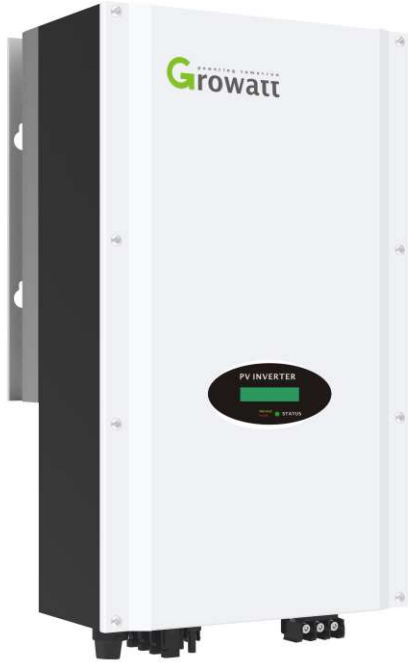

Growatt 8000MTLP-S

Growatt 9000MTLP-S

Growatt 10500MTLP-S

Installation & Operation Manual

Download Manual

Growatt New Energy

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GR-UM-157-A-00

list

1 Notes on this manual

1.1 Validity

This manual describes the assembly, installation, commissioning and maintenance of the following Growatt Inverter model:
Growatt 8000MTLP-S
Growatt 9000MTLP-S
Growatt 10500MTLP-S

This manual does not cover any details concerning equipment connected to the MTLP-S(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.

1.3 Additional information

Find further information on special topics in the download area at www.ginverter.com
The manual and other documents must be stored in a convenient place and be available at all times. We assume no liability for any damage caused by failure to observe these instructions. For possible changes in this manual, GROWATT NEW ENERGY TECHNOLOGY CO.,LTD accepts no responsibilities to inform the users.

1.4 Symbols in this document

1.4.1 Symbols in this document

A warning describes a hazard to equipment or personnel. It calls attention to a procedure or practice, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the Growatt equipment and/or other equipment connected to the Growatt equipment or personal injury.

Symbol	description
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 is used to address practices not related to personal injury.
Information	Information that you must read and know to ensure optimal operation of the system.

1.4.2 Markings on this product

Symbol	Explanation
	Electrical voltage!
	Risk of fire or explosion !
	Risk of burns
	Operation after 5 minutes
	Point of connection for grounding protection
	Direct Current (DC)
	Alternating Current (AC)
	The inverter has no transformer.
	Read the manual
CE	CE mark. The inverter complies with the requirements of the applicable CE guidelines.
	The inverter must not be disposed of with the household waste.

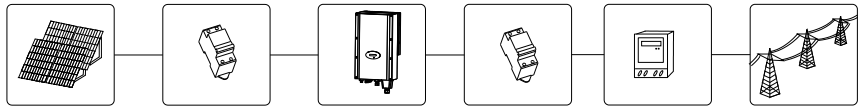
1.5 Glossary

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). The energy is the power calculated over time. For example, your inverter operates at a constant power of 4600 W for half an hour and then at a constant power of 2300 W for another half an hour, it has fed 3450Wh of energy into the power distribution grid within that hour.
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 radio 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 or volt amps. They are identical only when current and voltage are in phase than the power factor is 1.0. The power in an ac circuit is very seldom equal to the direct product of the volts and amperes. In order to find the power of a single phase ac circuit the product of volts and amperes must be multiplied by the power factor.
PV
Abbreviation for photovoltaic.
Wireless communication
The external wireless communication technology is a radio technology that allows the inverter and other communication products to communicate with each other. The external wireless communication does not require line of sight between the devices and it is selective purchasing.

2 Safety

2.1 Intended Use

The unit converts the DC current generated by the photovoltaic (PV) modules to grid-compliant alternating current and performs single-phase feed-in into the electricity grid.Growatt 8000MTLP-S, Growatt 9000MTLP-S, Growatt 10500MTLP-S inverters are built according to all required safety rules. Nevertheless, improper use may cause lethal hazards for the operator or third parties, or may result in damage to the units and other property.
Principle of a PV plant with thisGROWATT XXXX MTLP-S single-phase inverter



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

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.
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 Qualification of skilled person

This grid-tied inverter system operates only when properly connected to the AC - distribution network. Before connecting the MTLP-S to the power distribution grid, contact the local power distribution grid company. This connection must be made only by qualified technical personnel to connect, and only after receiving appropriate approvals, as required by the local authority having jurisdiction.

2.3 Safety instruction

The GROWATT MTLP-S Inverters is designed and tested according to international safety requirements（IEC61727/62116,INMETRO）; 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 (0)755 2747 1942.

2.4 Assembly Warnings

 WARNING	➢ 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. ➢ Assemble the inverter per the instructions in this manual. Use care when choosing installation location and adhere to specified cooling requirements. ➢ Unauthorized removal of necessary protections, improper use, incorrect installation and operation may lead to serious safety and shock hazards and/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：The Growatt MTLP-S 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 MTLP-S. Only ground the mounting frame of the PV modules.If you connect grounded PV modules to the Growatt MTLP-S, the error message "PV ISO Low". ➢ 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 with ground in order to have optimal protection of the system and personnel.

2.5 Electrical Connection Warnings

 DANGER	➢ The components in the inverter are live. Touching live components can result in serious injury or death. • Do not open the inverter except the wire box by qualified persons. • Electrical installation, repairs and conversions may only be carried out by electrically qualified persons. • Do not touch damaged inverters. ➢ Danger to life due to high voltages in the inverter • There is residual voltage in the inverter. The inverter takes 20 minutes to ischarge. ➢ Persons with limited physical or mental abilities may only work with the Growatt inverter following proper instruction and under constant supervision. Children are forbidden to play with the Growatt inverter. Must keep the Growatt inverter away from children.

 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. ➢ Systems with inverters typically require additional control (e.g., switches, disconnects) or protective devices (e.g., fusing circuit breakers) depending upon the prevailing safety rules.
 CAUTION	➢ The Growatt Inverter converts DC Current from PV generator into AC current. The 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.

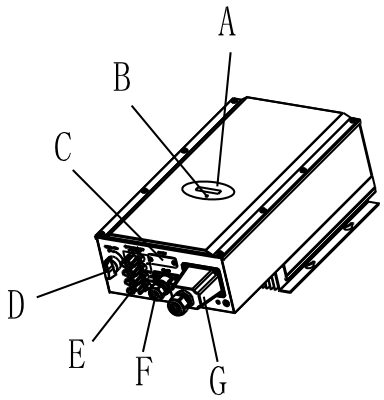
2.6 Operation Warnings

 WARNING	➢ Ensure all connectors are sealed 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.

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

3 Product description

3.1 MTLP-S Overview



Position	Description
A	LCD
B	LED
C	RS232 Port
D	DC Switch
E	PV Intput
F	RS485 Port
G	AC Output

Symbol on the inverter

Symbol	Description	Explanation
NORMALL / FAULT	Inverter status symbol	Indicates inverter operation status

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.

Growatt
PV Grid Inverter
Inversor FV Grid-tie

Model Name Modelo e código	Growatt 9000MTLP-S
Max. PV voltage Tensão c.c. Máxima	600 d.c.V
PV voltage range Faixa de tensão PV	100-600 d.c.V
PV Isc Corrente de curto circuito PV (Isc)	32 d.c.A
Max. input current Corrente c.c. Máxima	12.5/12.5/25 d.c.A
Max. output power Potência c.a. Máxima	9000 W
Max. apparent power Potência v.a. Máxima	9900 VA
Nominal output voltage Tensão c.a. Nominal	220 a.c.V
Max. output current Corrente c.a. Máxima	40.9 a.c.A
Nominal output frequency Freqüência de saída nominal	60 Hz
Power factor range Fator de Potência	0.8Capacitivo - 0.8Indutivo
Safety level Nível de segurança	Class I
Ingress Protection Grau de Proteção IP	IP65
Operation Ambient Temperature Faixa de temperatura de Operação	-25°C - +60°C

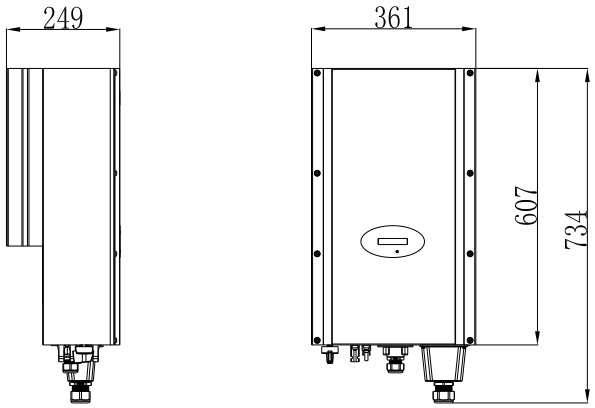
5min

Made in China
Feito na China

More detail about the type label as the chart below:

Model Name	Growatt 8000MTLP-S	Growatt 9000MTLP-S	Growatt 10500MTLP-S
Max input DC voltage	600V		
Max input DC current	12.5A/12.5A/25A		
PV voltage range	100V~600V		
AC nominal voltage	220V	220V	220V/230V
AC grid frequency	60 Hz	60 Hz	50/60 Hz
Max. apparent power	8800VA	9900VA	10500VA
AC normal output current	36.4A	40.9A	47.7A
Power factor	0.8leading...0.8lagging		
Environmental Protection Rating	IP65		
Operation Ambient temperature	-25...+60℃ (-13...+ 140°F) with derating above 45°C（113°F）		

3.3 Size and weight



Model	Height (H)	Width (W)	Depth (D)	Weight
Growatt 8000MTLP-S	734mm 28.9inch	361mm 14.2inch	249mm 9.8inch	28kg
Growatt 9000MTLP-S	734mm 28.9inch	361mm 14.2inch	249mm 9.8inch	28kg
Growatt 10500MTLP-S	734mm 28.9inch	361mm 14.2inch	249mm 9.8inch	28kg

3.4 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℃and +60℃. And the storage relative humidity can achieve to 100%.
- If there are a batch 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_today) error, you need to set the time and date, refer to clause 7.2.5 setting data and time.

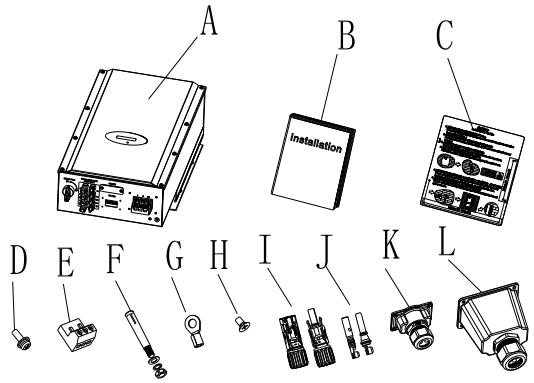
3.5 The advantage of the unit

- Maximum efficiency of 98.1%
- Wide input voltage range from 100--600Vdc
- Reactive power regulate
- Integrated DC switch
- Multi MPP controller
- DSP controller
- Sound control
- Multi communication pattern
- Easy installation

4 Unpacking and inspection

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 be used, and the maximum layers for original carton is four, as this ensures safe transport.

After opening the package, please check the contents of the box. It should contain the following, Please check all of the accessories carefully in the carton. If anything missing, contact your dealer at once.



Object	Description	Quantity
A	Inverter	1
B	User manual	1
C	Quick Guide	1
D	Cross Combination Screw	1
E	RS485 Connectors	2
F	Explosion bolt	4
G	OT Terminal	4
H	Countersunk head screw	6
I	PV+/PV- terminal	4/4
J	PV+/PV- metal terminal	4/4
K	RS485 Waterproof cover	1
L	AC Waterproof cover	1

Installation 5

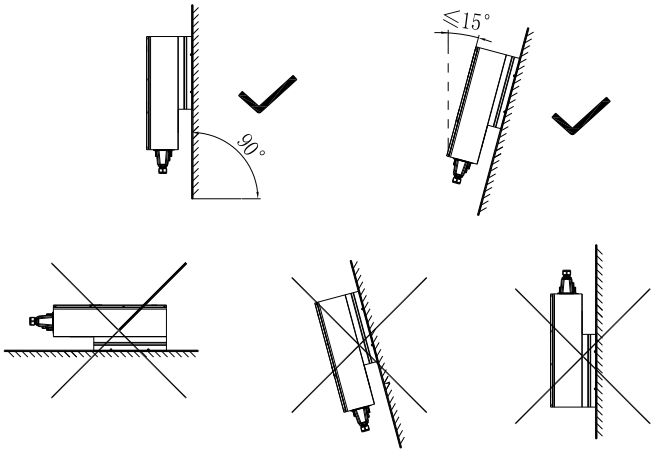
5.1 Safety instructions

	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.

- 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.

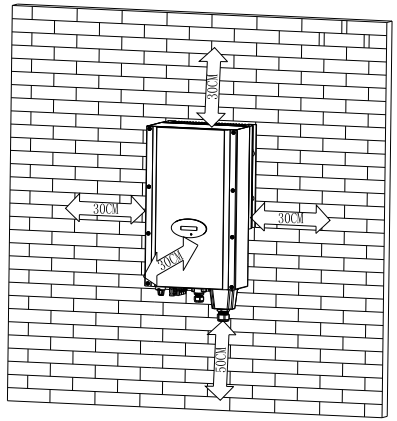
5.2 Selecting the installation location

- This is guidance for installer to choose a suitable installation location, to avoid potential damages to device and operators.
- The installation location must be suitable for the inverter's weight and dimensions for a long period time.
- Select the installation location so that the status display can be easily viewed.
- Do not install the inverter on structures constructed of flammable or thermolabile materials.
- Never install the inverter in environment of little or no air flow, nor dust environment. That may derate the efficiency of the cooling fan of the inverter.
- The Ingress Protection rate is IP65 which means the inverter can be installed outdoors and indoors.
- The humidity of the installation location should be 0~100% without condensation.
- The installation location must be freely and safely to get at all times.
- Vertically installation and make sure the connection of inverter must be downwards. Never install horizontal and avoids forward and sideways tilt.

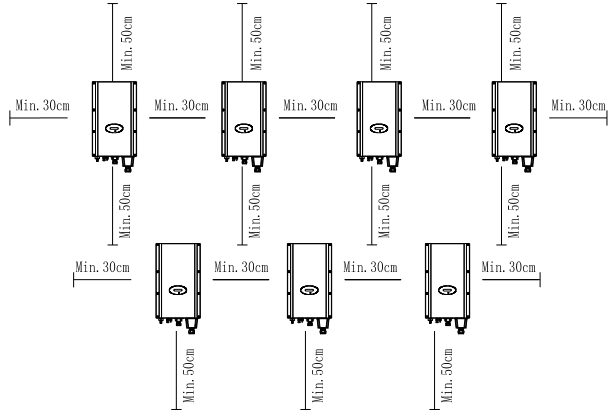


- Be sure that the inverter is out of the children's reach.
- Don't put any things on the inverter. Do not cover the inverter.
- Do not install the inverter near television antenna or any other antennas and antenna cables.
- Inverter requires adequate cooling space. Providing better ventilation for the 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.
- Observe the Min. clearances to walls, other inverters, or objects as shown in the diagram:

Direction	Min. clearance (cm)
above	30
below	50
sides	30
front	30

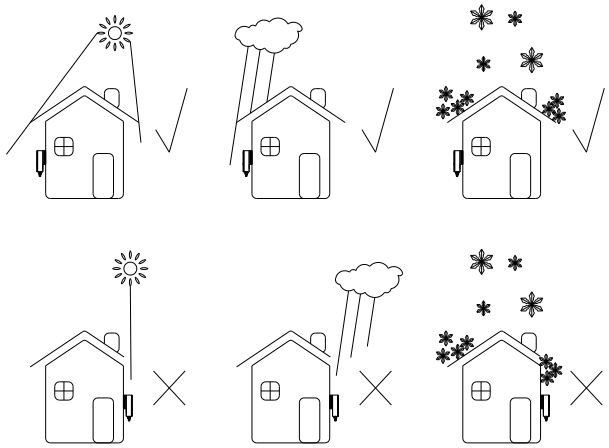


Ambient dimensions of one inverter

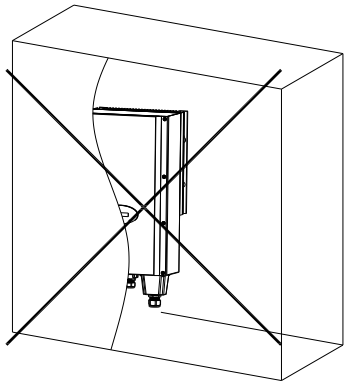


Ambient dimensions of series inverters

- 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.
- The inverter can't install to solarization，drench，firn location. We suggest that the inverters should be installed at the location with some cover or protection.



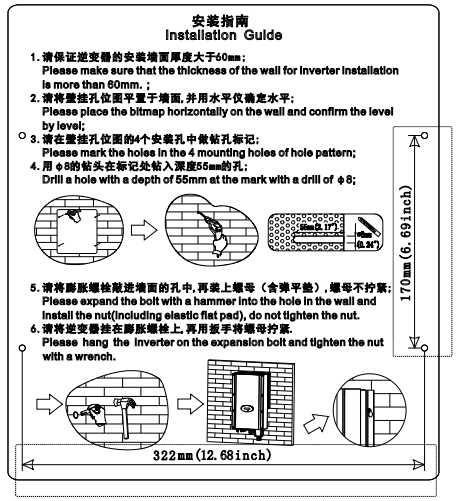
- Please make sure the inverter is installed at the right place.The inverter can't install close to trunk.



5.3 Mounting the Inverter

5.3.1 Preparatory work

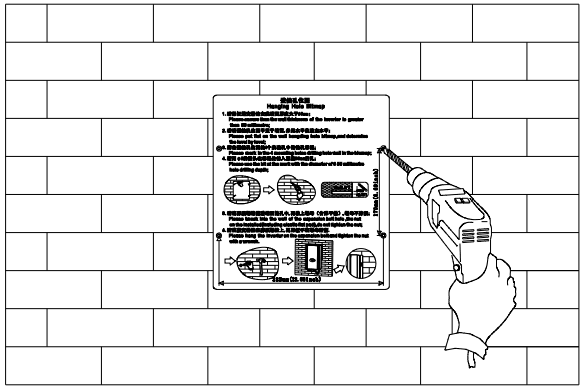
Information	➢ General tools 1.Personal safety equipment such as gloves,helmet,goggles,ear plugs,safety harness etc 2.Step ladders 3.Knife ➢ Tools for mechanical installation 1.Equipment for transporting and lifting the inverter 2.Electric(hammer) drill 3.Hammer 4.Set of drill bits,wrenches,sockets and screw bits 5.Socket driver,screw driver 6.Tape measure 7.Level 8.Pencil or other marker 9.Fastening screws,plugs etc



DANGER	In order to avoid electrical shock or other injury, inspect existing electronic or plumbing installations before drilling holes.
NOTICE	There are two types of installation mode ,please choose the corresponding installation instructions.

5.3.2 Fixed the Inverter on a concrete wall

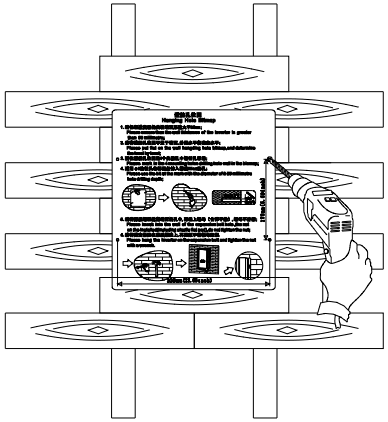
Using the mounting frame as a template, drill holes as illustrated in follow image:
Hole size: 0.31*2.0inch/8*50mm(diameter)*(depth,at least), then insert four explosion bolts into the holes, make sure the bolts paralleled with the outer surface of the bracket. One screw on the upper left side, one screw on the upper right side, one screw on the below left side, and the last screw on the below right side.



5.3.3 Fixed the inverter on a wooden wall

WARNING	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.

Using the mounting frame as a template, drill holes as illustrated in follow image:
The screws must be long enough to reach a depth in the wall of 11/2 inch, two screws at the upper left side, two screw on the upper right side.

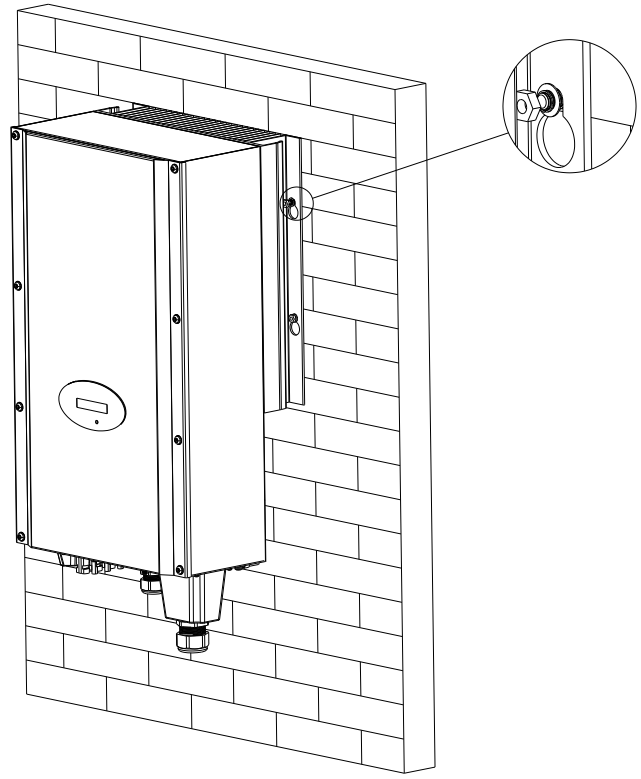


WARNING	Install the mounting frame as the figure shows. Do not drill the screws to be flush to the wall. Instead, leave 2 to 4mm exposed.

5.3.4 Hang the inverter on the wall

WARNING	Falling equipment can cause serious 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.

Hang the Inverter on the wall , after the inverter is installed, as shown below:



6 Electrical connection

6.1 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
WARNING	Danger of damage to electronic components due to electrostatic discharge. Take appropriate ESD precautions when replacing and installing the inverter.

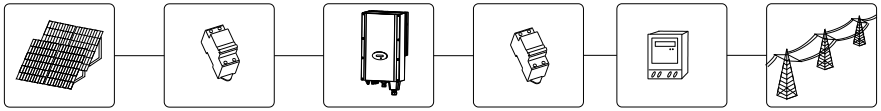
6.2 Wiring AC Output

WARNING	➢ You must install a separate single-phase circuit-breaker or other load disconnection unit for each inverter in order to ensure that the inverter can be safely disconnected under load. NOTE : The inverter has the function of detecting residual current and protecting the inverter against residual current. If your inverter has to equip a AC breaker which has the function of detecting residual current ,you must choose a AC breaker with the rating residual current more than 300mA.

We suggest you choice the AC breaker rating current in this table:

Growatt 8000MTLP-S	64A/230V
Growatt 9000MTLP-S	64A/230V
Growatt 10500MTLP-S	64A/230V

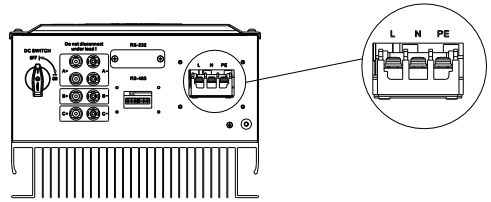
we recommend electrical connection as follows



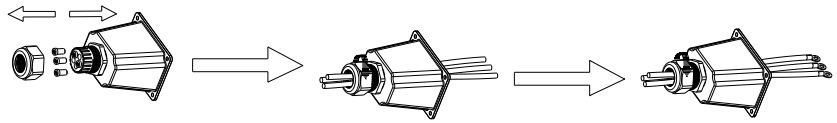
Position	Description
A	PV modules
B	DC load circuit breaker
C	Inverter
D	AC load circuit breaker
E	Energy meter
F	Utility grid

The AC wiring step:

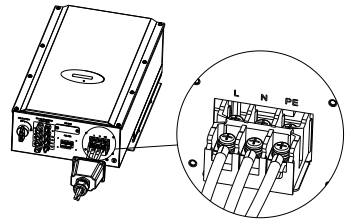
1.The grid connection is made using 3 wires (L, N, and PE).



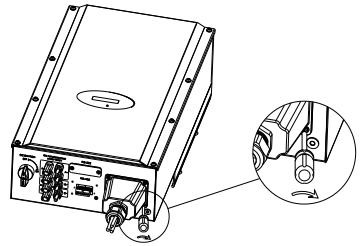
2.Unscrew the plastic nut of the AC waterproof cover counterclockwise, pull out the three rubber plugs, pass the three wires through the three holes on the waterproof cover, then crimp the OT terminal on the other end of the wire and screw the plastic nut. But don't have to screw it completely, as shown below.



3.The wires of the pressed terminal are correspondingly locked to the AC Output terminal of the inverter in sequence, as shown below.



4.Lock the AC waterproof cover to the inverter casing and tighten the plastic nut clockwise, as shown below.

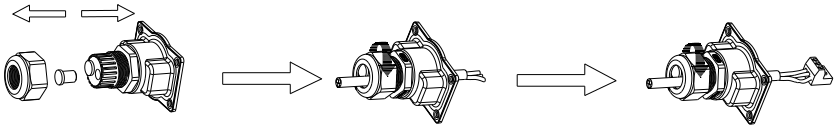


Wire suggestion conductor cross section and length:

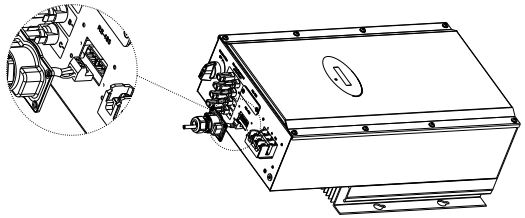
Model	Conductor cross section	Max. cable length
Growatt 8000MTLP-S	10mm2/8AWG	10m
Growatt 9000MTLP-S	10mm2/6AWG	10m
Growatt 10500MTLP-S	12mm2/6AWG	10m

6.3 RS485 Connection

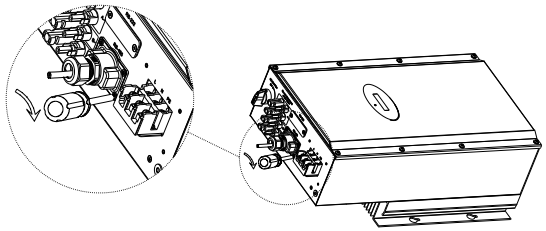
1. Unscrew the plastic nut of the RS485 waterproof cover counterclockwise, pull out the one rubber plug, pass the wire through the hole on the waterproof cover, then Then lock the wire to the RS485 terminal, The signals are A、GND and B from left to right, then screw the plastic nut., but don't have to screw it completely,as shown below.



2. Plugging the connected wire RS485 terminal into the RS485 terminal of the inverter, as shown below.

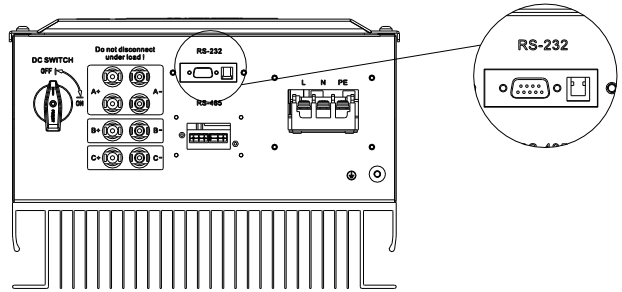


3. Lock the RS waterproof cover to the inverter casing and tighten the plastic nut clockwise, as shown below.

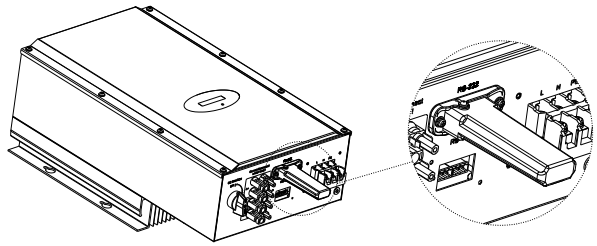


6.4 RS232 Connection

1.RS232 port of inverter is shown below:

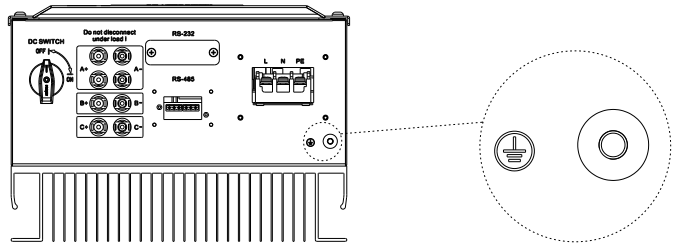


2. Plugging the monitoring module(WiFi/RF/GPRS Module) into the RS232 port of the inverter, and then screw the monitoring module to the inverter housing, as shown below.

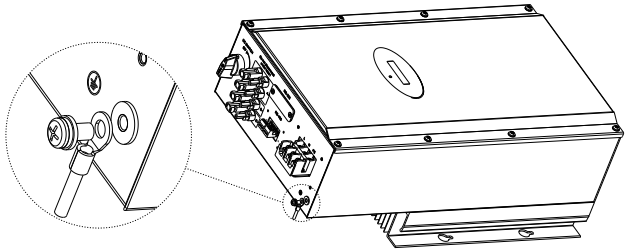


6.5 Connecting the second protective conductor

If the installation requires,the ground terminal can be used to connect a second protective conductor or as a equipotential bonding.The second protective point is shown below.



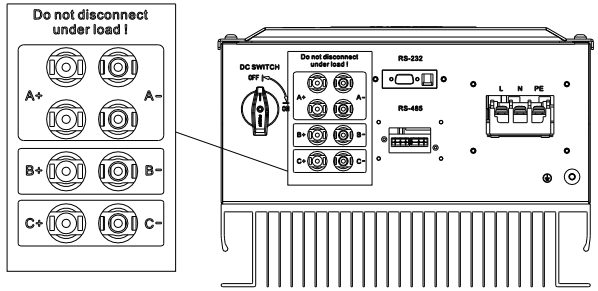
Crimp the grounding wire to the OT terminal, and then locking the grounding wire to the inverter housing by the cross combination screw, as shown below.



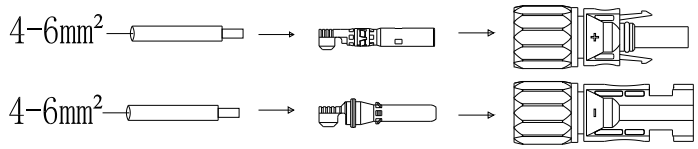
6.6 Connecting the PV Array (DC input)

DANGER	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. Make sure the maximum open circuit voltage(Voc) of each PV string is less than the maximum input voltage of the inverter. Check the design of the PV plant. The Max. open circuit voltage, which can occur at solar panels temperature of -25℃, must not exceed the Max. input voltage of the inverter.
WARNING	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.

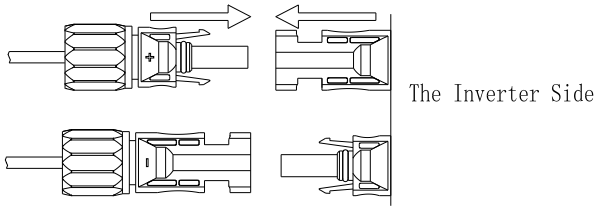
Wire step is shown below:
1. The Growatt MTLP-S single-phase inverter has three independent MPPT : A 、 B and C, the MPPT A has two independent PV array inputs, MPPT B and MPPT C have one PV array input, the corresponding terminal block is shown below.



2. The PV connection wire is crimped to the corresponding PV+/PV- metal terminals, and then plugging into the corresponding PV+/PV- terminals, as shown below.



3. Plugging the connected wires PV terminals into the corresponding PV terminals on the inverter side, as shown below.



Notice that the connectors are in paired (male and female connectors). The connectors for PV arrays and inverters are H4 connectors;

Suggestions for the PV modules of the connected strings:
- Same type
- Same quantity of PV modules connected in series

6.7 Using shinetool to set the information of the inverter

About the software of shinetool and the usage of it please download from the web: www.ginverter.com/Download.aspx

6.8 Grounding the inverter

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

WARNING	Because of the transformerless design, the DC positive pole and DC negative pole of PV arrays are not permitted to be grounded.

7 Commissioning

DANGER	Do not disconnect the DC connectors under load.
WARNING	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.
CAUTION	Damage to the inverter due to moisture and dust penetration ➢ Make sure the cable gland has been tightened firmly. ➢ If the cable gland are not mounted properly, the inverter can be destroyed due to moisture and dust penetration. All the warranty claim will be invalid.

Requirements:

- ➢ The AC cable is correctly connected.
- ➢ The DC cable is correctly connected.
- ➢ The country is correctly setted.

7.1 LCD display

Start-up display sequence, once the PV power or AC power is sufficient, the inverter display information as shown in the flow chart:
Model: xxxxxx
Ser No: xxxxxxxxxx
FW Version: x.x.x
Connect in: xxxS
Power: xxx.xW xxxx.xVar

The LCD display back-light automatically turns off after 30 seconds to save the power. The display on the inverter can be controlled by knocking on the front of it.

➢ The first line will show some status of the inverter, there are 4 status listed in below table.

The first line of LCD		
STATE	DISPLAY CONTENT	REMAK
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
	Power:xxxx.xW xxxx.xVA	Inverter watt at working
Fault State	Error: xxx	System Fault
Program State	Programming	Update Software

➢ The second line can change by knock on.

The second line of LCD		
Cycle display	Display time/S	Remark
2279.5W 12.4Var Model:PVIA00F163	2	The inverter model
1872.0W 25.4Var FW Version KC1.0	2	The sofeware version
2270.0W 14.3Var SerNo xxxxxxxxxx	2	The Serial Number
4240.1W 75.4Var Etoday 12.75KWh	4	The energy today
1270.0W 75.4Var Eall: 102.1KWh	4	The energy all
743.7W 20.3Var Ppv: 421/ 389W	4	PV input watt
427.3W 15.7Var PV:387/389 B:389	4	The PV and BUS Voltage
3274.3W 10.1Var AC:224V F:60.1Hz	4	Grid information
3143.7W 20.3Var L1:119V L2:120V	4	The grid system
2635.1W 10.3Var Setting	4	Setting
2521.7W 11.3Var 2014/12/05 11:20	4	Time system
2324.5W 16.7Var AC Error Record	4	The last 5 dated failure report

2635.1W 10.3Var Input 123: xxx	4	Set input page
2849.1W 18.3Var Language English	4	Language
2769.1W 28.3Var Set Language	4	Set language
2869.8W 21.3Var COM Address xxx	4	Set commucation address
3269.8W 25.3Var Net model x	4	Set Net Model
3321.8W 16.3Var Zegbee xxxxxxxx	4	Zigbee status

7.2 Setting the LCD display

7.2.1 Knock type and definition

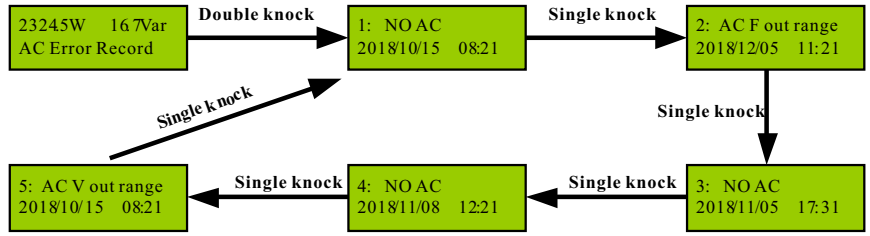
The inverter can support three kinds of knock: single knock, double knock and thrice knock. Each kind of knock has different function. Refer to specified definition in Table below:

Knock type	Definition
Single knock	KeyDown
Double knock	KeySET
Thrice knock	KeyEnter&ESC

Befor light the background, the types of knock functions are the same: just light the background.
NOTE: That the background light will automatically off if there is no knock detected in ten seconds.
Sound control can define the display language, communication address and utility model choice.

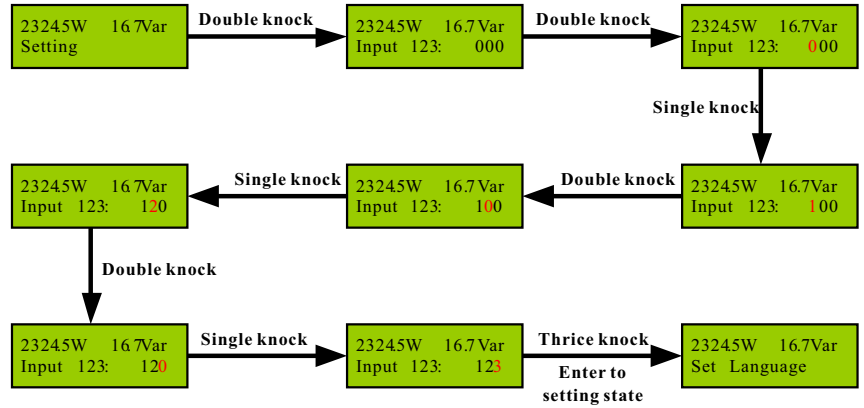
7.2.2 Read AC Error record information

When the LCD is dark, a knock and double knock will activate LCD. Knock to change the situation, enter to 'AC Error record' page. Double knock to information read state, Display show as follows:



7.2.3 Enter to SET

When the LCD is dark, a knock and double knock will activate LCD. Knock to display next information or change the set situation. Double knock makes the display stand for 30 seconds, enter to setting state. Display show as follows:



7.2.4 Setting inverter display language

On the set situation page knock to 'Set language' double knock to enter 'language: English' knock to select the language you need and thrice knock to enter or wait until the display become dark.

7.2.5 Setting communication address

On the set situation page knock to 'COM Address: xx' double knock to change the Address model knock to set address, thrice knock to enter or wait until the display become dark.

7.2.6 Setting grid model choice

This function is disabled when the inverter work in the normal state, you must turn off the AC(disconnect) separate unit, and the inverter LCD will display an error 'NO AC Connection' , LED turns red, then this model choice function is enable.
On the set situation page knock to 'Set Grid type' double knock to enter 'Grid Tx: xxxV' knock to select the grid model. Need to wait for 10S until the LCD background light gone out then the inverter will automatically restart. Turn on the AC(disconnect) separate unit, inverter will operate normally.

7.2.7 LED Display

The LED alse represents the status of the inverter.

LED color/status	Inverter status
Green/constant	Normally opertion
Red/constant	Fault -- Standby model contact installer
Red/flashing	Software update

7.3 Communications

7.3.1 RS485 communication(standard)

Users can connect to the computer through the RS485 port, then use the shinebus software that communicates with inverter to analyze the inverter working state.It is convenient for user to know the inverter's real-time working state and the history working information.

7.3.2 WiFi/RF/GPRS Wireless communication(Optional)

WiFi/RF/GPRS communication modules (It is available from Growatt) can be used as an optional monitoring device. They are wireless device used to monitor inverter. They transmits the data collected from the inverter to the server. User could get access to the inverter data by accessing the sever. More details can be found in the Wifi module manual.

Start-up and shut down the inverter 8

8.1 Start-Up the inverter

1. Connect the AC breaker of the inverter.
2. Turn on the dc switch, and the inverter will start automatically when the input voltage is higher than 100 V.

8.2 Turn-off the Inverter

DANGER	Do not disconnect the DC connectors under load.

Turn-off the inverter step:
1. Disconect the line circuit breaker from single-phases grid and prevent it from being reactivated.
2. Turn off the DC Switch.
3. Check the inverter operating status.
4. Waiting until LCD display go out, the inverter is shut dwon..

Maintenance and Cleaning 9

9.1 Checking Heat Dissipation

If the inverter regularly reduces its output power due to high temperature, please improve the heat dissipation condition. Maybe you need to clean the heat sink.

9.2 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, the display, and the LEDs using only a wet cloth. Do not use any cleaning agents (e.g. solvents or abrasives).

9.3 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.

10 Trouble shooting

Sometimes, the PV Inverter does not work normally, we recommend the following solutions for common troubleshooting. The following table can help the technician to understand the problem and take action.

10.1 Errors(E)

Errors(E) codes identify a possible equipment failure, fault or incorrect inverter setting or configuration. Any and all attempts to correct or clear a fault must be performed by qualified personnel. Typically, the (E) code can be cleared once the cause or fault is removed. Some of the (E) codes, Error as indicated in the table below, may indicate a fatel error and require you to contact the supplier or the Growatt to replace a new one.

Error code	Description	Suggestion
Error: 101	Communication fault Slave processor can not receive data from Master processor	1. Restart inverter 2. If error message still exists, contact Growatt
Error: 102	Consistent fault. Data received by Master and Slave processor are different. The reason can be utility grid voltage or frequency change frequently.	1. Restart inverter 2. If error message appears frequently or error message still exists after replacement, check utility grid. If you require help, contact Growatt. 3. If error message still exists, contact Growatt
Error: 111	PE abnormal	1.Check PE, to ensure that the PE line contact good. 2. Check the L and the N line to ensure that they are not reversed. 3. Restart inverter 4. If error message still exists, contact Growatt
Error: 116	EEPROM fault	Contact Growatt
Error: 117	Relay fault	Contact Growatt
Error: 118	Initial model fault	Contact Growatt
Error: 119	GFCI Device Damage	Contact Growatt
Error: 120	HCT fault	Contact Growatt
Error: 121	Communication fault. Master processor can not receive data from Slave processor.	1. Restart inverter 2. If error message still exists, contact Growatt
Error: 122	BUS voltage fault	Contact Growatt

10.2 Warnings(W)

Warnings(W) identify the current status of the Growatt 8-10K MTLP-S inverter. Warnings do not relate to a fault. When a (W) with a number after it appears in the display, it indicates a Warning Code and is usually cleared through an orderly shutdown/re-set or a self corrective action performed by the inverter. See the (W) codes in the following table.

Warning code	Meanings	Suggestion
Warning 100	Internal fan malfunction	Restart the inverter. If the warning still exists, please contact Growatt.
Warning 103	Fail to read EEPROM	Restart the inverter. If the warning still exists, please contact Growatt.
Warning 104	DSP and COM firmware version unmatch	Update program
Warning 105	Fail to write EEPROM	Restart the inverter. If the warning still exists, please contact Growatt.
No AC Connection	No utility grid connected or utility grid power failure	1. Check AC wiring and switch state, especially the ground wire. 2. Clear malfunction, Restart inverter.
AC V Outrange	Utility grid voltage is out of permissible range	1. Shut down the inverter, check grid voltage. 2. Ensur grid voltage is right, restart inverter.
AC F Outrange	Utility grid frequency is out of permissible range	1. Check grid frequency range 2. Restart inverter
Over Temperature	Temperature outrange	1. Check the inverter operation state 2.Lower ambient temperature, restart inverter
PV Isolation Low	Insulation problem	1. Check if PV panel enclosure ground properly 2. Check if inverter ground properly 3. Check if the DC breaker gets wet 4. Clear malfunction, restart inverter 5. Clear the PV array firn and desiccate
Output Hight DCI	Output current DC offset too high	Restart the inverter. If the warning still exists, please contact Growatt.
Residual High	Leakage current too high	Restart the inverter. If the warning still exists, please contact Growatt.
PV voltage High	The DC input voltage is exceeding the maximum value	Disconnect the DC switch immediately, then Check the PV input voltage.

11 Manufacturer Warranty

Please refer to the warranty card.

12 Decommissioning

12.1 Dismantling the Inverter

1. Disconnect the inverter as described in section6.
2. Remove all connection cables from the inverter.

 CAUTION	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.

12.2 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.

12.3 Storing the Inverter

Store the inverter in a dry place where ambient temperatures are always between -25°C and +60°C.

12.4 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.

13 Technical Data

13.1 Specification

Specifications \ Model	Growatt 8000MTLP-S	Growatt 9000MTLP-S	Growatt 10500MTLP-S
Input data(DC)			
Max. recommended PV power(for module STC)	9600W	10800W	12000W
Max. DC voltage	600V		
Start voltage	140V		
PV voltage range	100V-600V		
MPP work voltage range/ nominal voltage	110V-500V /360V		
Full load dc voltage range	280V-500V		
Max. input current of tracker A/B/C	25A/12.5A/12.5A		
Max. input current per string of tracker A/B/C	32A/16A/16A		
Number of independent MPP trackers	3		
Strings per MPP tracker	2/1/1		
Output (AC)			
Rated AC output power	8000W	9000W	10500W
Max. AC apparent power	8800VA	9900VA	10500VA
Max. output current	36.4A	40.9A	47.7A
AC nominal voltage; range	220V; 187Vac-276Vac	220V; 187Vac-276Vac	220V/230V; 187Vac-276Vac
AC grid frequency; range	60Hz;±5Hz	60Hz;±5Hz	60Hz;±5Hz
Phase factor at rate power	1	1	1
Displacement power factor, configurable*	0.8leading... 0.8lagging		
THDi	<3%		
AC connection	Single phase		

Efficiency	
Max. efficiency	98.1%
Euro weighted efficiency	97.6%
MPPT efficiency	99.5%
Protection devices	
DC reverse-polarity protection	yes
D C s w i t c h rating for each	yes
MPPT	
Output over current protection	yes
Output over voltage protection-varistor	yes
Ground fault monitoring	yes
Grid monitoring	yes
Integrated all - pole sensitive leakage current monitoring unit	yes
General data	
Dimensions (W / H / D) in mm	361*734*249
Weight	28 kg
Operating temperature range	- 25°C ... +60°C (-13...+140℉) with derating above 45°C /113℉
Noise emission (typical)	≤ 35 dB(A)
Altitude	4000m ＞2000m(6560ft) power derating
Self-Consumption night	<5W
Topology	transformerless
Cooling concept	Natural
Environmental Protection Rating	IP65
Relative humidity	100%
Features	
DC connection	H4/MC4(opt)
AC connection	Cable gland + OT terminal

Display	LCD
Interfaces: RS485/ RF/WiFi/GPRS	yes /opt/opt/opt
Warranty:5/10 years	yes /opt
Certificatesand approvals	INMETRO,IEC61727/62116

13.2 DC connector info

DC connector	H4/MC4(opt)

13.3 Torque

Enclosure lid screws	7kg.cm
Shell and RS232 screws	7kg.cm
AC terminal	6kg.cm
M6 soket head cap screws for securing the enclosure at the bracket	20kg.cm
Additional ground screws	20kg.cm

13.4 Accessories

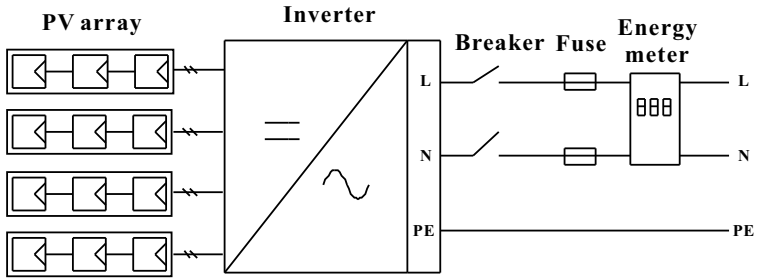
In the following table you will find the optional accessories for your product. If required, you can order these from GROWATT NEW ENERGY TECHNOLOGY CO.,LTD or your dealer.

Name	Brief description
External WiFi/RF/GPRS	

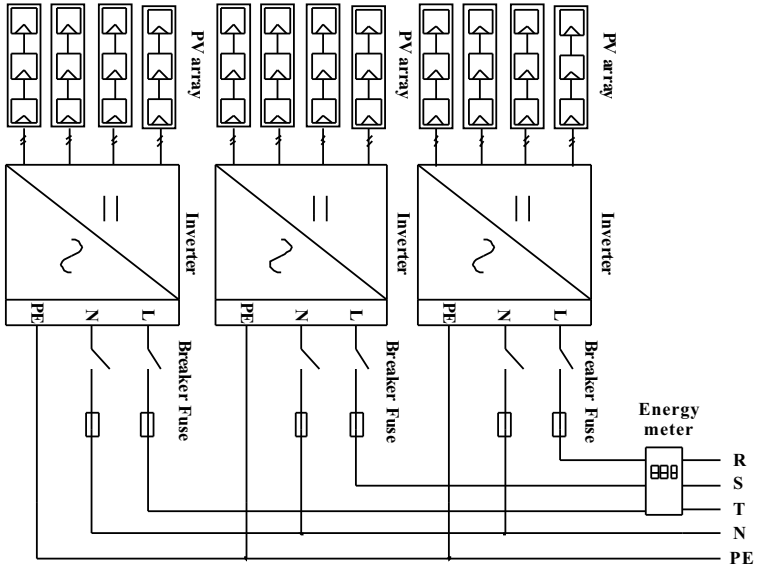
Shipped to a Growatt service centre for repair, or repaired on-site, or exchanged for a replacement device of equivalent value according to model and age.
The warranty shall not cover transportation costs in connection with the return of defective modules . The cost of the installation or reinstallation of the modules shall also be expressly exclude as are all other related logistical and process costs incurred by all parties in relation to this warranty claim.

14 PV system installation

Installation with multiple inverters on a single phase system



(A)Single inverter system



(B) multi inverter system

Compliance Certificates 15

15.1 List

Certified countries

With the appropriate settings, the unit will comply with the requirements specified in the following standards and directives (dated: December/2018):

- INMETRO
- IEC61727/62116

GROWATT can preset special grid parameters for other countries installation locations according to customer requests after evaluation by GROWATT.
You can make later modifications yourself by changing software parameters with respective communication products (e.g. shinebus or shineNet ect). To change the grid-relevant parameters, you need a personal access code, if you need it ,please contact with GROWATT.

15.2 Download Address

www.ginverter.com

16 Contact

If you have technical problems about our products, contact the GROWATT Serviceline. We need the following information in order to provide you with the necessary assistance:

- Inverter type
- Serial number of the inverter
- Event number or display message of the inverter
- Type and number of PV modules connected
- Optional equipment

GROWATT NEW ENERGY TECHNOLOGY Co.,LTD

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- Email： service@ginverter.com