enter into next position. Knock three times to save the PIN. Knock four times to exit the setting.

Setting Wifi of intern wireless

Input password->Setting->intern Wireless->wifi. Knock three times to save RS232 .Knock four times to exit the setting.
Set Bluetooth of intern wireless
Input password->Setting->intern Wireless->Bluetooth. Knock three times to save RS232 .Knock four times to exit the setting.

Setting 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.

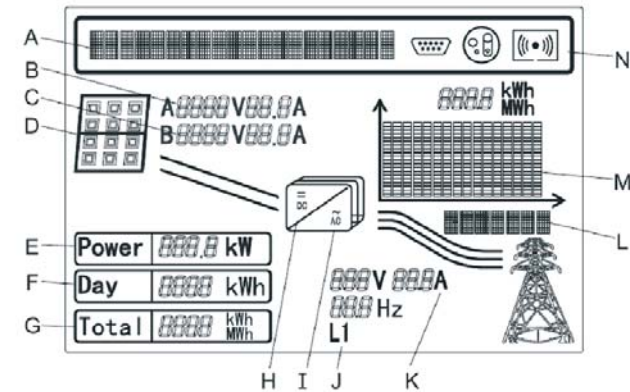
Input password->Setting-> 2009/03/27 00:38 ->is the current time. Double knock to go into setting. Single knock to change time. Konck three times to save time. Knock four times to exit setting. See Fig 6.3.6 for reference



Fig 6.3.9 current time

6.4 M3 LCD Display

6.4.1 Graphic display



Position

Detail

A	Text line for displaying an event
B	Input voltage and current of MPPTA
C	Input voltage and current of MPPTB
D	PV array A and B, Light when the array voltage is above the start voltage(150Vdc)
E	Current power
F	Daily energy
G	Total energy generated since the inverter was installed
H	Light when the array voltage is above the start voltage(150Vdc)
I	Lighted when "H" is lighted and feed-in
J	Output phase of the line conductor, switch every 5 seconds.
K	Output voltage /current /frequency of the line conductor
L	Graphical display of the inverter energy/power
M	



RS232 communication



RS485 communication



External wireless communication



Internal wireless communication

6.4.2 Graph

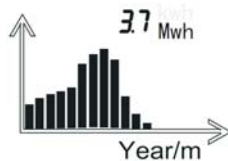
The inverter energy and/or power is shown as a graph on the display. The lower right-hand bar of the graph represents the current unit of time: Day/h, Week/day, Month/M, Year/Y. The top bar of the graph represents the maximum value of the graph values. The daily graph is displayed by default. You can trip the enclosure lid three times to switch the current unit of time and the generation information.



The graph shows recent 16 hours of power generation and the maximum value power of the 16 values.



The graph shows recent 7 days of power generation and the maximum value power of the 7 values.



The graph shows recent 12 months of power generation and the maximum value power of the 12 values.



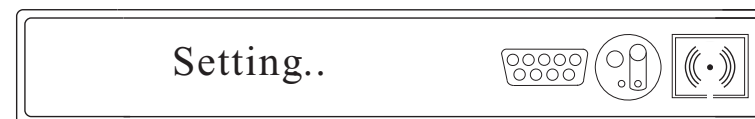
The graph shows recent 16 years of power generation and the maximum value power of the 16 values.

6.4.3 Text line

The Text line is used for displaying an event. Include the information of setting language, models, communication address, and time. The “Power Rate” and “Power Factor” are take turn to display by default. You need input “123” before enter into the setting interface.

You can operate the inputting “123” :

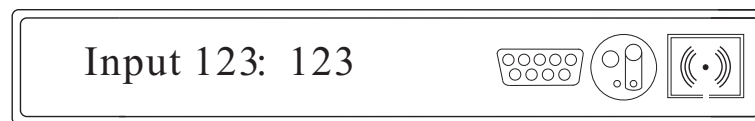
1) Single knock the enclosure lid until the text line switch to the text as follow:



2) Double knock, the text will show “input123: 000”.



3) Double knock the enclosure lid ready to input password. Single knock to change value of first, double knock enter into next position.



4) Knock the enclosure lid three times to enter into setting interface.

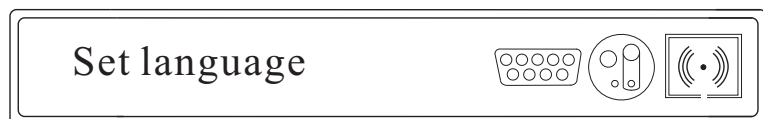


5) Knock the enclosure lid four times to exit setting interface.

You can operate the settings as follow:

a) Setting language

1) Knock the enclosure lid once every time until the text line switch to the text as follow:

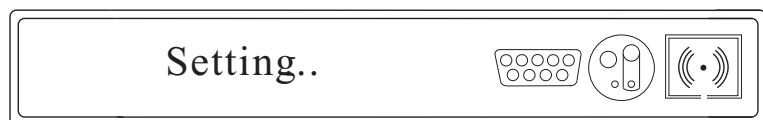


2) Knock the enclosure lid twice and the text will show the language.



3) You can choose the language by tripping the enclosure once; the language includes English, Deutsch, Espanol, Francais, Italiano.

4) Then you can trip the enclosure three times to confirm the language you have chosen. And the text line change as follow:



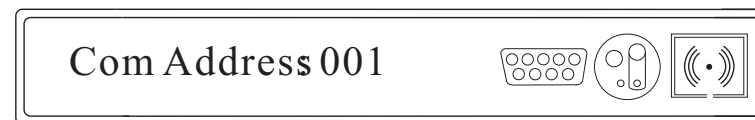
The language is set!

b) Setting Com Address



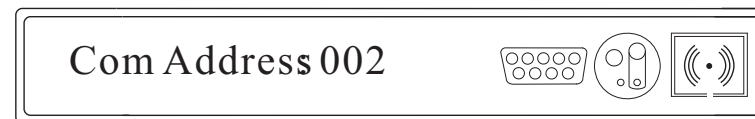
For the communicating, the inverter needs a communication address. In multi system, the addresses of inverters must be different from one to another.

1) Single knock until the text line switch to the text as follow:



2) Double knock the enclosure lid and the lower number text "1" will flash: 001.

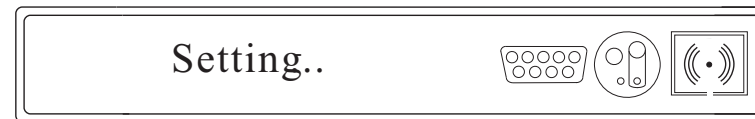
3) If you want to change it, single knock to change it from 0 to 9.



4) If you want to set the address more larger, double knock the enclosure lid to let the higher number text "002" flashing. And single knock the enclosure lid to change it from 0 to 9. So as the highest number text. In the general condition, the maximum number of the address is within 32.



5) Then you can knock the enclosure three times to confirm the address you have set.



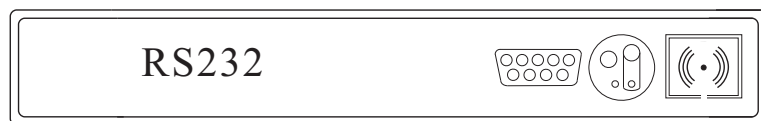
The Com Address is set!

C) Switching the RS232 and the External wireless communication



As the Serial communication with the computer and the external wireless communication using the same serial port, we have to choose one. The RS232 is communicating to computer so that the computer can be connected to the inverter using our software tools. The RS232 is chose by default in the inverter.

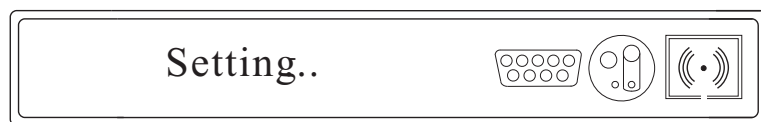
1) Trip the enclosure lid once every time until the text line switch to the text as follow:



2) Double knock the enclosure lid and switching to external wireless communication.follow:



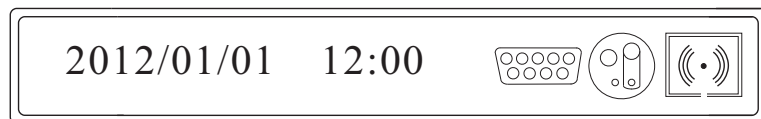
3) Then knock the enclosure three times to confirm it. And the text line change as follow:



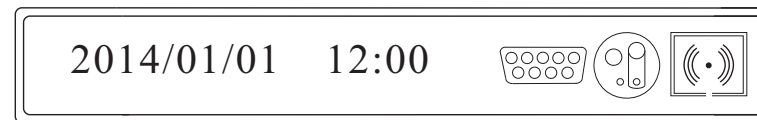
The External wireless communication is set!

d)Setting date and time

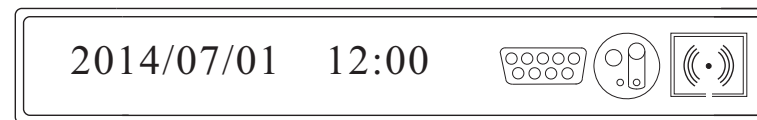
1) Single knock the enclosure lid until the text line switch to the text as follow (the time maybe different depends on the inverter) :



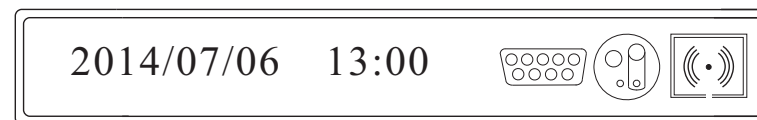
2) Double knock the enclosure lid and the text will switch to the year"2012", and the two lower numbers "2012" will flash, you can change it by single knock.



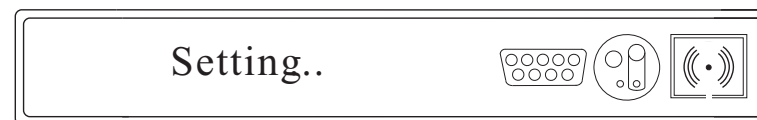
3) Double knock the enclosure lid and switching to the month"01", and it will flash. Then you can change it by single knock.



4) So as to setting the day and the time.



5) Then you need knock the enclosure three times to confirm it. And the text line change as follow:



The date and the time are set!

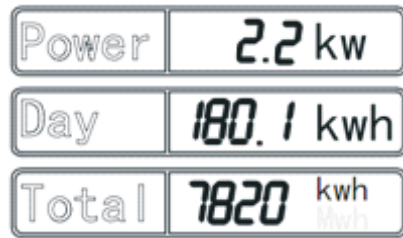


You can set all above by Growatt software 'Shinebus' with computer.

For further information please go to the site: www.ginverte.com.

6.4.4 Power display

The power and energy of the inverter are displayed in three fields: Power, Day and Total. The display is updated every five seconds.



Power

The power is that the inverter is currently feeding into the electricity grid.

Day

The energy fed into the electricity grid on this particular day. This equals the energy generated from the inverter's start-up in the morning to the current time.

Total

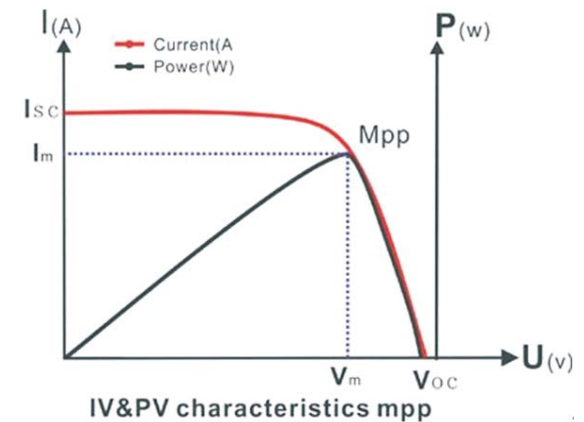
The total energy is that the inverter has fed into the electricity grid during its entire operating time.

Measurement accuracy

The display values may deviate from the actual values and must not be used for billing purposes. The inverter's measurement values are required for the operational control and to control the current to be fed into the electricity grid. The inverter does not have a calibrated meter.

6.5 Double MPPT of the Growatt UE

The Growatt UE includes dual input section to process two strings with independent MPPT, high speed and precise MPPT algorithm for real-time power tracking and energy harvesting, as well as transformerless operation for high performance, the max conversion efficiency is up to 98%. The wide input voltage range makes the inverter suitable to low power operation as well as the high power operation. As the weather influence and the location of two MPPT PV arrays different, the power of the MPPT A inputs is different from the power inputs of the MPPT B at the same time, the Growatt UE works at a non-symmetrical input state. But the MPPT algorithm of the inverter makes it tracking the maximum power point of every MPPT channel to improve the energy utilization of the PV arrays.

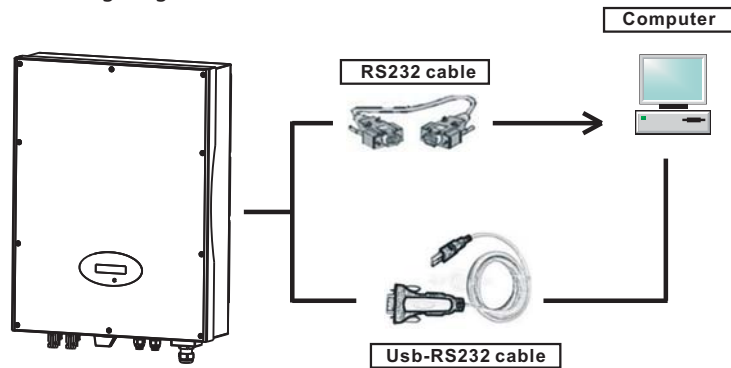


6.6 Communication

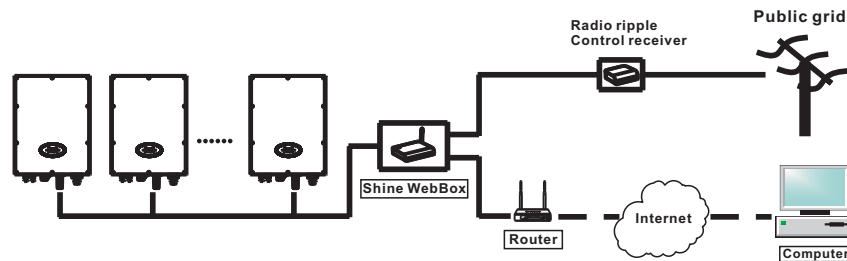
About the software of shinebus and the usage of it please download from the web: www.growatt.com/channel to improve the energy utilization of the PV arrays.



The connecting diagram as follow:



Active power control with a ripple control signal receiver



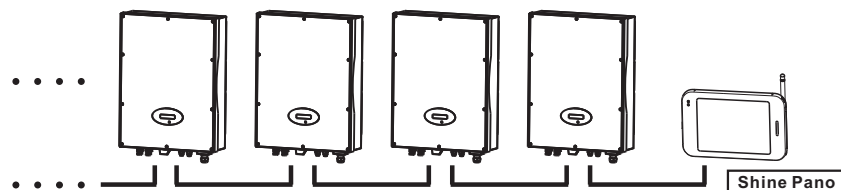
6.6.2 Monitor the inverters

The inverter provides RS485 interface and RS232 interface to communicate with remote PC or logger. User can monitor the inverter state via the following types of communication systems.

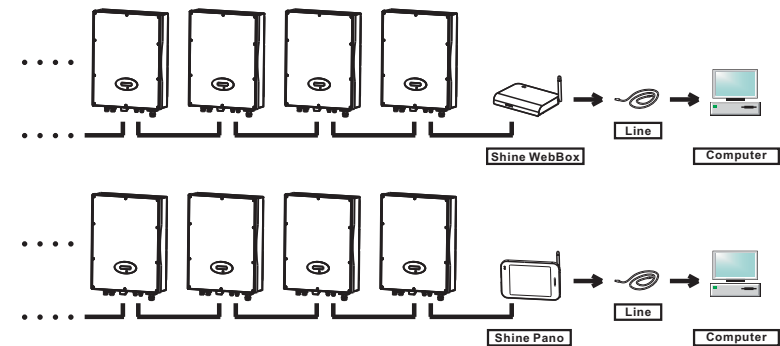
You can update firmware via RS232 or RS485*

Plan A:

- Through RS485 interface-Data logger.



- Through RS485 interface-Data logger.

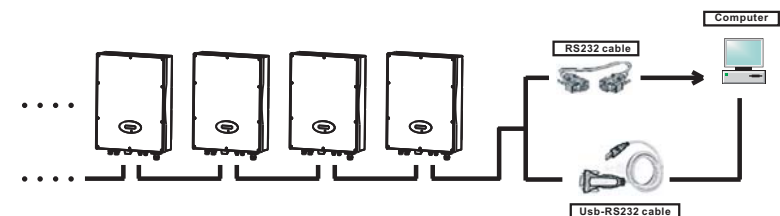


- Through RS485 interface-Data logger.

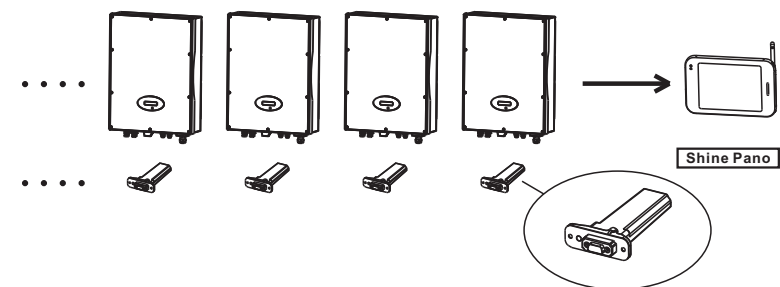
*Only for the inverter with the firmware after 0D37+0C30



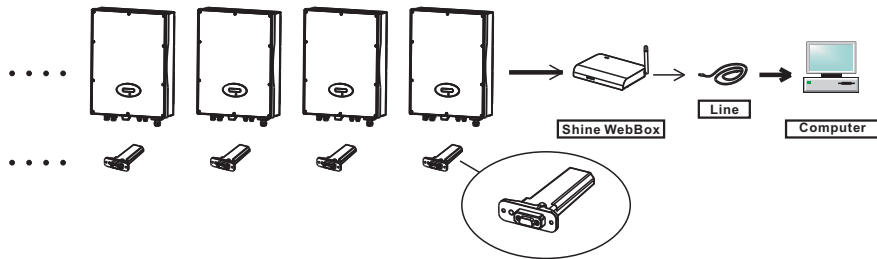
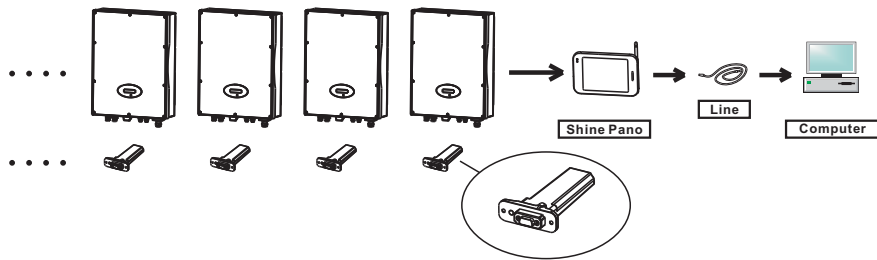
If you want to update firmware online, please disconnect AC breaker of the inverter first. If you plan to update firmware via RS485, please disconnect the monitor device.



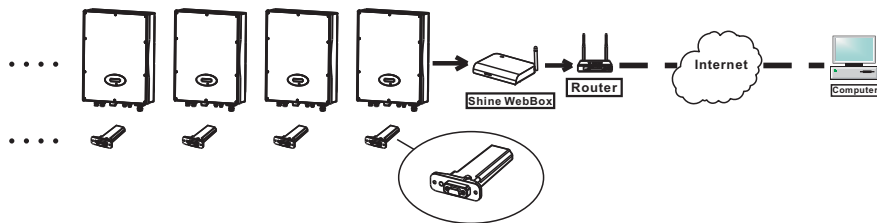
- Through RS232 interface- wireless module-Data logger.



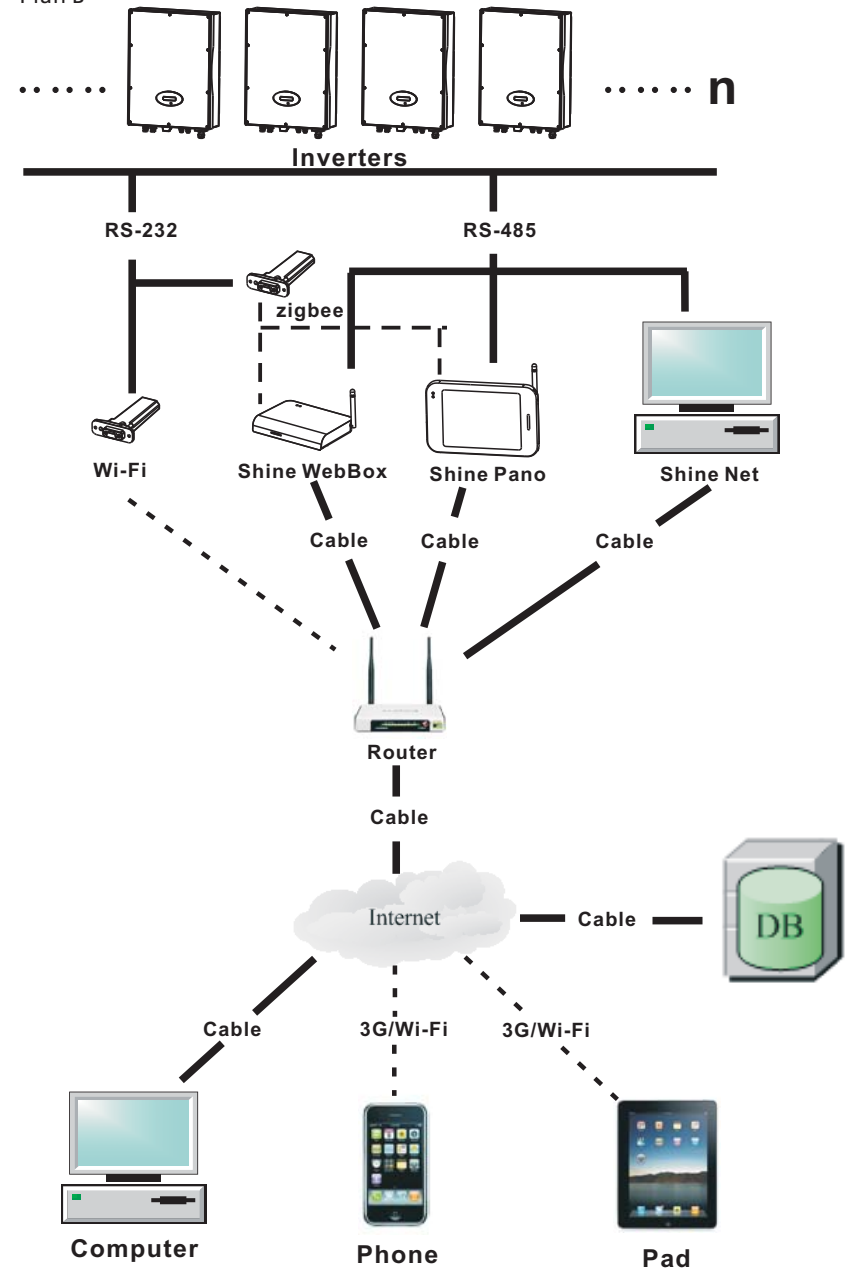
- Through RS232 interface- wireless module-Data logger-PC.



- Through RS232 interface- wireless module-Data logger-Internet.



Plan B





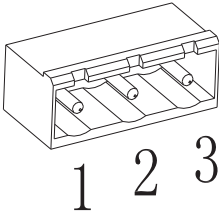
When three phase inverter and single-phase inverter shared a RS485 communication line, the total length of which does not exceed 1km.

6.6.3 RS485 cable connection

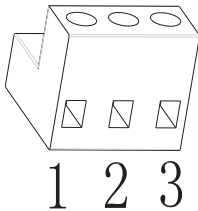
Please loosen four screws, take down the RS485 waterproof cover from inverter. If you don't choose RS485 as communication method, keep it on the inverter.

Type 1 (standard)

Definitions of RS485 socket (standard) as follows:

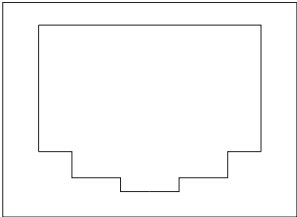
Pin1----- RS485A	
Pin2----- Shielding layer or no connection	
Pin3----- RS485B	

Definitions of RS485 PLUG (standard) as follows:

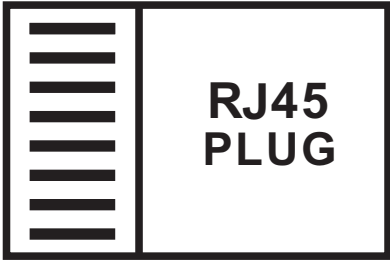
Pin1----- RS485A	
Pin2----- Shielding layer or no connection	
Pin3----- RS485B	

Type 2

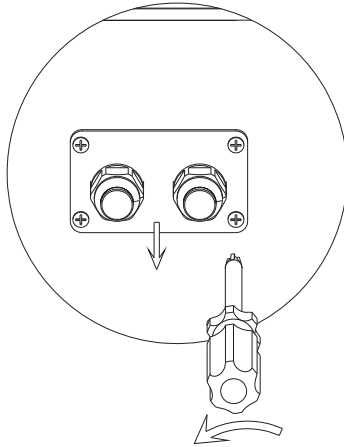
Definitions of RJ45 socket pins as follows:

Pin1----- No connection	<div>PIN 1--->8</div> <div></div> <div>RJ45 SOCKET</div>
Pin2----- No connection	
Pin3----- No connection	
Pin4----- RS485A	
Pin5----- RS485B	
Pin6----- No connection	
Pin7----- Short with Pin8	
Pin8-----Short with Pin7	

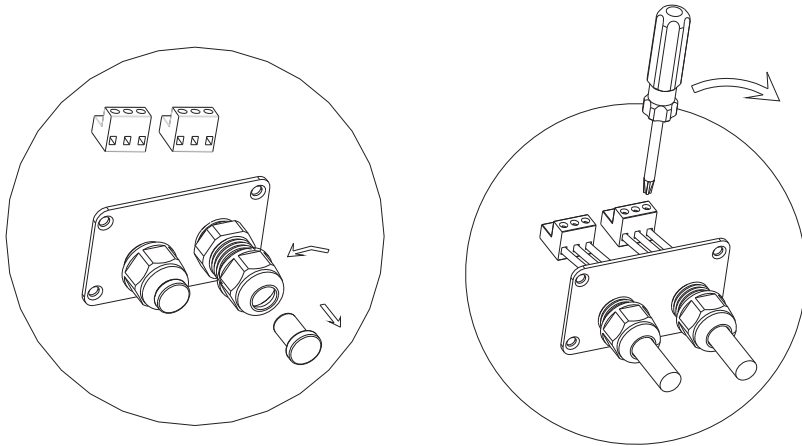
Definitions of RJ45 plug pins as follows:

No. of RJ45 plug	Color of the wires	<div><div>1 2 3 4 5 6 7 8</div><div></div><div>RJ45 PLUG</div></div>
1	white and orange	
2	orange	
3	white and green	
4	blue	
5	white and Blue	
6	green	
7	white and brown	
8	brown	

1. Please loosen four screws, take down the RS485 waterproof cover from inverter. If you don't choose RS485 as communication method, keep it on the inverter.



2. Slightly loosen the swivel nut, remove the filler-plug from the M16 cable gland.

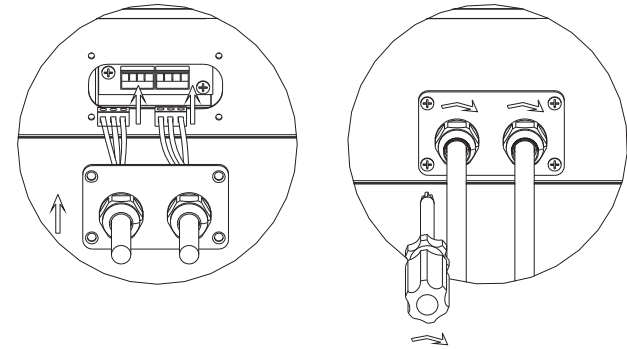


3. Make the cable through the hole of cable gland and put the cable into the RS485 terminals, fix all cables with screwdriver ('1'to'1', '3'to'3', '2' to the shielding layer or no connection.). The type of cable is recommended as "KVVRP22/2*1.5mm²".



Pull cables outwards to confirm whether they are installed firmly

4. Plug in two terminals. Cover the fix board.



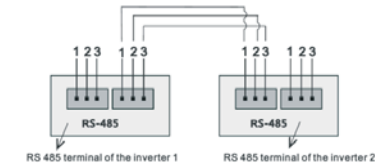
Information

Tighten 4 pcs screws first, then tighten cable gland.

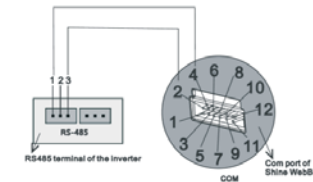
5. Tighten 4pcs screws and cable gland.

Note:

1) As to the connection between inverters, please refer to the following figure.



2) As to the connection between inverter and ShineWebBox (ShinePano), please



7 Start-Up and shut down the inverter

7.1 Start-Up the inverter

1. Turn on the AC grid breaker;
2. Turn on the DC switch of the inverter, and the inverter will start automatically when the input voltage is higher than 150V.

7.2 Shut down the Inverter

1. Turn off the AC grid breaker;
2. Turn off the DC switch of the inverter.
3. Check the inverter operating state.
4. Until the display of LCD goes out, the inverter is shut down.

Maintenance and Cleaning 8

Once the output power is derating because of too high warming, some tips can help you solve such problems:

- The air grills are clogged. To clean the air grills or heat sink.
- Ventilation of installation location is poor. Choose appropriate installation location before mounting.

8.1 Cleaning the Inverter

If the inverter is dirty, turn-off the AC breaker and DC switch, waiting the inverter shut down, then clean the enclosure lid and the display using only a wet cloth. Do not use any cleaning agents (e.g. solvents or abrasives).

8.2 Checking the DC Disconnect

Check for externally visible damage and discoloration of the DC Disconnect and the cables at regular intervals. If there is any visible damage to the DC Disconnect, or visible discoloration or damage to the cables, contact the installer.

- Once a year, turn the rotary switch of the DC Disconnect from the "On" position to the "Off" position 5 times in succession. This cleans the contacts of the rotary switch and prolongs the electrical endurance of the DC Disconnect.

9 Trouble shooting

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 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 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
AC V Outrange	Utility grid voltage is out of permissible range.	1. Check grid voltage. 2. Check AC wiring, especially the ground wire. 3. If the error message still exists despite the grid voltage being within the tolerable range, contact Growatt.
ACF Outrange	Utility grid frequency out of permissible range.	1. Check AC wiring and 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. Check the impedance of PV (+) & PV (-) between ground (must be more than 800 K Ω). If the error message is displayed despite the above checking passed, contact Growatt.
Residual I High	Leakage current too high	1. Restart invert 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.	1. Disconnect the DC wire immediately. 2. Check the voltage of each PV string with multimeter. 3. If the voltage of PV strings is lower than 780V, contact Growatt.
Auto Test Failed	Auto test didn't pass.	Restart inverter, repeat Auto Test, if problem still exist, contact Growatt.
Over Temperature	NTC OPEN or the temperature of heatsink is too high.	If the ambient temperature of inverter is lower than 60°C , restart invert, if error message still exists, contact

9.3 Inverter warning

Warning code	Meanings	Suggestion
Warning103	Fail to read EEPROM.	Restart the inverter. If the warning still exist, please contact Growatt customer service to replace the COM board.
Warning104	firmware version is not consistent.	Uptate the right version firmware.
Warning 105	Fail to write EEPROM.	Restart the inverter. If the warning still exist, please contact Growatt customer service to replace the COM board.

9.4 Inverter fault

Error code	Meanings	Suggestion
Error: 101	Communication board has not received data from control board for 10 seconds.	1、 Restart inverter, if problem still exist, update the firmware; 2、 Change control board or COM board, if problem still exist, contact Growatt.
Error: 103	EEPROM fault.	Restart inverter, if problem still exist, Contact Growatt.
Error: 107	The AC voltage sampled by the main MCU and redundant MCU is not the same.	Restart inverter, if problem still exist, Contact Growatt.
Error: 117	Relay fault.	Restart inverter, if problem still exist, Contact Growatt.
Error: 119	GFCI fault.	Restart inverter, if problem still exist, Contact Growatt.
Error: 121	Control board has not received data from Communication board for 5S.	1. Restart inverter, if problem still exist, update the firmware; 2. Change control board or COM board, if problem still exist, contact Growatt.

10 Decommissioning

10.1 Dismantling the Inverter

- 1. Disconnect the inverter as described in section 7.
- 2. Remove all connection cables from the inverter.



Danger of burn injuries due to hot enclosure parts!
Wait 20 minutes before disassembling until the housing has cooled down.

- 3. Screw off all projecting cable glands.
- 4. Lift the inverter off the bracket and unscrew the bracket screws.

10.2 Packing the Inverter

If possible, always pack the inverter in its original carton and secure it with tension belts. If it is no longer available, you can also use an equivalent carton. The box must be capable of being closed completely and made to support both the weight and the size of the inverter.

10.3 Disposing of the Inverter



Do not dispose of faulty inverters or accessories together with household waste. Please accordance with the disposal regulations for electronic waste which apply at the installation site at that time. Ensure that the old unit and, where applicable, any accessories are disposed of in a proper manner.

Specification 11

11.1 Specification of Growatt UE

Model	Growatt 4000UE	Growatt 5000UE	Growatt 6000UE
Specification			
Input data			
Max. DC power	4200W	5200W	6300W
Max. DC voltage	800V	800V	800V
Start Voltage	150V	150V	150V
PV voltage range	140V-800V	140V-800V	140V-800V
MPP voltage range/ nominal voltage	200V-800V/580V	200V-800V/580V	200V-800V/580V
Full load voltage range	250V-750V	300V-750V	350V-750V
Max. input current	9A/9A	9A/9A	10A/10A
Number of independent MPP trackers/strings per MPP tracker	2/1	2/1	2/1

Output (AC)

Max. AC apparent power	4000VA	5000VA	6000VA
Max. AC power (PF=1)	4000W	5000W	6000W
Nominal AC power (PF=0.95)	3800W	4750W	5700W
Max. output current	6.4A	7.9A	9.3A
AC nominal voltage; range	3/N/PE, 230V/400V 185~260V	3/N/PE, 230V/400V 185~260V	3/N/PE, 230V/400V 185~260V
AC grid frequency; range	50/60Hz 44-55Hz/54-65Hz	50/60Hz 44-55Hz/54-65Hz	50/60Hz 44-55Hz/54-65Hz
Power factor at rated power	1	1	1
Power factor	0.9leading - 0.9laging	0.9leading - 0.9laging	0.9leading - 0.9laging
THDi	<3%	<3%	<3%
AC grid connection type	Three phase	Three phase	Three phase

Efficiency

Max efficiency	97.8%	97.8%	97.8%
Euro-eta	96.5%	96.6%	96.8%
MPPT efficiency	99.5%	99.5%	99.5%

Protection devices

DC reverse polarity protection	yes	yes	yes
DC switch for each MPPT	yes	yes	yes
Output AC overcurrent protection	yes	yes	yes
Output AC overvoltage Protection - Varistor	yes	yes	yes
Ground fault monitoring	yes	yes	yes
Grid monitoring	yes	yes	yes
Integrated all-pole sensitive leakage current monitoring unit	yes	yes	yes

General Data

Dimensions(W/H/D) in mm	433/620/194 mm 17.0/24.4/7.6 inch	433/620/194 mm 17.0/24.4/7.6 inch	433/620/194 mm 17.0/24.4/7.6 inch
Weight	30kg/66.2lb	32.5kg/71.7lb	32.5kg/71.7lb
Operating temperature range	- 25 °C ... +60 °C (- 13 °F ... +140 °F) With derating above 45 °C (113 °F)	- 25 °C ... +60 °C (- 13 °F ... +140 °F) With derating above 45 °C (113 °F)	- 25 °C ... +60 °C (- 13 °F ... +140 °F) With derating above 45 °C (113 °F)
Noise emission (typical)	≤ 35 dB(A)	≤ 35 dB(A)	≤ 35 dB(A)

Altitude	2000m(6560ft) without derating		
Self-consumption night	<0.5 W	<0.5 W	<0.5 W
Topology	transformerless	transformerless	transformerless
Cooling concept	No Fan	No Fan	No Fan
Environmental Protection Rating	Ip65	Ip65	Ip65
Relative humidity	0...95% Non-condensing	0...95% Non-condensing	0...95% Non-condensing

Features

DC connection	H4/MC4(opt)	H4/MC4(opt)	H4/MC4(opt)
AC connection	Screw terminal	Screw terminal	Screw terminal
Display	LCD	LCD	LCD
Interfaces: RS232/RS485/Bluetooth /RF/Zigbee/Wifi	yes/yes/opt/opt /opt/opt	yes/yes/opt/opt /opt/opt	yes/yes/opt/opt /opt/opt
Warranty: 5 years / 10 years	yes /opt	yes /opt	yes /opt
Certificates and approvals	CE VDE0126-1-1, N4105,IEC 62109, AS3100 ,AS4777,EN61000-6-2 ,EN61000-6-3		

11.2 DC connector info

H4 Specification:

Contact size	2.5mm2/14AWG	4mm2/12 AWG
Rated current(at 90°C)	32A	40A
Rated system voltage	600V DC(UL) 1000V DC(TUV)	
Contact resistance	0.25mΩ TYP	
Degree of protection(mated)	Ip68	
Socket contact material	Copper. Tin plated	
Insulation material	Thermoplastic, UL94 V-0	
Ambient temperature range	-40°C to +90°C	
Strip length	7.0mm(9/32)	
Cable jacket diameter	4.5 to 7.8mm(3/16: to 5/16")	

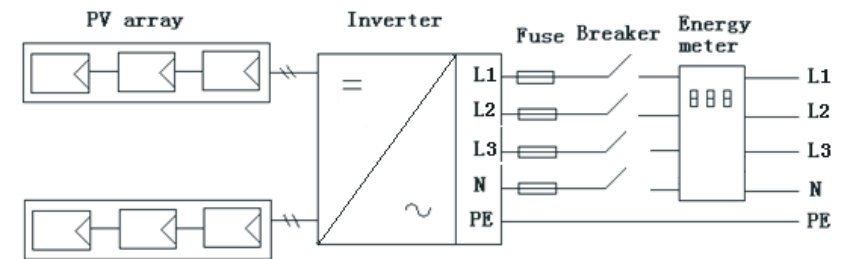
11.3 Torque Values

Enclosure lid screws	0.7Nm(6.2 1bf.in)
Shell and RS232 screws	0.7Nm(6.2 1bf.in)
AC terminal	0.6Nm(5.2 1bf.in)
M6 socket head cap screws for securing the enclosure at the bracket	2Nm(18 1bf.in)
Additional ground screws	2Nm(181bf.in)

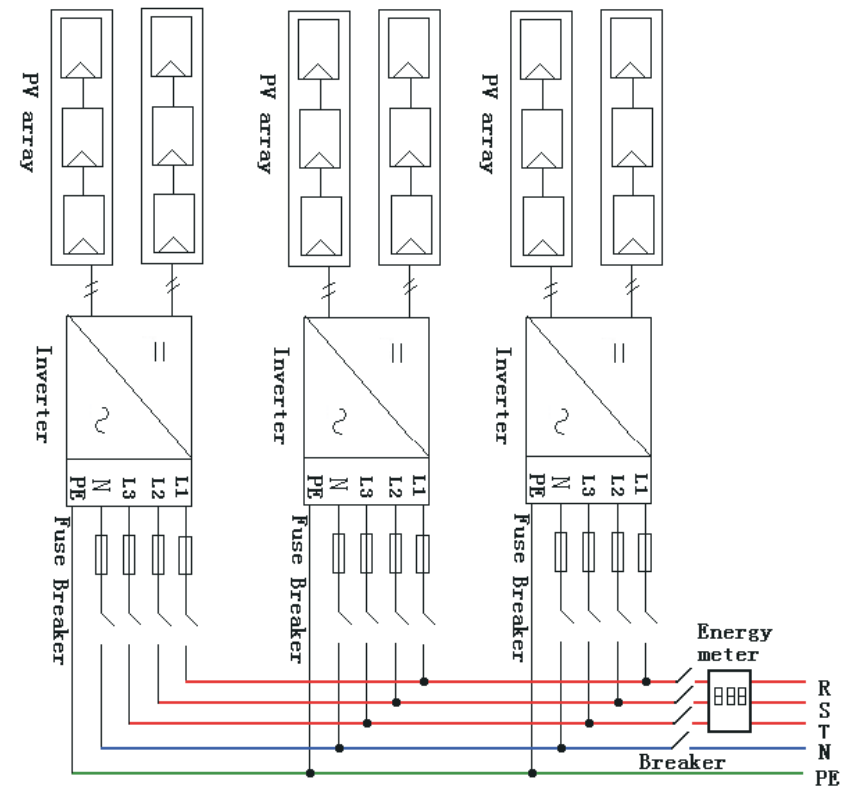
11.4 Spare Parts and Accessories

Name	Description	Growatt order number
Shine Webox	Communication data logger	MR00.0001700
Shine Pano	Communication data logger	200.0004900
Shine Vision receiver	Communication data logger receiver	MR00.0000201
Shine Vision emitter	Communication data logger emitter	MR00.0000601
Zigbee	Communication interface	200.0007000
Wi-Fi	Communication interface	200.0009000
Bluetooth	Communication interface	MR00.0002200

11.2 DC connector info



12.2 Multi inverters



13 Certificates

Growatt UE is designed to use worldwide, hence the inverters meet different safety standards of variety countries and regions.

Model	Certificates
Growatt 5000UE	CE ,VDE0126-1-1, N4105,IEC 62109, AS3100 ,AS4777
Growatt 4000UE	
Growatt 6000UE	

14 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 inverter

Shenzhen Growatt New Energy Technology CO.,LTD

1st East & 3rd Floor, Jiayu Industrial Zone, Xibianling, Shangwu Village,
Shiyan, Baoan District, Shenzhen,P.R.China

Serviceline

T: + 86 755 2747 1942

F: + 86 755 2747 2131

E: service@ginverter.com