



Service Guideline and Checklist

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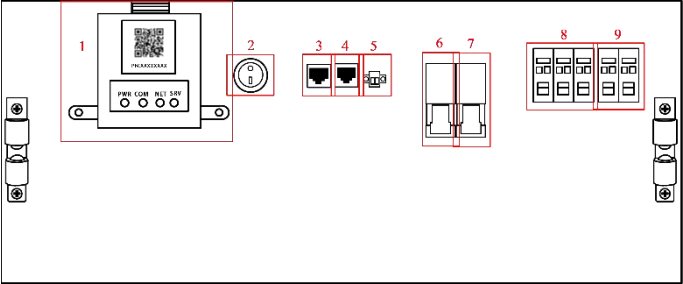
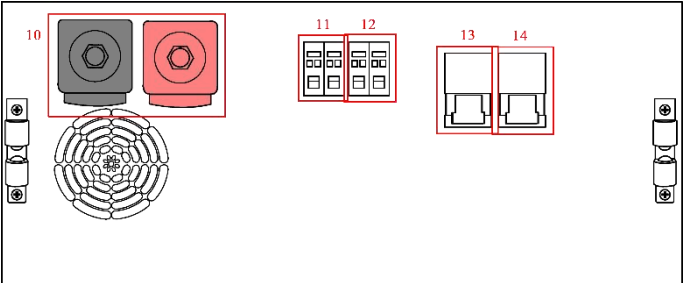
CONCENPOWER BUILD-IN INVERTER LOW VOLTAGE SYSTEM SERVICE CHECKLIST

13

1. General steps

(For detailed operation specifications and steps, please refer to the operating manual)

No.	Name	Description
1	Configuration	Check if the configuration is correct.
2	Only one connection method	The battery packs of the battery system only support a parallel connection. It is strictly forbidden to change the connection method in the battery cabinet
3	Make sure the functions of battery pack external connections	<div data-bbox="603 913 1289 1193" data-label="Image"> <p>A top-down view of a battery pack control panel. It features a row of five indicator lights labeled 1, 2, 3, 4, and 5. To the right are two RS485 communication ports labeled 6 and 7, and a circular ON/OFF button labeled 7. The panel is flanked by two vertical terminal blocks.</p> </div> <ol style="list-style-type: none"> 1. SOC of battery pack 2. Fault alarm light 3. Run light 4. Address dip 5. Mode dip (choose single or multiple battery packs mode) 6. RS485, RS485 communication ports 7. Battery pack ON/OFF button <div data-bbox="603 1608 1289 1888" data-label="Image"> <p>A side view of the battery pack terminal block and air switch. Two terminal posts are shown: a red one labeled 8 and a black one labeled 8. To the right is a rectangular air switch labeled 9. The battery pack's cooling fan is visible below the terminals.</p> </div> <ol style="list-style-type: none"> 8. Positive and negative terminal posts of the battery pack (red: positive; black: negative) 9. Battery pack air switch

<p>4</p>	<p>Make sure the functions of inverter external connection</p>	 <p>1. Wi-Fi receiver 2. Inverter switch 3. Wi-Fi App communication ports 4. RS 485 5. Generator start stop port 6. AC input air switch 7. AC output air switch 8. AC input connection terminal (From left to right: L, N, G; G is public) 9. AC output connection terminal (From left to right: L, N)</p>  <p>10. Positive and negative terminal posts of the battery pack (red: positive; black: negative) 11. PV input 1st road connection terminal 12. PV input 2nd road connection terminal 13. PV input 1st road air switch 14. PV input 2nd road air switch</p>
<p>5</p>	<p>Cable connection</p>	<p>1. Connect battery packs in parallel 2. Connect battery pack to inverter in parallel 3. Connect PV cables 4. Connect AC input and output cables</p>
<p>6</p>	<p>Dialing code</p>	<p>1. Dialing address code from bottom to top 2. Dialing work mode code</p>

7	Commission	<ol style="list-style-type: none"> 1. Push up air switches of all battery packs to ON 2. Press each ON/OFF button of battery packs from bottom to top. 3. Let the connected battery packs stand for about 15 minutes 4. Turn on the power switch of inverter 5. Push up AC and PV input air switches to ON (if any) 6. Charge the system to SOC to 100% 7. Push up AC output air switch to ON <p>Notice: After the system performs a complete charge and discharge cycle, the screen display parameters are accurate and enter the normal workbench.</p>
8	Closed connection area	<p>The Connection Area must be closed in order to keep safe.</p>
9	Proper restart	<p>NOTE: It is important that the battery is switched on before the inverter! Else, the inverter might not start and not show any reaction (the display no reaction)</p> <p>Defined restart (mind the sequence)</p> <ol style="list-style-type: none"> 1) Switch off Battery system 2) Turn off all AC switches of the inverter 3) Turn off all PV switches 4) wait 10 minutes 5) Turn on the battery system (switch up) 6) Turn on the PV switch 7) Turn on all AC switches on the inverter
10	Checking the correct operation	<p>The system runs properly if:</p> <ul style="list-style-type: none"> <input type="checkbox"/> the displays battery SOC correctly <input type="checkbox"/> System charges / discharges <p>Note: If you can not complete the commissioning, then turn off the battery before you leave the site and make sure all switches are off.</p> <p>Make sure the system will be set into operation quickly.</p>

2. Error analysis

2.1 Inverter shows no reaction.

No.	Name	Solution
1	Connection problem	Check whether the external connection is correct. <input type="checkbox"/> Positive & negative connection <input type="checkbox"/> Communication cable (More communication information on Part 3-3.1)
2	Dialing problem	Check whether the dial code is correct. (If the dial code is incorrect, please turn off the power of the whole system and dialing it again) <input type="checkbox"/> Address dip <input type="checkbox"/> Single or multiple battery packs mode dip More communication information on Part 3-3.2
3	Air switch	Check whether the inverter air switch has been opened
4	ON/OFF button	Check whether the Inverter ON /OFF button is working. (After pressing the button, the inverter screen lights up after hearing the beep. At this time, after hearing the clickety-clack sound, the system is running normally.)

2.2 Inverter switch is on, but inverter shows no reaction.

No.	Name	Solution
5	Connection problem	Check whether the external connection is correct. <input type="checkbox"/> Positive & negative connection <input type="checkbox"/> Communication cable (More communication information on Part 3-3.1)

2.3 SOC & charging logic

The first operating cycle (charge/discharge) is critical to the overall system/new battery pack. Please finish an operating cycle after the system connection is complete.

No.	Name	Solution
6	SOC at commissioning	A new inverter might show a different SOC at the beginning (mostly 50% / 30% / 0%). However, this is only to be understood as a placeholder value, as a new inverter cannot measure the SOC of packs. As soon as the system starts to run (charge/discharge) the SOC detection is corrected gradually. The SOC calibration is completed at the latest after a full cycle.
7	SOC accuracy	The SOC of an LFP battery cannot be measured. It is a calculated value. In general, the state of charge (SOC) of a battery is calculated using the voltage, but other factors such as temperature, current flow and charging behavior also play a role. The calculation of the state of charge is generally more precise if the battery regularly sees full cycles. Every now and then an SOC correction / calibration might occur. That is normal.
8	New battery pack connection	A new battery pack might show a different SOC at the beginning. However, this is only to be understood as a placeholder value, as inverter cannot measure the SOC of new battery pack. As soon as the system starts to run (charge/discharge) the SOC detection is corrected gradually. The SOC calibration is completed at the latest after a full cycle.
9	SOC of Battery packs	The overall capacity of the battery cabinet is affected by the capacity and connection method of the connected battery packs. If there are battery packs with low capacity in the battery cabinet the overall capacity of the battery cabinet is the average of the capacities of all connected battery packs under the same inverter.

2.4 Incorrect system parameter

The number of battery cabinets/battery packs displayed on the display does not match the actual installed number.

No.	Name	Solution
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10	Communication problem	<p>Check whether the communication cable connecting is correct. (Recommend reconnection)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Battery pack – inverter communication cable <input type="checkbox"/> Battery pack –Battery pack communication cable <p>More communication information on Part 3-3.1</p>
12	display delay	<p>Tap the screen to refresh. (If you change the setting of system, usually the display has a delay of about 10s, please refresh.)</p>

2.5 Unexpected shutdown

No.	Name	Solution
11	Low capacity	<p>Check the capacity of battery system.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Capacity is too low to operate normally
12	Inverter warning	<p>The parameter of inverter</p> <ul style="list-style-type: none"> <input type="checkbox"/> Inverter parameters do not match battery system parameters. (Please check the inverter data parameters settings) <input type="checkbox"/> The output power exceeds the inverter parameter range. (Please check the inverter data parameters settings)
13	Protection trigger	<p>See more information on Part2-2.7</p>

2.6 Module Extension

No.	Name	Solution
14	Extension battery pack	<p>When a new battery pack is connected, the display will show parameter information such as the capacity and relative information of newly connected battery pack which it is connected. The parameters such as the capacity of the battery cabinet will be adjusted according to the information of the new connected battery pack (refer to 2.3-8 for details).</p> <p>Note: Don't forget to adjust the number of modules in the configuration, it is</p>

		necessary. The first operating cycle (charge/discharge) is critical to the overall system/new battery pack. Please finish an operating cycle after the system connection is complete.
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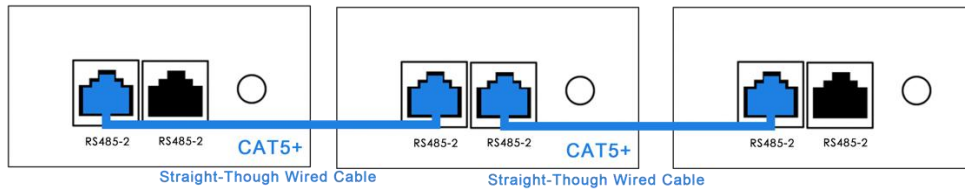
2.7 Error event

No.	Name	Solution
15	Overload protection (OPP)	The problem may be caused by charging the battery system. Turn off the charging of the system, wait for the system voltage to return to normal, and then the protection will be automatically released. Test the voltage of each battery pack (Part 4)
16	Low battery voltage protection (UVP)	Shut down the system quickly to avoid further discharge. Avoid further discharge of the battery, by searching the problem while the battery pack/Inverter is completely off. Do not turn on the battery before making sure the inverter should be able to charge the battery. Test the voltage of each battery pack (Part 4)
17	Over temperature protection (OTP)	Shut down the system quickly to avoid further operating. Wait for the system temperature to return to normal and the protection will be released automatically
18	Under temperature protection (OTP)	The ambient temperature (more information on parameter sheet) of the system is too low, please adjust the ambient temperature.

3. Communication information

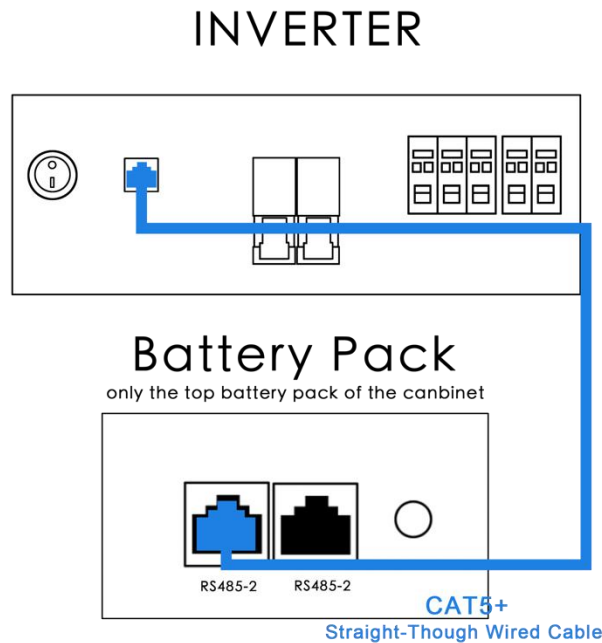
3.1 Communication cable connection

3.1.1 Between Battery packs (RS485-2 to RS485-2)



The figure shows 3 battery packs as an example, more battery packs can be deduced by analogy.

3.1.2 Between battery packs and inverter (RS485-2 to RS485-2)

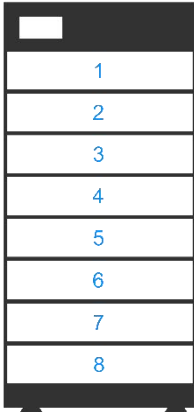
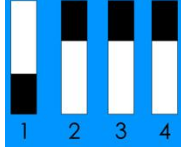
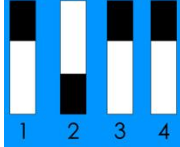
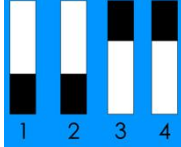
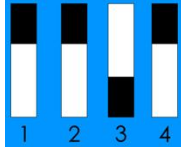
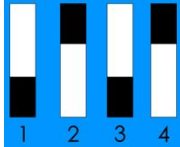
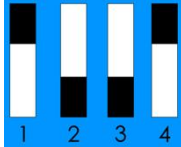


3.2 Dial code

3.2.1 Battery pack address dial code (Blue dip)

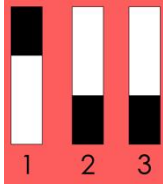
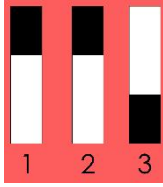
Please dial in numerical order, prohibit dialing jump the numerical order.

- Note: 1. The black is dial button
 2. Dial order from top to bottom. (The battery pack at the top of the system is the No. 1)

 <p>Address code diagram</p>	Dial code			
	Pack No.	1 <i>(The top battery pack)</i>	2	3
	Dial code			
	Pack No.	4	5	6

3.2.2 Battery pack operating mode dial code (Red dip)

- Note: 1. The black is dial button
 2. The battery pack works in parallel connection (as shown below).

Battery Pack Capacity	Dial code
5kWh Battery Pack	
10kWh Battery Pack	

4. Voltage measurement and undervoltage

ATTENTION: HIGH VOLTAGE! Before the first operation, insulation measures must be taken and insulating gloves should be worn.

Please remove metal objects on your body, such as bracelets, necklaces and other items that may touch the positive and negative terminals of the battery pack.

4.1 Measurement of battery pack voltage

- a) Before measuring the voltage of a single battery pack, please make sure that the battery pack is not connected to any cables.
- b) Open the air switch of the battery pack.
- c) Press the ON/OFF button for the battery pack.
- d) Remove the cover of the positive and negative terminals of the battery pack. **(It is strictly forbidden to operate this step without any insulation measures. It is strictly forbidden to allow uninsulated body parts to touch the battery pack.)**
- e) Use voltage meter to measure the voltage. Normally, the voltage range of a single battery pack is around 51.0V~53.2V.
- f) After the measurement is completed, please turn off the button and the air switch in sequence and cover the positive and negative terminals.

4.2 Measurement of cabinet voltage

Take down Disconnect all cables (including communication cable) of the inverter and measure the cabinet voltage on the topmost module as shown below. Note: The nominal voltage should be 51.2V

- a) Open all air switches of the battery packs.
- b) Press all ON/OFF buttons for the battery pack.
- c) Remove the cover of the positive and negative terminals of the topmost battery pack. **(It is strictly forbidden to operate this step without any insulation measures. It is strictly forbidden to allow uninsulated body parts to touch the battery pack.)**
- d) Use voltage meter to measure the voltage.
- e) After the measurement is completed, please turn off all buttons and air switches in sequence and cover the positive and negative terminals.

If the measured voltage deviates significantly from the nominal value, please check the electrical voltage at the individual modules, as shown in the following section.

CONCENPOWER Build-in Inverter Low Voltage System

Service Checklist

Important: The installation and all other kinds of works or measurements in combination with the CONCENPOWER battery pack are only allowed by professional and qualified electricians. Improper handling can cause danger and damage. This document does not replace the official CONCENPOWER manuals and documents. No responsibility is accepted for the accuracy of the information.

1. General Steps

Please carefully check all "General Steps" from page 3 of the Service Guideline and confirm this in the boxes below:

- | | |
|--|---|
| <input type="checkbox"/> 1.1 Configuration | <input type="checkbox"/> 1.2 Only one connection method |
| <input type="checkbox"/> 1.3 Battery pack external connections | <input type="checkbox"/> 1.4 inverter external connection |
| <input type="checkbox"/> 1.5 Closed connection area | <input type="checkbox"/> 1.6 Proper restart |
| <input type="checkbox"/> 1.7 Checking the correct operation | |

2. Error analysis

Please mark the error related Analysis from Chapter 2 of the Service Guideline that you checked and collect all the information related to those Sections.

- 2.1 inverter shows no reaction
- 2.2 inverter ON/OFF button is on, but inverter shows no reaction
- 2.3 SOC & Charging logic
- 2.4 Incorrect number quantity
- 2.5 Unexpected shutdown
- 2.6 Module extension/parallel
- 2.7 Error event

3. Service information

Please fulfill all available information in below table. Some information like the Serial Number of the inverter is mandatory to receive service

Service ticket number: _____

Installer / Delivery information/ contact

Company: _____ ZIP/city: _____
 Contact person: _____ Phone: _____
 Street No.: _____ Email: _____

System information

Battery pack number: _____ Inverter number: _____

Description of problem: