

# 9 Troubleshooting and Maintenance

## 9.1 Troubleshooting

### 9.1.1 LED Indicator

See “**Tab. 6-2Indicator Status Description**” for the definition.

Fault Type	Troubleshooting
LED indicator cannot be lit.	<ol style="list-style-type: none"> <li>1. Disconnect the AC circuit breaker.</li> <li>2. Rotate the DC switch to “OFF”.</li> <li>3. Check the polarity of DC input.</li> </ol>
Green indicator goes out.	<ol style="list-style-type: none"> <li>1. Disconnect the AC circuit breaker.</li> <li>2. Rotate the DC switch to “OFF”.</li> <li>3. Check the inverter electrical connection. Refer to “<b>5 Electrical Connection</b>”.</li> <li>4. Check whether the voltage of DC input exceeds the inverter start-up voltage.</li> <li>5. If all the above conditions are OK, please contact SUNGROW.</li> </ol>

### 9.1.2 Errors on the App or LCD Screen

If an error occurs, the “Error” state will be shown on the main screen. We need the following information to provide you with the best assistance:

- inverter model (e.g. string, central, grid-connected, hybrid, transformerless, single phase, triple phase, single MPPT, multiple MPPTs),
- product name,
- serial number of the inverter,
- error code / name, and
- a brief description of the problem.

Code	Description	Troubleshooting
002	Grid over-voltage. The grid voltage exceeds the protective value. (stage I)	<ol style="list-style-type: none"> <li>1. Check the voltage of the grid.</li> <li>2. If the grid voltage exceeds the permissible range of inverter protection parameters, ask utility grid company for solution.</li> <li>3. If the grid voltage is within the permissible range, contact Sungrow Service Dept.</li> </ol>

Code	Description	Troubleshooting
003	Transient over-voltage. The grid transient voltage exceeds inverter allowable upper limit.	<ol style="list-style-type: none"> <li>1. This is a short-term fault due to grid condition. Wait a moment for inverter recovery.</li> <li>2. If the fault persists, please contact Sungrow Service Dept.</li> </ol>
004	Grid under-voltage. The grid voltage is below the protective value. (stage I)	<ol style="list-style-type: none"> <li>1. Check the grid voltage.</li> <li>2. If the grid voltage exceeds the permissible range of inverter protection parameters, ask utility grid company for solution.</li> <li>3. If the grid voltage is within the permissible range, contact Sungrow Service Dept.</li> </ol>
005	Grid under-voltage. The grid voltage is below the protective value, which is lower than the protective value of error 004.(stage II)	<ol style="list-style-type: none"> <li>1. This is a short-term fault due to grid condition. Wait a moment for inverter recovery.</li> <li>2. If the fault persists, please contact Sungrow Service Dept.</li> </ol>
006	AC over-current. The AC output current exceeds inverter allowable upper limit.	<ol style="list-style-type: none"> <li>1. The inverter will resume if the output current falls below the protection value.</li> <li>2. If the fault persists, please contact Sungrow Service Dept.</li> </ol>
007	Transient AC overcurrent.	<ol style="list-style-type: none"> <li>1. The inverter will self-recover after several seconds.</li> <li>2. If the fault persists, please contact Sungrow Service Dept.</li> </ol>
008	Grid over-frequency. The grid frequency exceeds the protective value. (stage I)	<ol style="list-style-type: none"> <li>1. Check the grid frequency.</li> <li>2. If the grid frequency exceeds the permissible range of inverter protection parameters, ask utility grid company for solution.</li> </ol>
009	Grid under-frequency. The grid frequency is below the protective value. (stage I)	<ol style="list-style-type: none"> <li>3. If the grid frequency is within the permissible range, contact Sungrow Service Dept.</li> </ol>
010	Grid failure (Islanding)	<ol style="list-style-type: none"> <li>1. Check whether AC circuit breaker is triggered.</li> <li>2. Check whether AC cables are all firmly connected.</li> <li>3. Check whether grid is not in service.</li> <li>4. If all conditions are OK and this fault still occurs in the LCD screen, contact Sungrow Service Dept.</li> </ol>

Code	Description	Troubleshooting
011	DC injection over-current. The DC current injection of AC current exceeds the upper limit.	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
012	Leakage current over-current. The leakage current exceeds inverter allowable upper limit.	<ol style="list-style-type: none"> <li>1. Check the PV strings for ground fault.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
014	10-minute grid over-voltage. The average grid voltage in 10 minutes exceeds the permissible range.	<ol style="list-style-type: none"> <li>1. Check whether the inverter selected country code is the country you are in.</li> <li>2. Wait a moment for inverter recovery.</li> <li>3. Check the voltage of the grid. If the grid voltage exceeds the permissible range of inverter protection parameters, ask utility grid company for solution.</li> <li>4. If the fault occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
015	Grid over-voltage The grid voltage exceeds the protective value, which is higher than the protective value of error 002. (stage II)	<ol style="list-style-type: none"> <li>1. Check the model of the AC cables.</li> <li>2. Wait a moment for inverter recovery.</li> <li>3. If the grid voltage exceeds the permissible range, ask utility grid company for solution.</li> <li>4. If the fault occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
016	The bus voltage or power is high.	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
019	Bus transient over-voltage. The transient bus voltage exceeds inverter allowable upper limit.	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
020	Bus over-voltage. The bus voltage exceeds inverter allowable upper limit.	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
021	PV1 input over-current.	Check the layout and the wiring of PV1 input.
022	PV2 input over-current.	Check the layout and the wiring of PV2 input.
028	PV1 reverse connection.	Check the cable connections of PV1.
029	PV2 reverse connection.	Check the cable connections of PV2.


Code	Description	Troubleshooting
036	The temperature of radiator is too high.	<ol style="list-style-type: none"> <li>1. Check whether the ambient temperature shown on the screen is too high. Wait a moment for inverter recovery.</li> <li>2. Check whether there is enough space for convection.</li> <li>3. Check whether the inverter is in direct sunlight.</li> <li>4. Check whether the fan is normal. Replace it if necessary.</li> <li>5. Clean the air inlets.</li> <li>6. If the fault persists, please contact Sungrow.</li> </ol>
037	The internal temperature of inverter is too high.	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
038	Relay fault on the grid side.	<ol style="list-style-type: none"> <li>1. Check whether there is a reliable inverter grounding line.</li> <li>2. Check whether one of the PV strings is short-circuited with ground.</li> <li>3. Wait a moment for inverter recovery.</li> <li>4. If the fault occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
039	The insulation resistance of PV to earth is low. (ISO-ft)	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
041	Leakage current sampling fault.	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
043	Inner under-temperature fault. The ambient temperature inside the inverter is too low.	The inverter will recover once the ambient temperature rises above -25°C.
044	Inverter self-test fault.	
045	PV1 boost circuit fault.	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
046	PV2 boost circuit fault.	
048	Phase current sampling fault.	<ol style="list-style-type: none"> <li>1. Check the grid voltage.</li> <li>2. If the grid voltage exceeds the permissible range of inverter protection parameters, ask utility grid company for solution.</li> <li>3. If the grid voltage is within the permissible range, contact Sungrow Service Dept.</li> </ol>
053	The slave DSP detects that the grid voltage exceeds inverter allowable upper limit.	

Code	Description	Troubleshooting
054	The slave DSP detects that the grid frequency exceeds inverter allowable upper limit.	<ol style="list-style-type: none"> <li>1. Check the grid frequency.</li> <li>2. If the grid frequency exceeds the permissible range of inverter protection parameters, ask utility grid company for solution.</li> <li>3. If the grid frequency is within the permissible range, contact Sungrow Service Dept.</li> </ol>
056	The slave DSP detects that the leakage current exceeds inverter allowable upper limit.	<ol style="list-style-type: none"> <li>1. Check whether there is a grounded fault of the PV string.</li> <li>2. If the error occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
059	Communication alarm between master DSP and slave DSP.	<ol style="list-style-type: none"> <li>1. Wait 1 minute for inverter recovery.</li> <li>2. If the fault persists, contact Sungrow Service Dept.</li> </ol>
061	Alarm for no inverter type setting.	Contact Sungrow Service Dept.
070	Fans are defective	Stop the inverter and disconnect the AC & DC cables. Check whether the fan duct has been blocked. If not, replace fans.
084	Warning for reverse cable connection of the Sungrow Meter.	<ol style="list-style-type: none"> <li>1. Check whether the power cable connections are correct.</li> <li>2. If "Existing Inverter" is set to "ON" via LCD menu, check and ensure that its rated power is correctly set.</li> <li>3. For Sungrow single-phase meter, check whether the CT clamp of the 1-phase sensor is correctly placed.</li> </ol>
085	Mismatched software version.	Please contact Sungrow Service Dept.
087	Arc detection module abnormal alarm.	Please contact Sungrow Service Dept.
088	Arc fault on PV side.	<ol style="list-style-type: none"> <li>1. Rotate the DC switch to "OFF" and check whether there are damaged cables, loose terminals or fuses, or poor contact. Replace it if necessary.</li> <li>2. Rotate the DC switch to "ON" and clear the error via the App or LCD menu.</li> <li>3. If the error occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
089	The arc detection function is disabled.	<ol style="list-style-type: none"> <li>1. Enable the arc detection function via the App or LCD menu.</li> <li>2. If the error occurs repeatedly, contact Sungrow Service Dept.</li> </ol>

Code	Description	Troubleshooting
100	The AC output current exceeds the upper limit.	<ol style="list-style-type: none"> <li>1. The inverter will resume if the output current falls below the protection value.</li> <li>2. If the fault persists, please contact Sungrow Service Dept.</li> </ol>
101	Grid over-frequency. The grid frequency exceeds the protective value, which is higher than the protective value of error 008. (stage II)	<ol style="list-style-type: none"> <li>1. Check the grid frequency.</li> <li>2. If the grid frequency exceeds the permissible range of inverter protection parameters, ask utility grid company for solution.</li> </ol>
102	Grid under-frequency. The grid frequency is below the protective value, which is lower than the protective value of error 009. (stage II)	<ol style="list-style-type: none"> <li>3. If the grid frequency is within the permissible range, contact Sungrow Service Dept.</li> </ol>
106	Abnormal grounding. Neither the PE terminal on the AC connection block nor the second PE terminal on the enclosure is reliably connected.	Check whether there is a reliable inverter grounding line, if there is access to the ground, and the fault persists, please contact Sungrow Service Dept.
200	Bus hardware over-voltage fault. The bus voltage exceeds the protective value.	<ol style="list-style-type: none"> <li>1. Wait for inverter recovery after bus voltage lower.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
201	The bus voltage is too low.	<ol style="list-style-type: none"> <li>1. Wait a moment for inverter recovery.</li> <li>2. If the fault occurs repeatedly, contact Sungrow Service Dept.</li> </ol>
202	PV hardware over-current fault. The PV1 or PV2 current exceeds the protective value.	If the fault occurs repeatedly, contact Sungrow Service Dept.
203	The PV input voltage exceeds the bus voltage.	Check the functionality of the PV connection terminals.
306	Input and output power mismatching fault.	If the fault occurs repeatedly, contact Sungrow Service Dept.
315	PV1 current sampling fault.	Channel sampling anomaly.
316	PV2 current sampling fault.	Contact Sungrow Service Dept.

Code	Description	Troubleshooting
320	Leakage current sensor fault.	Contact Sungrow Service Dept.
409	All temperature sensors fail.	
503	Ambient temperature sensor open circuit warning.	
504	Ambient temperature sensor short circuit warning.	If the fault occurs repeatedly, contact Sungrow Service Dept.
505	Radiator temperature sensor open circuit warning.	
506	Radiator temperature sensor short circuit warning.	
501	External memory reading/writing warning.	1. Inverter can normally be connected to the grid. 2. Power on the inverter again. If the fault persists, contact Sungrow Service Dept.
514	Abnormal communication warning of the Sungrow Meter. (Inverter can be normally connected to the grid.)	1. Check whether the power cable connections of the meter are correct. 2. Check whether the RS485connection is correct.

## 9.2 Maintenance

** DANGER**

**Risk of inverter damage or personal injury due to incorrect service!**

**Always keep in mind that the inverter is powered by dual sources: PV strings and utility grid.**

**Before any service work, observe the following procedure.**

- **Disconnect the AC circuit breaker and then set the DC load-break switch if the inverter to OFF;**
- **Wait at least 10 minutes for inner capacitors to discharge completely;**
- **Verify that there is no voltage or current before pulling any connector.**