

Troubleshooting Guide for Growatt Inverters

Introduction

Due to a large amount of inappropriate outcome of troubleshooting on Growatt inverters, our Australian office decide to compile a trouble shooting guide for Growatt installer customers, which aims to resolve the problem in the initial stage of a technical diagnosis of Growatt inverters and reduce the related cost of its process. We hope this document would be helpful during a phone or email conversation when facing customer’s technical enquiries.

1. Faulty code

Faulty code identifies the current states of the Growatt inverter. Warnings do not relate to a fault. When a fault code with a number after it appears in the display, it indicates a fault on the inverter or the system and is usually cleared through an orderly shutdown/re-set or a self-corrective action performed by the inverter. See the faulty codes in the following table and corresponding solutions.

The faulty code will display on the first line of the LCD screens of Growatt inverters, please ask the customers to read this part for you and then you can figure out the phenomenon accordingly by following sections.

1.1 No AC Connection

Cause: Somewhere disconnected from grid to inverter.

Error message	Description	Solutions
No AC Connection	No utility grid connected or utility grid power failure	1. Check if AC isolator /solar main supply switch is on 2. Check if AC cables are firmly and correctly connected. 3. Contact Growatt to claim warranty

1.2 AC V Outrange

Cause: The grid voltage is out of permitted range, or the inverter’s voltage limit is incorrect.

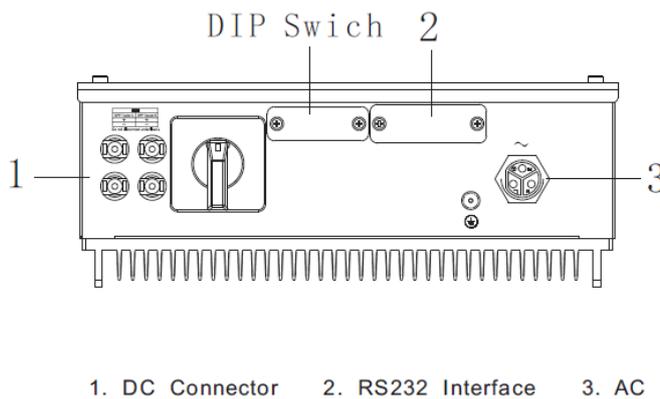
AC V Outrange	MTL-S model	Go to 1.2.1	
	Non-MTL-S model	Purchased after 2017	Go to 1.2.3

		Purchased before 2017	AC voltage reading<262V	1.2.2.1
			AC voltage reading>262V	1.2.2.2

NB: for 5000UE model, if the inverter indicate AC V OUTRAGE, please ask your customer to check the AC switches first, including AC isolator and solar main supply switch(in the Main Switch Board)

1.2.1 MTL-S model inverter

If the inverter's model is MTL-S, please find DIP switch at the bottom of inverter and set it to switch 1, 5 on while switch 2, 3, 4 off. Please refer to Fig 1.1 and Fig 1.2.



NOTE: Before selecting country, please turn off DC input and AC grid, then unscrew the dam-board of the DIP switch by appropriate tool.

Fig 1.1

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

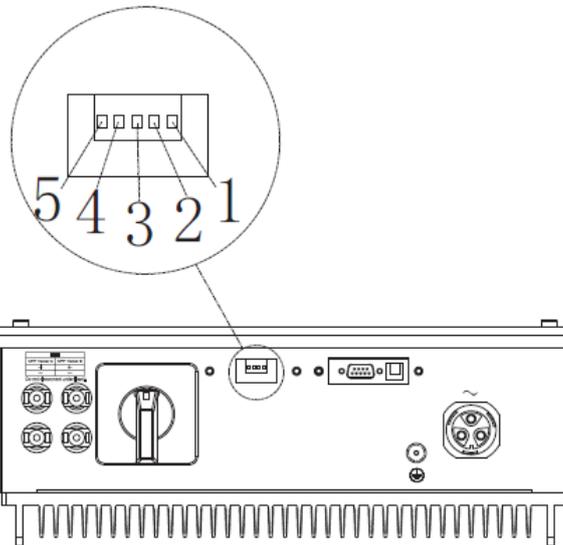
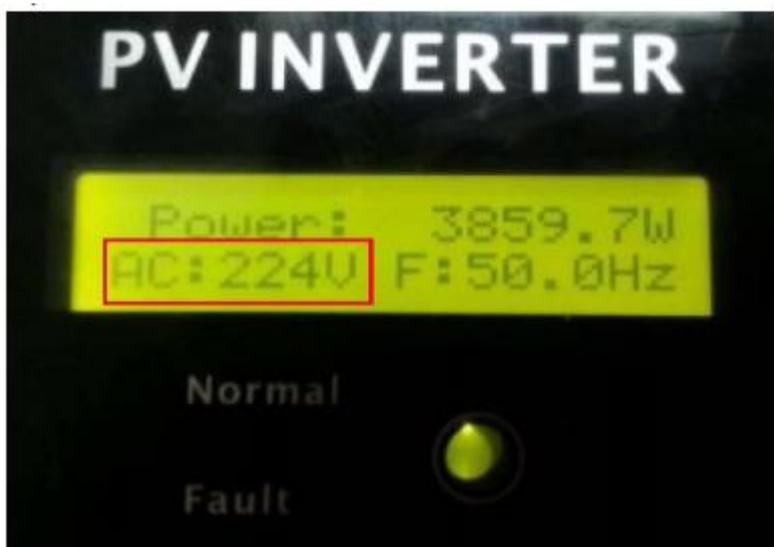


Fig 1.2

1.2.2 voltage setting by knocking the inverter (for old model) please check the LCD display of the inverter below if the AC figure is lower than 262V or not. If yes, please follow the next steps.



1.2.2.1 lower than 262V

Knock to make the display become bright → Knock to item “Model: GTXXXXXX” → Double knock to enter voltage range setting → Knock to change “QLD VMAX 255V” it to “Normal Vot range” → wait until the display become dark, then the inverter saved change.

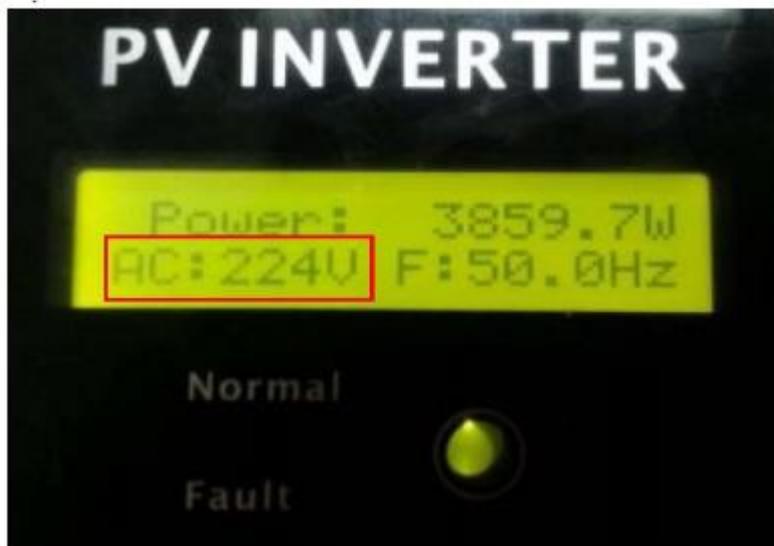
Note: This function is only for Ergon Energy area, Queensland, Australia.

1.2.2.2 higher than 262V

Voltage calibration by RS232 USB cable

Our inverters support communication function via cable, please use RS232 USB cable and PC computer to recalibrate your inverter’s voltage sensor as follows:

Turn on DC switch, compare the grid voltage measured by multi-meter, and the AC voltage displayed on the inverter. If the difference is more than 3V, please calibrate the detected AC voltage of the inverter by following steps:



- Connect the inverter to PC via RS232 USB cable.
- Open the software, ShineCHKVac to calibrate AC voltage as below picture.
- Turn on the AC breaker, then type the whole number of the voltage value measured by multi-meter. For example, if the multi-meter measured grid voltage is 230.2V, you can input 230, if the grid voltage is 230.6V, you should input 231V.

Please make sure to input the right COM port number of your PC.



Fig 1.4 ShineCHK

Increase voltage range via shinewifi

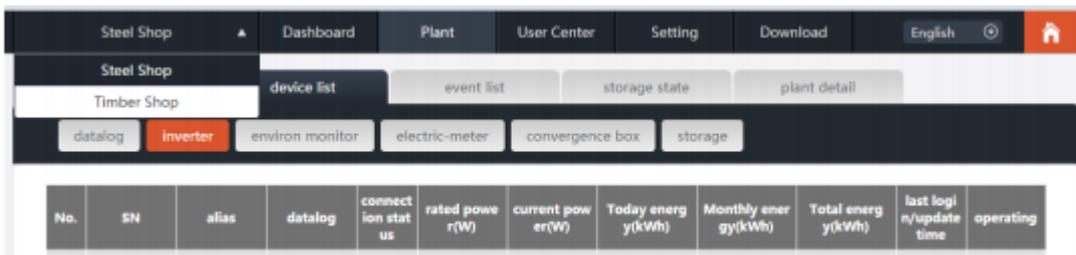
Basically we have two methods to increase the voltage range, one is via ShineWifi and the other is via software Shinebus.

a) Change it remotely via Wi-Fi module monitoring

If the inverter had been monitored by Growatt Wi-Fi module, then the setting can be changed via computer/laptop remotely. ShineServer set inverter tripping voltage V_{max}

Please follow the below steps to change the tripping voltage V_{max} settings via ShineServer:

(1) After signed in, click Plant -> Device List, then click inverter. A list of monitored inverter under the monitoring would then be available.



(2) In the right side, operating field, click the SET symbol  to open the Inverter setting interface.

(3) Choose the option "Set grid voltage high", and fill in the value. We suggest changing it to 268 volt.

Inverter setting

Inverter

SN:LW24150148 Alias:LW24150148

Port:AH30811444 property:G.1.8/GBAB3101/A0B0D0TOPFU1M353

Command

Set PV On/Off Shut down

Set save PF command On

Set active power rate %

Set reactive power rate % Over

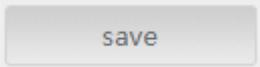
Set PF value (-0.8 - -1/0.8 - 1)

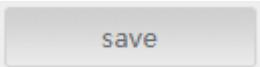
Set Time

Set grid voltage high 268

Set grid voltage low

save cancel advanced set

(4) Click  button to apply the change.

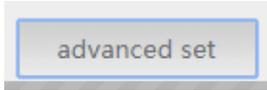
(5) Repeat to click  button to apply the change again for 3 times.

1.2.3 ShineServer change inverter 10 minutes average voltage 255v setting

Please note, this option is only valid for new version inverters installed after 9, October, 2016. Which meet the new AS4777.2:2015 standard. Old version inverters installed before that date are not have 10 minutes average voltage 255v limitation, thus, this step is NOT required.

Please follow the below steps to change the 10 minutes average voltage 255v setting via

ShineServer:



(1) Continue with the above process, on inverter setting page, click the page would then display an additional register option, as follows:

register value

(2) Choose the option “register”, and fill in the register number 112, and the set value. We suggest changing it to 265 volt. Please fill in 2650 there. As follows:

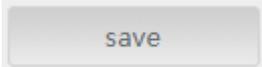
Inverter

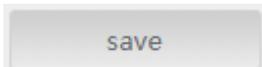
SN:LW24150148 Alias:LW24150148

Port:AH30811444 property:G.1.8/GBAB3101/A0B0D0T0PFU1M353

Command

- Set PV On/Off Shut down
- Set save PF command On
- Set active power rate %
- Set reactive power rate % Over
- Set PF value (-0.8 - -1/0.8 - 1)
- Set Time
- Set grid voltage high
- Set grid voltage low
- register value

(7) Click  button to apply the change.

(8) Repeat to click  button to apply the change again for 5 (FIVE) times.

b) Use ShineBus software to change voltage settings

Tools we need to prepare are: RS232-to-USB cable

Laptop (or computer)

ShineBus software.

- Change tripping voltage Vmax setting

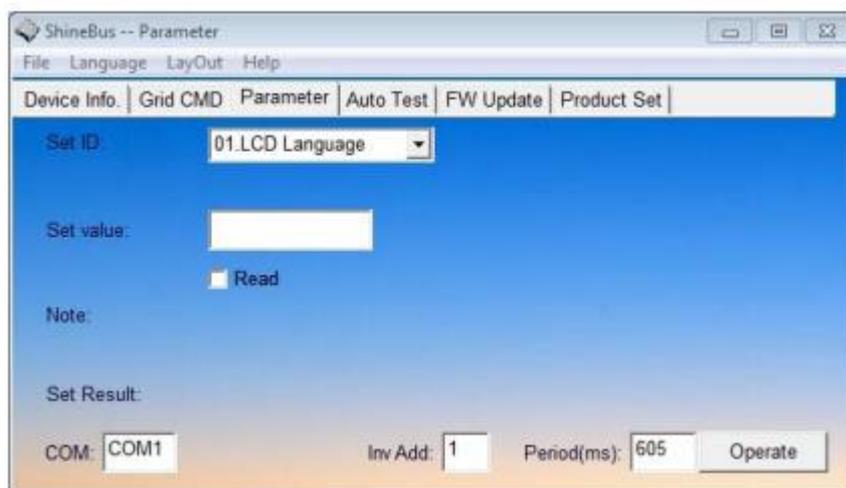
Please follow the below steps to change the tripping voltage Vmax setting:

(1) Get ShineBus software from Growatt and install it to your laptop. Then connect inverter and laptop via RS232-to-USB cable.

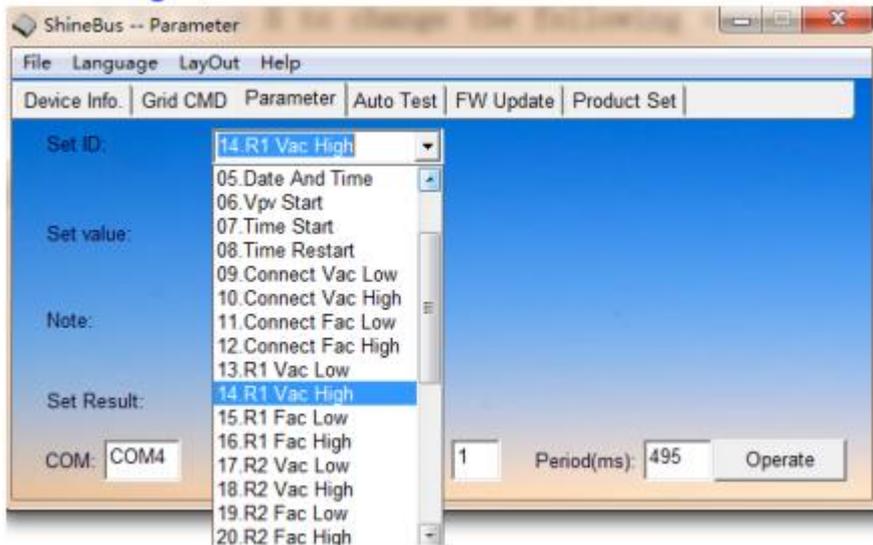
(2) Switch on the DC switch to power on inverter, and switch OFF the AC switch to disconnect inverter grid connection.

(3) Run ShineBus software.

(4) Choose the option "Parameter", as follows:



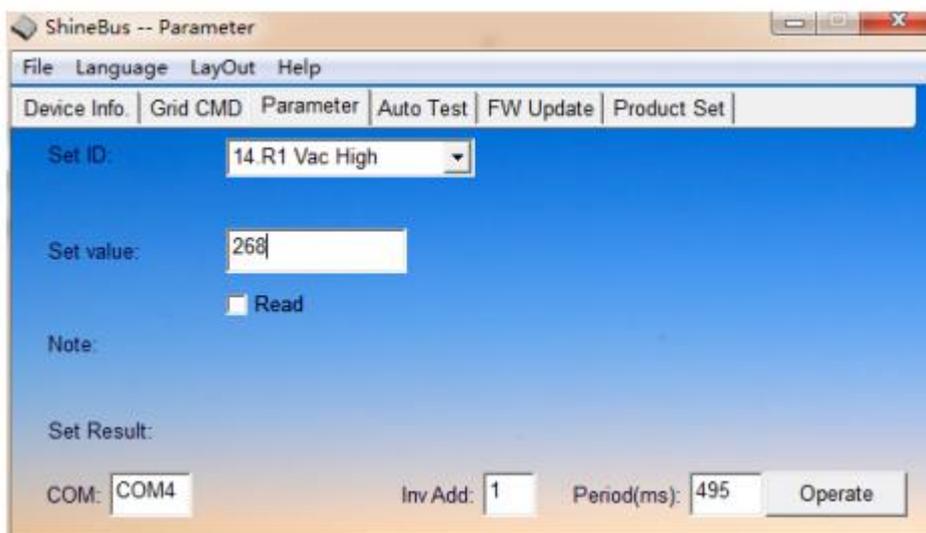
(5) Choose "14. R1 Vac High", as follows:



(6) Fill in RS232-to-USB cable's COM port number in "COM:" field.

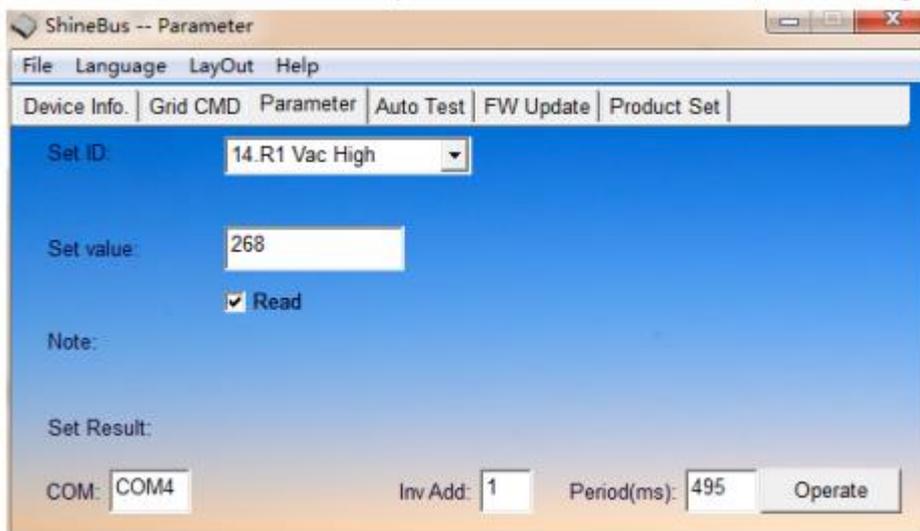
Set inverter's COM address by knocking to inverter's knock control panel (please refer to the manual), and fill the address in "InvAdd" field.

Fill in the set value in "Set value" field. We suggest to change "14. R1 Vac High" value to 5v higher, thus is 268v.



(7) Click "Operate" to apply the change. Once inverter accepted, it would show "Set OK" in "Set Result" field.

(8) Tick the "Read" checkbox, and click "Operate" to read and check the change.

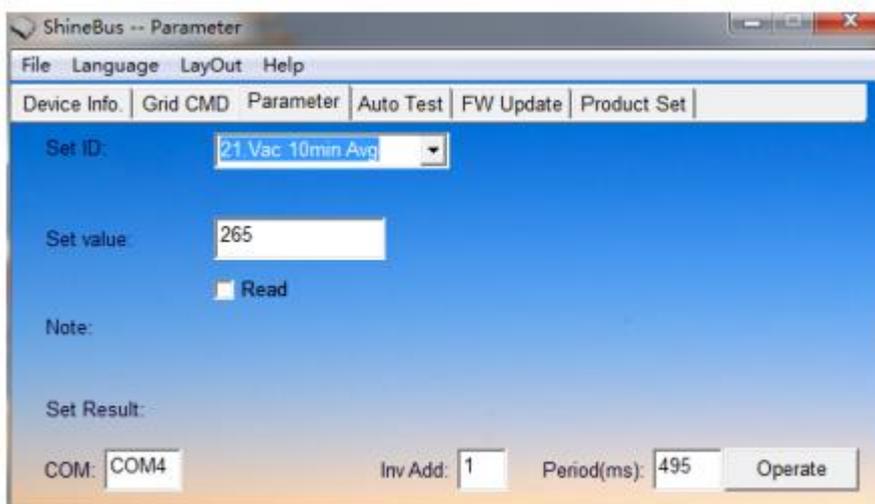


- Change 10 minutes average voltage 255v setting

Please note, this option is only valid for new version inverters installed after 9, October, 2016. Which meet the new AS4777.2:2015 standard. Old version inverters installed before that date are not have 10 minutes average voltage 255v limitation, thus, this step is NOT required.

Please follow the below steps to change the tripping voltage 10 minutes average voltage 255v setting:

(1) Continue with the above process, Choose “21.Vac 10min Avg”, as follows:



(2) Fill in the value in “Set value” field. We suggest change “21.Vac 10min Avg” value to 10

volt higher, thus is 265 volt.

(3) Then click “Operate” to apply the change. Once inverter accepted, it would show “Set OK” in “Set Result” filed.

(4) Tick the “Read” checkbox, and click “Operate” to read and check the change.

After BOTH of the above adjustment had been done successfully (For new version inverters installed after 9, October, 2016), please switch ON the AC switch to start up inverter.

1.3 PV Isolation Low

Cause: Insulation problem.

Error message	Description	Solutions	
PV Isolation Low	Insulation problem	Error message shown on the screen all the day	Contact Growatt to claim warranty
		Message can only be found in mornings, and will disappear in the afternoon.	Inspection needed, it could be a leakage on DC side anywhere from panels to DC isolator, including earth wires and solar panels

Inspection procedure of insulation problem on site:

Check the earth wiring on AC side, check the isolation on DC side (PV side).

1. Check if the inverter’s AC side is well grounded,
2. Switch off the DC isolator, unplug the DC connectors, test the positive to earth and negative to earth voltage or resistance on the DC MC4 plugs. If the voltage is not 0, please check the earth wire of the solar panels.
3. Turn on the DC switch to measure the voltage of DC positive to ground and the voltage of DC negative to ground. The reading will be 0 under normal condition, if the voltage is not 0, you can locate the fault area by dividing the voltage by Voc of PV solar module, as a panel with Voc=21v , if the test indicate that the Positive to ground voltage is 42V, Negative to ground voltage is 63V, then the fault is located between the 2 and 3 panels from positive side.

1.4 AC F Outrange

Cause: The grid frequency is out of permitted range, or the inverter's frequency limits is incorrect.

Error message	Description	Solutions
AC F Outrange	Grid frequency out of permitted range	<ol style="list-style-type: none"> 1. Check grid frequency 2. Contact Growatt to claim warranty

1.5 Over Temperature

Error message	Description	Solutions
Over Temperature	Temperature outrange	<ol style="list-style-type: none"> 1. Reboot inverter 2. Contact Growatt to claim warranty

1.6 Output High DCI

Error message	Description	Solutions
Output High DCI	Output current DC offset too high	<ol style="list-style-type: none"> 1. Reboot inverter 2. Contact Growatt to claim warranty

1.7 Residual I high

Error message	Description	Solutions
Residual I high	Leakage current too high	<ol style="list-style-type: none"> 1. Reboot inverter 2. Test the AC leakage current on solar switches 3. Test DC side following 1.3 procedures 4. Contact Growatt to claim warranty, if the leakage issues are clear.

1.8 PV Voltage High

Error message	Description	Solutions
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PV Voltage High	The DC input voltage is exceeding the maximum tolerable value	Disconnect the DC switch immediately, check DC input voltage
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1.9 Auto Test Failed

Error message	Description	Solutions
Auto Test Failed	Leakage current too high	Reboot inverter

1.10 Please Select VDE0126-1-1

VDE0126-1-1 is a country selection code, please follow instructions below to fix this problem. It's all about single knock to switch the country (For Australia, we choose VDE0126-1-1), and double knock to confirm the right country.

6.2.1. Country selecting

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



Information

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

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



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



The GROWATT2500-3000 MTL series inverter can only be used for single grid-connected in the area where Italy (CEI 0-21) and Germany (VDE-AR-N4105) are requested to accord.

Please finish the country selecting according to the following steps

A The LCD will quickly switch to and stay at the 'Please select' interface after power on, as below:

Please Select:
VDE0126-1-1

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

Please Select:
Germany

C When you need to select any of these countries, you can Double knock to enter the next interface. Here we select Italy as an example, as below:

Please Select:
Italy

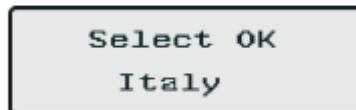
D When the country arrives at Italy, Double knock to enter the two options 'YES' and 'NO', and the cursor stays at 'NO' in default, as below:

Italy
 YES NO

E Single knock to select 'YES', as below:



F Double knock to confirm your selection, LCD will display 'Select OK' with the country name in the below, as below:



if you still single knock at the interface as E, the cursor will go to 'NO' again as D, then if you double knock, the display will switch to the interface as C.

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



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

Error codes identify a possible equipment failure, fault or incorrect inverter setting or configuration. Typically, error code can be cleared once the cause or fault is removed. Some of the error codes may indicate a fatal error and require you to contact the supplier or Growatt to replace it.

Error code	Description	Suggestion
Error 100	Internal reference voltage fault	<ol style="list-style-type: none"> 1. Reboot inverter 2. Contact Growatt to claim warranty
Error 101, Error 102, Error 121	Communication error	<ol style="list-style-type: none"> 1. Reboot inverter 2. Contact Growatt to claim warranty
Error 111	Neutral line charged	<ol style="list-style-type: none"> 1. Test N line and L line reversed or not 2. Check the inverter terminals damaged or not 3. Contact Growatt for a warranty if damaged spot found.
Error 116	EEPROM fault	<ol style="list-style-type: none"> 4. Reboot inverter 5. Contact Growatt to claim warranty
Error 117	Relay fault	<ol style="list-style-type: none"> 1. Reboot inverter 2. Contact Growatt to claim warranty
Error 118	Init model fault	<ol style="list-style-type: none"> 1. Check the dip switches at underneath of the inverter follow 1.2.1 2. Contact Growatt to claim warranty
Error 119	GFCI Device Damage	<ol style="list-style-type: none"> 1. Reboot inverter 2. Contact Growatt to claim warranty
Error 120	HCT fault	<ol style="list-style-type: none"> 1. Reboot inverter 2. Contact Growatt to claim warranty
Error 122	Bus voltage fault	<ol style="list-style-type: none"> 1. Reboot inverter 2. Contact Growatt to claim warranty

2 Other faults

In some cases, there is no message on the screen, please determine the fault by matching up with table of fault description below.

Fault description	Suggestions
No display, no light	<ol style="list-style-type: none"> 1. Check if PV Array isolator is on 2. Contact Growatt to claim warranty
Display is filled with black square	Contact Growatt to claim warranty
Inverter keeps reconnecting	DC input voltage is too low(< 200V)
Inverter trips over frequently	AC V Outrange
AC circuit breaker trips over	<ol style="list-style-type: none"> 1. Check the isolator tripping off or not, once the inverter is on. 2. If the isolator tripped off just after the inverter LCD screen display "connect ok", please contact Growatt for a warranty enquiry.