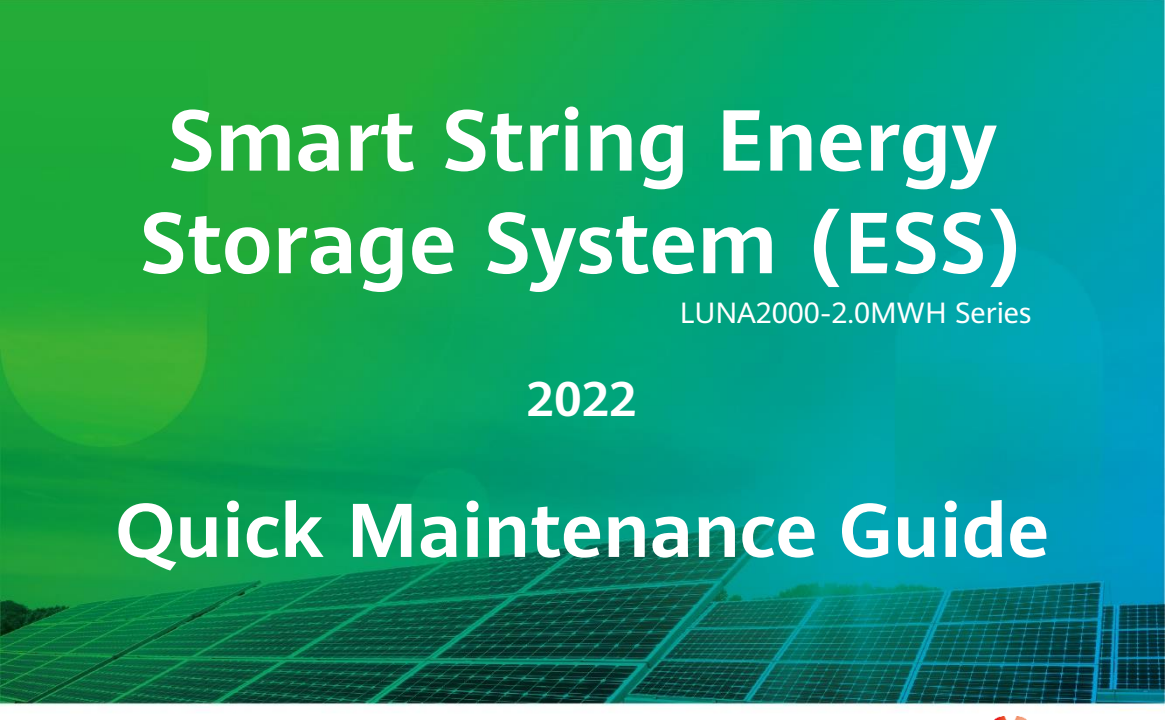
Smart String Energy Storage System (ESS)

LUNA2000-2.0MWH Series

2022

Quick Maintenance Guide



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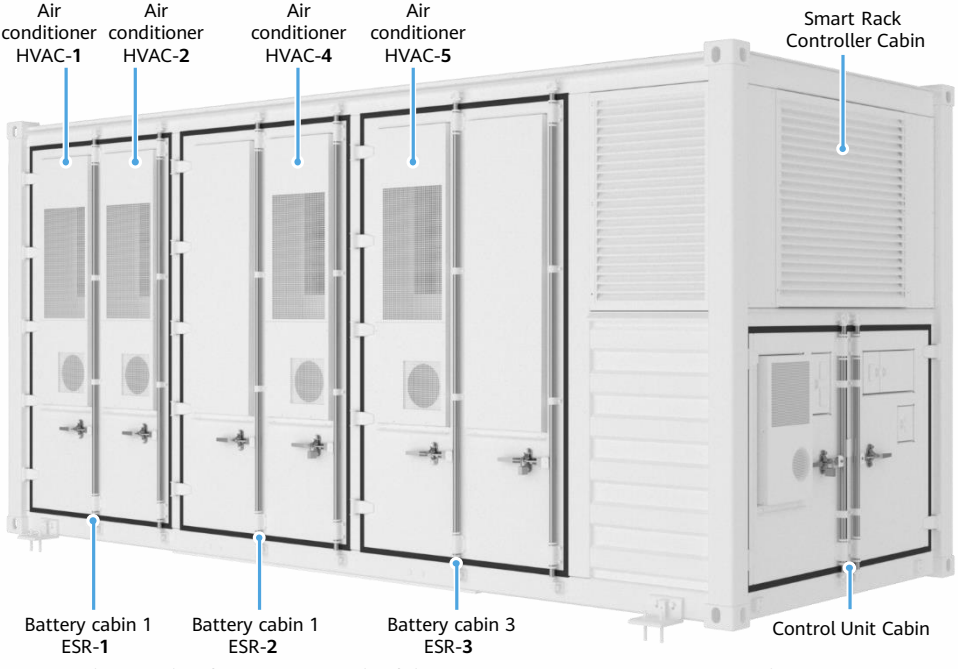
Contents

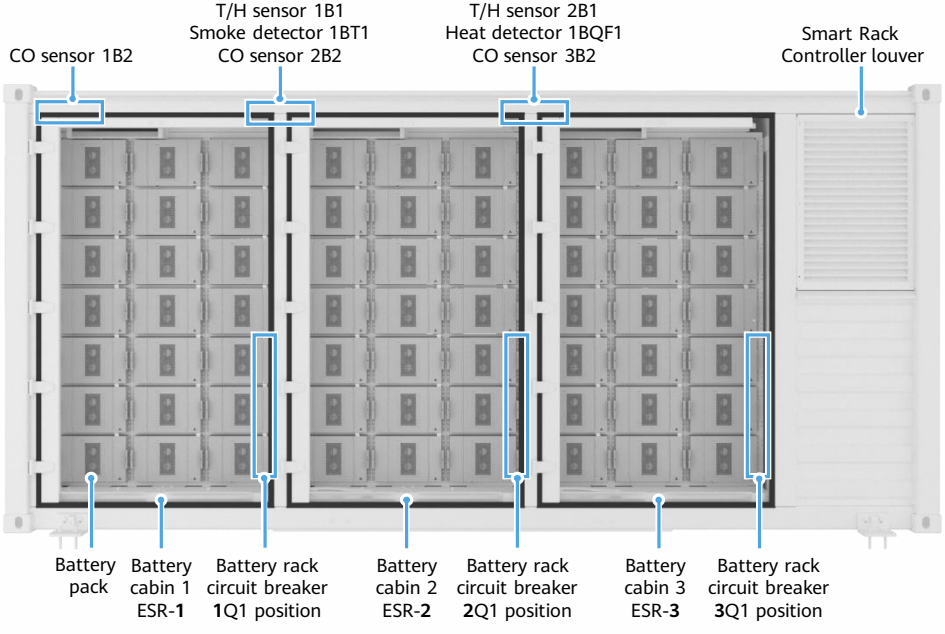
Equipment

- Appearance
- Key Components Layout
- Fire Suppression System
- Power Distribution Switches

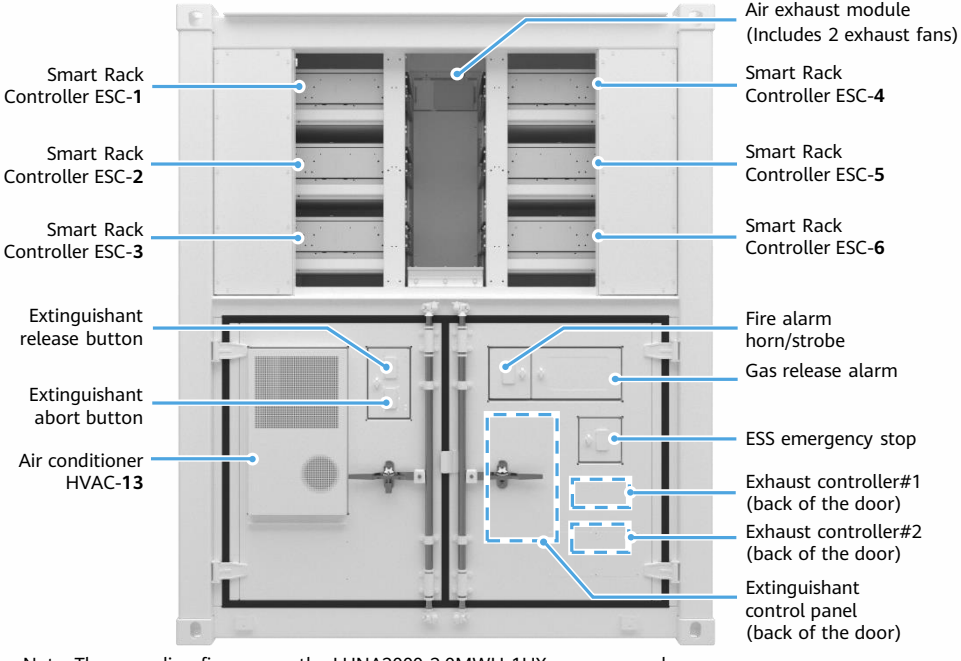
Note: The figures in this document are for reference only. The actual products may vary.



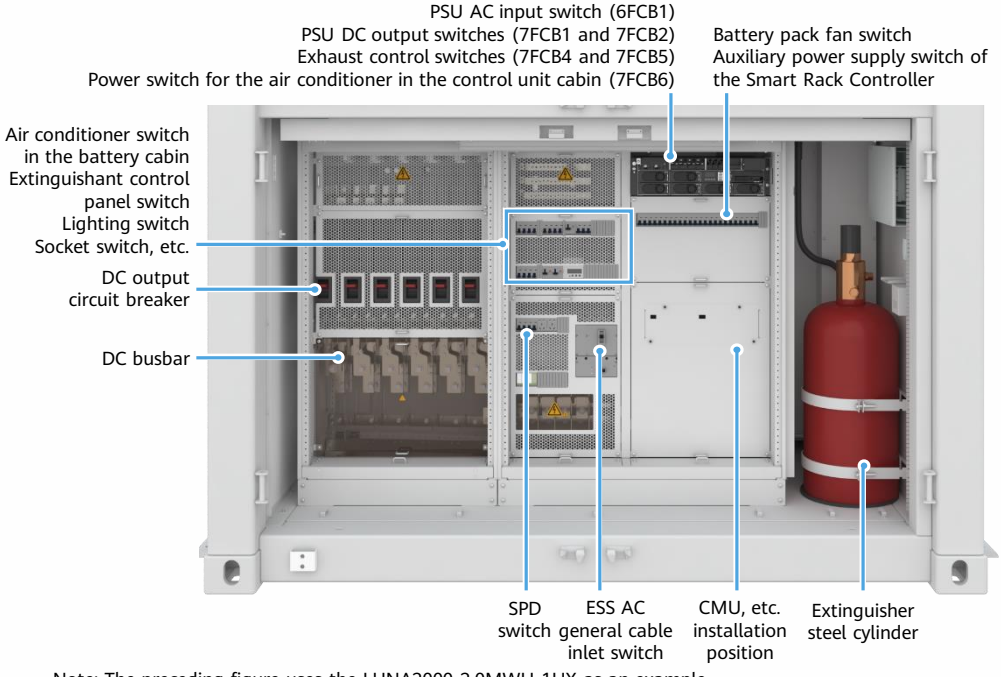
Note: The preceding figure uses one side of the LUNA2000-2.0MWH-1HX as an example.



Note: The preceding figure uses one side of the LUNA2000-2.0MWH-1HX as an example.

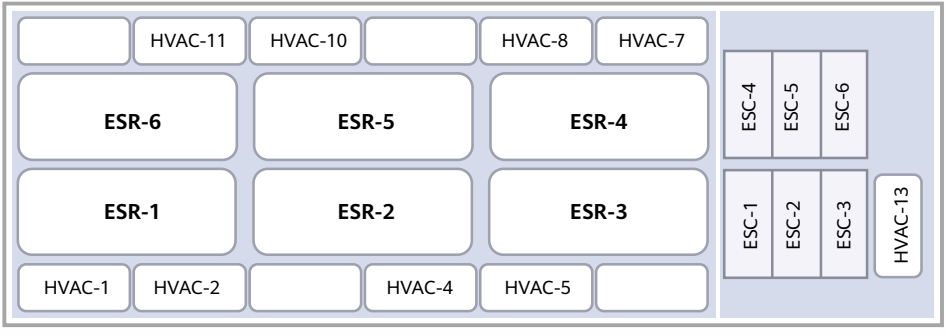


Note: The preceding figure uses the LUNA2000-2.0MWH-1HX as an example.

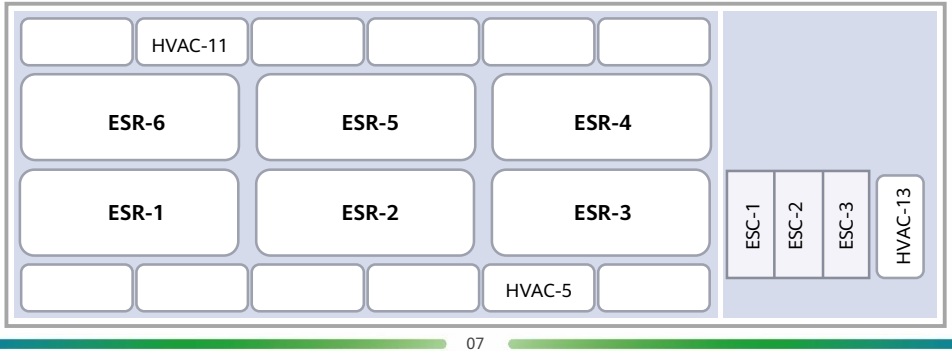


Note: The preceding figure uses the LUNA2000-2.0MWH-1HX as an example.

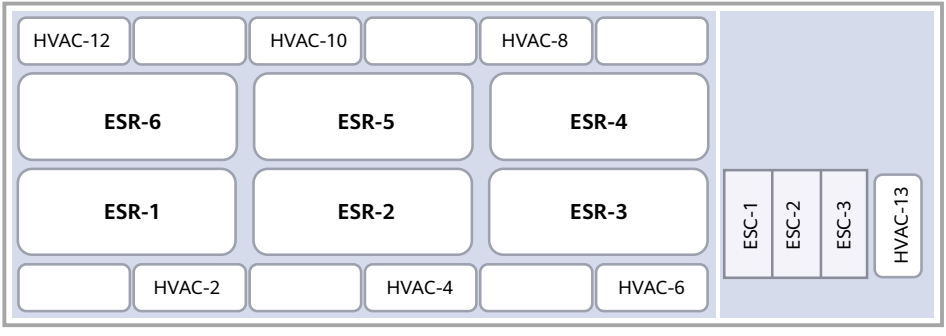
LUNA2000-2.0MWH-1HX Layout



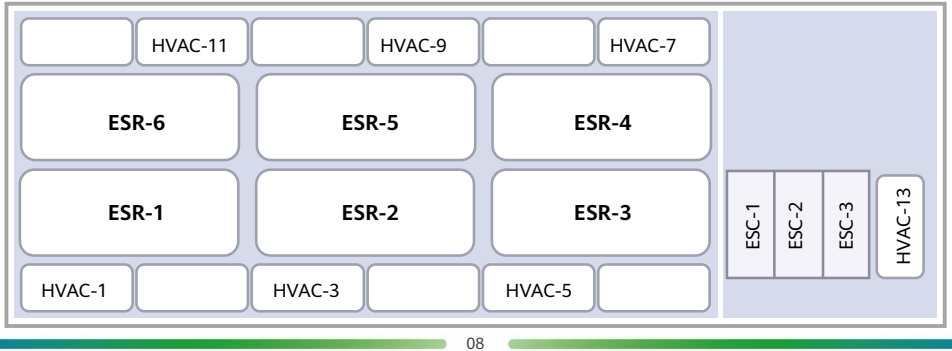
LUNA2000-2.0MWH-4H1 Layout

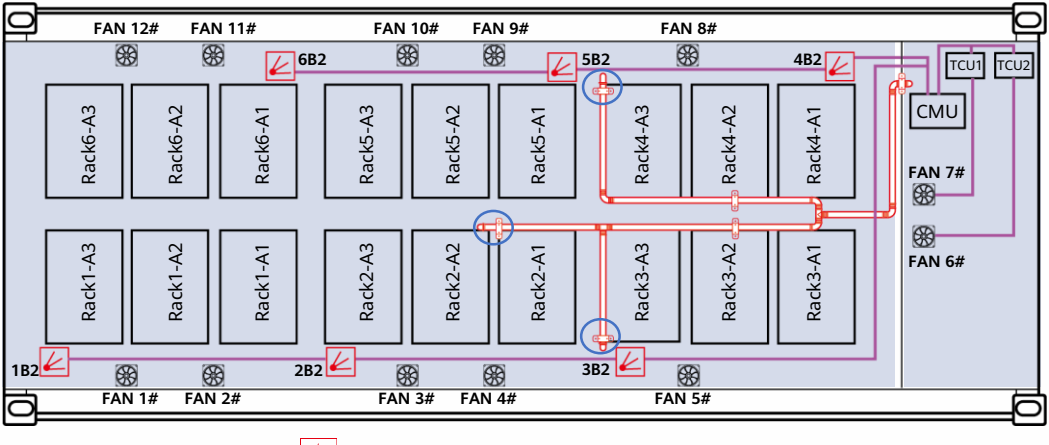


LUNA2000-2.0MWH-2HX Layout 1



LUNA2000-2.0MWH-2HX Layout 2





CO sensor (top of battery cabin)

Mixed-flow fan (bottom of the battery cabin)
Exhaust fan (top of smart rack controller cabin)

Extinguisher nozzle (top of battery cabin)

LUNA2000-2.0MWH-1HX

Battery Cabin	Battery Rack Circuit Breaker	Battery Pack ESM Fan Switch		PSU DC Output Switch	Smart Rack Controller ESC	ESC Auxiliary Power Supply Switch	DC Output Circuit Breaker
ESR-1	1Q1	ESM1-7	7FCB7	7FCB1	ESC-1	7FCB16	1Q2
		ESM8-14	7FCB8				
		ESM15-21	7FCB9				
ESR-2	2Q1	ESM1-7	7FCB10		ESC-2	7FCB17	2Q2
		ESM8-14	7FCB11				
		ESM15-21	7FCB12				
ESR-3	3Q1	ESM1-7	7FCB13		ESC-3	7FCB18	3Q2
		ESM8-14	7FCB14				
		ESM15-21	7FCB15				
ESR-4	4Q1	ESM1-7	7FCB19	7FCB2	ESC-4	7FCB28	4Q2
		ESM8-14	7FCB20				
		ESM15-21	7FCB21				
ESR-5	5Q1	ESM1-7	7FCB22		ESC-5	7FCB29	5Q2
		ESM8-14	7FCB23				
		ESM15-21	7FCB24				
ESR-6	6Q1	ESM1-7	7FCB25		ESC-6	7FCB30	6Q2
		ESM8-14	7FCB26				
		ESM15-21	7FCB27				

LUNA2000-2.0MWH-2HX (3U ETP Subrack)

Battery Cabin	Battery Rack Circuit Breaker	Battery Pack ESM Fan Switch		PSU DC Output Switch	Smart Rack Controller ESC	ESC Auxiliary Power Supply Switch	DC Output Circuit Breaker
ESR-1	1Q1	ESM1-7	7FCB7	7FCB1	ESC-1	7FCB16	1Q2
		ESM8-14	7FCB8				
		ESM15-21	7FCB9				
ESR-2	2Q1	ESM1-7	7FCB10		ESC-2	7FCB17	2Q2
		ESM8-14	7FCB11				
		ESM15-21	7FCB12				
ESR-3	3Q1	ESM1-7	7FCB13		ESC-3	7FCB18	3Q2
		ESM8-14	7FCB14				
		ESM15-21	7FCB15				
ESR-4	4Q1	ESM1-7	7FCB19	7FCB2	ESC-3	7FCB18	3Q2
		ESM8-14	7FCB20				
		ESM15-21	7FCB21				
ESR-5	5Q1	ESM1-7	7FCB22		ESC-2	7FCB17	2Q2
		ESM8-14	7FCB23				
		ESM15-21	7FCB24				
ESR-6	6Q1	ESM1-7	7FCB25		ESC-1	7FCB16	1Q2
		ESM8-14	7FCB26				
		ESM15-21	7FCB27				

LUNA2000-2.0MWH-2HX (2U ETP Subrack) and LUNA2000-2.0MWH-4H1

Battery Cabin	Battery Rack Circuit Breaker	Battery Pack ESM Fan Switch		PSU DC Output Switch	Smart Rack Controller ESC	ESC Auxiliary Power Supply Switch	DC Output Circuit Breaker
ESR-1	1Q1	ESM1-7 ESM8-14 ESM15-21	7FCB7	7FCB1	ESC-1	7FCB16	1Q2
ESR-2	2Q1	ESM1-7 ESM8-14 ESM15-21	7FCB8		ESC-2	7FCB17	2Q2
ESR-3	3Q1	ESM1-7 ESM8-14 ESM15-21	7FCB9		ESC-3	7FCB18	3Q2
ESR-4	4Q1	ESM1-7 ESM8-14 ESM15-21	7FCB10		ESC-3	7FCB18	3Q2
ESR-5	5Q1	ESM1-7 ESM8-14 ESM15-21	7FCB11		ESC-2	7FCB17	2Q2
ESR-6	6Q1	ESM1-7 ESM8-14 ESM15-21	7FCB12		ESC-1	7FCB16	1Q2

Troubleshooting

CMU Alarm Handling

ESC and BCU Alarm Handling

BMU Alarm Handling

Note: When checking and maintaining the equipment, comply with the safety requirements of the equipment as well as local laws and regulations.

Alarm ID	3802	Alarm Name	Fire Alarm

Possible Cause	Handling Suggestion
Cause ID = 1 Smoke or overheating is detected in the battery cabin.	1. Monitor the system remotely for 30 minutes to check whether other exceptions (such as abnormal battery voltage, battery temperature, and combustible gas concentration) occur. • If yes, power off the ESS remotely. During remote monitoring, do not approach the battery cabin or open the cabin doors. • If no other exception is found, manually clear the alarm. If the alarm clearance fails, go to step 2. 2. Send professional personnel to the site and observe the system for 30 minutes from a safe distance. • If there is smoke or fire, ensure that the system is powered off, evacuate the onsite personnel as soon as possible, and call the fire emergency number. • If no exception is found, manually clear the alarm. If the alarm clearance fails, go to step 3. 3. Open the doors of the control unit cabin and check whether the Extinguishant Control Panel generates an alarm. • If no, manually clear the alarm. • If yes, reset the alarm on the Extinguishant Control Panel. ▫ If the reset fails, contact your technical support. ▫ If the reset is successful, manually clear the alarm 3802 remotely. If the alarm clearance fails, close the cabin doors and clear the alarm 20 minutes later. If the alarm persists, contact your technical support.
Cause ID = 2 A fire has been detected in the battery cabin.	1. Do not open the cabin doors and evacuate onsite personnel. 2. Handle the fire according to the site fire emergency handling plan. 3. Contact your technical support.

Alarm ID	3826	Alarm Name	Combustible Gas Alarm

Possible Cause	Handling Suggestion
Cause ID = 1 1. The safety valve of the lithium battery is open, and combustible gas is leaked. 2. Lithium battery thermal runaway occurs.	1. Monitor the system remotely for 30 minutes to check whether other exceptions (such as abnormal ambient temperature, battery voltage, and battery temperature) occur. • If yes, power off the ESS remotely. During remote monitoring, do not approach the battery cabin or open the cabin doors. • If no other exception is found, manually clear the alarm. If the alarm clearance fails, go to step 2. 2. Send professional personnel to the site and observe the system for 30 minutes from a safe distance. • If there is smoke or fire, ensure that the system is powered off, evacuate the onsite personnel as soon as possible, and call the fire emergency number. • If no exception is found, manually clear the alarm. If the alarm persists, contact your technical support.

CO sensor

Note:

CO sensors 1 to 6 displayed on the SmartLogger WebUI correspond to the component identifiers 1B2 to 6B2 in the electrical conceptual diagram respectively, and the corresponding DIP switch addresses are 1 to 6.

Alarm ID	3805	Alarm Name	Air Conditioner Temperature High

Possible Cause	Handling Suggestion
Cause ID = 1 to 13 The return air temperature exceeds the high temperature alarm threshold.	1. Check that **High temperature alarm threshold** is set to a proper value on the SmartLogger WebUI. Note: The default value of **High temperature alarm threshold** is 45°C. You can choose **Monitoring** > **Running Param.** to change the setting. 2. If multiple air conditioners report the alarm, shut down the system and contact your technical support. 3. If the alarm is generated from only one air conditioner, check for other related alarms. • If other alarms are generated, clear the alarms according to the handling suggestions. • If no other alarm is generated, shut down the air conditioner and contact your technical support.

Alarm ID	3806	Alarm Name	Air Conditioner Temperature Low

Possible Cause	Handling Suggestion
Cause ID = 1 to 13 The return air temperature is lower than the low temperature alarm threshold.	1. Check that **Low temperature alarm threshold** is set to a proper value on the SmartLogger WebUI. Note: The default value of **Low temperature alarm threshold** is –30°C. You can choose **Monitoring** > **Running Param.** to change the setting. 2. If multiple air conditioners report the alarm, shut down the system and contact your technical support. 3. If the alarm is generated from only one air conditioner, check for other related alarms. • If other alarms are generated, clear the alarms according to the handling suggestions. • If no other alarm is generated, shut down the air conditioner and contact your technical support.

Alarm ID	3813	Alarm Name	Air Conditioner AC Overvoltage

Possible Cause	Handling Suggestion
Cause ID = 1 to 13 1. The auxiliary power cable is incorrectly connected. 2. The main control board is faulty. 3. The overvoltage alarm threshold is improper.	1. Check that **AC overvoltage alarm threshold** is set to a proper value on the SmartLogger WebUI. Note: • Air conditioners HVAC-1 to HVAC-12 in battery cabins are AC air conditioners. • The default value of **AC overvoltage alarm threshold** for the air conditioners is 264 V. You can choose **Monitoring** > **Running Param.** to change the setting. 2. Measure the voltage of the air conditioner wiring terminal: • If the voltage is approximately 380 V, the auxiliary power cable is incorrectly connected. Disconnect the auxiliary power supply and reconnect the cable correctly. • If the voltage is approximately 220 V, contact your technical support.

Alarm ID	3814	Alarm Name	Air Conditioner AC Undervoltage

Possible Cause	Handling Suggestion
Cause ID = 1 to 13 1. The power cable is loose. 2. The model of auxiliary power supply is incorrect. 3. The main control board is faulty. 4. The undervoltage threshold setting is improper.	1. Check that **AC undervoltage alarm threshold** is set to a proper value on the SmartLogger WebUI. Note: • Air conditioners HVAC-1 to HVAC-12 in battery cabins are AC air conditioners. • The default value of **AC undervoltage alarm threshold** for the air conditioners is 176 V. You can choose **Monitoring** > **Running Param.** to change the setting. 2. Measure the voltage of the air conditioner wiring terminal: • If the voltage is approximately 110 V or 127 V, the auxiliary power supply does not meet the requirements. Disconnect the auxiliary power supply immediately and replace it with a 380 V power supply. • If the voltage is less than 150 V, check whether the cable is loose. • If the voltage is approximately 220 V, contact your technical support.

Alarm ID	3821	Alarm Name	Air Conditioner DC Overvoltage

Possible Cause	Handling Suggestion
Cause ID = 1 to 13 1. The input voltage is higher than the overvoltage threshold. 2. The overvoltage threshold setting is improper. 3. The voltage test device is faulty.	1. Check that **DC overvoltage alarm threshold** is set to a proper value on the SmartLogger WebUI. Note: • The HVAC-13 in the control unit cabin is a DC air conditioner. • The default value of **DC overvoltage alarm threshold** for the air conditioners is 58 V. You can choose **Monitoring** > **Running Param.** to change the setting. 2. Measure and record the power voltage of the air conditioner and contact your technical support.

Alarm ID	3822	Alarm Name	Air Conditioner DC Undervoltage

Possible Cause	Handling Suggestion
Cause ID = 1 to 13 1. The input voltage is lower than the undervoltage threshold. 2. The undervoltage threshold setting is improper. 3. The voltage test device is faulty.	1. Check that **DC undervoltage alarm threshold** is set to a proper value on the SmartLogger WebUI. Note: • The HVAC-13 in the control unit cabin is a DC air conditioner. • The default value of **DC undervoltage alarm threshold** for the air conditioners is 42 V. You can choose **Monitoring** > **Running Param.** to change the setting. 2. Measure and record the power voltage of the air conditioner and contact your technical support.

Alarm ID	3809	Alarm Name	Air Conditioner Compressor Fault

Possible Cause	Handling Suggestion
Cause ID = 1 to 13 1. The cable of the compressor is loose. 2. The compressor is damaged.	1. Shut down the system at a proper time and take safety measures. 2. Power off the air conditioner, open the enclosure, and check whether the compressor cable is loose. If yes, securely connect the cable. 3. Check whether the compressor is damaged or burnt. If yes, contact your technical support.

Alarm ID	3827	Alarm Name	Ambient Overtemperature

Possible Cause	Handling Suggestion
Cause ID = 1 The ambient temperature of the battery cabin is too high. Cause ID = 2 The ambient temperature of the control unit cabin is too high, which triggers system derating or shutdown.	1. On the SmartLogger WebUI, check the status of air conditioners HVAC-1 to HVAC-12 in battery cabins and HVAC-13 in the control unit cabin. Green indicates that the air conditioners are running properly, yellow indicates that the air conditioners are hibernating, and red indicates that the air conditioners are faulty. • If the air conditioner is abnormal, rectify the fault based on the troubleshooting suggestions. • If the air conditioner is hibernating or running properly, go to step 2. 2. Check whether the cabin door is completely closed. • If yes, go to step 3. • If no, close the cabin door and check whether the alarm is cleared 20 minutes later. If the alarm persists, go to step 3. 3. Check the ID of the T/H sensor in the cabin on the SmartLogger WebUI. Note: T/H sensors 1 to 5 displayed on the SmartLogger WebUI correspond to the component identifiers 1B1, 2B1, 5B1, 6B1, and 7B1 respectively in the electrical conceptual diagram, and the corresponding DIP switch addresses are 12 to 16. 4. To replace the T/H sensor, perform the following steps: a. Record the DIP switch settings of the faulty T/H sensor. b. Remove the faulty T/H sensor and related cables. c. Set the DIP switch addresses for the new T/H sensor based on the recorded information. d. Install the new T/H sensor and related cables.

Alarm ID	3828	Alarm Name	Condensation Risk

Possible Cause	Handling Suggestion
Cause ID = 1 Condensation risk exists in the battery cabin. Cause ID = 2 Condensation risk exists in the control unit cabin.	1. This alarm indicates that dehumidification is required inside the cabin. Check that **T/H Control Mode** is set to **Automatic** on the SmartLogger WebUI. 2. If the alarm persists for no more than 30 minutes, check whether the alarm is cleared after the dehumidification of the air conditioner is complete. 3. If the alarm persists for more than 30 minutes, check whether the cabin door is completely closed. • If yes, go to step 4. • If no, close the cabin door, wait for 20 minutes (time for forcible dehumidification of the air conditioner after the cabin door is closed), and check whether the alarm is cleared. If the alarm persists, go to step 4. 4. Check whether the air conditioner in the battery cabin or control unit cabin is faulty. If yes, rectify the fault based on the corresponding troubleshooting suggestions.

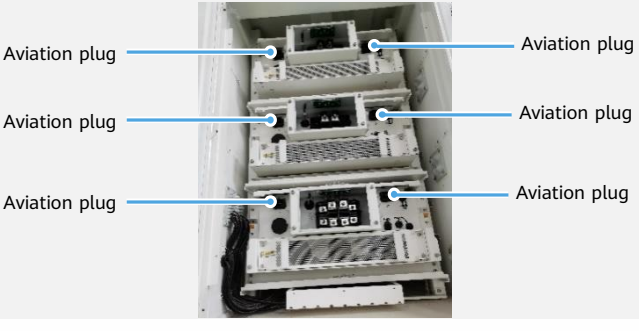
Alarm ID	3851	Alarm Name	Exhaust Fan Fault

Possible Cause	Handling Suggestion
Cause ID = 1 to 12 The exhaust fan is faulty.	1. Check whether the cable to the exhaust fan or mixed-flow fan is loose. If yes, reconnect the cable. 2. Check whether the exhaust fan or mixed-flow fan is damaged or burnt. If yes, replace the corresponding fan. 3. On the SmartLogger WebUI, start **Exhaust fan control** under CMU, observe the fan speed, and check whether the exhaust controller TCU connected to the exhaust fan or mixed-flow fan works properly. 4. If the alarm persists, contact your technical support.

Note:
TCU-1 and TCU-2 displayed on the SmartLogger WebUI correspond to the component identifiers K6 and K7 respectively in the electrical conceptual diagram, and the corresponding DIP switch addresses are 37 and 38.

Alarm ID	3853	Alarm Name	ESU Physical Location Failure

Possible Cause	Handling Suggestion
Cause ID = 1 ESU physical location failed.	1. Remove the louver, air baffle, and decorative cover from the ESC. 2. Check that the cables (aviation plug) between ESCs are properly connected. 3. Check that the network cables between ESCs are properly connected. 4. Check that the RS485 cable between the ESC-1 and the CMU is properly connected. 5. After checking the preceding cables, wait for 5 minutes and check whether the alarm is cleared. • If the alarm is cleared, install the decorative cover, air baffle, and louver for the ESC. • If the alarm persists, contact your technical support.



Alarm ID	3013	Alarm Name	Battery Pack Communication of Rack Controller Abnormal

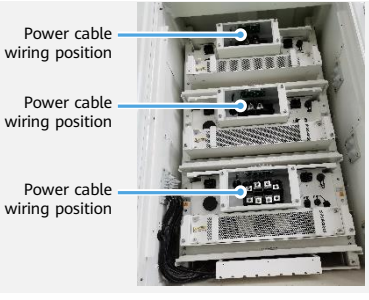
Possible Cause	Handling Suggestion
Cause ID = 2 The rack controller failed to communicate with the battery pack.	1. Send a shutdown command on the SmartLogger WebUI: a. Choose **Maintenance** > **Connect Device**. b. Click  to send a shutdown command to the Smart PCS and Smart Rack Controller. 2. Turn off the switch on the battery side, the switch on the bus side, and the AC power supply switch, and wait for 5 minutes. 3. Check whether the communications cable between the battery pack and the battery rack is properly connected. 4. Turn on the AC power supply switch, the switch on the battery side, and the switch on the bus side in sequence. 5. Send a system startup command on the SmartLogger WebUI. 6. If the alarm persists, contact your technical support.

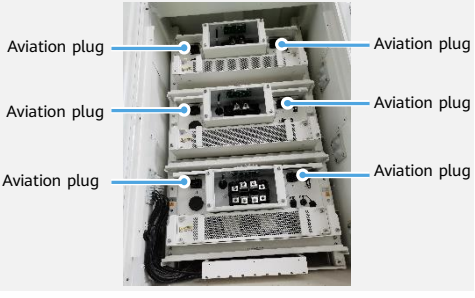
Alarm ID	3014	Alarm Name	Rack Controller Abnormal

Possible Cause	Handling Suggestion
Cause ID = 1 to 34 A major fault has occurred on the internal circuit of the rack controller.	1. Send a shutdown command on the SmartLogger WebUI: a. Choose **Maintenance** > **Connect Device**. b. Click  to send a shutdown command to the Smart PCS and Smart Rack Controller. 2. Turn off the switch on the battery side, the switch on the bus side, and the AC power supply switch, and wait for 5 minutes. 3. Check whether the communications cable between the battery pack and the battery rack is properly connected. 4. Turn on the AC power supply switch, the switch on the battery side, and the switch on the bus side in sequence. 5. Send a system startup command on the SmartLogger WebUI. 6. If the alarm persists, contact your technical support.

Alarm ID	3034	Alarm Name	Rack Controller Cable Connection Abnormal

Possible Cause	Handling Suggestion
Cause ID = 1 The cable connection between the battery rack and the corresponding power module is incorrect.	1. If this alarm is generated during array topology identification, wait until the process is complete or exit the process. 2. Determine the positions of the input and output circuit breakers associated with [ESC-No] and the AC input power switch of the PSU. 3. On the SmartLogger WebUI, send a hibernation command to all ESRs. 4. Turn off the switch on the battery side, the switch on the bus side, and the AC input power switch of the PSU in sequence, and wait for 5 minutes. 5. Check whether the power cable and J1/J2 communications cable (aviation plug) on the battery side of the [ESR-CabinetNo] rack controller are correctly connected. 6. Check whether the auxiliary power supply of the [ESR-CabinetNo] battery rack is normal and whether the auxiliary power supply switch is turned on. 7. Turn on the AC input power switch of the PSU, the switch on the battery side, and the switch on the bus side in sequence, and send a startup command. 8. If the alarm persists, contact your technical support.



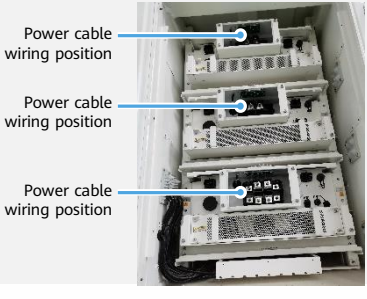


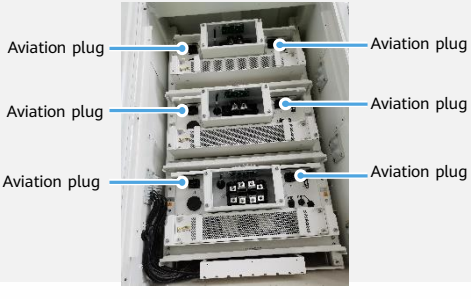
Alarm ID	3034	Alarm Name	Rack Controller Cable Connection Abnormal

Possible Cause	Handling Suggestion
Cause ID = 2 The power-on self-test was terminated due to a system exception.	1. Check whether the battery rack circuit breaker associated with [ESC-No] is ON. 2. Check whether other alarms are generated on the device. • If no, go to step 3. • If yes, rectify the fault based on the troubleshooting suggestions. Check whether the alarm 3034 is cleared. If the alarm persists, go to step 3. 3. If the alarm persists after the system is reset, contact your technical support. For example, if you press the reset button  on the ESU page of the SmartLogger WebUI, the ESU restarts cable connection detection.

Alarm ID	3042	Alarm Name	Rapid Shutdown Cable Connection of Battery Pack Abnormal

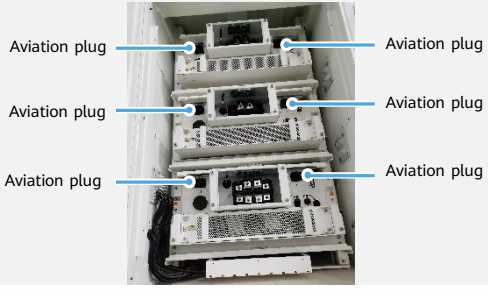
Possible Cause	Handling Suggestion
Cause ID = 1 The rapid shutdown cabling between battery racks is incorrect.	1. If this alarm is generated during array topology identification, wait until the process is complete or exit the process. 2. Determine the positions of the input and output circuit breakers associated with [ESC-No] and the AC input power switch of the PSU. 3. On the SmartLogger WebUI, send a hibernation command to all ESRs, turn off the switch on the battery side, the switch on the bus side, and the AC input power switch of the PSU in sequence, and wait for 5 minutes. 4. Check whether the power cable and J1/J2 communications cable (aviation plug) on the battery side of the [ESR-CabinetNo] rack controller are correctly connected. 5. Verify that the cables are correctly connected, and turn on the AC input power switch of the PSU, the switch on the battery side, and the switch on the bus side in sequence. 6. On the SmartLogger WebUI, send a startup command to all ESRs. 7. If the alarm persists, contact your technical support.





Alarm ID	3042	Alarm Name	Rapid Shutdown Cable Connection of Battery Pack Abnormal

Possible Cause	Handling Suggestion
Cause ID = 2 The rapid shutdown cabling in the battery rack is incorrect.	1. If this alarm is generated during array topology identification, wait until the process is complete or exit the process. 2. Determine the positions of the input and output circuit breakers associated with [ESC-No] and the AC input power switch of the PSU. 3. On the SmartLogger WebUI, send a hibernation command to all ESRs, turn off the switch on the battery side, the switch on the bus side, and the AC input power switch of the PSU in sequence, and wait for 5 minutes. 4. Check whether the J1/J2 communications cable (aviation plug) in the [ESR-CabinetNo] battery rack is correctly connected. 5. Verify that the cables are correctly connected, and turn on the AC input power switch of the PSU, the switch on the battery side, and the switch on the bus side in sequence. 6. On the SmartLogger WebUI, send a startup command to all ESRs. 7. If the alarm persists, contact your technical support.



Alarm ID	3042	Alarm Name	Rapid Shutdown Cable Connection of Battery Pack Abnormal

Possible Cause	Handling Suggestion
Cause ID = 3 The power-on self-test was terminated due to a system exception.	1. Check whether the battery rack circuit breaker associated with [ESC-No] is ON. 2. Check whether other alarms are generated on the device. • If no, go to step 3. • If yes, rectify the fault based on the troubleshooting suggestions. Check whether the alarm 3042 is cleared. If the alarm persists, go to step 3. 3. If the alarm persists after the system is reset, contact your technical support.

Alarm ID	3054	Alarm Name	Rack Controller NTC Abnormal

Possible Cause	Handling Suggestion
Cause ID = 1 The NTC is short-circuited or open-circuited. Cause ID = 2 The NTC is short-circuited, open-circuited, or not securely connected.	1. Locate the input and output circuit breakers associated with the ESC. 2. On the SmartLogger WebUI, send a hibernation command to the ESR corresponding to the ESC. 3. Turn off the switch on the battery side and then the switch on the bus side, and wait for 5 minutes. 4. Turn on the switch on the battery side and then the switch on the bus side. 5. On the SmartLogger WebUI, send a startup command to the ESR corresponding to the ESC. 6. If the alarm persists, contact your technical support.

Alarm ID	3027	Alarm Name	Battery Pack Monitoring Board Abnormal

Possible Cause	Handling Suggestion
Cause ID = 1 to 20 A major fault has occurred on the internal circuit of the BMU.	1. On the SmartLogger WebUI, check whether the battery cell voltage of the [ESR-CabinetNo ESM-SlotNo] ranges from 2.5 V to 3.65 V and whether the battery cell voltages of the ESM are the same (the deviation is within 200 mV). • If the battery cell voltage is normal, manually clear the alarm. • If the battery cell voltage is abnormal, go to step 2. 2. Send a hibernation command to the ESR corresponding to the ESC. 3. Turn off the switch on the battery side, the switch on the bus side, and the DC output power switch of the PSU in sequence, and wait for 5 minutes. 4. Turn off the [ESR-CabinetNo] circuit breaker, remove the [ESM-SlotNo] panel, and test the voltage between the positive and negative terminals of the [ESM-SlotNo]. • If the voltage between the positive and negative terminals of [ESM-SlotNo] is the same as that displayed on the WebUI: a. Swap the BMU of the faulty battery pack with that of a normal battery pack. b. Turn on the DC output power switch of the PSU, the switch on the battery side, and the switch on the bus side in sequence. c. Delete invalid battery packs on the SmartLogger WebUI, reset ESUs, and start battery pack position detection. Then check whether the alarm persists. ▫ If the alarm persists, replace the battery pack. ▫ If the alarm is cleared, replace the BMU of the battery pack. • If the voltage between the positive and negative terminals of [ESM-SlotNo] is different from that displayed on the WebUI, replace the BMU of the battery pack.

Alarm ID	3027	Alarm Name	Battery Pack Monitoring Board Abnormal

Possible Cause	Handling Suggestion
Cause ID = 21 1. The BMU is incompatible with the battery pack. 2. The fan is faulty.	1. Check the positions of the input and output circuit breakers associated with the ESC corresponding to [ESR-CabinetNo ESM-SlotNo] and the DC output power switch of the PSU. 2. On the SmartLogger WebUI, send a hibernation command to the ESR corresponding to the ESC. 3. Turn off the switch on the battery side, the switch on the bus side, and the DC output power switch of the PSU in sequence, and wait for 5 minutes. 4. Open the front panel of the battery pack and compare the quantity of fans in a normal battery pack with that in the battery pack for which the alarm is generated. • If the quantity of fans is different, replace the BMU. • If the quantity of fans is the same, go to step 5. 5. Check whether the fan blades are damaged. Clear the foreign matter around the fan, rectify the power supply fault, and install a new fan. 6. Turn on the DC output power switch of the PSU, the switch on the battery side, and the switch on the bus side in sequence. 7. On the SmartLogger WebUI, send a startup command to the ESR corresponding to the ESC. 8. If the alarm persists, replace the BMU.

Alarm ID	3028	Alarm Name	Battery Pack Abnormal

Possible Cause	Handling Suggestion
Cause ID = 1 to 7 A major fault has occurred on the battery pack.	1. On the SmartLogger WebUI, check whether the battery cell voltage of [ESR-CabinetNo ESM-SlotNo] ranges from 2.5 V to 3.65 V and whether the battery cell voltages of the ESM are the same (the deviation is within 200 mV). • If the battery cell voltage is normal, manually clear the alarm. • If the battery cell voltage is abnormal, go to step 2. 2. Check whether the input and output circuit breakers associated with the ESC corresponding to [ESR-CabinetNo ESM-SlotNo] and the DC output power switch of the PSU are turned on, and whether the output voltage is 48 V±1 V DC. 3. On the SmartLogger WebUI, send a hibernation command to the ESR corresponding to the ESC. 4. Turn off the switch on the battery side, the switch on the bus side, and the DC output power switch of the PSU in sequence. 5. Turn off the [ESR-CabinetNo] circuit breaker, remove the [ESM-SlotNo] panel, and test the voltage between the positive and negative terminals of the [ESM-SlotNo]. • If the voltage between the positive and negative terminals of [ESM-SlotNo] is the same as that displayed on the WebUI: a. Swap the BMU of the faulty battery pack with that of a normal battery pack. b. Turn on the DC output power switch of the PSU, the switch on the battery side, and the switch on the bus side in sequence. c. After the system is powered on, delete invalid battery packs, reset ESUs, and start battery pack position detection. Then check whether the alarm persists. ▫ If the alarm persists, replace the battery pack. ▫ If the alarm is cleared, replace the BMU of the battery pack. • If the voltage between the positive and negative terminals of [ESM-SlotNo] is different from that displayed on the WebUI, replace the BMU of the battery pack.

Alarm ID	3030	Alarm Name	Battery Module Fan Fault

Possible Cause	Handling Suggestion
Cause ID = 1 1. The fan is short-circuited. 2. The power supply is insufficient. 3. The fan is damaged. 4. The fan is stuck.	1. Send a shutdown command to the ESS on the SmartLogger WebUI. 2. Check that the input and output circuit breakers associated with the ESC corresponding to [ESR-CabinetNo ESM-SlotNo] and the DC output power switch of the PSU are turned on. 3. Check whether the RUN/ALM indicator on the [ESR-CabinetNo ESM-SlotNo] panel is on. • If the indicator is off, measure the input voltage corresponding to [ESR-CabinetNo ESM-SlotNo]. If the voltage is 48 V±1 V DC, go to step 4. If the voltage is not 48 V±1 V DC, check the PSU and its output loop to ensure that the ESM power supply is normal. • If the indicator is on, go to step 4. 4. Turn off the switch on the battery side, the switch on the bus side, and the DC output power switch of the PSU in sequence, and wait for 5 minutes. 5. Turn on the DC output power switch of the PSU, the switch on the battery side, and the switch on the bus side in sequence. Check whether the fan is running when the device is powered on again. • If the fan is running, manually clear the alarm. • If the fan does not run, check whether the fan of the battery pack is damaged. Clear the foreign matter around the fan, reinstall the fan, and go to step 6. 6. Send a startup command to the ESS on the SmartLogger WebUI. 7. If the alarm persists, contact your technical support.

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Published by: Huawei Technologies Co., Ltd.

Co-produced by: Digital Power Information Experience Dept and Digital Power Technical Service & Operation Dept