8 Troubleshooting and Maintenance

8.1 Troubleshooting

8.1.1 Troubleshooting of LED Indicators

See "**Tab. 7-5 State Descriptions of LED Indicators**" for the definition.

Fault Type	Troubleshooting
LED indicators and LCD screen cannot be lit	1. Disconnect the AC circuit breaker. 2. Rotate the DC Switch to "OFF". 3. Check the polarities of the DC inputs.
"RUN" indicator goes out	1. Disconnect the AC circuit breaker. 2. Rotate the DC Switch to "OFF". 3. Check the electrical connection. 4. Check whether the DC input voltage exceeds the start voltage of the inverter. 5. If all of the above are OK, please contact SUNGROW.
"Fault" indicator is lit	1. A fault is not resolved. 2. Perform troubleshooting according to the fault type on the LCD screen. See "**8.1.2 Troubleshooting of Faults**". 3. If it cannot be resolved, please contact SUNGROW.

8.1.2 Troubleshooting of Faults

When faults occur, the "Fault" state will be shown on the main screen. **Press** ▼ to view all the fault information.

- For the battery fault codes, if all the conditions are OK but the fault still occurs, contact the distributor or the battery manufacturer.
- The default ranges only apply to the grid standards in Australia. Refer to **Tab. 7-3** for the specified value.
- We need the following information to provide you with the best assistance: inverter type (e.g. string, central, grid-connected, hybrid, transformerless, single phase, triple phase, single MPPT, multiple MPPTs), or product name, serial number of the inverter, fault code/name, and a brief description of the problem.

For Inverter Side

Code	Specification	Troubleshooting
002	Grid over-voltage. (default range: 257 V–270 V)	1. Check the grid voltage. 2. If the grid voltage exceeds the permissible range, consult the utility grid for a solution.
003	Temporary grid over-voltage in the on-grid mode. (default value: 400 V)	This is a short-term fault. Wait a moment for inverter recovery or restart the system.
004	Grid under-voltage. (default range: 180 V–210 V)	1. Check the grid voltage. 2. If the grid voltage exceeds the permissible range, consult the utility grid for a solution.
005	Grid under-voltage. (default value: 180 V)	
007	Temporary AC over-current. The transient AC current has exceeded the allowable upper limit.	Wait a moment for inverter recovery or restart the system.
008	Grid over-frequency. (default range: 51.5 Hz–52 Hz)	1. Check the grid frequency. 2. If the grid frequency exceeds the permissible range, consult the utility grid for a solution.
009	Grid under-frequency. (default range: 47.0 Hz–48.5 Hz)	
010	Islanding. Abnormal connection between the system and the grid.	1. Check whether the AC circuit breaker is triggered. 2. Check whether all the AC cables are firmly connected. 3. Check whether the grid is in service.
011	DC injection over-current. The DC injection of the AC current exceeds the upper limit.	Wait a moment for inverter recovery or restart the system.
012	Leakage current over-current. The leakage current exceeds the upper limit.	1. Check whether there is a grounding fault in the PV strings. 2. Wait a moment for inverter recovery or restart the system.
014	10-minute grid over-voltage. The average grid voltage is outside the permissible range for over 10 minutes. (default range: 255 V–258 V)	1. Check whether the grid is operating normally. 2. Wait a moment for inverter recovery or restart the system.
015	Grid over-voltage. (default value: 265 V)	1. Check the grid voltage. 2. If the grid voltage exceeds the permissible range, consult the utility grid for a solution.
019	Bus over-voltage. The transient bus voltage exceeds the upper limit.	Wait a moment for inverter recovery or restart the system.

Code	Specification	Troubleshooting
021	PV1 over-current. The input current of PV1 exceeds the upper limit.	1. Check the PV input power and configuration. 2. Wait a moment for inverter recovery or restart the system.
022	PV2 over-current. The input current of PV2 exceeds the upper limit.	
024	Neutral point voltage imbalance. The deviation of the neutral point voltage exceeds the allowable limit.	1. The inverter will recover once the deviation falls below the protective limit. 2. Wait a moment for inverter recovery or restart the system.
028	Reverse polarity of the PV1 connection.	1. Disconnect the DC switch. 2. Check the polarity of the PV inputs. 3. Reconnect the PV strings if the polarity is incorrect.
029	Reverse polarity of the PV2 connection.	
037	Inner over-temperature fault. The ambient temperature inside the inverter exceeds the upper limit.	1. Check and clean the heat sink. 2. Check whether the inverter is installed in sunlight or the ambient temperature of the enclosure exceeds 45℃. If not, please contact SUNGROW for a solution.
038	Relay fault on the grid side.	Wait 5 minutes for inverter recovery or restart the system.
041, 622	Leakage current sampling fault.	Wait 5 minutes for inverter recovery or restart the system.
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℃.
044	INV open-loop self-check fault.	Wait 5 minutes for inverter recovery or restart the system.
045	PV1 boost circuit fault.	
046	PV2 boost circuit fault.	
048	Phase current sampling fault.	
051	Load overpower fault in the off-grid mode.	If the fault persists, disconnect some non-key loads.
052	INV under-voltage fault in the off-grid mode.	Wait 5 minutes for inverter recovery or restart the system.
062	DI fault of the backup box STB5K.	1. Check whether the DI connection between the inverter and the backup box is correct. 2. Wait 5 minutes for inverter recovery.
063	The version of CPLD (complex programmable logic device)	Power off the system and program the CPLD

Code	Specification	Troubleshooting
	cannot be detected.	
064	INV over-voltage fault in the off-grid mode.	Wait 5 minutes for inverter recovery or restart the system.
065	INV under-frequency fault in the off-grid mode. (default value: 47 Hz)	
066	INV over-frequency fault in the off-grid mode. (default value: 52 Hz)	
067	Temporary grid over-voltage in the off-grid mode. (default value: 500 V)	
083	Fan2 abnormal speed warning.	1. Check if the fan is blocked. 2. Restart the system.
084	Warning for reverse cable connection of the Sungrow Meter.	1. Check whether the power cable connections are correct. 2. For Sungrow single-phase meter, check whether the CT clamp of the 1-phase sensor is correctly placed. Refer to "**7.4.1 Meter Installation and Connection**".
100	INV hardware over-current fault. The AC current exceeds the protective value.	Wait 5 minutes for inverter recovery or restart the system.
101	Grid over-frequency. (default value: 52 Hz)	Check the grid frequency.
102	Grid under-frequency. (default value: 47 Hz)	
106	The inverter is not grounded. Neither the PE terminal on the AC connection block nor the second PE terminal on the enclosure is reliably connected.	1. Check whether there is a reliable grounding connection. 2. If there is access to the ground, and the fault still exists, please contact SUNGROW for a solution. 3. Check whether the L-line and N-line are connected correctly.
107	DC injection over-voltage fault in the off-grid mode. The DC injection of INV voltage exceeds the upper limit.	The inverter will recover once the DC injection voltage falls below the recovery value.
200	Bus hardware over-voltage fault. The bus voltage exceeds the protection value.	Wait 5 minutes for inverter recovery or restart the system.
201	Bus under-voltage fault.	
202	PV hardware over-current fault. The PV1 or PV2 current exceeds the protective value.	

Code	Specification	Troubleshooting
203	The PV input voltage exceeds the bus voltage.	Check the functionality of the PV connection terminals.
204	PV1 boost short-circuit fault	The inverter may be damaged. Contact SUNGROW for a solution.
205	PV2 boost short-circuit fault	
300	INV over-temperature fault.	1. Check and clean the heat sink. 2. Check whether the inverter is installed in sunlight or the ambient temperature of the enclosure exceeds 45℃-60℃. 3. Restart the system.
302	PV insulation resistance fault.	1. Check whether the PV cable connection is intact. 3. Wait for a sunny day to check whether the system can run well.
308	Slave DSP redundant fault.	Restart the system.
309	Phase voltage sampling fault.	
312	DC injection sampling fault.	
315	PV1 current sampling fault.	
316	PV2 current sampling fault.	
317	PV1 MPPT current sampling fault.	
318	PV2 MPPT current sampling fault.	
319	System power supply failure fault.	
320	Leakage current CT self-check fault.	
321	SPI communication failure. Communication faults between the master DSP and the slave DSP.	
322	Master DSP communication fault.	
401-408	Permanent faults.	
409	All temperature sensors failed fault.	Forced restart the system.
501	FRAM1 reading warning.	1. Inverter can normally be connected to the grid. 2. Restart the system.
503-506, 511	Temperature sensor warnings.	
507	Error alarm of DO power settings.	Modify the DO control power according to the load power. Refer to "**Optimized Control**".
509	Clock reset fault.	Manually reset the clock or synchronize the clock with the network time. This will clear the fault.

Code	Specification	Troubleshooting
510	PV over-voltage fault.	1. Check whether the configuration of the PV array exceeds the permissible range of the inverter. 2. Wait a moment for inverter recovery or restart the system.
513	Fan1 abnormal speed warning.	1. Check if the fan is blocked. 2. Restart the system.
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 RS485 connection is correct. 3. Check if the 120 Ohm (2) resistor for RS485_2 is pushed to "ON" when the length of RS485 cable is longer than 100 m.
600	Temporary BDC charging over-current fault.	Wait a moment for system recovery or restart the system.
601	Temporary BDC discharging over-current fault.	
602	Clamping capacitor under-voltage fault.	1. Check the cable connection of the battery. 2. Wait a moment for system recovery or restart the system.
603	Temporary clamping capacitor over-voltage fault.	Wait a moment for system recovery or restart the system.
608	BDC circuit self-check fault.	
612	BDC over-temperature fault.	1. Check and clean the heat sink. 2. Check whether the inverter is installed in sunlight or the ambient temperature of the enclosure exceeds 45℃. 3. Restart the system.
616	BDC hardware over-current fault.	The system will resume once the battery charge/discharge current falls below the upper limit or restart the system.
620	BDC current sampling fault.	Wait a moment for system recovery or restart the system.
623	Slave DSP communication fault.	
624	BDC soft-start fault.	
800,802 804,807	BDC internal permanent faults.	Restart the system
900,901	BDC temperature sensor warnings	1. Check and clean the heat sink. 2. Check whether the inverter is installed in sunlight or the ambient temperature of the enclosure

Code	Specification	Troubleshooting
		exceeds 45℃. 3. Restart the system.
906	Transformer direction recognition error.	1. The inverter can normally be connected to the grid but charge/discharge has stopped. 2. Wait a moment for system recovery or restart the system.
910	FRAM2 warning	Restart the inverter.

For Battery Side

For the battery faults, please consult the battery manufacturer for a solution.

Code	Specification	Troubleshooting
703	Battery average under-voltage fault.	1. The inverter can normally be connected to the grid but charge/discharge has stopped. 2. Wait a moment for system recovery or restart the system.
707	Battery over-temperature fault.	1. The inverter can normally be connected to the grid but charge/discharge has stopped. 2. Check the ambient temperature of the battery location. 3. Wait a moment for system recovery or restart the system.
708	Battery under-temperature fault.	
711	Instantaneous battery over-voltage.	1. The inverter can normally be connected to the grid but charge/discharge has stopped. 2. Wait a moment for system recovery or restart the system.
712	Battery average over-voltage fault.	
714	Abnormal communication between battery and the hybrid inverter.	1. The inverter can normally be connected to the grid but charge/discharge has stopped. 2. Check the battery type and communication connection. 3. Wait a moment for system recovery or restart the system.
715	Battery hardware over-voltage fault.	1. The inverter can normally be connected to the grid but charge/discharge has stopped. 2. Wait a moment for system recovery or restart the system.
732	Battery over-voltage protection.	1. The inverter can normally be connected to the grid. Charge has stopped but discharge is allowed.

Code	Specification	Troubleshooting
		2. Wait a moment for system recovery.
733	Battery over-temperature protection.	1. The inverter can normally be connected to the grid but charge/discharge has stopped. 2. Check the ambient temperature of the battery location. 3. Wait a moment for system recovery or restart the system.
734	Battery under-temperature protection.	
735	Battery charging/discharging over-current protection.	1. The inverter can normally be connected to the grid but charge/discharge has stopped. 2. Wait a moment for system recovery or restart the system.
739	Battery under-voltage protection.	1. The inverter can normally be connected to the grid. Discharge has stopped but charge is allowed. 2. Wait a moment for system recovery or restart the system.
832	Battery FET fault or electrical switch failure.	1. The inverter can normally be connected to the grid but charge/discharge has stopped. 2. Check the battery port voltage and the battery communication cable connection. 3. Force a shutdown and restart the inverter and battery system. 4. Wait a moment for system recovery or restart the system.
834	Battery charging/discharging over-current permanent fault.	
836	ID competing failure	Restart the system, if the fault persists, please contact SUNGROW for a solution.
837, 838	Battery internal faults.	1. The inverter can normally be connected to the grid but charge/discharge has stopped. 2. Check the cable connection of the battery. 3. Try to restart the inverter and battery.
839	Mismatched software version.	Contact SUNGROW for a solution.
844	Software self-verifying failure.	Restart the system, if the fault persists, please contact SUNGROW for a solution.
866	Battery precharge voltage fault.	1. The inverter can normally be connected to the grid but charge/discharge has stopped. 2. Check the battery port voltage and the battery communication cable connection.
867	Battery under-voltage fault.	
868	Battery cell voltage imbalance fault.	
870	Battery cable connection	

Code	Specification	Troubleshooting
	fault.	3. Force a shutdown and restart the inverter and battery system. 4. Wait a moment for system recovery or restart the system.
909	Low SOH (State of Health) warning.	1. The inverter can normally be connected to the grid and the charge/discharge function is normal. 2. Batteries are beyond the scope of the warranty. It is recommended to contact the distributor for replacements.
932	Battery over-voltage warning.	1. The inverter can normally be connected to the grid. Charge has stopped but discharge is allowed. 2. The system will resume after a certain time of discharging.
933	Battery over-temperature warning.	1. The inverter can normally connected be to the grid but charge/discharge has stopped. 2. Check the ambient temperature of the battery location. 3. Wait a moment for system recovery or restart the system.
934	Battery under-temperature warning.	
935	Battery charging/discharging over-current warning.	1. The inverter can normally be connected to the grid but charge/discharge has stopped. 2. Wait a moment for system recovery or restart the system.
937	Battery tray voltage imbalance warning.	1. The inverter can normally be connected to the grid and the charge/discharge functions are normal. 2. Check whether the cable connection of the battery is correct.
939	Battery under-voltage warning.	1. The inverter can normally be connected to the grid. Discharge has stopped but charge is allowed. 2. The system will resume after a certain time of charging.
964	Battery internal warning.	Consult the battery manufacturer for a solution.