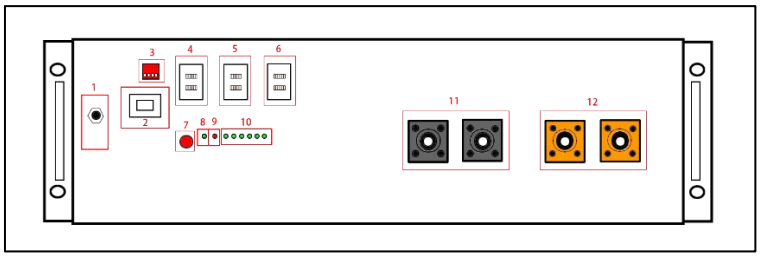
CONCENPOWER®
Make Impossible to Possible

Service Guideline and Checklist

Version 24.2

Table of Content

1. General steps

No.	Name	Description
1	Configuration	Check if the configuration is correct. Please confirm whether the inverter parameters match this product
2	Only one connection method	The battery packs in one cabinet only support a single connecting mode: series connection (high voltage system) or parallel connection (Rack-mounted system). It is strictly forbidden to connect in series and parallel at the same time in one battery cabinet
3	Connection Area View	 1. Grounding point 2. Power switch 3. ADD 4. Dry contact / console 5. A/B RS485 6. Link port 0/1 7. Start 8. Run 9. Alarm 10. SOC 11. -Power terminal 12. +Power terminal
4	Proper restart	NOTE: It is important that the energy storage system is switched on before switching on inverter! Defined restart (mind the sequence) 1) Switch off the inverter (if any) 2) Press ON/OFF button on the BMU communication area (If more than two battery cabinets, press the ON/OFF button of Master BMU only). When the “Beep” sound is heard, the system is powered off and

		the display is turned off. 3) Push down each BMU air switches to off. 4) Push down air switches of all battery packs. 5)wait 10 minutes 6) Switch on all air switches of battery packs and BMUs. 7) Press the “ON/OFF” button of the master BMU 8) Switch on the inverter (if any)
5	Checking the correct operation	The system runs properly if: ☐ the displays battery SOC correctly ☐ System charges / discharges Note: If you cannot complete the commissioning, then turn off the battery before you leave the site and make sure all switches are off. If this is not possible, lift the BMU. Make sure the system will be set into operation quickly.

2. Error analysis

2.1 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
1	SOC at commissioning	A new BMU 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 BMU cannot measure the SOC of battery modules. 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.
2	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.
3	New battery pack/cabinet connection	A new battery pack / cabinet might show a different SOC at the beginning. However, this is only to be understood as a placeholder value, as BMU cannot measure the SOC of new battery pack / cabinet. 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.
4	SOC of Battery cabinet	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, then depending on the connection method of batteries are packs this will happen: - Series connection (high voltage system): The overall capacity of the battery cabinet is the same as the capacity of the lowest capacity battery pack. - Parallel connection (Rack-mounted system): The overall capacity of the battery cabinet is the average of the capacities of all connected battery packs under the same BMU.

2.2 Incorrect number quantity

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

No.	Name	Solution
5	Communication problem	Check whether the communication cable connecting is correct. (Recommend reconnection) ☐ Cabinet – cabinet communication cable ☐ Battery pack– BMU communication cable ☐ Battery pack – battery pack communication cable More communication information on Part 3-3.1
6	display delay	Tap the BMU screen to refresh. (If you change the setting of system, usually the BMU display has a delay of about 10s, please refresh.)

2.3 Unexpected shutdown

No.	Name	Solution
7	Low capacity	Check the capacity of battery system. ☐ Capacity is too low to operate normally
8	Inverter warning	The parameter of inverter ☐ Inverter parameters do not match battery system parameters. (Please check the inverter data parameters) ☐ The output power exceeds the inverter parameter range. (Please check the inverter data parameters)
9	Protection trigger	See more information on Part2-2.7

2.4 System Extension

No.	Name	Solution
10	Extension battery pack	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 and battery

		cabinet 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). **Note: Don't forget to adjust the number of modules in the configuration, it is 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.**

2.5 Error event

No.	Name	Solution
11	Over voltage protection (OVP)	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).
12	Under voltage protection (UVP)	Shut down the system quickly to avoid further discharge. Check whether the system can shut down normally (by pressing the BMU ON/OFF button for 3 seconds). - If the system cannot shut down normally, lift the BMU. Avoid further discharge of the battery, by searching the problem while the battery is completely off / BMU is lifted. 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)
13	Over current protection (OCP)	Shut down the output of system. Wait for the system current to return to normal and the protection will be released automatically

14	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
15	Under temperature protection (UTP)	The ambient temperature (more information on parameter sheet) of the system is too low, please adjust the ambient temperature.

3. 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.

3.1 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 48V~51.2V.
f) After the measurement is completed, please turn off the button and the air switch in sequence and cover the positive and negative terminals.

3.2 Measurement of cabinet voltage

Take down the BMU and measure the tower voltage on the topmost module as shown below. Note: The nominal voltage should be module quantity times 51.2V (for High voltage system); the nominal voltage

should be around 51.2V (for Rack-mounted system).

a) Before performing the following operations, please ensure that the battery cabinet is not connected to the BMU.
b) Open all air switches of the battery packs.
c) Press the ON/OFF button of each battery pack.
d) 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.)**
e) Use voltage meter to measure the voltage.
f) After the measurement is completed, please press ON/OFF button of each battery pack for 3 seconds and turn off the air switch in sequence and cover the positive and negative terminals.

If the measured voltage deviates significantly from the nominal value as mentioned at beginning in this section, please check the electrical voltage at the individual battery pack.

CONCENPOWER Rack-mounted Energy Storage 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:

   ☐ 1.1 Configuration ☐ 1.2 Only one connection method

   ☐ 1.3 Battery pack external connections ☐ 1.4 Proper restart

   ☐ 1.5 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 SOC & Charing logic

   ☐ 2.2 Incorrect number quantity

   ☐ 2.3 Unexpected shutdown

   ☐ 2.4 Module extension/parallel connection

   ☐ 2.5 Error event

3. Service information

   Please fulfill all available information in below table. Some information like the Serial Number of the BMU 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 brand: _____

_____

Inverter model: