Index of Goodwe Trouble-Shooting Guide

Please note that the following information might be needed before starting the Trouble-shooting steps, please try to collect this information in advance including

a). Inverter serial number, e.g. 52000SSN197W****
b). Software version number, e.g. V1.85.09.09.04.60.
c). Installation date, failure date
d). Frequency of failure occurrence
e). Monitoring type, e.g. WiFi, RS485
f). Basic installation information and site description (surrounding environment)
g). Grid condition (Stable or Not)
h). Weather (average temperature of the recent week)

It is best to have pictures and videos as reference, which can also help analyze the problem.

Symptom

- Low Power Generation
- Terminal burnt
- Water inside of inverter
- Garbled display
- Inverter LED are off
- Utility Loss
- ISO Failure
- Ground I
- DC Injection High
- Relay Check
- PV over voltage
- EEP Rom RW Failure
- VAC Failure
- SPI Failure
- FAC Failure
- DC Bus High
- Over temperature
- All LED ON
- AC HCT failure
- No button response
- GFCI Failure
- Int Fan Failure
- Ext fan Failure
- Waiting
- Inverter Reconnecting
- Noise of inverter
- No display on LCD

Symptom	**Low Power Generation**				
Problem description	**Power Generation does not reach the expectation of customer**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm if the time of inverter matches with the local time or NOT	NA	Power on the inverter	Check it visually	If the time displayed on the inverter LCD screen does NOT match with the local time, please modify the inverter's time setting accordingly; If the time displayed on the inverter LCD screen matches with the local time, please go to step 2
Step 2	Check and confirm if the power limit and anti-reverse current function of the inverter was enabled or NOT	NA	Power on the inverter	Check it visually	If the inverter has enabled the anti-reverse current function, over-frequency load shedding, PU curve, slope loading functions, please disable these functions; If the inverter does not enabled the anti-reverse current function, over-frequency load shedding, PU curve, and slope loading functions, please go to step 3
Step 3	Check and confirm if the grid voltage showing on the inverter is within the safety regulations or not	Multimeter	Power on the inverter	Use a multimeter to measure the grid voltage at the output side	If the grid voltage is close to the upper limit of the safety range, it may trigger overvoltage and load reduction. You need to change the inverter safety regulation to 50 / 60Hz Default; If the measured grid voltage is close to the bottom limit of the safety range, it may trigger undervoltage and load reduction,You need to change the inverter safety rule to 50 / 60Hz Default; If the measured grid voltage is within the range allowed by safety regulations, please go to step 4
Step 4	Check and confirm if the parameters of PV module is normal or not	Multimeter	Power off the inverter and disconnect the cables between PV modules and the inverter on both the inverter and the PV module side	Measure the parameters of the PV modules : open circuit voltage and short circuit current. Then compare with the parameter information on the back of the PV module	If the comparison between the measured value and the parameter on the component label does not meet the component aging rule, it is suspected to be a component-side problem. It is recommended to rectify the component until the component parameters meet the requirements; If the comparison between the measured value and the parameters on the component label meets the component aging rule, please go to step 5

Step 5	Check and confirm that the installation environment of the inverter meets the installation requirements of Goodwe User Manual	NA	NA	Check it visually	If the installation environment of the module has a shadow barrier, please adjust it until it meet the requirements of the photovoltaic power plant installation; If the PV Array's inclination and azimuth do not conform to the reasonable range values in the area, please correct the PV Array's installation inclination and azimuth until they meet the reasonable range values in the area; If there is debris or dust on the array's surface, please clean the array's surface until it is clean; If there are hot spots and cracks inside the PV module, please check with professional equipment until the module runs normally If the inverter is installed in a closed environment, the inverter will experience excessive temperature and load reduction, and the installation position needs to be changed until the operation is normal. If the above installation environment does not exist, then go to step 6
Step 6	Check and confirm that the power output displayed on the inverter screen is roughly consistent with the power output value calculated by the energy meter	NA	Power on the inverter and record the display value on both the inverter and the energy meter every day	Record specific data for 5-7 days and compare the difference between the inverter's generation and the figure on energy meter	If the difference between the inverter's power generation and the meter is more than ± 5% (in the case of full power export), please contact Goodwe HQ to confirm the solution; If the difference between the inverter's power generation and the meter is less than ± 5% (in the case of full power export), please go to step 7
Step 7	Check and confirm that the diameter of the cable which connected from inverter to the power distribution cabinet meets the requirements	NA	Power on the inverter and turn on the household appliances	When the power generation is high at noon, it is recommended that customers turn on the high-power appliances at home and check the change of inverter power generation	If the power generated by the inverter is increased after the high-power appliances are turned on, it proves that the cable diameter of which connected from the inverter to the power distribution cabinet is too thin and the power transmission capacity is limited. Please enlarge the size of the power transmission cable until the power need; If there is no obvious increase or change in the power generated by the inverter after the high-power appliances are turned on, please contact GoodWe for solution.

Symptom	**Terminal burnt**				
Problem description	**AC or DC terminals burnt**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm whether the customer is using our standard DC terminal	NA	Power off the inverter	Check it visually	If the DC terminal burnt is because of the terminal used by the customer is not the standard DC terminal supplied by Goodwe, the warranty is void in this condition. If the inverter uses GoodWe standard DC terminals, please go to step 2
Step 2	Check and confirm that the DC terminals of the inverter meet the crimp requirements	NA	Power off the inverter	Check it visually	If the DC terminal burnt because of a poor DC terminal crimping condition and does not meet the installation requirements of the user manual, the warranty is void in this kind of situation. If the DC terminals of the inverter are well crimped and meet the installation requirements of the user manual, please go to step 3
Step 3	Check and confirm that there is no reverse connection between the positive and negative poles of each DC string	Multimeter	Power off the inverter, disconnect all strings from the inverter	Use a multimeter to measure the voltage between the positive and negative poles of each string. The multimeter selects the DC voltage range (the voltage range is greater than the open-circuit voltage range of the string). The red test lead is connected to the positive electrode, and the black test lead is connected to the negative electrode.	If there is a reverse connection between the positive and negative poles of any DC string which resulted in the DC terminal burning out, which does not meet the installation requirements of the user manual, the site needs to be rectified until the string positive and negative poles meet the installation requirements. The warranty is void in this condition. If there is no reverse connection between the positive and negative poles of any DC string measured, please go to step 4 "
Step 4	Check and confirm that there is no cross wiring between DC strings	NA	Power off the inverter,disconnect all strings from the inverter	Use a multimeter to measure the voltage between the positive and negative poles of each string. The multimeter selects the DC voltage range (the voltage range is greater than the open-circuit voltage range of the string). The red test lead is connected to the positive electrode, and the black test lead is connected to the negative electrode.	If the voltage value between the positive and negative poles of any DC string is abnormal (much smaller than the open-circuit voltage of the string), there is a cross-wiring problem between the DC strings. Please rectify on site until each DC string works normally ; If the voltage between the positive and negative poles of each DC string is normal, please go to step 5

Step 5	Check and confirm that the AC terminals of the inverter have no bad crimping	NA	Power off the inverter,shut down the AC switch	Pull the AC cable to the outside to check whether the AC terminal is crimped in place.	If the inverter has poor crimping of the AC terminals and causes the AC terminals to burn out, it does not meet the installation requirements of the user manual, which is makes the warranty void. If the inverter's AC terminals are crimped, please go to step 6
Step 6	Check and confirm that the material of inverter AC cable meets the requirements of the user manual	NA	Power off the inverter,shut down the AC switch	Check it visually	If the inverter's AC cable is made of aluminum and copper-aluminum alloy terminals are not used,which leads the AC terminals burned out, this condition does not meet the installation requirements of the user manual and is beyond the warranty scope; If the inverter AC cable is made of aluminum and copper-aluminum alloy terminals are used, the requirements of the user manual are met. Go to step 7; If the material of the inverter AC cable is copper wire, it meets the requirements of the user manual, please go to step 7
Step 7	Check and confirm that the diameter of the AC cable of the inverter meets the requirements of the user manual	Micrometer	Power off the inverter,shut down the AC switch	Measure the actual cable outer diameter and inner diameter with a micrometer	If the diameter of the AC cable is smaller than that required in the user manual,which leads the AC terminals to be burned out, it does not meet the installation requirements of the user manual and the warranty is void; If the diameter of the AC cable is greater than or equal to the wire diameter required in the user manual, it meets the requirements of the user manual, please go to step 8
Step 8	Check and confirm whether the inverter has been struck by lightning	Screwdriver, multimeter	Power off the inverter, and disconnect all the wirings on both DC and AC sides from the inverter	Open the inverter cover and check the status of the SPD	If the inverter lightning protection module is damaged, it means that the inverter has been struck by lightning, and the lightning strike is beyond the warranty scope; If the inverter lightning protection module does not have any sign of damage, it means that the inverter has not been struck by lightning. please contact GoodWe for solution.

Symptom	**Water inside of inverter**				
Problem description	**Water enters inverter, causing the inverter failure to work properly or affecting some functions**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm that the sealing condition of inverter external is good	NA	NA	Check whether all the used terminals are well connected and whether the screws are tight; check whether all unused terminals are well blocked; check whether the external sealing screws are tight	If the external sealing of the inverter is not good, it is considered that the installation does not meet the requirements of the user manual, which resulted in the inverter's IP65 cannot be achieved,warranty void in this condition; If the external sealing of the inverter is good, please go to step 2
Step 2	Check that there is no internal water in the inverter	Screwdriver	Power off the inverter	Open the cover of inverter	If there is stagnant water in the inverter, it is judged as water inside inverter, please contact Goodwe HQ to confirm the solution If there is no water in the inverter, please go to step 3
Step 3	Check and confirm that there is no moisture condensation inside the inverter	Screwdriver	Power off the inverter	Open the cover of inverter	If there is condensation inside the inverter between the transparent board and the surface mount, which affects the normal function, please contact GoodWe for solution. ; If there is condensation inside the inverter between the transparent board and the surface mount, and it will not affect the normal function and use.It can be eliminated by itself under good weather conditions.

Symptom	**Garbled display**				
Problem description	**Display shows chip failure**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm that the language setting of the inverter is normal	NA	Power on the inverter and enter the interface of language settings	Take photos and feedback photos	If the content displayed by the inverter is in another language, you need to reset the language; If the content displayed by the inverter is garbled, you need to reset the language with the correction tool. If the content displayed by the inverter is not in another language, please go to step 2
Step 2	Check and confirm that the wiring of inverter is normal	Screwdriver	Power off the inverter	Open the cover of the inverter and replug the cable between the screen and the control board	If the screen recovers to normal status after re-plugging the cable, it is a cable problem; If the screen still displays garbled characters after replugging the cable, please go to step 3
Step 3	Check and confirm that the inverter 's firmware is normal	Laptop	NA	Upgrade the latest DSP software version of the inverter	If the screen displays normally after re-upgrading, it is a software problem; If the screen still shows garbled characters after re-upgrading, please go to step 4
Step 4	Check and confirm that the screen of inverter is normal	Screwdriver, spare parts for display	Power off the inverter	Open the inverter cover and replace the new display spare parts	If the screen display is normal after replacing the display spare parts, it is a display problem; If the screen still displays garbled characters after replacing the display spare parts, please contact GoodWe for solution.

Symptom	**Inverter LED are off**				
Problem description	**Inverter does not work properly, no display on the screen**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm that the inverter DC switch is turned on	NA	NA	Check the status of the DC switch	If the inverter DC switch is in the "OFF" state, please turn on the DC switch and observe whether the screen and LEDs of the inverter are displayed; If the inverter DC switch is already “On”, please go to step 2
Step 2	Check and confirm that the string voltage on the DC side of the inverter reaches the minimum starting voltage of the inverter	Multimeter	Power off the inverter and disconnect all DC strings from the inverter	Use a multimeter to measure the open circuit voltage between the positive and negative poles of each DC string	If the string voltage on the DC side of the inverter is less than the minimum starting voltage of the inverter, check the module configuration and DC side wiring until the string voltage on the DC side reaches the minimum starting voltage of the inverter.If the string voltage on the DC side of the inverter is greater than or equal to the minimum start-up voltage of the inverter, and still cannot start after waiting for 5-10mins, please go to step 3
Step 3	Check and confirm that there is no reverse connection between the positive and negative poles of each DC string	Multimeter	Power off the inverter and disconnect all strings from the inverter	Use a multimeter to measure the voltage between the positive and negative poles of each string. The multimeter selects the DC voltage range (the voltage range is greater than the open-circuit voltage range of the string). The red test lead is connected to the positive electrode, and the black test lead is connected to the negative electrode.	If there is a reverse connection between the positive and negative poles of any DC string to be measured, the site needs to be rectified until the positive and negative strings of the string meet the installation requirements; If there is no reverse connection between the positive and negative poles of any DC string measured, please go to step 4
Step 4	Check and confirm whether the inverter is locked by SPS (for inverters produced in 2015)	NA	Disconnect the circuits on both sides of DC and AC, wait for 10 minutes and restart	Observe the machine startup	If the inverter can be started normally after restarting, it can be judged that the SPS is locked and can be solved by upgrading the software. If the inverter still cannot be started after restarting, please contact GoodWe for solution.

Symptom	**Utility Loss (Grid Loss or Error code 23)**				
Problem description	**The inverter detects no AC voltage ,the voltage is lower than the safety low voltage.**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Confirm that other electrical equipment under the same grid connection works normally, and the mains power supply is normal	NA	NA	Check it visually	If other electrical equipment under the same grid does not work properly, it is determined that the power grid is abnormal. Please contact the electrician or local power grid company to troubleshoot the power grid until the power grid returns to normal; If other electrical equipment under the same grid connection works normally, please go to step 2
Step 2	Confirm that the upper AC switch of the inverter is closed and intact	Multimeter	NA	Visual inspection; Multimeter measures the voltage at the upper and lower ends of the AC switch	If the upper AC switch of the inverter is open, please close the switch; If the upper AC switch of the inverter is in the closed state, measure the voltage value at the upper and lower ends of the AC switch. If the measured upper and lower voltage values of the switch are different, the AC switch is judged to be damaged and the upper AC switch of the inverter needs to be replaced. If the inverter's upper-level AC switch is intact, please go to step 3
Step 3	Confirm the AC wiring is good	NA	Power off the inverter and turn off the AC side switch	Pull the AC cable outward manually	If the inverter has poor AC termination wiring, it needs to be rectified until the AC side wiring is good; If the inverter AC wiring is good, go to step 4.
Step 4	Confirm that the overvoltage and undervoltage protector is not working	NA	NA	Check it visually	If the over / undervoltage protector is disconnected, it needs to be removed; Pay attention to the installation direction of the overvoltage and undervoltage protectors. If the connection is reversed, the overvoltage and undervoltage will not work (the upper end of the overvoltage and undervoltage must be connected to the power grid) If the over / under voltage protector does not work, please go to step 5
Step 5	Confirm that the inside of the inverter is intact	Multimeter	Shut down AC，DC	Multimeter resistance measurement of impedance between live and neutral wires of the inverter	If the measured impedance between the live and neutral wires on the AC side is much less than 200KΩ, it means that there is internal continuity between the live and neutral wires, and it is recommended to contact Goodwe headquarters to confirm the solution; If the measured impedance between the live and neutral wires on the AC side is greater than 200KΩ, it indicates that the live and neutral wires of the inverter are not connected. please go to step 6.

Step 6	Confirm the neutral and ground wires are well wired	Multimeter	NA	Use a multimeter to measure the voltage between the neutral and ground of the inverter	If the measured voltage between neutral and ground is greater than 10V, it indicates that the site has poor grounding. It is recommended to rectify until the voltage between neutral and ground is 10V or less; If the measured voltage between neutral and ground is less than or equal to 10V, please go to step 7.
Step 7	Confirm that the AC side wiring meets the requirements	Multimeter	NA	Measure the AC side wiring of the inverter with a multimeter	If it is found that the neutral line of the inverter AC and ground are reversely connected, it is recommended to rectify until the neutral and ground lines are in the correct position; If it is found that there is a reverse connection between the neutral line and live line on the AC side of the inverter, it is recommended to rectify until the neutral line and live line are in the correct position; If the inspection shows that the AC side wiring is in the correct position, please contact GoodWe for solution.

Symptom	**ISO Failure (The panel has low insulation resistance to ground or Error code 14)**				
Problem description	**Suspected component problems, the insulation resistance to ground is less than 100KΩ.**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 0	confirm the panel module type, and confirm whether it is a crystalline silicon module or a thin film module	NA	NA	Check it visually	If it is a crystalline silicon module, go to step 1 For thin film modules, please contact Goodwe for confirming.
Step 1	Check and confirm whether the frame of the component and the metal bracket are well grounded (whether the grounding hole of the module frame is grounded)	Multimeter	NA	Use a multimeter to measure the resistance between the module frame and the metal bracket (grounded)	If the ground resistance is less than or equal to 10 ohms, it is determined that the ground is good, please go to step 2; If the grounding resistance is greater than 10 ohms, it is determined to be bad grounding. Please correct the grounding until the resistance is less than or equal to 10 ohms. If the problem persists, please go to step 2
Step 2	By connecting only one string at a time, it is determined whether the fault is caused by one or more strings.	NA	Power off the inverter; unplug all strings from the inverter	Connect only one group of strings at a time, and then turn on the inverter to see if it is successfully connected to the grid. Connect and test all strings in this way.	When each group of strings is connected in turn, the inverter displays ISO failure, it is determined to be an inverter problem, please contact Goodwe headquarters to confirm the solution; When each group of strings is connected in sequence, the inverter works normally, but when all strings are connected, the inverter reports ISO failure. Please contact Goodwe headquarters to confirm the solution; When each group of strings is connected in turn, some strings show ISO failure, but the other strings are working normally, please go to step 3
Step 3	Check and confirm that PV string has good impedance to ground	Impedance meter	Power off the inverter and disconnect the cables between the inverter and the module from both the inverter and the module	Connect the positive terminal of the impedance meter to either end of the cable and ground the negative terminal to read the impedance value.	If the impedance value is greater than or equal to 10 megohms, it is judged that the cable is well insulated, please go to step 4; If the impedance value is less than 10 megohms, it is determined that the cable is not well insulated. Please replace or repair the cable and measure again until the impedance value is greater than or equal to 10 megohms, and then go to step 4 You can use the multimeter DC gear to test the positive and negative voltages of the components respectively. If the positive or negative DC voltage is a fixed value, it indicates that there is a problem with the string. If the positive or negative DC voltage is a constant change during measurement A small value indicates that the string is normal. (This solution can be used as an auxiliary reference)

Step 4	Check and confirm that the surface of the module cable is good	NA	NA	Check it visually	If damaged, please replace the cable; if there is no problem, please go to step 5
Step 5	Check and confirm that the AC side is well grounded	Multimeter	Power off the inverter	Measure whether the N and ground wires in the AC terminal are well connected	If the impedance of the N and ground wires in the AC terminal is less than 10 ohms, it is determined to be well grounded. If it is greater than or equal to 10 ohms, check the ground wire on the AC side until the measured value above is less than 10 ohms. If the fault continues Unable to resolve, please contact GoodWe for solution.

Symptom	**Ground I (Excessive leakage current or Error code 22/32)**				
Problem description	**Detected leakage current is large**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Confirm that the error is not related to the weather	NA	NA	Check it visually: observe the working condition of the inverter on a sunny day	If the fault occurs in rainy weather or sooner or later, it may be due to the high humidity environment. The leakage current of the solar panels increases due to the increase in the parasitic capacitance to the ground. After the weather is clear, the error can be automatically eliminated and the normal operation can be resumed; If the fault occurs on a sunny day, please go to step 2
Step 2	Confirm that AC and DC has good grounding	Multimeter	NA	Check it visually: observe module grounding and use a multimeter to measure the impedance between the AC-side ground wire and the ground copper bar of the grid-tied point	If the modules are well grounded, and the impedance between the module frame and the metal bracket (grounded) is greater than 10 ohms, the module is judged to be poorly grounded. Please correct the DC side grounding until the resistance is less than or equal to 10 ohms; If the impedance between the AC-side ground wire and the grounding copper bar of the grid-tied point is greater than 10 ohms, it is determined that the AC grounding is poor, please correct the grounding until the resistance is less than or equal to 10 ohms; If the DC component is well grounded and the AC side is well grounded, please go to step 3
Step 3	Confirm the string cables are well insulated	NA	Power off the inverter	Plug and unplug each string in turn	If the inverter displays a fault when each group of strings is connected in turn, please contact GoodWe for solution. If each group of strings is connected in sequence, the inverter works normally, but when all strings are connected, the inverter reports a fault, please contact Goodwe headquarters to confirm the solution; If each group of strings is connected in sequence, some of the strings are faulty, but the other strings are working normally. Please check the cables of these abnormal strings until the strings can work normally.

Symptom	**DC Injection Failure (Error code 29)**				
Problem description	**The DC component of the inverter is too high during output.**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm that the inverter version is normal	Laptop	NA	Upgrade to the latest DSP version	If the inverter work normal after upgrade the DSP version, no need to deal more; If the inverter keep alarming after upgrade the DSP version, please go to step 2
Step 2	Check and confirm that the control board is normal	Spare control board	NA	Replace the control board	If the inverter work normal after replace the spare control board, no need to deal more; If the inverter keep alarming after replace the spare control board, please contact GoodWe for solution.

Symptom	**Relay-Check Failure (Error code 07)**				
Problem description	**The inverter detected a fault in the relay.**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Confirm the neutral and ground wires are well wired	Multimeter	NA	Use the multimeter to measure the voltage between the neutral and ground of the inverter	If the measured voltage between neutral and ground is greater than 10V, it indicates that the site has poor grounding. It is recommended to rectify until the voltage between neutral and ground is 10V or less; If the measured voltage between neutral and ground is less than or equal to 10V, please go to step 2
Step 2	Check and confirm that the inverter can normal work after restart	NA	NA	Restart the inverter	If the inverter can be started normally after restarting, it can be judged that the alram is caused by the disturb of the AC voltage , no need to deal. If the inverter still cannot be started after restarting, please contact GoodWe for solution.

Symptom	**EEP Rom RW Failure (Error code 02)**				
Problem description	**The control board storage chip failed to read.**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm the software version is normal	Laptop	NA	Upgrade latest DSP	If the inverter could work normally after upgrading,then it is ok. If the inverter still shows the error after upgrading, please go to step 2
Step 2	Check and confirm the control board is normal	Screwdriver,spare control board	NA	Replace the old control board with the spare one	If inverter could work normally after replacing the control board, then it is ok. If the error still exist after repalcing the control board, please contact GoodWe for solution.

Symptom	**PV over voltage (Error Code 17)**				
Problem description	**The input voltage of the DC string exceeds the allowable range of the inverter.**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm the PV voltage are same with the voltage on LCD	Multimeter	NA	Using multimeter to check the PV voltage of each string and compare with the voltage on LCD to comfirm whether they are same or not	If the PV Voc are not same with the voltage on LCD,it is the data sampling problem, need replace the control board If the PV Voc are same with the voltage on LCD, please go to step 2
Step 2	Check and confirm the input board	Screwdriver,spare input board	Power off the inverter and disconnect the DC and AC side,wait for 5 min	Replace the old input board with the spare one	If inverter could work normally after replacing the input board, then it is the problem of input board. If the error still exist after repalcing the input board, please go to step 3
Step 3	Check and confirm the PV voltage are under the range of DC voltage requirement	Multimeter	Power off the inverter and disconnect all of the PV strings from inverter	Using multimeter to measure the Voc between the PV+and PV- voltage of each string and according to the actual PV panel configuration and local environment to caculate the possible max Voc	If the max PV Voc are out of inverter DC voltage range ,please reduce the pv panel amount till the Voc is under the requirement. If the Voc is under the requirement, please contact GoodWe for solution.

Symptom	**Vac Failure (Error code 15)**				
Problem description	**The inverter detected that the grid voltage exceeded the safety requirements of the machine.**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm that the AC voltage is under the range of the safety requirement	NA	NA	NA	If the AC voltage is out of the range of the the safety requirement, it must be the grid problem instead of the inverter problem, can try to change the safety to 50hz grid default/60hz grid default; If the AC voltage is under the range of the safety requirement, go to step 2
Step 2	Check and confirm the AC wiring is good	NA	Shut down the AC switch and power off the inverter	Pull the AC cable outward manually	If the inverter has poor AC termination wiring, it needs to be rectified until the AC side wiring is good; If the inverter AC wiring is good, please go to step 3
Step 3	Check and confirm the neutral and ground wires are well wired	Multimeter	NA	Use the multimeter to measure the voltage between the neutral and ground of the inverter	If the measured voltage between neutral and ground is greater than 10V, it indicates that the site has poor grounding. It is recommended to rectify until the voltage between neutral and ground is 10V or less; If the measured voltage between neutral and ground is less than or equal to 10V, please go to step 4
Step 4	Check and confirm the AC Voltage sampling is normal	Multimeter/Laptop	NA	Use the multimeter to measure the AC voltage, use the vcalibration tool to calibrate the inverter AC voltage	If the AC voltage show on the LCD is different with the measured value, please use the calibration tool to calibrate the ac voltage; If calibrate failed for several times(more than three times), please go to step 5 If the AC voltage show on the LCD is same with the measured value, please go to step5
Step 5	Check and confirm that the control board is normal	Spare control board	NA	Replace the control board	If the inverter work normal after replace the spare control board, no need to deal more; If the inverter keep alarming after replace the spare control board, please contact GoodWe for solution.

Symptom	**SPI Failure (Error code 01)**				
Problem description	**Internal communication failure or control board read failure**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm the software version is normal	Laptop	NA	Upgrade latest DSP	If the inverter could work normally after upgrading,then it is ok. If the inverter still shows the error after upgrading, please go to step 2
Step 2	Check and confirm the control board is normal	Screwdriver,spare control board	NA	Replace the old control board with the spare one	If inverter could work normally after replacing the control board, then it is ok. If the error still exist after repalcing the control board, please contact GoodWe for solution.

Symptom	**FAC Failure(Error code 03)**				
Problem description	**The inverter has detected that the frequency of the power grid exceeds the range permitted by the machine's safety regulations.**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Confirm that other electrical equipment under the same grid connection works normally, and the mains power supply is normal	NA	NA	Check it visually	If other electrical equipment under the same grid does not work properly, it is determined that the power grid is abnormal. Please contact the electrician or local power grid company to troubleshoot the power grid until the power grid returns to normal; If other electrical equipment under the same grid connection works normally, please go to step 2
Step 2	Check and confirm the neutral and ground wires are well wired	Multimeter	NA	Use the multimeter to measure the voltage between the neutral and ground of the inverter	If the measured voltage between neutral and ground is greater than 10V, it indicates that the site has poor grounding. It is recommended to rectify until the voltage between neutral and ground is 10V or less; If the measured voltage between neutral and ground is less than or equal to 10V, please go to step 3
Step 3	Check and confirm the frequency of the alarm	NA	NA	Check it visually	If inverter alarm FAC occasionally, it may be caused by the instantaneous grid frequency change, inverter will automatically return to normal, no need to deal; If inverter usually alarm FAC and can not normal work, please go to step 4
Step 4	Check and confirm that the AC frequency is satisfied with the local safety requirement	NA	NA	NA	If the AC frequency is different with the local safety requirement, please re-select the suitable safety according to the local requirement; If the AC frequency is same with the local safety requirement, please go to step 5
Step 5	Check the real frequency when the inverter alarm	NA	NA	Check it visually	If the frequency shown on the LCD is out of the range of the safety requirement, inverter will automatically return to normal, no need to deal; if the frequency shown on the LCD is under the range of the safety, please go to step 6
Step 6	Check and confirm that the ac output board is normal	Spare ac output board	NA	Replace the control board	If the inverter work normal after replace the spare ac output board, no need to deal more; If the inverter keep alarming after replace the spare ac output board, please go to step 7;
Step 7	Check and confirm that the control board is normal	Spare control board	NA	Replace the control board	If the inverter work normal after replace the spare control board, no need to deal more; If the inverter keep alarming after replace the spare control board, please contact GoodWe for solution.

Symptom	**DC Bus High (Error code 21)**				
Problem description	**The DC bus voltage inside the inverter is too high.**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm inverter is normal	Cellphone/solar go	NA	Restart inverter	If inverter becomes normal after reboot then the issue is solved； If inverter still fails to work properly after reboot, please go to step 2
Step 2	Check and verify that the open circuit voltage of each group string on the actual PV side meets the requirements of the inverter user manual	Multimeter	Power off inverter；remove all PV cables from inverter side	Use multimeter to measure the open-circuit voltage between PV+ and PV- in each group.	If the actual open circuit voltage of the group string exceeds the allowable range of the inverter, the group string is judged to be overmatched. Please rectify the PV group string until the open circuit voltage of all the group strings meets the requirements; If the actual open circuit voltage of the group string is within the allowable range of the inverter, please go to step 3
Step 3	Verify that the theoretical open circuit voltage meets the requirements of the inverter user manual	NA	NA	Calculate the maximum open circuit voltage of the group string based on the actual component configuration information in the field and the local historical environmental conditions	If the maximum open circuit voltage of the calculated group string exceeds the allowable range of the inverter, it is judged to be a group string overmatch. Please rectify PV group string until the open circuit voltage of all group strings meets the requirements; If the maximum open circuit voltage of the calculated group string is within the allowable range of the inverter, please go to step 4
Step 4	Check and confirm the software version of the inverter	NA	NA	Visual: view the current software version of the inverter	If the software version of the inverter is not the latest version, upgrade to the latest version; If the software version of the inverter is the latest, follow step 5
Step 5	Check and confirm that the connection between control board and power board is normal	Screwdriver	Power off inverter	Reinsert the cable between control board and power board to confirm whether it is loose	If the cable between the control board and the power board is abnormal, please rectify the cable until the cable is normal; If the cable between the control board and the power board is normal, please follow step 6
Step 6	Check and confirm that the control board is normal	Screwdriver，spare control board	NA	Replace control board	If the control board is replaced and the machine works normally, there is no need to continue processing; If the machine does not work properly after replacing the control board, please contact GoodWe for solution.

Symptom	**Over temperature (Error Code 19)**				
Problem description	**Inverter over temperature protection, the internal temperature of the inverter reaches the inverter over temperature protection point.**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm the inverter installation meets the user manual requirements	NA	NA	Check it visually	If the inverter installation doesn't meet the user manual requirements,please reform the installation till meeting the user manual requirements If the inverter installation meets the user manual requirements, please go to step 2
Step 2	Check and confirm the temperature surrounding the inverter	NA	NA	Thermometer	If the temperature surrounding the inverter is over 45℃, then it is the problem of over temperature of the working environment ,please cool down the working temperature till lower than 45℃. If the temperature surrounding the inverter is below 45℃, please go to step 3
Step 3	Check and confirm the inverter is normal	NA	NA	Power off the inverter for 15min then restart the inverter	If the inverter could work normally after restarting, then it is the problem of over temperature. If the inverter couldn't work normally after restarting, then it is the problem of temperature sensor,please contact GoodWe for solution.

Symptom	**All LED ON**				
Problem description	**The three lights POWER, RUN and FAULT on the display are all on, control Board has no programs**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Confirm that the wiring between the control board and the display is normal	Screwdriver	Power off Inverter	Replug the cable between the control board and the display to check whether it is loose.	If the wiring between the control board and the display is abnormal, correct the wiring until the wiring is normal. If the wiring between the control board and the display is normal, please go to step 2
Step 2	Check and confirm the software version of the inverter	NA	NA	View the current software version of the inverter	If the software version of the inverter is not the latest version, please upgrade to the latest version; If the software version of the inverter is the latest version, please go to step 3
Step 3	Check and confirm that the control board is normal	Screwdriver, control board spare parts	NA	Replace the control board	If the inverter works normally after replacing the control board, there is no need to continue processing; If the inverter does not work properly after replacing the control board,please contact GoodWe for solution.

Symptom	**AC HCT failure (Error code 31)**				
Problem description	**AC output current sensor fault**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm inverter is normal	Cellphone/solar go	NA	Restart inverter	If inverter becomes normal after reboot then the issue is solved； If inverter still fails to work properly after reboot, please go to step 2
Step 2	Check and confirm the software version of the inverter	NA	NA	View the current software version of the inverter	If the software version of the inverter is not the latest version, upgrade to the latest version; If the software version of the inverter is the latest, please go to step 3
Step 3	Check and confirm that the cable connection between control board and output board is normal	Screwdriver	Power off inverter	Reinsert the cable between control board and output board to confirm whether it is loose	If the cable between the control board and the output board is abnormal, please rectify the cable until the cable is normal; If the cable between the control board and the output board is normal, please go to step 4
Step 4	Check and confirm output board is normal	Screwdriver,spare output board	NA	Replace output board	If the output board is replaced and the machine works normally, there is no need to continue processing; If the machine does not work properly after replacing the outputboard,please go to step 5
Step 5	Check and confirm control board is normal	Screwdriver,spare control board	NA	Replace control board	If the control board is replaced and the machine works normally, there is no need to continue processing; If the machine does not work properly after replacing the control board, please contact GoodWe for solution.

Symptom	**No button response**				
Problem description	**Button Fault**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Confirm that the wiring between the control board and the display is normal.	Screwdriver	Power off Inverter	Replug the cable between the control board and the display to confirm whether it is loose.	If the wiring between the control board and the display is abnormal, correct the wiring until the wiring is normal. If the wiring between the control board and the display is normal, go to step 2
Step 2	Check and confirm that face stick is normal.	Spare parts for screwdriver and face stick	Power off Inverter	Replace the face stick	If the replacement is normal, the problem is solved; If the buttons are still not good after replacing the sticker, please go to step 3
Step 3	Check and confirm that the control board is normal.	Spare parts for screwdriver and control board	NA	Replace the control board	If the machine works normally after replacing the control board, there is no need to continue processing; If the machine does not work properly after replacing the control board, please contact GoodWe for solution.

Symptom	**GFCI failure (Error code 28/32)**				
Problem description	**Leakage current detection equipment failure**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm inverter is normal	Cellphone/solar go	NA	Restart inverter	If inverter becomes normal after reboot then the issue is solved ; If inverter still fails to work properly after reboot, please go to step 2
Step 2	Determine whether a fault is caused by one or more sets of strings by connecting only one set of strings at a time.	NA	Power off inverter and remove all PV cables from inverter side	Connect only one set of strings at a time, and then power on the inverter to see if it can connect to grid successfully. In this way, connect and test all the strings in turn	When connecting each group string in turn, the inverter reports an error, then it is judged to be an inverter's problem. Please contact GW HQ to confirm the solution; When connecting each group string in turn, the inverter works normally, but when connecting all group strings, the inverterreports error, then it is judged to be inverter's problem, pleaseGW HQ to confirm the solution; When connecting each group string in turn, some strings are displayed and error is reported, but other strings are working normally. please go to step 3
Step 3	Check and confirm the software version of the inverter	NA	NA	View the current software version of the inverter	If the software version of the inverter is not the latest version, upgrade to the latest version; If the software version of the inverter is the latest, please go to step 4
Step 4	Check and confirm that the cable connection between control board and output board is normal	Screwdriver	Power off inverter	Reinsert the cable between control board and output board to confirm whether it is loose	If the cable between the control board and the output board is abnormal, please rectify the cable until the cable is normal; If the cable between the control board and the output board is normal, please follow step 5
Step 5	Check and confirm control board is normal	Screwdriver,spare control board	NA	Replace control board	If the control board is replaced and the machine works normally, there is no need to continue processing; If the machine does not work properly after replacing the control board, please contact GoodWe for solution.

Symptom	**Int Fan Failure (Error code 20)**				
Problem description	**Internal fan failure**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm inverter is normal	Cellphone/Solargo	NA	Restart inverter	If inverter becomes normal after reboot then the issue is solved ; If inverter still fails to work properly after reboot, please go to step 2
Step 2	Check and make sure there is no foreign body in the fan	Screwdriver	Turn on inverter	Open the cover and observe whether the internal fan works normally when the inverter is running	If there is something in the fan, please clean the fan until it can work properly; If there is no foreign body in the fan, please go to step 3
Step 3	Check and make sure the fan is working properly	NA	Power off inverter	Replace the Fan	If the fan can work normally and the error is eliminated after replacing the fan, then this problem is solved; If the inverter still reports an error after replacing the fan, please go to step 4
Step 4	Check and confirm control board is normal	Screwdriver,spare control board	NA	Replace control board	If the control board is replaced and the machine works normally, there is no need to continue processing; If the machine does not work properly after replacing the control board, please contact GoodWe for solution.

Symptom	**Ext fan Failure (Error code 16)**				
Problem description	**External Fan Failure**				
No.	Description of Troubleshooting	Tools	Preparation	Detection method	Judgment and Solution
Step 1	Check and confirm that the inverter is normal by restarting.	Phone/Solargo	NA	Restart the inverter	If the inverter returns to normal after restarting the inverter, the problem is solved; If after restarting the inverter, the machine still reports an error and cannot work normally, please go to step 2
Step 2	Check that there is nothing inside the fan.	Screwdriver	Inverter starts normally	Observe whether the internal fan is working normally when the inverter is running.	If there is something in the fan, please clean the fan until the fan can work normally; If there is nothing in the fan, go to step 3
Step 3	Check that the fan is operating normally.	NA	Inverter shutdown	Replacement fan spare parts	If the fan can work normally after being replaced, and the error is eliminated, then the problem is solved; If the inverter still reports an error after replacing the fan, please go to step 4
Step 4	Check and confirm that the wiring between the fan and the power board is normal	Spare parts for screwdrivers, fan cables	Inverter shutdown	Replace fan cable spare parts	If theinverter works normally after replacing the fan cable, there is no need to continue processing; If the inverter does not work properly after replacing the fan cable, please go to step 5
Step 5	Check and confirm that the control board is normal	Spare parts for screwdrivers, control board	NA	Replace control board	If the inverter works normally after replacing the control board, there is no need to continue processing; If the inverter does not work properly after replacing the control board,please contact GoodWe for solution.

Symptom	**LCD shows "Waiting"**				
Problem description	**PV voltage reaches the starting voltage, but does not reach the inverter's gennerating voltage**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check 'safety country' setting	NA	NA	Check it visually	If the selected safety country is inconsistent with the requirements of the local power grid, you need to re-select the appropriate safety country according to the actual situation; If the selected safety country meet local grid requirements, please go to step 2
Step 2	Check and confirm that the string voltage on the DC side of the inverter reaches the minimum starting voltage of the inverter	NA	NA	Check PV voltage on LCD	If the voltage of any string does not reach the minimum starting voltage of the inverter, the machine should be in Waiting state until the string voltage rises to meet the minimum starting voltage of the inverter; If all the voltages of each string reach the minimum starting voltage of the inverter and it remains waiting, please go to step 3
Step 3	Check and confirm that the inverter's hardware is in good condition	NA	Power off the inverter，disconnect AC cables	Shut down AC switch and remain DC switch on	If only the DC switch is turned on and the inverter is in the Waiting state, the hardware problem of the inverter is determined. Please contact Goodwin headquarters to confirm the solution; If only the DC switch is turned on, the inverter reports that the utility power is lost, please go to step 4
Step 4	Check warning code	NA	NA	View the warning code on the screen when the machine reports an error or find it from the data via GM	If there are warning codes on the screen when the machine reports an error，please contact GoodWe for solution.

Symptom	**Inverter Reconnecting**				
Problem description	**Screen displays Checking and Reconnecting, failed to pass the power-on self-test**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check 'safety country' setting	NA	NA	Check it visually	If the selected safety country is inconsistent with the requirements of the local power grid, you need to re-select the appropriate safety country according to the actual situation; If the selected safety country meet local grid requirements, go to step 2
Step 2	Check and confirm that the string voltage on the DC side of the inverter reaches the minimum starting voltage of the inverter	NA	NA	Check PV voltage on LCD	If the voltage of any string does not reach the minimum starting voltage of the inverter, the machine should be in Waiting state until the string voltage rises to meet the minimum starting voltage of the inverter; If all the voltages of each string reach the minimum starting voltage of the inverter and it remains waiting, please go to step 3
Step 3	Check and confirm that the neutral wire on the AC side is well connected to the ground wire.	Multimeter	NA	Use a multimeter to measure the voltage of the neutral line to ground on the AC side of the inverter.	If the measured voltage between neutral and ground is greater than or equal to 10V, it is judged as poor grounding. Please correct the ground until the voltage between neutral and ground is less than 10V. If the voltage between the neutral and the ground is less than 10V, it is determined that the ground is good. Please go to step 4
Step 4	Confirm the cables of AC side are firmly connected	NA	Power off the inverter and turn off the AC switch	Pull the AC cable outward manually	If the inverter has poor AC cables connection, it needs to be rectified until it is good; If not, please go to step 5
Step 5	Check warning code	NA	NA	View the warning code on the screen when the machine reports an error or find it from the data via GM	If there are warning codes on the screen when the machine reports an error,please contact GoodWe for solution.

Symptom	**Noise of inverter**				
Problem description	**Inverter has noise,sound of inverter internal inductor / external fan noise during power generation**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check whether the noise is from external fan	NA	NA	Check it visually/listen	If it is from the fan, please clean the fan until there is no obvious noise from the fan; If it is not fan, please go to step 2
Step 2	Check 'safety country' setting	NA	NA	Check it visually	If the selected safety country is inconsistent with the requirements of the local power grid, you need to re-select the appropriate safety country according to the actual situation; If the selected safety country meet local grid requirements, please go to step 3
Step 3	Check and confirm the noise level at the site	Decibel meter/ phone	NA	Use a decibel meter to measure the actual noise of the machine in the field, or take a video with your mobile phone.	If the inverter's actual noise decibel is greater than 55dB, please contact GoodWe for solution.

Symptom	**No display on LCD**				
Problem description	**No display on LCD**				
No.	Description of Troubleshooting	Tools	Preparation before checking	Checking method	Solution
Step 1	Check and confirm that the DC input of the inverter is normal	Multimeter	Power off the inverter and disconnect all the strings	Measure the string voltage with a multimeter and confirm the polarity is correct	If the inverter DC string is abnormal, please correct the DC string until the DC string returns to normal; If the inverter DC string is normal, please go to step 2
Step 2	Check that the inside of the inverter is good	Multimeter	Power off the inverter and disconnect all the strings	Diode measurement with multimeter , red lead is connected to PV negative, black lead is connected to PV positive	If the data displayed by the multimeter is greater than 0.6V or less than 0.3V, you suspect internal damage, please contact Goodwin headquarters to confirm the solution If the data displayed by the multimeter is in the range of 0.3-0.6V, it means the machine is normal, please go to step 3
Step 3	Check the cable between the control board and the display	Screwdriver	Power off the inverter	Replug the cable between the control board and the display to confirm whether it is loose	If the wiringbetween the control board and the display is loose, please fasten it; If the wiring between the control board and the display is normal, please go to step 4
Step 4	Check the LCD	Screwdriver, Spare LCD	Power off the inverter	Replace LCD	If the screen is normal after the replacement, then the problem is solved; If not, please go to step 5
Step 5	Check the control board	Screwdriver, Spare control board	NA	Replace control board	If the machine works normally after replacing the control board, there is no need to continue processing; If not, please contact GoodWe for solution.