powering tomorrow
Growatt

Growatt 3600 MTL-10

Growatt 4200 MTL-10

Growatt 5000 MTL-10

Installation & Operation Manual ▶

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GR - UM - 012 - 05

Directory

1.1 Validity

This manual describes the assembly, installation, commissioning and maintenance of the following Growatt Inverters:

Growatt 3600 MTL-10
Growatt 4200 MTL-10
Growatt 5000 MTL-10

This manual does not cover any details concerning equipment connected to the Growatt MTL-10(e.g. PV modules). Information concerning the connected equipment is available from the manufacturer of the equipment.

1.2 Target Group

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

Additional information

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

Notes: The manual and other documents must be stored in a convenient place and be available at all times.

1.3 Safety

Appropriate Usage

The Growatt PV Inverter converts DC Current from PV generator into AC current. The Growatt PV Inverter is suitable for mounting indoors and outdoors.

You can use the AC current gernerated 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 is not gernerating any energy, e.g., at night, the consumers which are connected are supplied by the public grid.The Growatt does not have its own energy meter. 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 is connected to a separate energy meter. The energy produced is compensated at a rate depending on the electric power company.

Stand-alone grid:

The Growatt is connected to a stand-alone grid.A stand-alonr grid is a grid which is not connected to a public grid ,the growatt needs a grid-forming generator in order to function, The energy generated is consumed directly on site, surplus energy can be stored in batteries.but the energy must not fed to the grid-forming generator. or it will destory the grid-forming generator.

Alternative uses, modifications to the Growatt PV inverter or the installation of component parts not expressly recommended or sold by Growatt are not permitted.

Persons with limited physical or mental abilities may only work with the Growatt PV inverter following proper instruction and under constant supervision. Children are forbidden to play with the Growatt PV inverter. Keep the Growatt PV inverter away from children.

DC and AC Switch

Separate the Growatt MTL-10 securely from the grid and the PV generators using DC and AC Switch. DC and AC Switch shall be able to disconnect all unground conductors after installation.

Notes: The Growatt MTL-10 include a DC switch ,if you turn off it when inverter is working , please waiting 5 minutes to turn on it again.

Grounding the PV modules

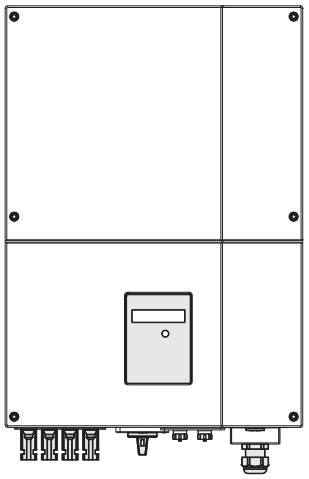
The Growatt MTL-10 is a transformerless inverter. That is why it has no galvanic separation. Do not ground the DC circuits of the PV modules connected to the Growatt MTL-10. Only ground the mounting frame of the PV modules.

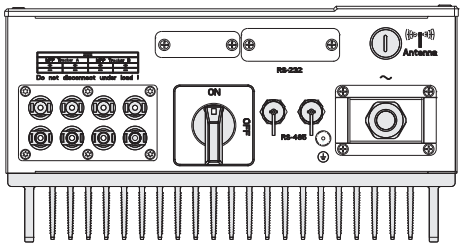
If you connect grounded PV modules to the Growatt MTL-10, the error message "PV ISO Low".

Qualification of Skilled Workers

- Knowledge of how an inverter works and is operated
- Instruction in how to deal with the dangers and risks associated with installing and using electrical devices and plants
- Training in the installation and commissioning of electrical devices and plants
- Knowledge of all applicable standards and guidelines
- Knowledge and observance of this manual and all safety instructions

2.1 Overview





2.2 Identifying model and basic datasheet

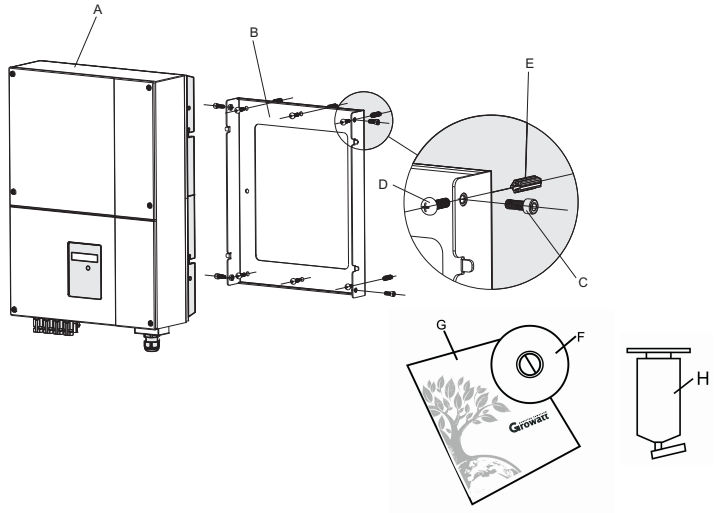
You can identify the PV inverter by the type label.
It is on the left-hand side of the enclosure.

It includes follow information:

- The type of product (Type/Model).
- Device-specific characteristics.
- Certificates and approvals.

GROWATT PV Grid Inverter	
Model Name	**********
U DC max	***V
I DC max	**A/**A
U DC range	***V
V AC norm	***V
f AC norm	**Hz
P AC norm	****W
I AC norm	**A
PF(norm)	1.0
Protection Degree	IP 65
Operation Ambient Temperature	-25°C~+60°C
CE	VDE-AR-N 4105, VDE126-1-1 CEI 0-21

After opening the package, please check the contents of the box.
It should contain the following:



Item	Name	Quantity
A	solar inverter	1
B	Mounting frame	2
C	Safety-lock screws	2
D	Mounting screws	4
E	Mounting frame screws sleeve	4
F	Monitor software(disk)	1(Optional)
G	manual	1
H	Bluetooth	1(Optional)

Notes: Please check all of the accessories carefully in the carton. If anything missing, contact your dealer at once. Thoroughly inspect the packaging upon delivery, if you detect any damage to the packaging which indicates the inverter may be damaged, inform the responsible transport company immediately. We will be glad to assist you if required.

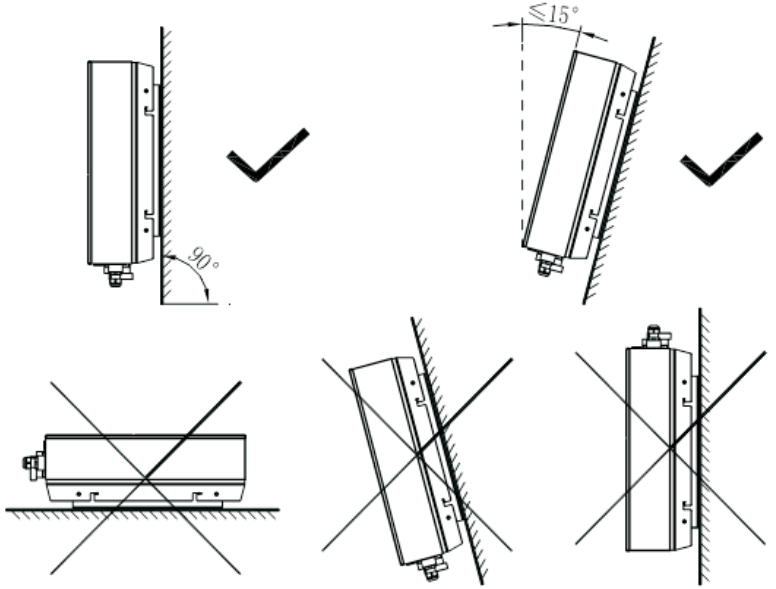
4 INSTALLATION

4.1 Safety instructions

- 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 of energy 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.
- According to VDE-AR-N 4105,password is given for protection. For CEI 0-21, no password needed.

4.2 Selecting the INSTALLATION location

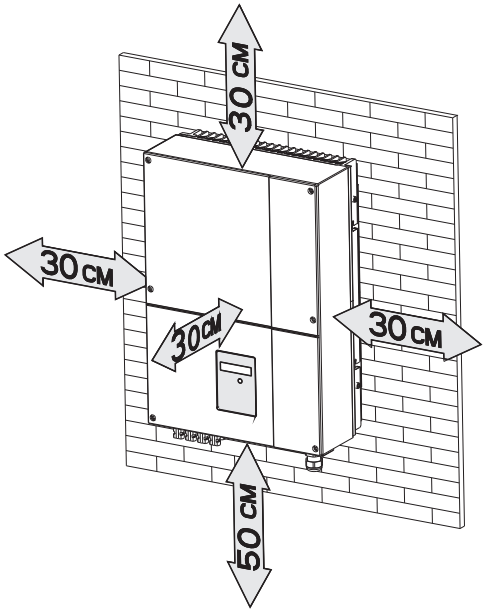
- The installation method and mounting location must be suitable for the weight and dimensions of the inverter. Select a wall or solid vertical surface that can support the PV-Inverter.
- Mount on a solid surface, the mounting location must be accessible at all times.
- In living areas, do not mount the unit on plasterboard walls or similar to avoid audible vibrations. When in use, the inverter emits noises which may be perceived as a nuisance in a living area.
- Vertical installation or tilted backwards by max. 15°.
- The connection area must point downwards.
- Do not install horizontally.
- Be sure that the inverter is out of the children's reach.
- Don't put any things on the inverter. Do not cover the inverter.



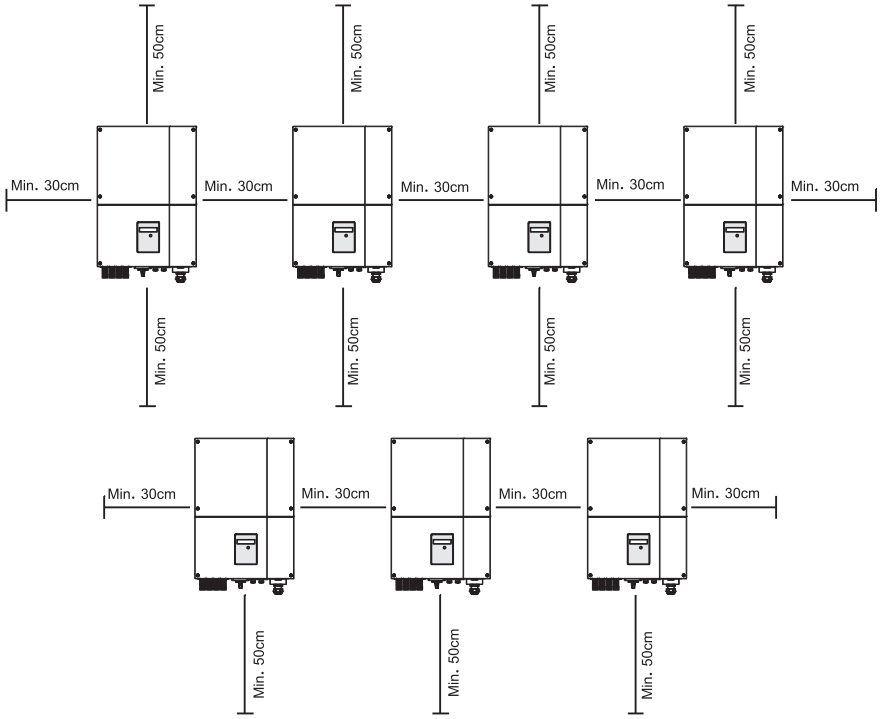
4.3 Fixed the mounting on the wall

- Inverter requires adequate cooling space. Providing better ventilation for the inverter to ensure the heat escape adequately. The ambient temperature should be below 40°C to ensure optimum operation.
- Do not expose the inverter to direct sunlight, as this can cause excessive heating and thus power reduction.
- The ambient clearance needed is shown as following:

(a) Ambient dimensions of one inverter



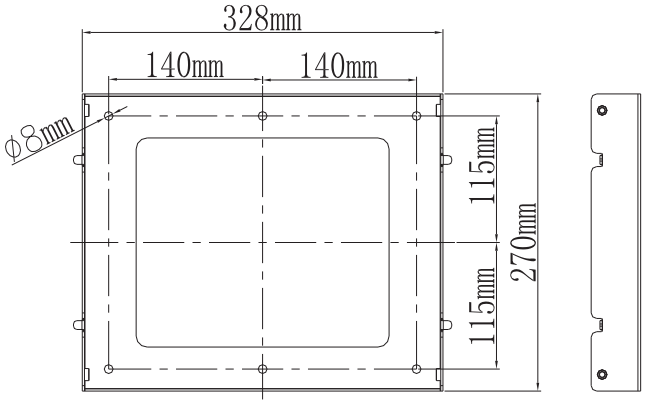
(b) Ambient dimensions of a series inverters



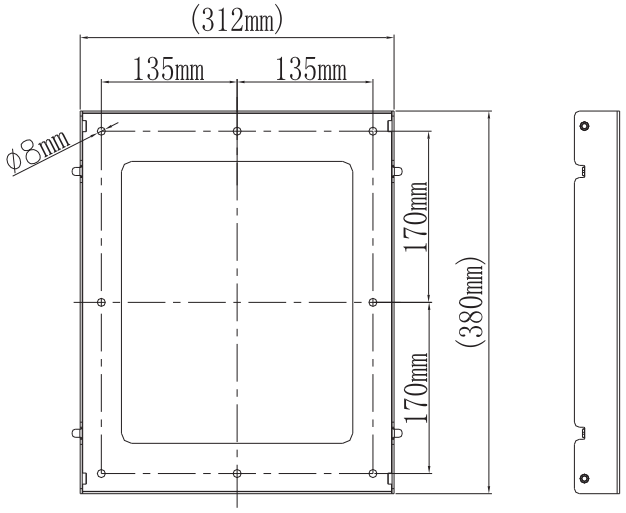
There must be sufficient clearance between the individual inverters to ensure that the cooling air of the adjacent inverter is not taken in.

If necessary, increase the clearance spaces and make sure there is enough fresh air supply to ensure sufficient cooling of the inverters.

- Using the mounting frame as a template, drill 4 holes as illustrated in image.

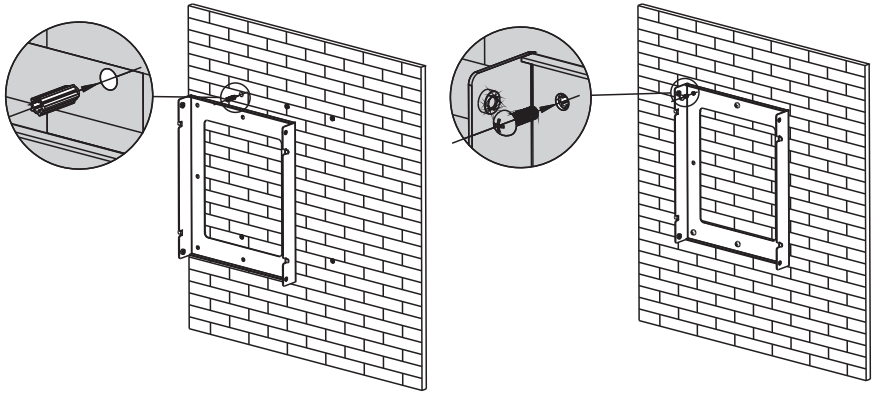


For Growatt 3600MTL-10



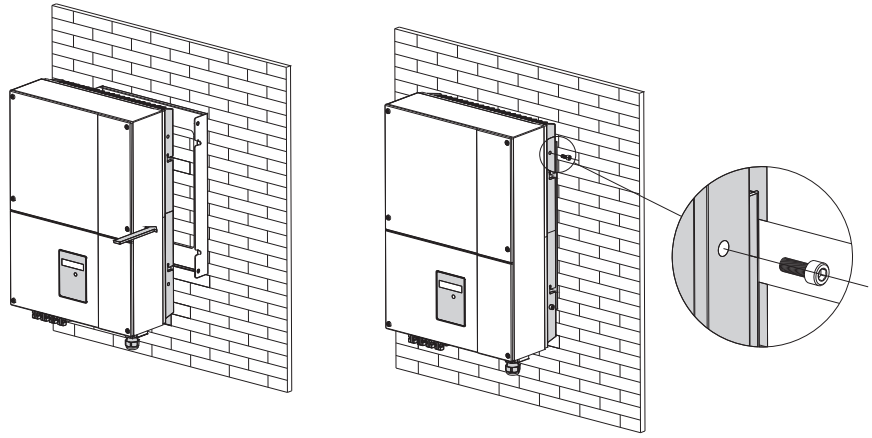
For Growatt 4200MTL-10 and Growatt 5000MTL-10

- Fix the mounting frame as the figure shows. Do not make the screws to be flush to the wall. Instead, leave 2 to 4mm exposed.



4.4 Fixed the inverter on the wall

- Hang the inverter on the mounting frame.
- Insert safety-lock screws to the bottom leg to secure the inverter.



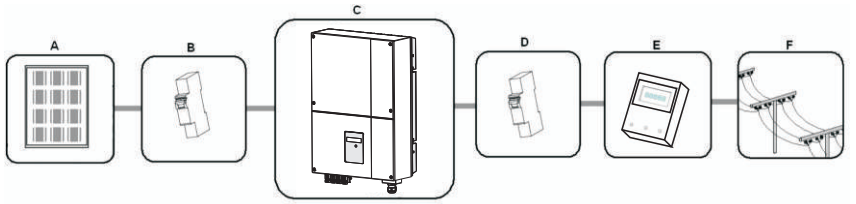
4.5 Check Inverter Installation Status

- Check the upper straps of PV-Inverter and ensure it fits on to the bracket.
- Check the secure mounting of the PV-Inverter by trying to raise it from the bottom. The PV-Inverter should remain firmly attached.
- Select the installation location so that the status display can be easily viewed.
- Choose a strong mounting wall to prevent vibrations while inverter is operating.

5 Electrical Connection

5.1 System Diagram with Inverter Electrical connection

- The inverter must be installed only by trained and authorized electricians
- Before doing the electrical connection, both AC and DC end must be disconnected from all power sources. Always disconnect the AC line first, afterwards disconnect the PV lines.
- Be sure that the inverters connect to the ground in order to protect property and personal safety.
- PV Panel: Provide DC power to inverter.
- Converts DC (Direct Current) power from PV panel(s) to AC (Alternating Current) power. Because Inverter is grid-connected it controls the current amplitude according to the PV Panel power supply. Inverter always tries to convert the maximum power from your PV panel(s).
- Connection system: This "interface" between Utility and PV-Inverter may consist of electrical breaker, fuse and connecting terminals. To comply with local safety standards and codes, the connection system should be designed and implemented by a qualified technician.
- Utility: Referred to as "grid" in this manual, is the way your electric power company provides power to your place.
- we recommend electrical connection as follows:



Position	Description
A	PV modules
B	DC load circuit breaker
C	Growatt Inverter
D	AC load circuit breaker
E	Energy meter
F	Utility grid

5.2 Safety

The Growatt Inverter must be connected to the AC ground from the utility via the Ground Terminal (PE) before wiring to the grid or PV panel!

5.3 Connecting to the grid (AC utility)

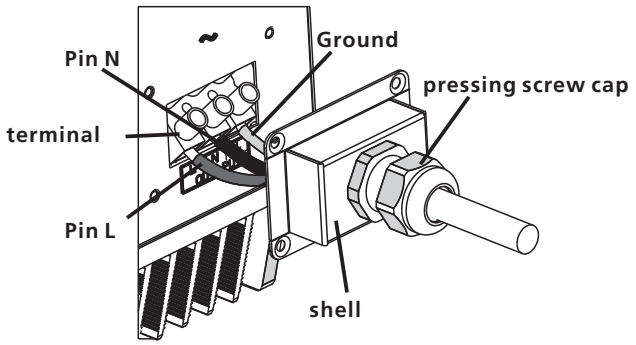
Suggestion: It is suggested that each inverter should have an individual AC breaker in order that the inverter can be disconnected safely.

Note: The PV-Inverter system capacitance can't over 13.8KVA, because the inverter's displacement factor adjust function had accorded to VDE-AR-N 4105. According to CEI 0-21, when the system capacity is smaller than 6KW, SPI needn't to be modified, PF value can be set to 0.95. When the system capacity is bigger than 6KW, SPI need to change to be 'External', PF value can be set to 0.9.

The inverter is equipped with an integrated all-pole sensitive residual current monitoring unit. The inverter can automatically distinguish between residual currents and "normal" capacitive leakage currents.

5.3.1Connection of the AC wiring

- Open the breaker or fuse between PV Inverter and utility.
- For the inverter , connecting AC wires as follows:
  - the strip insulation length of L, N ,PE is 5mm.
  - all wires through the shell and screw to the AC terminal connection.
  - screwing the shell to inverter and pressing screw cap tighten.



Wire requirements

Product Model	_(mm)	Area(mm²)	AWG no.
Growatt 3600MTL-10	_2.59	5. 260	10
Growatt 4200MTL-10	_2.59	5.260	10
Growatt 5000MTL-10	_2.59	5.260	10

5.4 Connecting to PV Panels(DC input)

Warning:

• Risk of electric shock and fire, use only with PV modules with a maximum system voltage of 600Vdc!

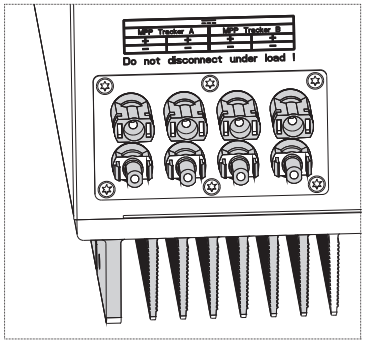
• For instance, if the positive pole of a string is connected at input zone A and the string's negative pole at input zone B, this is called a mixed connection.
Only connect strings at one input zone and never mix the input zones A and B!

Danger:

• Before connecting the PV generator, ensure the DC-switch is switched off and that it cannot be reactivated.

• Do not disconnect the DC connectors under load.

There are two MPP trackers for Growatt MTL-10, you can connect two independent MPP channels.



- Under any condition! Make sure the maximum open circuit voltage (Voc) of each PV string is less than 600Vdc.

  • Do not connect strings with an open circuit voltage greater than the Max. input voltage of the inverter. If the strings voltage exceeds the Max. input voltage of the inverter, it can be destroyed due to overvoltage. All warranty claims become void.

  • Check the design of the PV plant. The Max. open circuit voltage, which can occur at solar panels temperature of -10℃ , must not exceed the Max. input voltage of the inverter.

- Open the independent DC circuit breaker as well as the DC switch on the Growatt MTL-10 inverter.

- Before connecting PV panels to DC terminals, please make sure the polarity is correct. Incorrect polarity connection could permanently damage the unit. Check short-circuit current of the PV string.

- Connect the positive and negative terminals from the PV panel to positive (+) terminals and negative (-) terminals on the PV-Inverter. Each MPP tracker's max. input current as follow:

  15A for Growatt 5000MTL-10
  15A for Growatt 4200MTL-10
  10A for Growatt 3600MTL-10

- High voltages exist when the PV panel is exposed to the sun. To reduce risk of electric shock, avoid touching live components and treat connection terminals carefully

Cable requirements:

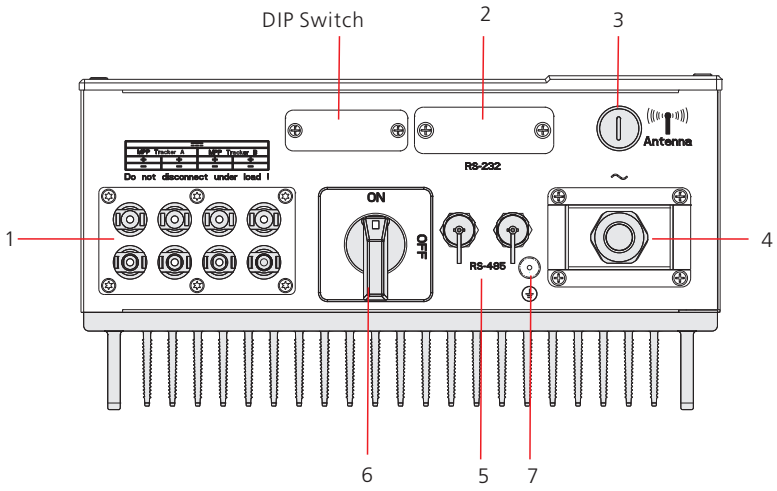
Model	_(mm)	Area(mm²)	AWG no.
Growatt 3600MTL-10	_2.59	5.260	10
Growatt 4200MTL-10	_2.59	5.260	10
Growatt 5000MTL-10	_2.59	5.260	10

5.5 Selecting country by DIP switch

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.

5.5.1 Location of the DIP switch

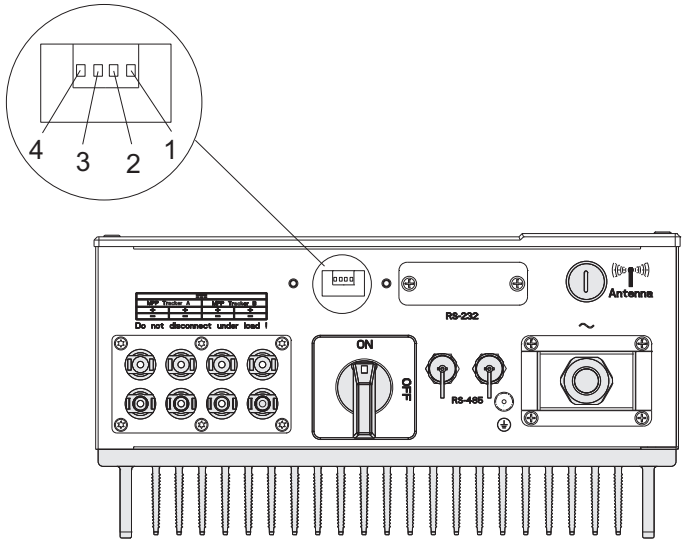
The DIP switch is located on the left of the RS 232 interface at the bottom of the inverter, as the figure below.



1. DC Connector 2. RS 232 Interface 3. Antenna
4. AC Connector 5. RS 485 Interface 6.DC Switch 7.ground point

NOTE: Before selecting country, please unscrew the dam-board of the DIP switch by appropriate tool.

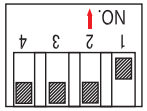
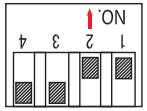
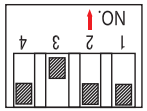
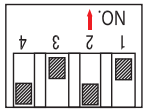
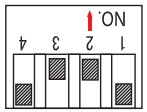
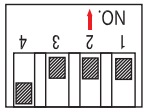
The internal structure of the DIP switch is as the following figure:

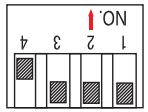
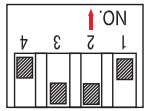
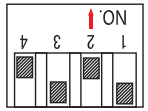
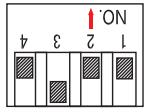
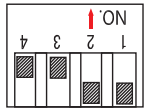
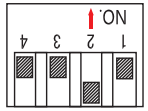
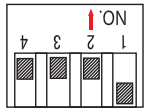
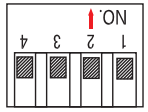


5.5.2 DIP switch option corresponding to the country

The DIP switch is composed of four-digit binary number PINS. The different combination of the four PINS can represent the last one character's value of the inverter's model, which is corresponding to different country. 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, please refer to the table below:

MTL-10 DIP switch to country table

DIP switch status	Country	Model display
	VDE 0126	GTXXXXXXX1
	AS4777	GTXXXXXXX3
	CEI 0-21	GTXXXXXXX4
	Spain	GTXXXXXXX5
	Greece	GTXXXXXXX6
	VDE-AR-N 4105	GTXXXXXXX7

DIP switch status	Country	Model display
	UK_G83	GTXXXXXXX8
	Ireland	GTXXXXXXX9
	CGC	GTXXXXXXXA
	Denmark	GTXXXXXXXB
	UK_G59	GTXXXXXXXC
	Belgium	GTXXXXXXXD
	Reserved	GTXXXXXXXE
	Reserved	GTXXXXXXXF

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 as the above table, it means your setting is successful.

Attention: you should change the time displayed on the LCD of inverter to your local time after inverter starts up.

NOTE: If the country is set incorrectly, please shut down the inverter and set again.

5.6 Commissioning

- When the PV panels are connected and their output voltage is greater than 100 Vdc(Min. input voltage) but the AC grid is not yet connected, the message on the LCD display produce the following messages in order: "Growatt Inverter"-> "Waiting" -> "No AC connection". The display repeats "No AC connection" and the LED will be red.
- Close the AC breaker or fuse between PV-Inverter and grid. The normal operating sequence begins.
- When the voltage of the strings is greater than 150Vdc (start-up voltage), the inverter will check feeding conditions at once. If there is anything wrong during checking, the inverter will turn into the "Fault" state.
- Under normal operating conditions the LCD displays "Power: xxxx.xW". That is the power fed to the grid. The LED turns green.
- This completes the check.

6.1 LCD display

Starting-up display sequence, Once the PV power is sufficient, Inverter displays information as shown in the flow chart as follow:

6.2 LCD control

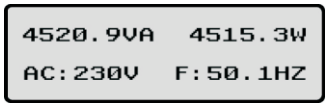
To save power, the LCD display's backlight automatically turns off after 30 seconds. The display on the inverter can be control by Knock on the front of it.

The first line will show some status of the inverter, there are 5 status listed in below table.

The First Line Of LCD

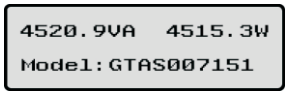
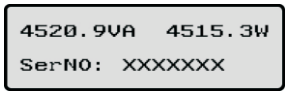
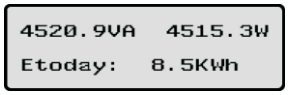
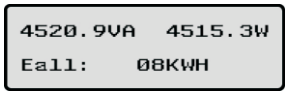
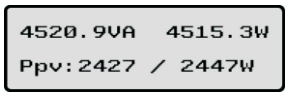
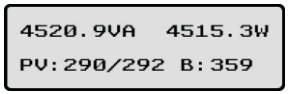
STATE	DISPLAY CONTENT	REMARK
Wait State	Standby	PV voltage low
	Waiting	Initial waiting
	Connect in xxS	System checking
	Reconnect in xxS	System checking
Inverter State	Connect OK	Connect to Grid
	xxxx.xVA xxxx.x W	Inverter watt at working
Fault State	Error: xxx	System Fault
Auto Test State	Auto Testing	Protection auto test
Program State	Programming	Update Software

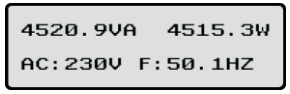
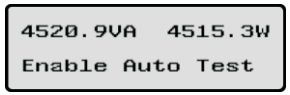
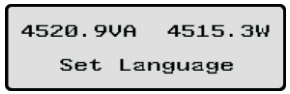
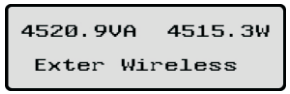
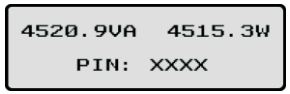
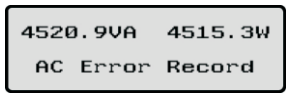
While Growatt inverter is working, the first line will normally show Power status:



The Second line can change by knock on

The Second Line Of LCD

CYCLE DISPLAY	DISPLAY TIME/S	REMARK
	2	The inverter model
	2	The software version
	2	The Serial Number
	4	The energy today
	4	The energy all
	4	PV input watt
	4	The PV and Bus Votage

CYCLE DISPLAY	DISPLAY TIME/S	REMARK
	4	The grid system
	4	The enable auto test
	4	Set Language
	4	Set Communications Address
	4	Setting exter wireless or inter wireless ,Rs232
	4	Setting Zigbee PIN/Bluetooth PIN
	4	Setting Zigbee Channel
	4	record of the 5 latest grid faults

CYCLE DISPLAY	DISPLAY TIME/S	REMARK
4520.9VA 4515.3W 2012/05/05 09:06	4	Setting year/month/day/time

6.3 Setting the LCD display

Sound control can define the display language, luminance of the display, auto test etc. when the LCD is dark, any knock to make it bright, and then single knock to make it display next item or change the setting options. Double knock can either make the displays stayed for 30s or enter the options which need to be modified.

Setting language

When the LCD stays bright, single knock to 'set language', and then double knock to enter the language options. Single knock to select the language you want, when setting finishes, wait for 30s or triple knock to save your setting.

Setting COM Address

When the LCD stays bright, single knock to 'COM Address: xxx', and then double knock to enter the setting status, single knock to change the COM Address. When setting finishes, wait for 30s or triple knock to save your setting.

Auto test

When the LCD stays bright, single knock to 'Enable Auto Test', and then double knock to enter 'Waiting to start', and then single knock to start auto test and wait for the test results.

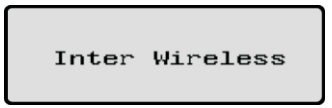
Communication Type

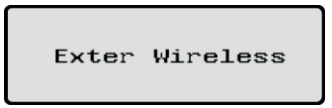
● RS 232 ● Inter wireless ● Exter wireless
(NOTE: RS485 is the standard communication type of the inverter)

Communication Mode Setting Steps:

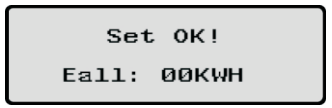
1. When the LCD stays bright, single knock until the LCD displays 'RS232', at this interface the communication type can be selected.

2. Double knock to enter the options, the options will flash. Single knock to select the option you want.

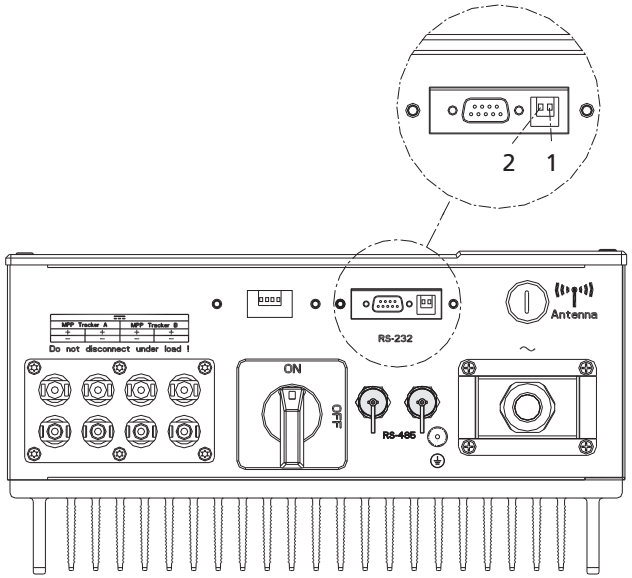




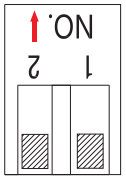
3. When setting finishes, wait for 30s or triple knock to save your setting.



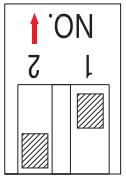
Attention: if you select RS 232 or Exter wireless, you must set the 2-PIN switch to different status. The 2-PIN switch is located beside the RS 232 interface, as the figure below.



a. when 'RS 232' is selected, you have to set PIN1 of the switch downward to OFF.

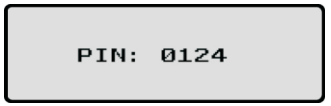


b. When 'Exter wireless' is selected, you have to set PIN1 of the switch upward to ON.



c. When 'Inter wireless' is selected, RS 232 interface will be disabled. Under this mode,if what integrated internally is Zigbee, PIN and Channel need to be set, if what integrated internally is Bluetooth, only PIN needs to be set.

PIN XXXX



Single knock on LCD to 'PIN XXXX', and then double knock to make each number of the PIN flashes. Then single knock to change the number to what you want it to be, the PIN should be same as ShineWebbox or ShinePano. When setting finishes, wait for 30s or triple knock to save your setting.

Channel :XX

Single knock on LCD to 'Channel: XX', and then double knock to make each number of Channel flashes. Then single knock to change the number to what you want it to be, the PIN should be same as ShineWebbox or ShinePano. When setting finishes, wait for 30s or triple knock to save your setting.

Setting time

When the LCD stays bright, single knock until LCD displaying 'xxxx/xx/xx xx:xx', and then double knock to enter the setting status, the numbers begin to flash. Single knock to change the number, each knock makes the flashing number add '1', and double knock to shift to next number setting. When setting finishes, wait for 30s or triple knock to save your setting.

AC Error Record Checking

When the LCD stays bright, single knock to 'AC Error Record', and then double knock to enter the checking status. Single knock to check each error item, triple knock can exit.

7 MODES OF OPERATION

There are 3 different modes of operation.

7.1 Normal mode

In this mode, Inverter works normally. Whenever the supplied power from PV panel is sufficient (voltage>150Vdc), Inverter converts power to the grid as generated by the PV panel. If the power is insufficient(voltage<120Vdc), Inverter enters a "waiting" state. Whilst "waiting" Inverter uses just enough power from the PV panel monitor internal system status. In normal mode the LED is green.

7.2 Fault mode

The internal intelligent controller can continuously monitor and adjust the system status. If Inverter finds any unexpected conditions such as grid problems or internal failure, it will display the information on its LCD and the LED will be red.

7.3 Shutdown mode

During periods of little or no sunlight, Inverter automatically stops running. In this mode, Inverter does not take any power from the grid. The display and LED's on the front panel do not work.

Notes : Operating inverter is quite easy. During normal operation, Inverter runs automatically. However, to achieve maximum conversion efficiency of Inverter, please read the following information:

Automatic ON-OFF: Inverter starts up automatically when DC-power from the PV panel is sufficient.

Once the PV-Inverter starts up, it enters one of the following 3 states:

1. Standby: The PV string can only provide just enough voltage to minimum requirements of the controller.
2. Waiting: When the PV string DC voltage is greater than 100V, Inverter enters "waiting" state and attempts to connect to the grid.
3. Normal operation: When PV string DC voltage is greater than 150V, Inverter operates in the normal state.

INVERTER STATUS 8

Inverter is designed to be user-friendly; therefore, the status of the Inverter can be easily understood by reading the information shown on the front panel display. All possible messages are shown in the following table.

system fault

DISPLAY	OPERATION
Auto Test Failed	Auto Test do not pass
No AC Connection	No Utility, No Grid Connect
PV Isolation Low	Insulation Problem
Residual I High	leakage current too 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
Over Temperature	temperature outrange

Inverter fault

DISPLAY	OPERATION
Error: 101	Redundant CPU Communication Fault
Error: 102	Consistent Fault
Error: 116	EEPROM Fault
Error: 117	Relay Fault
Error: 118	Init Model Fault
Error: 119	GFCI Fault
Error: 120	HCT Fault
Error: 121	Main CPU Communication Fault
Error: 122	Bus Voltage Fault

The latest 5 NS(Network and System) protection records can be read by LCD or communication software. An interruption of ≤3Sec to the power supply does not lead to any loss of fault records (according to VDE-AR-N 4105, cl.6.5.1).

9 Communication

9.1 Monitoring Products

9.1.1 ShineNet

Shine NET is a PC software that communicate with inverter to analyze the inverter working state. It is convenient for you to know the inverter's real-time working state and the history work information.

Specification:

• Communicate with inverter by RS 232 and Bluetooth.

• Construct net with inverter, GRO monitor and Shine NET by RS 232, Bluetooth and Internet.

• Two Interfaces: Multi Inverter Interface and Wave Data Interface.

• In Multi Inverter Interface: See at most 4 inverters working data at the same time, you can select your own compare inverters and parameters.

• In Wave Data Interface: Query the inverter real time and history power wave,work data and error information.

• Multi languages: English, French, German, Spanish and etc.

• Support OS: WinXP/ Vista/win7/2000/2003.

9.1.2 ShineVision

Shine Vision, which consists of a power monitor and a number of transmitters, can achieve 1 to 6 monitoring modes. The transmitters transmit the power data collected from a photovoltaic inverter to the monitor and display the data onto the monitor screen, as along as data of generated energy, the gross generated energy and the generation income obtained from the above-mentioned data through some simple calculations. We can also see 3-phase AC voltage, two-way PV voltage, indoor temperature, date and time, as well as CO2 emissions.

ShineVision

9.1.3 Shine Pano

Shine Pano have a large touch screen, customers can browse data or set communication parameters, inverter parameters by touching easily. It is designed for solar power plant remote monitoring. While supporting both wired and wireless communication, ShineWebbox can simultaneously monitor, record and analyze inverter operating parameters real time with a maximum quantity of 50. Monitored data also can be sent to Shine Server.

Shine Pano

9.1.4. Shine WebBox

Shine WebBox is specially designed for solar power plant remote monitoring. While supporting both wired and wireless communication, Shine WebBox can simultaneously monitor, record and analyze inverter operating parameters real time with a maximum quantity of 50. Monitored data can be sent to ShineServer.

Shine WebBox

Detailed introduction please refer to Growatt Shine WebBox User Manual.

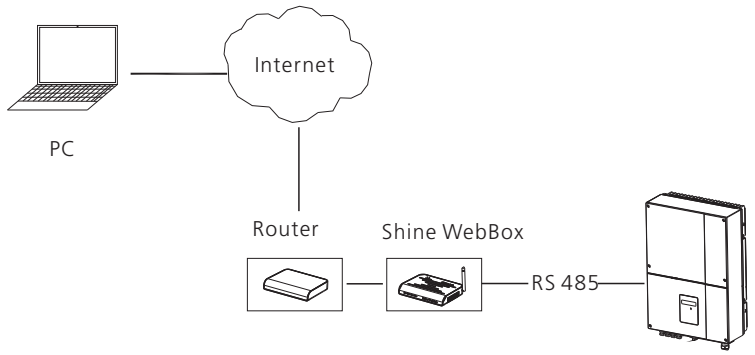
9.1.5. Shine Server

Shine Server is a remote data server, it is based on B/S structure. It can receive monitoring data from Shine WebBox or Shine Pano, and publish monitored data to LAN or WAN. User can easily access data browse interface via an Internet Explorer.

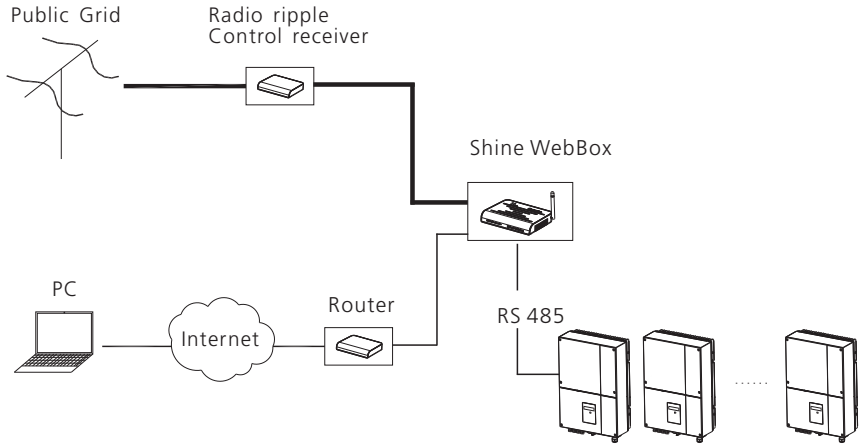
9.2 Communication Type

9.2.1. RS 485 (standard)

RS 485 is used for multipoint communication. Shine WebBox can monitor 32 units at the same time. But the Max length of the cable should not exceed 1000m. The monitoring system layout for one inverter is as follows:

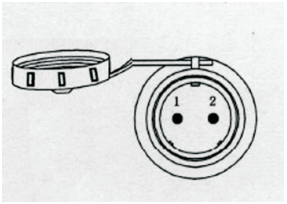


We recommend the monitoring system layout for a number of inverters as follows:



Definitions of RS 485 plug pins as follows:

- Pin1------- RX_ RS 485
- Pin2------- TX_RS 485



The program "Shine Server " operating on the PC can provide real-time monitoring of these inverters via Shine WebBox.

9.2.2. RS232 (standard)

RS 232 is used for single point communication. Use a RS 232 cable to connect from inverter's RS 232 port to computer's RS 232 port, or to connect to a RS 232-to-USB converter, then connect to computer's USB port. And then run ShineNet to monitor the inverter.

9.2.3. External Bluetooth / Zigbee (Optional)

Bluetooth wireless can be used as an optional monitoring scheme. Simply insert Bluetooth module (It is available from Growatt) to inverter's RS 232 port, then run ShineNet in a computer (with a Bluetooth adapter). Zigbee wireless monitoring must be used with ShinePano or ShineWebbox.

9.2.4 Internal integrated Bluetooth / Zigbee / WiFi (Optional)

If customer required, as an option, Bluetooth module / Zigbee module / WiFi module can be integrated to internal of inverter.

10 TROUBLE SHOOTING

In most situations, the Inverter requires very little service. However, if Inverter is not able to work perfectly, please refer to the following instructions before calling your local dealer.

Should any problems arise, the LED on the front panel will be red and the LCD displays the relevant information. Please refer to the following table for a list of potential problems and their solutions.

Ground Fault

1. The ground current is too high.
2. Unplug the inputs from the PV generator and check the peripheral AC system.
3. After the cause is cleared, re-plug the PV panel and check PV-Inverter status.
4. If the problem persists please call service.

Isolation Fault

1. Check the impedance is between PV (+) & PV (-) and the PV-Inverter is earthed. The impedance must be greater than 8M.
2. If the problem persists please call service.

No Utility

1. Grid is not connected.
2. Check grid connection cables.
3. Check grid usability.

12 INVERTER FAILURE

PV Over Voltage

1. Check the open PV voltage, if it is greater than or too close to 600VDC.
2. If PV voltage is less than 600VDC, and the problem still occurs, please call local service.

Consistent Fault

1. Disconnect PV (+) or PV (-) from the input, restart the PV-Inverter.
2. If it does not work, call service.
   > If there is no display on the panel, please check PV-input connections. If the voltage is higher than 150V, call your local service.

   > During periods of little or no sunlight, the PV-Inverter may continuously start up and shut down. This is due to insufficient power generated to operate the control circuits.

13 SPECIFICATIONS

	3600MTL-10	4200MTL-10	5000MTL-10
Input Data			
Max. DC power	3800W	4400W	5000W/5200W
Max. DC voltage	600V	600V	600V
Start voltage	150V	150V	150V
DC nominal voltage	360V	360V	360V
PV voltage range	100V-600V	100V-600V	100V-600V
MPP voltage range	175V-550V	175V-550V	175V-550V
Number of MPP trackers/ strings per MPP tracker	2/2	2/2	2/2
Max. input current / per string	2X10A/10A	2X15A/15A	2X15A/15A

	3600MTL-10	4200MTL-10	5000MTL-10
Output Data			
Nominal AC output power	3600W	4200W	4600W
Max. AC apparent power	3600VA	4200VA	5000VA *
Nominal output current	15.6A	18.5A	20A
Max. output current	18A	21A	23A/25A **
AC nominal voltage; range	220V / 230V / 240V 180Vac - 280Vac	220V / 230V / 240V 180Vac - 280Vac	220V / 230V / 240V 180Vac - 280Vac
AC grid frequency; range	50Hz,60Hz;±5Hz	50Hz,60Hz;±5Hz	50Hz,60Hz;±5Hz
Phase factor at rate power	1	1	1
Displacement power factor, configurable ***	0.9leading… 0.9lagging	0.9leading… 0.9lagging	0.9leading… 0.9lagging
THDI	<3%	<3%	<3%
AC connection	Single phase	Single phase	Single phase

* 4600VA with VDE-AR-N 4105 , CEI0-21

** 23A with output power 4600W, 25A with output power 5000W

*** 0.95leading…0.95lagging with VDE-AR-N 4105
0.95leading…0.95lagging with CEI 0-21 (System power less than 6KW)
0.9leading…0.9lagging with CEI 0-21 (System power larger than 6KW)

Protection Devices			
DC reverse polarity protection	yes	yes	yes
AC short-circuit protection	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

	3600MTL-10	4200MTL-10	5000MTL-10
Efficiency			
Max . efficiency	97.1%	97.1%	97.1%
Euro-eta	96.5%	96.5%	96.5%
MPPT efficiency	99.5%	99.5%	99.5%
General Data			
Dimensions (W / D / H) in mm	360/510/188	360/510/188	360/510/188
Weight	24 KG	24 KG	24 KG
Operating temperature range	–25°C..+60°C	–25°C..+60°C	–25°C..+60°C
Noise emission (typical)	⩽ 25 dB(A)	⩽ 25 dB(A)	⩽ 25 dB(A)
Altitude	Up to 2000m without power derating	Up to 2000m without power derating	Up to 2000m without power derating
Consumption: operating (standby) / night	<5W /< 0.5 W	<5W /< 0.5 W	<5W /< 0.5 W
Topology	transformerless	transformerless	transformerless
Cooling concept	No fan	No fan	No fan
Installation: Indoors / Outdoors (IP65 electronics)	yes / yes	yes / yes	yes / yes
Features			
DC connection: MC3/MC4/H4	opt / opt / yes	opt / opt / yes	opt / opt / yes
AC connection: Terminals	yes	yes	yes
LCD displqy	yes	yes	yes
Interfaces: Bluetooh / RS 485 / RS 232	opt / yes / yes	opt / yes / yes	opt / yes / yes
Warranty:5years / 10years	yes / opt	yes / opt	yes / opt

Certificates and approvals

CE,IEC 62109, VDE 0126-1-1, VDE-AR-N4105, CEI 0-21
RD1663,G59,G83, AS4777, AS/NZS 3100.

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 3600MTL-10, Growatt 4200MTL-10, Growatt 5000MTL-10

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 and kind whatsoever with respect to, any inverter which has been subjected to:

— Misuse, abuse, neglect or accident;

— Alteration, improper installation or application;

— Unauthorised 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.

Liability

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.

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.

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.

16 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