

LUNA2000-100KTL&200KTL Series Smart Power Control System

Alarm Reference

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About This Document

Purpose

This document describes how to handle all alarms of the following products:

- LUNA2000-100KTL series Smart PCS
- LUNA2000-200KTL series Smart PCS





Intended Audience


This document is intended for:

- Technical support engineers
- Commissioning engineers
- Maintenance engineers

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 DANGER	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.

Symbol	Description
 NOTE	Supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

Changes between document issues are cumulative. The latest document issue contains all the changes made in earlier issues.

Issue 02 (2023-11-15)

Added [36 2109 Abnormal Running Scenario](#).

Issue 01 (2023-05-22)

This issue is the first official release.

Moved "Alarm Reference" in the user manuals and maintenance manuals of the following products to this document:

- LUNA2000-100KTL series Smart PCS
- LUNA2000-200KTL series Smart PCS

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1 Description of Alarm Reference Items

Item	Description
Alarm ID	Indicates the ID of an alarm. Unique identifier of an alarm in one product.
Alarm Name	Indicates the name of an alarm. In the same product, alarm names and alarm IDs correspond to each other, which clearly and accurately reflect the meaning of alarms.
Alarm Severity	Alarm severities are defined as follows: <ul style="list-style-type: none">• Major: The device is faulty or the external environment is abnormal. As a result, the output power decreases or the device stops feeding to the grid.• Minor: Some components of the device are faulty but the device can still connect to the grid and generate power.• Warning: The device functions normally, but its output power decreases or some authorization functions fail due to external factors.
Introduced Since	Indicates the software version where the alarm is generated.
Possible Cause	Indicates the possible cause of the alarm, including the cause ID and cause description.
Suggestion	Indicates the procedure for handling the alarm.

2 2004 DC input overvoltage

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2004	DC input overvoltage	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The DC bus voltage of the device exceeds the upper threshold.

Suggestion

Turn off the AC switch and DC switch, wait for 5 minutes, and then turn on the AC switch and DC switch. If the fault persists, contact your dealer or technical support.

3 2005 DC input in reverse polarity

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2005	DC input in reverse polarity	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The DC bus of the device is connected in reverse polarity.

Suggestion

Power off the device (turn off the AC switch and DC switch, and wait for a period specified on the device safety warning label), and then perform the following operations: Check whether the DC terminals are connected in reverse polarity. If yes, adjust the DC polarities.

4 2006 Input short-circuited or in reverse polarity

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2006	Input short-circuited or in reverse polarity	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The DC bus of the device is short-circuited or connected in reverse polarity.

Suggestion

Power off the device (turn off the AC switch and DC switch, and wait for a period specified on the device safety warning label), and then perform the following operations: Check whether the DC terminals are short-circuited or connected in reverse polarity. If yes, adjust the DC bus cable connection.

5 2007 Input connected in series

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2007	Input connected in series	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The DC buses of device are connected in series.

Suggestion

Power off the device (turn off the AC switch and DC switch, and wait for a period specified on the device safety warning label), and then perform the following operations: Check whether the DC terminals are connected in series. If yes, adjust the DC bus cable connection.

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2008 DC Cable Not Securely Connected

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2008	DC Cable Not Securely Connected	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The DC bus of the device is not securely connected.

Suggestion

Power off the device (turn off the AC switch and DC switch, and wait for a period specified on the device safety warning label), and then perform the following operations: Check whether the DC terminals are connected securely. If not, adjust the DC bus cable connection.

7 2031 Phase Wire Short-Circuited to PE

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2031	Phase Wire Short-Circuited to PE	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The phase wire is short-circuited to PE or its impedance to PE is low.

Suggestion

Check the impedance of the phase wire to PE, locate the position with low impedance, and rectify the fault.

8 2032 Grid Loss

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2032	Grid Loss	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	1. The power grid experiences an outage. 2. The AC power cable is disconnected or the AC circuit breaker is OFF.

Suggestion

1. Check whether the AC voltage is normal.
2. Check that the AC power cable is connected and that the AC switch is ON.

9 2033 Grid Undervoltage

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2033	Grid Undervoltage	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The grid voltage is below the lower threshold or the low voltage duration has lasted for more than the value specified by LVRT.

Suggestion

1. If the alarm occurs occasionally, the power grid may be abnormal temporarily. The device automatically recovers after detecting that the power grid becomes normal.
2. If the alarm occurs frequently, check whether the power grid voltage is within the allowed range. If not, contact the local power operator. If yes, modify the power grid undervoltage protection threshold after obtaining the consent of the local power operator.
3. If the fault persists for a long time, check the connection between the AC switch and the power cable.

10 2034 Grid Overvoltage

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2034	Grid Overvoltage	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The grid voltage exceeds the higher threshold or the high voltage duration has lasted for more than the value specified by HVRT.

Suggestion

1. If the alarm occurs occasionally, the power grid may be abnormal temporarily. The device automatically recovers after detecting that the power grid becomes normal.
2. If the alarm occurs frequently, check whether the power grid voltage is within the allowed range. If not, contact the local power operator. If yes, modify the power grid overvoltage protection threshold after obtaining the consent of the local power operator.
3. Check whether the peak voltage of the power grid is too high. If the fault occurs frequently and persists for a long time, contact the local power operator.

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2035 Grid Voltage Imbalance

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2035	Grid Voltage Imbalance	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The difference between grid phase voltages exceeds the upper threshold.

Suggestion

1. If the alarm occurs occasionally, the power grid may be abnormal temporarily. The device automatically recovers after detecting that the power grid becomes normal.
2. If the alarm occurs frequently, check whether the power grid voltage is within the normal range. If not, contact the local power operator.
3. If the fault persists for a long time, check the connection of the AC cable.
4. If the AC cable is correctly connected and the alarm persists and affects the operation of the plant, contact the local power operator.

12 2036 Grid Overfrequency

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2036	Grid Overfrequency	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	Power grid exception: The power grid frequency is higher than the frequency required in the local standard.

Suggestion

1. If the alarm occurs occasionally, the power grid may be abnormal temporarily. The device automatically recovers after detecting that the power grid becomes normal.
2. If the alarm occurs frequently, check whether the power grid frequency is within the allowed range. If not, contact the local power operator. If yes, modify the power grid overfrequency protection threshold after obtaining the consent of the local power operator.

13 2037 Grid Underfrequency

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2037	Grid Underfrequency	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	Power grid exception: The power grid frequency is lower than the frequency required in the local standard.

Suggestion

1. If the alarm occurs occasionally, the power grid may be abnormal temporarily. The device automatically recovers after detecting that the power grid becomes normal.
2. If the alarm occurs frequently, check whether the power grid frequency is within the allowed range. If not, contact the local power operator. If yes, modify the power grid underfrequency protection threshold after obtaining the consent of the local power operator.

14 2038 Unstable Grid Frequency

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2038	Unstable Grid Frequency	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	Power grid exception: The actual grid frequency change rate does not comply with the local power grid standard.

Suggestion

1. If the alarm occurs occasionally, the power grid may be abnormal temporarily. The device automatically recovers after detecting that the power grid becomes normal.
2. If the alarm occurs frequently, check whether the power grid frequency is within the allowed range. If not, contact the local power operator.

15 2039 AC Overcurrent

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2039	AC Overcurrent	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The grid experiences a dramatic voltage drop or is short-circuited. As a result, the transient AC current of the device exceeds the upper threshold and triggers protection.

Suggestion

1. The device detects its external working conditions in real time. After the fault is rectified, the device automatically recovers.
2. If the alarm occurs frequently and affects the operation of the power plant, check whether AC short circuit exists. If the fault persists, contact your dealer or technical support.

16 2040 DC Component Overhigh

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2040	DC Component Overhigh	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The DC component in the AC current exceeds the upper threshold.

Suggestion

1. The device detects its external working conditions in real time. After the fault is rectified, the device automatically recovers.
2. If the alarm occurs frequently, contact your dealer or technical support.

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2041 Reverse Phase Sequence on AC
Side

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2041	Reverse Phase Sequence on AC Side	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The phase sequence on the AC side is reversed.

Suggestion

Check whether the AC cable connection is normal.

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2051 Abnormal Residual Current

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2051	Abnormal Residual Current	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The ground insulation resistance decreases during device operation.

Suggestion

1. If the alarm occurs occasionally, the external circuit may be abnormal temporarily. The device will automatically recover after the fault is rectified.
2. If the alarm occurs frequently or persists, check whether the DC-to-ground impedance is too low.

19 2061 Abnormal Grounding

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2061	Abnormal Grounding	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	<ol style="list-style-type: none">1. The neutral wire or PE cable of the device is not connected.2. The output mode of the device does not match the actual cable connection.

Suggestion

Power off the device (turn off the AC switch and DC switch, and wait for a period specified on the device safety warning label), and then perform the following operations:

1. Check that the PE cable of the device is connected properly.
2. If the device is connected to a TN power grid, check whether the neutral wire is properly connected and whether the voltage to ground is normal.
3. After powering on the device, check whether the output mode set on the device matches the actual cable connection.

20 2062 Low Insulation Resistance

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2062	Low Insulation Resistance	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
2	<ol style="list-style-type: none">1. The battery rack is short-circuited to the ground.2. The battery rack is in a humid environment and the insulation between the circuit and ground is poor.

Suggestion

Send a shutdown command to devices connected to the same DC bus. Start insulation impedance detection for the battery rack to locate the fault. After the fault is located, perform the following operations:

1. Check the battery rack-to-ground impedance. If a short circuit or inadequate insulation is found, rectify it.
2. Check that the PE cable of the device is correctly connected.
3. If the impedance is lower than the specified protection threshold in rainy and cloudy days, change the **Insulation resistance protection threshold** setting.

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2063 Cabinet Overtemperature

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2063	Cabinet Overtemperature	Minor	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1, 2	1. The device is installed in a place with poor ventilation. 2. The ambient temperature is high. 3. The device is faulty.

Suggestion

1. Check the ventilation and ambient temperature of the device installation position.
2. If the ventilation is poor or the ambient temperature exceeds the upper threshold, improve the ventilation and heat dissipation.
3. If the ventilation and ambient temperature meet requirements, contact your dealer or technical support.

22 2064 Device Fault

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2064	Device Fault	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
3-12, 16, 17, 19	A major fault has occurred on a circuit inside the device.
18	The AC soft-start board is abnormal, the DC precharge circuit is abnormal, or the common DC bus is short-circuited.

Suggestion

Cause ID = 3-12, 16, 17, 19

Turn off the AC switch and DC switch, wait for 5 minutes, and then turn on the AC switch and DC switch. If the fault persists, contact your dealer or technical support.

Cause ID = 18

Power off the device (turn off the AC switch and DC switch, and wait for a period specified on the device safety warning label), and then perform the following operations: Check whether the common DC bus is short-circuited. If not, turn on the AC switch and DC switch, and restart the AC soft-start circuit. If the fault persists, contact your dealer or technical support.

23 2065 Upgrade Failed or Version Mismatch

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2065	Upgrade Failed or Version Mismatch	Minor	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1-4	The update failed.
8	The communication protocol version is incorrect.

Suggestion

Cause ID = 1-4

1. Perform the update again.
2. If the update fails for multiple times, contact your dealer or technical support.

Cause ID = 8

1. Perform the update again.
2. If the update fails for multiple times, contact your dealer or technical support.

24 2086 External Fan Abnormal

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2086	External Fan Abnormal	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1-3	The external fan is short-circuited, the power supply is insufficient, or the air channel is blocked.

NOTE

Cause ID = 1-3, corresponding to FAN 1-3

Suggestion

1. Turn off the AC switch and DC switch, check that the fan blades are normal, and clear the foreign objects around the fan if there are any.
2. Reinstall the fan and turn on the AC switch and DC switch. If the fault persists after the device runs for 15 minutes, replace the external fan.

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2087 Internal Fan Abnormal

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2087	Internal Fan Abnormal	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1-4	The internal fan is short-circuited, the power supply is insufficient, or the fan is damaged.

Suggestion

Turn off the AC switch and DC switch, wait for 5 minutes, and then turn on the AC switch and DC switch. If the fault persists after the device runs for 5 minutes, contact your dealer or technical support to replace the device.

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2094 Allowable discharge capacity of battery is low

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2094	Allowable discharge capacity of battery is low.	Warning	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The remaining dischargeable capacity of the battery is lower than 10% of the total capacity in off-grid scenario.

Suggestion

The remaining power of the battery is low. Please remove unnecessary loads to increase power backup duration.

27 2095 Management System Certificate Invalid

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2095	Management System Certificate Invalid	Warning	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The digital signature certificate is invalid.

Suggestion

Check the time or replace the digital signature certificate.

28 2096 Management system certificate to expire

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2096	Management system certificate to expire	Warning	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The digital signature certificate is about to expire.

Suggestion

Replace the digital signature certificate in time.

29 2097 Management System Certificate Expired

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2097	Management System Certificate Expired	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The digital signature certificate has expired.

Suggestion

Replace the digital signature certificate immediately.

30 2098 Parallel System Communication Failure

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2098	Parallel System Communication Failure	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The parallel communication line is abnormal.

Suggestion

Power off the devices connected to the same DC bus (turn off the AC switches and DC switches, and wait for a period specified on the device safety warning label), and then perform the following operations: Check that the communications cable is securely connected and turn on the AC switches and DC switches. If the fault persists, contact your dealer or technical support.

31 2103 AC Terminal Temperature Abnormal

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2103	AC Terminal Temperature Abnormal	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	<ol style="list-style-type: none">1. The AC power cable is not of the recommended specifications or is oxidized.2. The OT/DT terminal of the AC power cable is not crimped as required.3. The fastening torque of the AC terminal does not meet the requirement.

Suggestion

Power off the devices connected to the same DC bus (issue a shutdown command, turn off the AC and DC switches, and wait for the period specified on the device safety warning label), and then perform the following steps:

1. Check whether the cables meet the requirements.
2. Check whether the OT/DT terminals are crimped as required.
3. Check that the fastening torque of wiring terminals meets the requirement.

4. Turn on the AC switch and DC switch, and restart the device.

If the fault persists, contact your dealer or technical support.

32 2104 DC Terminal Temperature Abnormal

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2104	DC Terminal Temperature Abnormal	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	<ol style="list-style-type: none">1. The DC power cable is not of the recommended specifications or is oxidized.2. The OT/DT terminal of the DC power cable is not crimped as required.3. The fastening torque of the DC terminal does not meet the requirement.

Suggestion

Power off the devices connected to the same DC bus (issue a shutdown command, turn off the AC and DC switches, and wait for the period specified on the device safety warning label), and then perform the following steps:

1. Check whether the cables meet the requirements.
2. Check whether the OT/DT terminals are crimped as required.
3. Check that the fastening torque of wiring terminals meets the requirement.

4. Turn on the AC switch and DC switch, and restart the device.

If the fault persists, contact your dealer or technical support.

33 2105 Black Start Failed

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2105	Black Start Failed	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	<ol style="list-style-type: none">1. The grid codes configured on PCSs are inconsistent.2. The external load is abnormal or the power cable is not properly connected.

Suggestion

Issue a shutdown command to devices connected to the same DC bus and check whether the grid codes configured on all PCSs are consistent. If not, correctly set the grid code to an identical value on all PCSs and perform black start again. If the grid codes are the same, perform the following steps:

1. Turn off the AC switches and DC switches of the devices connected to the same DC bus.
2. Check whether the external load power is lower than the current system output power. It is recommended that black start be performed without loads.
3. Check that the power cable is connected correctly.
4. Turn on the AC switch and DC switch, and perform black start again.

If the fault persists, contact your dealer or technical support.

34 2106 Incorrect Black Start Instruction Sequence

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2106	Incorrect Black Start Instruction Sequence	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	The black start instructions are incorrect.

Suggestion

1. Issue a shutdown command to devices connected to the same DC bus.
2. Contact the microgrid controller vendor to check whether the black start instructions are delivered in wrong sequence.
3. After confirming that the instructions are delivered in correct sequence, perform black start again.

If the fault persists, contact your dealer or technical support.

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2107 CAN Bus Cable Between
Parallel PCSs Disconnected

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2107	CAN Bus Cable Between Parallel PCSs Disconnected	Major	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	One or more CAN bus cables between parallel PCSs are disconnected

Suggestion

Power off the devices connected to the same DC bus (issue a shutdown command, turn off the AC and DC switches, and wait for the period specified on the device safety warning label), and then perform the following operations: Check that the communications cable is securely connected and turn on the AC and DC switches. If the fault persists, contact your dealer or technical support.

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2109 Abnormal Running Scenario

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
2109	Abnormal Running Scenario	Major	PCS2000HA V100R023C00SPC 120

Possible Cause

Cause ID	Possible Cause
1	The off-grid feature has not been authorized.
2	The device does not support off-grid and on/off-grid scenarios.

Suggestion

- Cause ID =1
Set the running scenario to on-grid.
- Cause ID =2
Check whether the running scenario is correctly set. In off-grid and on/off-grid scenarios, you need to purchase and load the off-grid feature license.

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61440 Faulty Monitoring Unit

Alarm Attribute

Alarm ID	Alarm Name	Alarm Severity	Introduced Since
61440	Faulty Monitoring Unit	Minor	FusionSolar V800R021C10

Possible Cause

Cause ID	Possible Cause
1	1. The flash memory is insufficient. 2. The flash memory has bad sectors.

Suggestion

Turn off the AC switch and DC switch, wait for 5 minutes, and then turn on the AC switch and DC switch. If the fault persists, replace the monitoring board or contact your dealer or technical support.

A Acronyms and Abbreviations

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PCS	Smart Power Control System
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