



SolBank3.0 Maintenance Manual

V2.2
CSI Energy Storage Co., Ltd.

1 Preface

1.1 Document Purpose and Scope

The purpose of this document is to provide an overview of the processes and procedures required to maintain the SolBank3.0 series (referring to all application models mentioned in Section 1.2, unless specifically stated otherwise, this will not be reiterated in the following text.). With this manual, you can fully understand and grasp the requirements for maintenance on key components related to the e-Storage SolBank3.0 series, additional safety notes supplied along with some key troubleshooting information.

This manual should be made available to all field personnel participating in the maintenance of the e-STORAGE SolBank3.0 series.

1.2 Applicable Models

This manual covers the following models only:

- CSI-SolBank-S-5016-2h-NA
- CSI-SolBank-S-5016-4h-NA
- CSI-SolBank-S-5016-2h-EU
- CSI-SolBank-S-5016-4h-EU
- CSI-SolBank-S-PL-5016-2h-NA
- CSI-SolBank-S-PL-5016-4h-NA
- CSI-SolBank-S-PL-5016-2h-EU
- CSI-SolBank-S-PL-5016-4h-EU
- CSI-SolBank-S-5016-2h-NA-LH,
- CSI-SolBank-S-5016-4h-NA-LH,
- CSI-SolBank-S-5016-2h-EU-LH,
- CSI-SolBank-S-5016-4h-EU-LH,
- CSI-SolBank-S-PL-5016-2h-EU-LH
- CSI-SolBank-S-PL-5016-4h-EU-LH

1.3 Reference Documents

The SolBank3.0 Maintenance Manual exists as part of library of product specific documents. Please consult the following documents to ensure a comprehensive understanding of SolBank3.0 attributes.

- **SolBank3.0 Installation Manual**
- **SolBank3.0 User Manual**
- **SolBank3.0 Maintenance Manual**
- **SolBank3.0 Commissioning Manual**

- **SolBank3.0 Decommissioning Manual**
- **SolBank3.0 Safety Manual**
- **SolBank3.0 Transportation Instruction Document**

1.4 Version Control

This is the initial release of the SolBank3.0 manual. As part of e-STORAGE's continuous improvement process, e-STORAGE reserves the right to make technology and document changes. Please contact e-STORAGE support to verify this manual reflects the most recent release or to report omissions or inaccuracies.

Version	Description	Date of Issuance
v1.0	Initial publication date	2024.3.4
v1.1	The nameplate energy is confirmed at 5016 kWh	2024.6.24
V1.2	1.Update Applicable Models 2.Add SolBank3.0 specifications with String PCS in Table 3	2024.8.8
V1.3	Section 7.2 “Coolant tester Visual inspection” change to “Semi-Annual”	2024.9.23
V1.4	Add requirements to section 5.3	2024.12.3
V1.5	Add door open time to section 5.3	2024.12.30
V1.6	Add circuit breaker lock to section 5.4	2025.2.17
V1.7	Add Solbank PL to section 1.2 and mirror design to 13 Annex 4	2025.3.31
V1.8	1、 Add identification instructions to section 1.5; 2、 Add fuse replacement to section 8.7; 3、 Add replacement contact person to section 10	2025.4.23
V1.9	Add confirm coolant brand/model before refilling to section 8.5	2025.7.15
V2.0	Add decription for new version chiller to section 8.5 and 8.6	2025.9.17
V2.1	Add Zero Calibration method of Gas detector. Add charge method of UPS, FACP battery.	2025.12.8
V2.2	1、 In Section 7.2, add "Special Circumstances Explanation" (battery voltage/capacity check) to the battery system maintenance section. 2、 Add Contactor replacement to section 8.8; 3、 Add a signal for the 5-year expiration replacement of gas sensors in Section 9.4.3	2026.6.6

1.5 Document Safety Notices

Throughout this manual the below indicated labels are used to convey hazards associated with specific tasks and procedures. These safety notices do not represent all hazards present when performing a given task. Installers and operators of the SolBank3.0 should adhere to industry safety best practices; site specific Environmental, Health and Safety plans; and local safety requirements and regulations. Only properly trained and qualified personnel should be permitted to complete the installation procedures identified in this manual.

Labels	Explanation
	CE mark of conformity.
	Indicates a hazardous situation which, if not avoided, could result in death or serious injury. Indicators are not used for property damage hazards unless personal injury risk appropriate to this level is also involved.
	Label the product as inflammable and explosive, and do not involve open flame.
	Electrical hazard sign, non-professional personnel do not approach. Professional personnel are required to perform maintenance and operation.
	Do not discard randomly
	Recycling equipment
	Consult instructions for use
	Noise source
	cTUVus certification

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3 Acronyms and Abbreviations

AC – Alternating Current
BMS – Battery Management System
BOL – Beginning of Life
DC – Direct Current
EMS – Energy Management System
EOR – Engineer of Record
ESS – Energy Storage System
HVAC – Heating Ventilation Air Conditioning
IFC - Issued for Construction
LFP – Lithium Iron Phosphate
LOTO – Lock-Out-Tag-Out
NFPA – National Fire Protection Association
PCS – Power Conversion System
PPE – Personnel Protective Equipment
SPD – Surge Protection Device
UPS – Uninterruptible Power Supply

4 Introduction

4.1 Acknowledgement

Thank you for purchasing the containerized SolBank3.0 series supplied by e-STORAGE. The SolBank3.0 series is an advanced modular battery energy storage system incorporating industry leading capabilities enabled by cutting-edge technologies and innovative design. High energy density, liquid cooled battery and power electronics, extended service life, and advanced safety features are just a few of the attributes that set the SolBank3.0 series apart from other ESS products.

The following document provides an overview of the SolBank3.0 and the maintenance steps required.

4.2 System Overview

The SolBank3.0 integrates all power electronics, controls, and safety features required to support the DC side of a battery energy storage system. An overview of the DC layout and key features is shown in Figure 1 and further described in Table 2.



Figure 1: Layout and features of the SolBank3.0

Table 2: Key System Features

NO.	Name	Remarks
1	Standard Enclosure and Rack	All models of the SolBank3.0 utilize a standard IP55 rated 20'ft HC container and battery rack design allowing for enhanced system modularity without increased production and equipment costs.
2	Pack	The SolBank3.0 contains 48 Lithium Iron Phosphate (LFP) battery packs, each consisting of 104 series wired battery cells.
3	Fire Protection System	The SolBank combines heat and smoke detection with an explosion-proof ventilation system.
4	BMS Box	The SolBank3.0 contains 12 BMS Boxes. These are easily accessed for installation and maintenance within the central bay of the container. The BMS ensure optimal battery functionality and safety.
5	Liquid Cooling piping	The liquid-cooled piping connecting the liquid-cooled chiller to the pack
6	Cable & Wire	High-voltage connection and low-voltage communication power cable
7	DMC	The Distribution and Control Cabinet houses all aux power distribution equipment including 2-hour backup UPS; system communication, control, and monitoring hardware including network switch, and Local EMS, and all required customer communication, signal, and aux power interfaces.
	Junction Box	The SolBank3.0&SolBank3.0 PL's DC Junction box contains all primary DC bus work, fusing, Surge Protection Devices (SPD), and power monitoring required to safely exchanged power between the SolBank3.0&SolBank3.0 PL and PCS.
8	Liquid Cooled Chiller	The SolBank3.0&SolBank3.0 PL's liquid cooling/heating system facilitates improved battery temperature management efficiency relative to traditional forced air systems. Each battery pack is liquid cooled, allowing for greater heat dissipation and uniform cell temperature management. During charge and discharge, cell temperature is maintained between 20°C - 35°C.

4.3 System Specifications

Table 3 shows the parameters of the SolBank3.0.

Table 3: SolBank3.0 Specifications.

SYSTEM MODEL NUMBER	e-STORAGE-SolBank3.0-S-5016-4h/CSI-SolBank-S-5016-4h	e-STORAGE-SolBank3.0-S-5016-2h/CSI-SolBank-S-5016-2h
Discharge Duration (hour)	4	2
Charge/Discharge C-rate (P)	0.25	0.5
Nameplate Energy (kWh)	5016	5016
Dated DC capacity (kWh)	4800 (For String PCS) / 4800 (For centralize PCS)	4800 (For String PCS) / 4700 (For centralize PCS)
Voltage Range (VDC)	1164.8V~1497.6V	
Recommended Discharge Power (kW)	1200 (For String PCS) /1200 (For centralize PCS)	2400 (For String PCS) /2350 (For centralize PCS)
# of LFP Battery Rack	12	12
# of BMS boxes	12	

5 Basic Requirements

5.1 Safety Requirements

This section contains safety info that must be always observed during operation, repairing, maintenance and other activities in the ESS field. To prevent personal injury and property damage and to ensure long-term operation of the product, read the following carefully and always observe all safety information.



Danger to life from the electric shock due to live voltage

High voltage is present in the live components of the product. Touching live components results in death or serious injury due to electric shock.

- Wear suitable personal protective equipment for all work on the product.
- Do not touch any live components.
- Observe all warning messages on the product and in the documentation.
- Open all the main and auxiliary power breaker while maintenance or repair the product.



Danger to life due to battery leak.

Battery leaking can lead to hazardous situation that result in death or serious injuries due to electric shock.

- Stop the ESS immediately and open DC and AC breaker and auxiliary power.
- Disconnect the jumper cable of leaking battery pack.
- Keep good ventilation in the leaking area, fire and sparks are forbidden.
- Use gauze (common medical gauze) or other liquid-absorbent solid to clean the electrolyte leak.
- Do not contact electrolyte directly and keep away from skin. If skin contact accidentally, please wash with plenty of water. If eyes contact, please immediately clean with large amount of 2%~ 4% boric acid solutions and go to hospital at once.
- Wear suitable personal protective equipment for all work on the product.



Danger to life from the electric shock due to ground fault

If a ground fault has occurred, parts of the ESS plant that are supposedly grounded may in fact be live. Touching incorrectly grounded parts of the ESS plant results in death or serious injuries from electric shock.

- Before working on the ESS plant, ensure that no ground fault is present.

- Wear suitable personal protective equipment for all work on the device.



Danger to life from the electric shock due to damaged product

Operating a damaged product can lead to hazardous situation that result in death or serious injuries due to electric shock. Before working on the ESS plant, ensure that no ground fault is present.

- Only operate the product when it is in a flawless technical condition and safe to operate.
- Check the product regularly for visible damage.
- Make sure that all external safety equipment is always freely accessible.
- Make sure that all safety equipment is in good working order.
- Wear suitable personal protective equipment for all work on the product.



Danger to life due to fire risk

If the ESS gets fire, it may result in serious personnel injuries or property damage.

- Do not block the escape route.
- Check and test the fire extinguishing system regularly.
- Once ESS gets fire, press down the emergency button immediately, cut off the main power, close the door and call the local fire apartment.



Danger to life from electric shock if the product is not locked

If the product is not locked, unauthorized persons will have access to live components carrying lethal voltages. Touching live components can result in death or serious injury due to electric shock.

- Always close and lock the product.
- Remove the keys.
- Store the keys in a safe place.
- Ensure that no unauthorized persons have access to the closed electrical operating area.



Danger to life due to blocked escape routes

In hazardous situations, blocked escape routes can lead to death or serious injury. It is imperative that the escape route is always freely accessible.

- An escape route must always be available. Make sure the minimum passage

width of the escape route meets local standards.

- Do not place any objects in the escape route area.
- Remove all the tripping hazards from escape routes.
- Check the door on the escape routes regularly. Make sure all the doors can be easily pushed opened.



Risk of burn due to hot components

Some components of the product can get very hot during operation. Touching these components can cause burns.

- Observe the warnings on all components.
- After ESS is stopped, wait until any hot components have cooled down sufficiently.
- Wear suitable personal protective equipment for all work on the product.



Wrong operation may cause component failure or shorten the device service life.

Frequent operation of the emergency-stop button may cause damage and shorten the device service life.

- Only operate the emergency-stop button in an emergency.
- Strictly follow the instruction of user manual during operation or maintenance.



Get injured due to slipping, falling over or scuffing.

Slipping, falling over or scuffing injury might occur when doing maintenance on ESS.

- Strictly follow the instructions when doing any activity on ESS.
- Wear suitable personal protective equipment for all work on the product.

5.2 PPE Requirements

Always wear suitable protective equipment

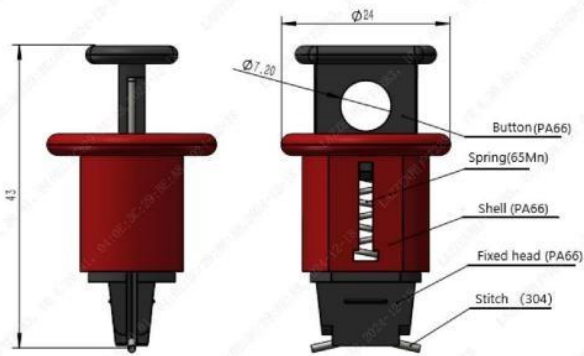
Always wear appropriate personal protective equipment for any operation, repairing, maintenance and other activities in the ESS field. The following personal protective equipment is regarded to be the minimum requirement:

- Safety boots with perforation-proof soles and steel toe caps
- Tight-fitting flame-resistant work clothes
- Suitable flame-resistant work pants
- Individually fitted hearing protection
- Safety gloves
- Any other prescribed protective equipment must be used as well.

5.3 Qualification Requirements

- The operator must be local qualified electrician and competent to undertake work on the system.
- The operating personnel must be authorized and trained with electric operation skills. Otherwise, operator must not operate the system in case of severe injury by operating equipment improperly.
- The operator should be fully familiar with the structure and working principle of the whole storage system.
- The operator should be fully familiar with the manual.
- The operator should be fully familiar with relevant standards of the project host country.
- The personnel commissioned with performing the work can evaluate their assigned tasks and recognize possible risks.
- Only authorized and trained electricians can carry out the maintenance work, and change settings and connections on the device.
- If our customers use SolBank for charging and discharging daily, the battery will not remain in a state of less than 2% or greater than 99% SOC for an extended period. However, in case customers need to store SolBank for a longer duration due to special circumstances, the following SOC recommendations apply:
 - For a storage period of up to 1 week: It won't have a significant impact on the battery's life to leave it at 0% or 99% SOC during this time.
 - For a storage period exceeding 1 week but not exceeding 6 months: We recommend adjusting the SOC to around 30% before storing SolBank.
 - In the case of anticipated storage without operation for more than 6 months: We recommend adjusting the SOC to approximately 50%.
- In case of water vapor enter to the container, the door should not be open for more than one day during maintenance period.

5.4 Circuit breaker lock



Before maintenance job, please hang the circuit breaker lock to prevent electric shock.

6 Maintenance Tools

Table 4: Maintenance Tools List

Maintenance Tools				
NO.	Tool Name	Requirement	Quantity	Remark
1	Multi-meter	digital	1pcs	
2	Screw driver	Flat head and phillips	1pcs each	
3	Socket set		1set	
4	Torque Wrench		1pcs	
5	Electric Tape		1pcs	
6	Soft brush		1pcs	
7	Vacuum		1pcs	
8	Mark pen	Red	1pcs	
9	Cloth		1pcs	

7 Maintenance Schedule

7.1 Periodic Replacement

Table 5: Periodic Replacement List

NO.	Replacement Items	Periodic Replacement	Replacement Time	Remarks
1	UPS battery	4 years	45min/pc	
2	SPD	5 years	5min/pc	
3	Warning label	5 years	1min/pc	
4	Chiller	10 years	80min/pc	
5	Fan	8 years	5min/pc	
6	Gas sensor	5 years	15min/pc	

Note:

1. Periodic Replacement is for reference, evaluated based on expected operation conditions.
2. For any component replacement over 10 years, please contact e-Storage for further instruction.

7.2 Preventive Maintenance

Table 6: Preventive Maintenance Service Activities

Component Category	Service Descriptions	Frequency
Battery	Set battery maintenance (system check, cell balancing) —For detailed information, please refer to the notes at the end of the table.	Semi-Annual
	Battery cable, appearance, grounding, dust removal	Annual
	Inspect battery management system alarms	Annual
	Visual inspection of all electrical terminations using thermal imager	Semi-Annual
DMC/Junction Box/ Auxiliary System/ Miscellaneous	Auxiliary equipment maintenance and inspection	Annual
	Enclosure dust removal	Annual
	Inspect cable entry, grounding, sealing, dust removal	Annual
	Replace new desiccant bags	Semi-Annual (Long term storage)
	Charge the battery of UPS to full State of	Semi-Annual

	Charge	
	Critical sensor calibration check	Annual
	Maintenance report	Annual
Fire Safety System	Fire alarm and detection system inspection	Annual
	Fire alarm and detection system maintenance	Annual
	Charge the battery of FACP to full State of Charge	Semi-Annual
	Fire suppression System Inspection	Annual
Thermal Management System	Thermal management system inspection	Semi-Annual
	Thermal management system maintenance	Semi-Annual
	Clean Filters by rinsing with Water	Semi-Annual
	Electric Heater - Dust accumulation on the coil, signs of overheating on the heater frame, traces of water or rust on the electric heater control box.	Semi-Annual
	Check of coolant pH value (If the pH value exceeds the range of 7.5 - 8.5, the coolant needs to be replaced)	Annual
General	System configuration check	Annual

Notes:

Location and ambient conditions influence the maintenance intervals. Cleaning and corrosion protection may be required more frequently depending on the conditions of the installation site.

Special Circumstances Explanation :

For battery systems that have been stored for more than 6 months without being installed, every battery rack needs to be inspected after 6 months to check if the voltage of each battery pack is normal. If the voltage is too low, the battery packs should be charged regularly (using a portable charger). Here is the recommended charging energy table :

For 104S PACK	
PACK OCV Range/V	Charge Energy/kWh
338	0
332~338	15
328-332	21
312-328	31
260-312	42
≤260	Possible serious self-discharge, judged by actual voltage

If only one or two packs in the same battery cluster have a total voltage lower than the others, we still recommend charging the lower-voltage packs using the higher voltage as the target. This

approach ensures a more efficient and consistent charging process.

7.2.1 Charge method of Lead-acid battery

- Connect the lead-acid battery of UPS and FACP to each device.
- Connect the main auxiliary power of Solbank system.
- Switch on QF4 and QF6 and make sure UPS and FACP are being powered
- Keep the UPS and FACP powered for 48 hours.

7.3 Corrective Maintenance (As Applicable)

Under an executed long term service agreement, Canadian Solar shall provide corrective maintenance as listed below.

Table 7: Corrective Maintenance Service Activities

Reporting and Diagnostics	Inspection, maintenance reports and recommendations	Monthly
	Technical support and fault diagnosis	As required
	Data server connectivity check	Monthly
	Inspect battery running status, provide operating recommendations and maintain battery	Monthly

8 Replacement Work

8.1 UPS Battery Replacement (power-off)

8.1.1 Remove battery

- Remove the connection between front board and battery;
- Disconnect battery connector if battery is connected;
- Hold the battery and pull it out of the UPS frame. While battery is almost out, pull up and down slightly to avoid the block.

8.1.2 Install battery

- Hold the bottom of battery and match the battery with the battery frame box and push it into the box;
- Reconnect the battery and install the cover of battery box and front window board.

8.1.3 Battery parameter optimization

For Solbank3.0 UL version, it's high recommended to adjust battery settings of UPS to make sure 2 hours power supply capacity of Eaton USP after 2~3 years operation.

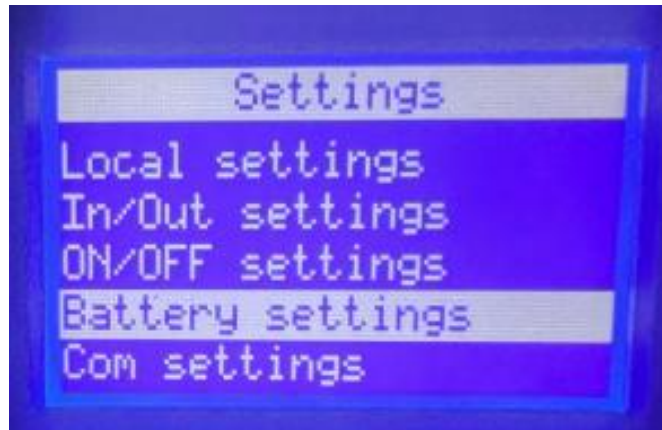
Setting steps:

As shown in the figure below, adjust in the host's "Device - Battery Settings - External Battery" option:

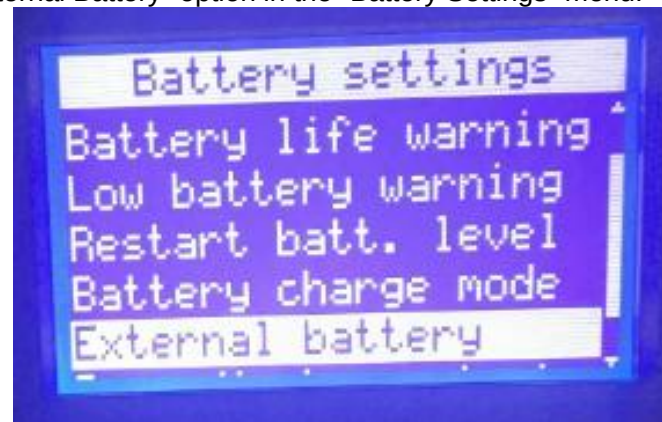
1. Locate the "Settings" option in the screen menu:



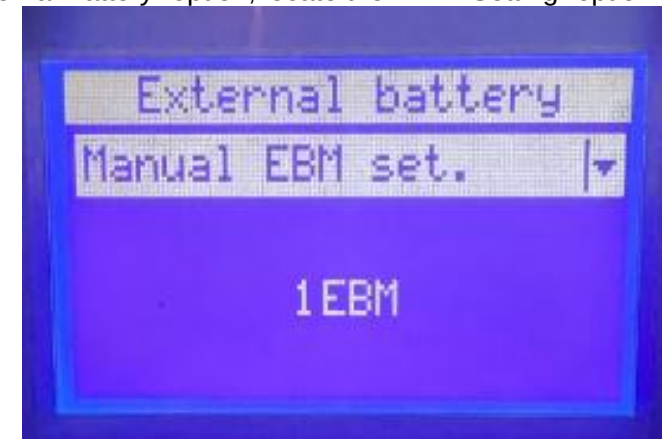
2. Locate the "Battery Settings" option under the "Settings" menu:



3. Locate the "External Battery" option in the "Battery Settings" menu:



4. Under the "External Battery" option, locate the "EBM Setting" option:



5. Adjust the "EBM setting" parameter to 1EBM.

8.2 SPD Replacement (power-off)

- Open DC junction box or DMC;
- Use the multi-meter to test the voltage between each connection and ground;
- If no voltage is detected, loose the cable connection and tape the cable conductor.
- Push the SPD from the bottom and get it out of the mounted rail.
- Reinstall the new SPD and fasten the connection cable;

8.3 Safety Label Replacement (power-off)

The outside and inside of SolBank3.0 are attached with lots of safety labels. When the labels are damaged, fallen or aged and cannot be correctly identified, please replace it with new spare parts.

- Remove the old safety signs. Wipe and clear the sign bonding marks with wet cloth;
- After the marks are wiped out and dried, paste the new signs in the original position;
- Forcefully press the signs, ensure the mark inside free of bubbles and paste them firmly;

8.4 Pack Replacement (power-off)

8.4.1 Voltage and insulation resistance test on the new pack

- Make sure the voltage of the new battery pack is consistent with the other packs. (pack voltage difference $< 2V$)

If the voltage difference of the new pack is big, use the battery charger to balance it.

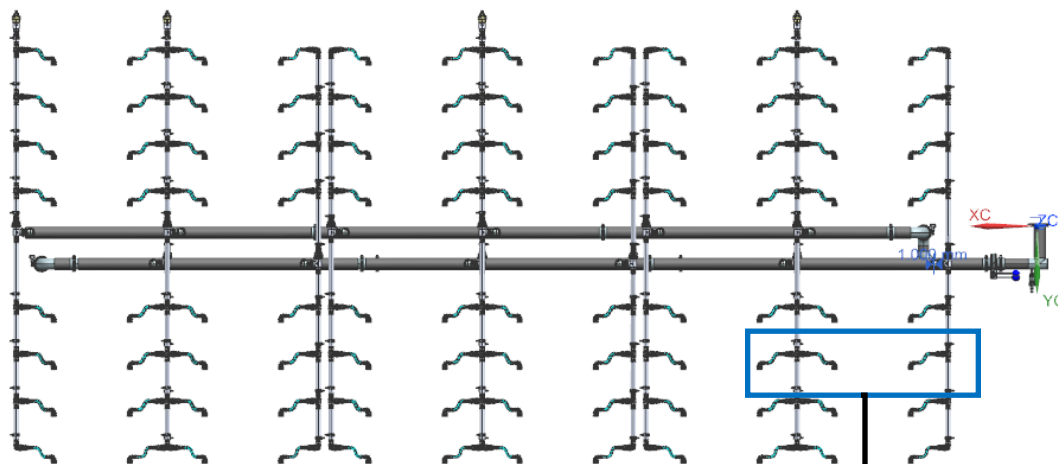
- Test the insulation resistance of the new pack. (Test voltage=DC 1000v ,value $\geq 20M \Omega$)

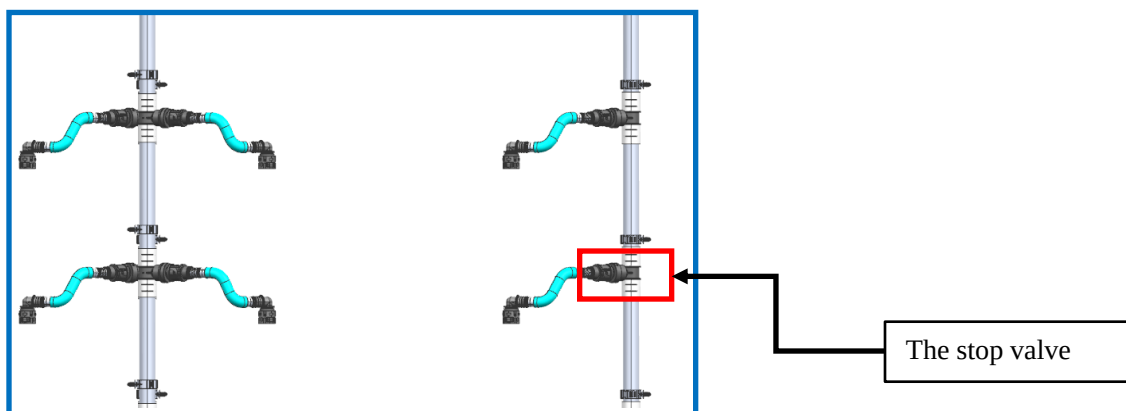
8.4.2 Cable removal

- Removal of power cable and communication power cable fixing ties;
- Cable connector pull-out;
- Wire harness fixing bracket removal.

8.4.3 Liquid cooling line removal

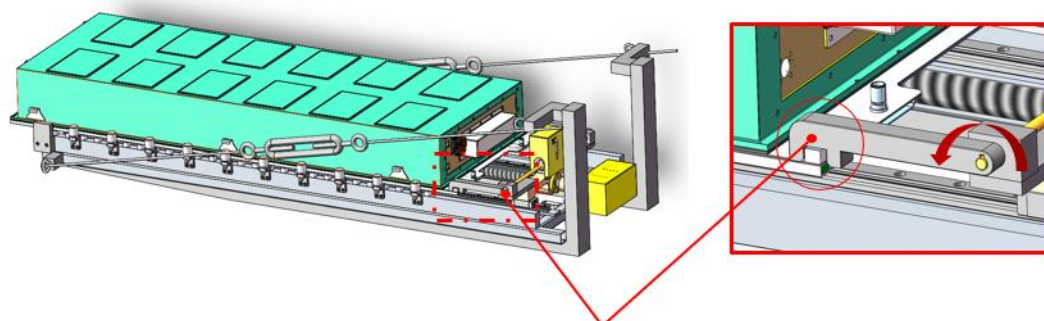
- Quickly unplug the stop valve on both sides of the inlet and outlet of the pack, and then the pack can be removed. After replacing the pack, install the stop valves on both sides of the inlet and outlet of the pack.



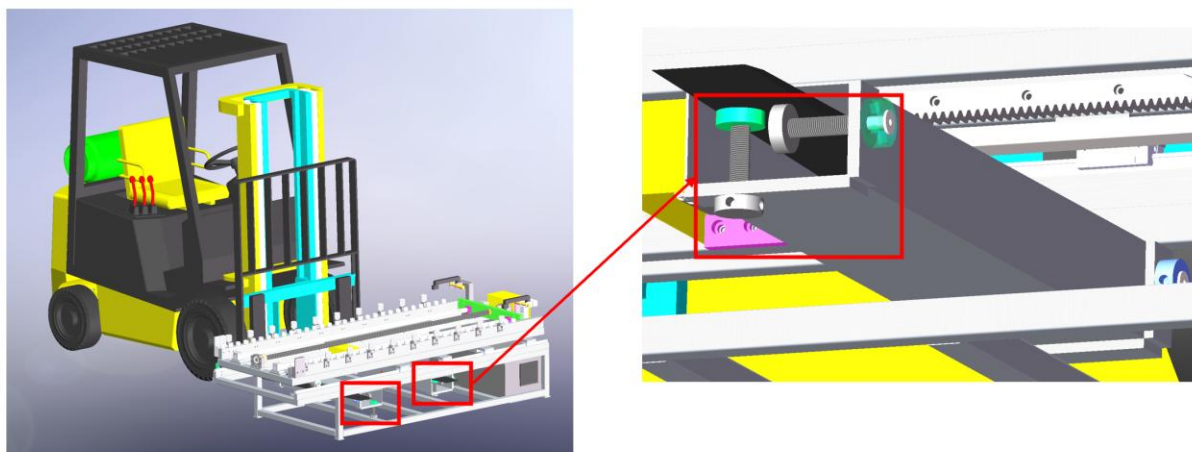


8.4.4 Pack removal

- Removal of battery pack power cables and communication cables
- Complete the pre-work of battery pack removal tooling

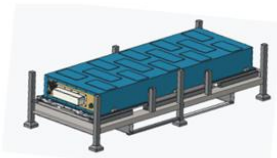


The rotating bracket allows you to push or pull the battery pack after hooking the pack lugs.;

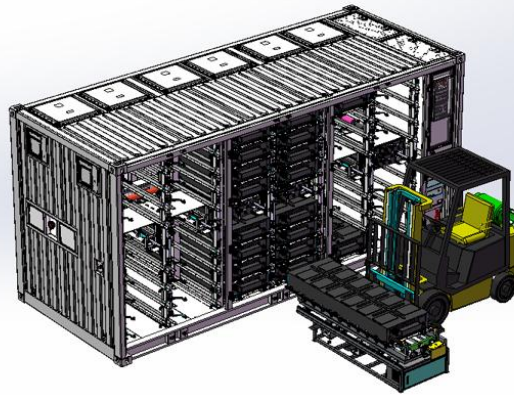


Fixing the battery pack unpacking tooling to the forklift

- Align the disassembly tool with the battery pack to be removed;



Turnover of battery packs with the help of a special pallet holder.



Forks can be installed from the left side or from the right side, depending on the actual road conditions on site;

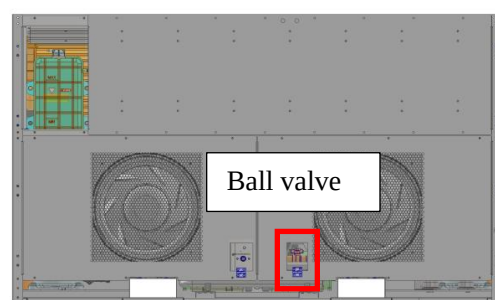
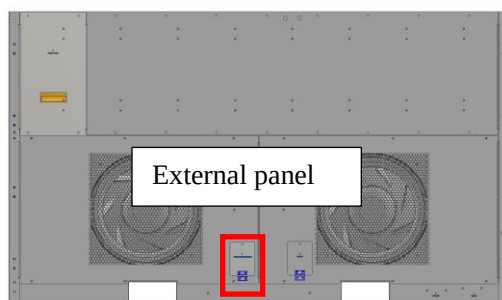
- Pulling out the battery pack into the tooling;

8.4.5 Inspections after replacing the new pack

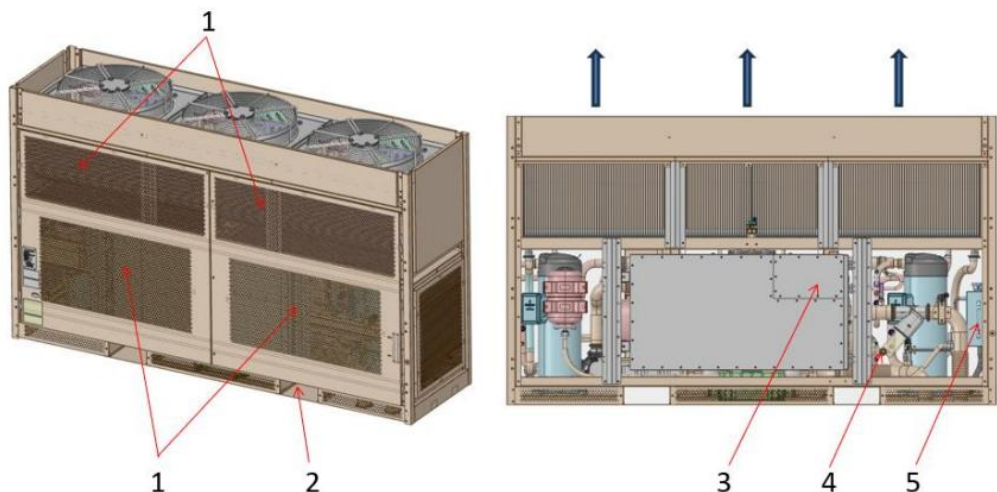
- Use [EVBMA Soft](#) to check the BMS software. (the version of the software should be the same)
If the software is not the same, should update the software.
- Check the voltage of every battery cell.(both [EVBMA Soft](#) and ESMU can check it)

8.5 Coolant filling (power-off)

- Notice: Confirm coolant brand/model before refilling. Do not mix different coolants.
- Open the external panel, connect the pump, open the ball valve, and start the fill. When the inlet and outlet water pressure reaches $1.2\text{bar} \pm 0.1\text{bar}$, stop fill and close the ball valve.

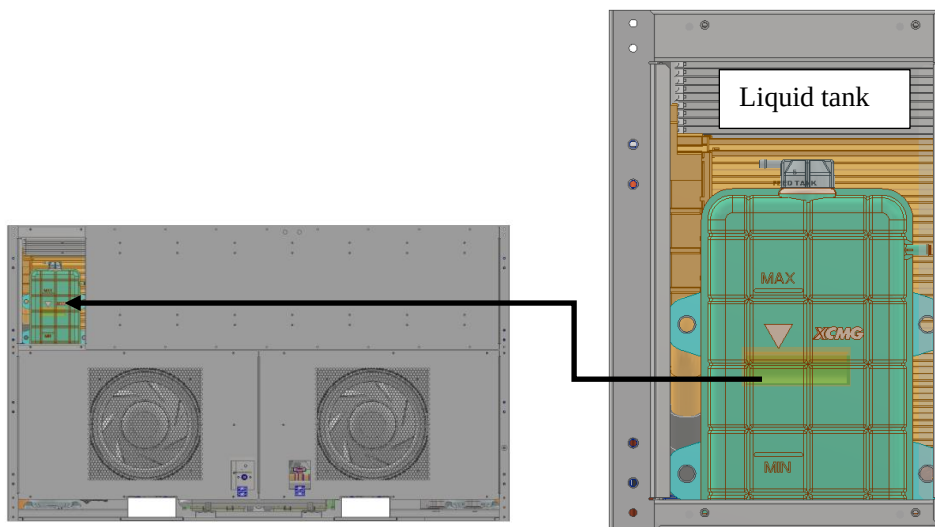


- First generation chiller

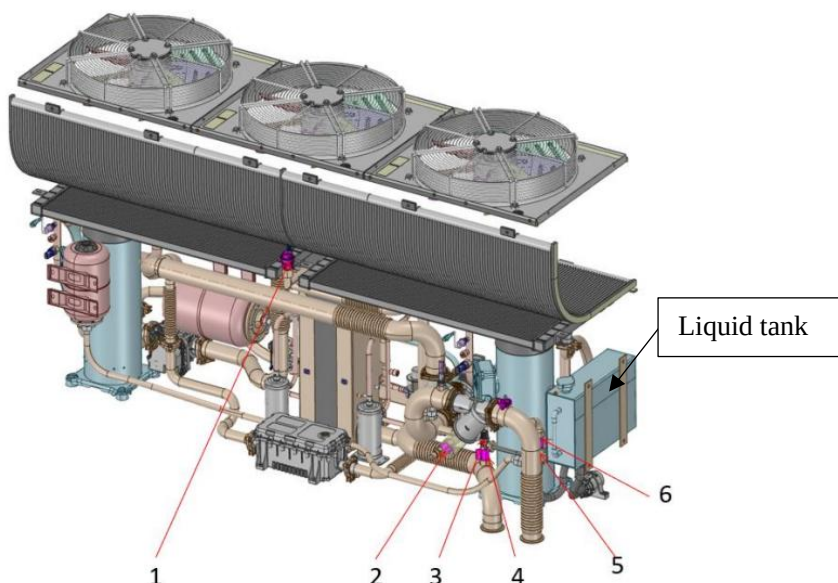


1-Air inlet 2- Forklift hole 3- Electrical line interface 4- Liquid replenishment and drainage port
5- Water replenishment tank

- Second generation chiller
- Open the liquid tank cap, then fill the liquid through the pump to the high level, stop the liquid fill, and close the liquid tank cap.



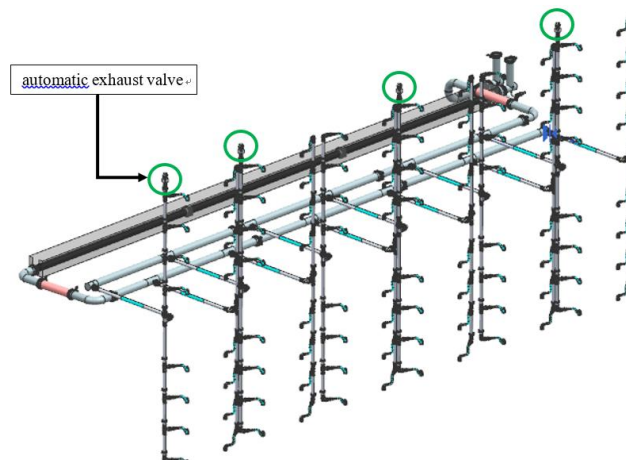
- ~~Old version~~ First generation chiller



1-Automatic exhaust valve 2-Ball valve 3-Safety valve 4-Ball valve 5-Check valve 6-Ball valve

Figure 7-4 System debugging valve position diagram

- Second generation chiller
- Open the automatic exhaust valve at the top of the pipeline and the self-circulation mode of the chiller to exhaust the system air until the liquid level of the liquid tank no longer drops, and then fill the liquid again to the high level.

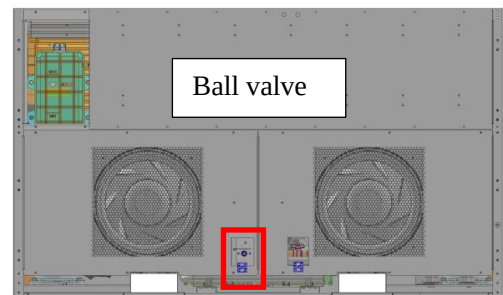
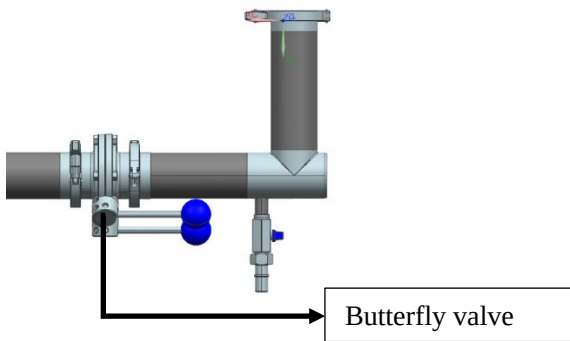


8.6 Liquid Cooled Chiller Replacement (power-off)

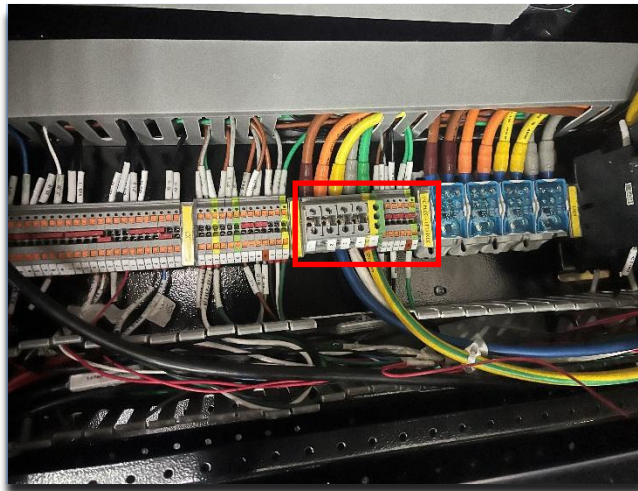
- Liquid Cooled Chiller power off-QF1;



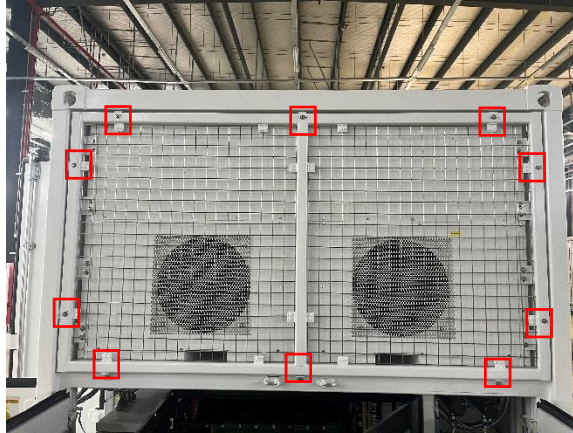
- Close butterfly valve and liquid Cooled Chiller drain liquid;



- Remove the electrical circuit, communication line and water pipe of the Liquid Cooled Chiller;



- Remove the protective net outside the chiller;

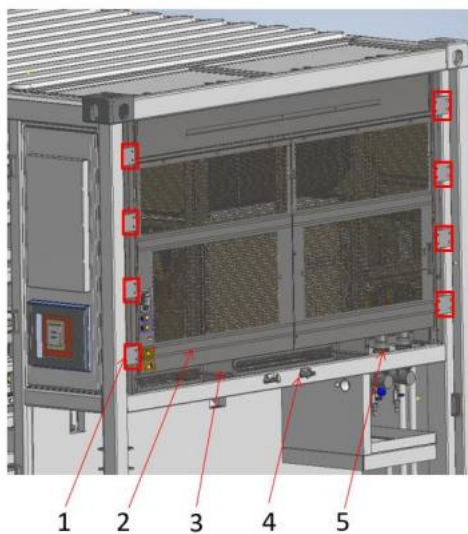


- Remove the fixing support of the liquid chiller



Fixed support

- First generation chiller

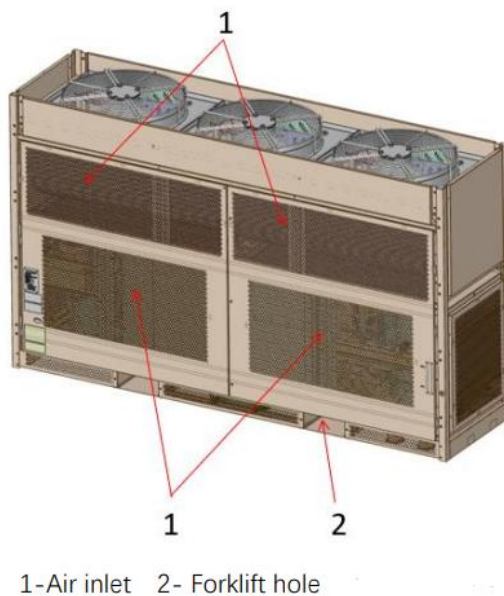


- Second generation chiller
- Remove the old Chiller from the door and place it on the wooden holder;



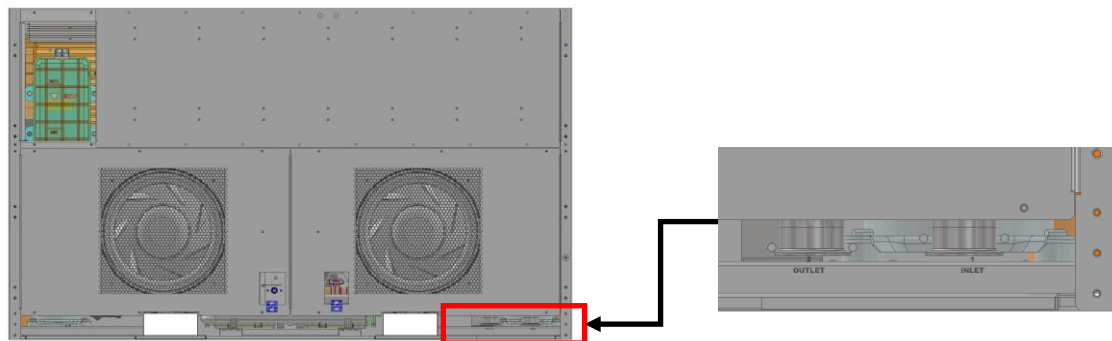
Taking out chiller
by forklift

- Old version



- New version

- Use a forklift to lift the new chiller to the installation position and secure it with bolts;
- Connect the circuit, communication line and water pipe of the Liquid Cooled Chiller;



- The Liquid Cooled Chiller is powered on-QF1;
- The liquid cooling system is filled with coolant, refer to 8.5;

8.7 Fuse Replacement (power-off)

8.7.1 BMS BOX fuse replacement (power-off)

Replacement and debugging tools:

Replacement and debugging tool table

Serial number	name	Attached photos	Remark
1	multimeter		It is used to measure voltage, current and other related parameters during installation to confirm that each connection is correct. Since the acquisition accuracy of the device is 0.2%, a 4.5-digit precision multimeter is recommended, such as FLUKE289
2	Torque wrench		Screw torque measurement, insulation type, used for folding high voltage box power terminal, insulation type
3	Socket wrench		Used to disassemble and install the high-voltage box power line screws and Pack fixing screws
3	Screwdriver (2.5mm flat head)		Used to remove fuse micro switch

4	Screwdriver (6mm Phillips)		Used to disassemble and install the high-voltage box screws
5	Electric screw driver		Electric screw driver

Replacement steps:

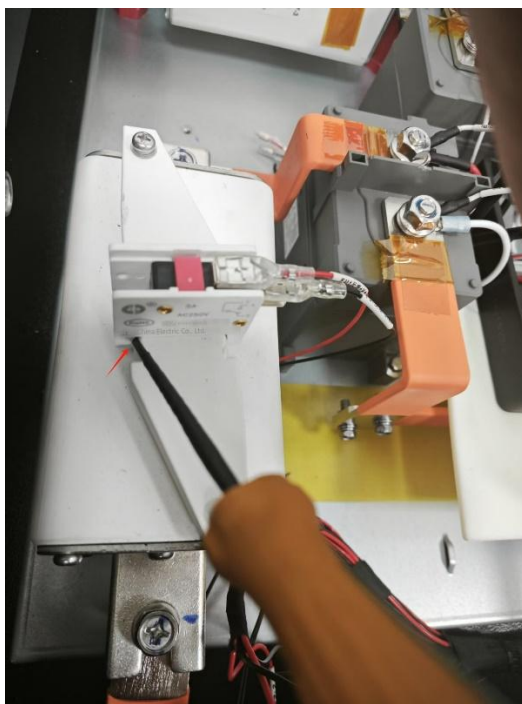
1. Unplug B+, B-, P+, P- on the high-voltage box and wrap them with insulating tape to prevent electric shock and short circuit. Unplug all communication plug-ins;
2. Remove the fixing screws on both sides of the high-voltage box; (as shown in the figure below)



3. Place the disassembled high-voltage box on a flat table, protect the box body, and use an (electric) screwdriver to remove the fixing screws of the box cover in sequence (note that there is a screw under the anti-tear label), and keep the removed screws for later use; (as shown in the figure below)



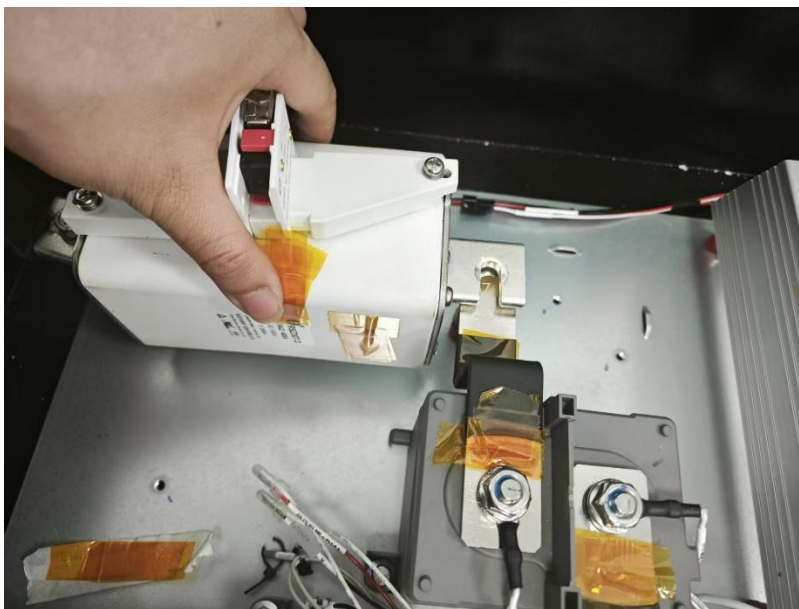
4. Use a flat-blade screwdriver to remove the micro switch (gently pry the part)



5. Use a torque wrench to remove the fuse from the chassis and place it in a suitable location to mark it to prevent mixing of fuses before and after replacement; (as shown in the figure below)



6. Place the new fuse on the insulating column in the direction shown in the figure (same as before removal); (as shown in the figure below)



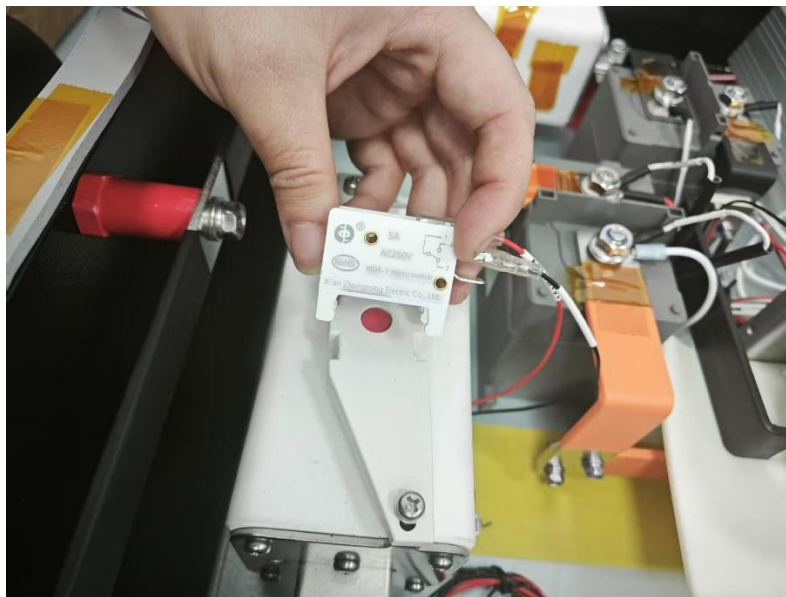
7. Use a torque wrench to adjust the installation torque to 110kgf.cm and tighten the fuse screws; (as shown in the figure below)



8. Use a torque wrench to confirm again that the torque of the fuse screw is 110kgf.cm. After confirmation, draw an uninterrupted straight line at the connection between the fastening screw and the fuse; (as shown in the figure below)



9. After the fuse is installed, reinstall the micro switch.



10. After the fuse is installed, make sure there is no debris inside the box. Install the cover back to the box (pay attention to the direction of the cover, some high-voltage boxes have insulation boards, do not install them wrong) and tighten the screws (13kgf.cm torque); (as shown in the figure below)





11. Install and fix the high-voltage box, and plug back B+, B-, P+, P- and all wiring harness plugs in sequence (check whether all are plugged in tightly to prevent poor contact);



Note:

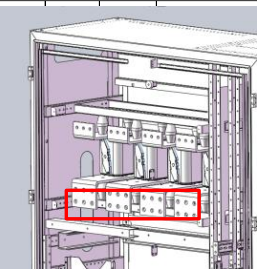
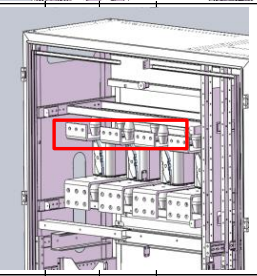
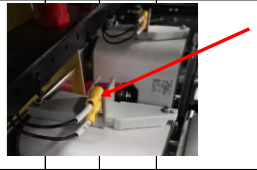
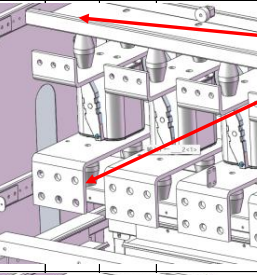
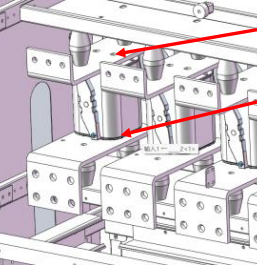
Fixtures, equipment and instruments	Labor protection products	Assignment points
(Electric) screwdriver, torque wrench, PH2 cross bit, red marker	Insulating gloves, labor protection gloves, labor protection shoes, safety helmets, anti-static clothing	1. It is forbidden to work with high-voltage boxes live; 2. When disassembling and replacing the high-voltage box, pay attention to protecting the box body; 3. After opening the box cover, be careful not to leave foreign objects and tools in the box;

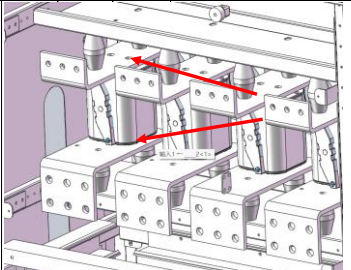
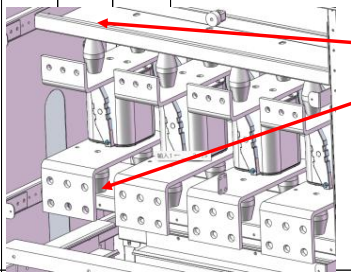
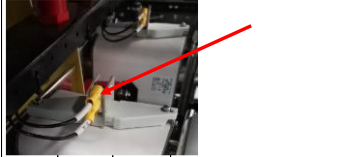
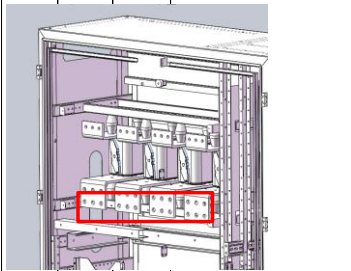
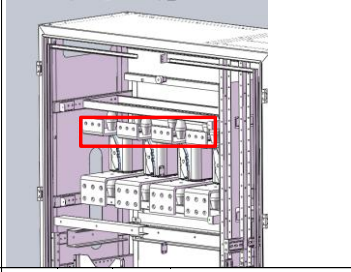
		4. Recycling of high-voltage box assembly screws;
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8.7.2 DMC fuse replacement (power-off)

Note: The operation should be carried out under the condition that the isolating switch of the Solbank 3.0 high-voltage cabinet, the DC relay, the DMC auxiliary power supply, and the PCS DC-side switch are all disconnected.

Replacement steps:

1.Disconnect the connection cables between Solbank 3.0 and PCS.	Based on the actual size of the connecting bolts (standard products are M14, while some are customized by EPC), select the appropriate tools to dismantle the connection cables between Solbank 3.0 and PCS.	
2.Disconnect the battery cables of Solbank 3.0.	Use the appropriate tools to dismantle the cables connected to the battery tester. The 0.25P connection bolts are M10 and the 0.5P ones are M12.	
3.Disconnect fuse signal wire	Pull out the Fuse signal line plug and mark the position.	
4.Remove insulator screws	Use an electric tool and the appropriate wrench to remove the M10 screws at the connection between the copper busbar and the insulator, and then remove the copper busbar.	
5.Remove the bolts that connect the Fuse to the copper busbar	Remove the connecting bolts between the fuse and the copper busbar.	

6. Connect the new Fuse to the copper busbar.	Connect the new Fuse to the copper bus bar with M12 bolts. The recommended installation torque value for the Fuse is $36 \pm 1 \text{ N}\cdot\text{m}$.	
7. Install the copper bar with the new Fuse on the bracket.	Connect the copper busbar with the new Fuse installed on it to the bracket by using insulators. The recommended installation torque value for the insulators is $20 \pm 1 \text{ N}\cdot\text{m}$ for M10 bolts.	
8. Install the new Fuse auxiliary terminals	Connect the fuse signal line plug to the new Fuse according to the marked positions.	
9. Connect the cables for Solbank 3.0 and PCS installation	Based on the actual size of the connecting bolts (standard products are M14, while some are customized by EPC), select the appropriate tools to install the connection cables of Solbank3.0 and PCS.	
10. The cable used for installing the Solbank 3.0 battery	Use the appropriate tools to install the connecting cables for the battery measurement. The torque value for the M10 bolts (0.25P) is $36 \pm 2 \text{ N}\cdot\text{m}$, and for the M12 bolts (0.5P) it is $45 \pm 2 \text{ N}\cdot\text{m}$.	
11. Replacement completed		

8.8 Contactor replacement (power-off)

Replacement and debugging tools:

Serial number	name	Attached photos	Remark
1	multimeter		It is used to measure voltage, current and other related parameters during installation to confirm that each connection is correct. Since the acquisition accuracy of the device is 0.2%, a 4.5-digit precision multimeter is recommended, such as FLUKE289
2	Torque wrench		Screw torque measurement, insulation type, used for folding high voltage box power terminal, insulation type
3	Socket wrench		Used to disassemble and install the high-voltage box power line screws and Pack fixing screws
3	Scissors		Used for cutting the connection wires
4	Screwdriver (6mm Phillips)		Used to disassemble and install the high-voltage box screws
5	Electric screw driver		Electric screw driver

Replacement steps:

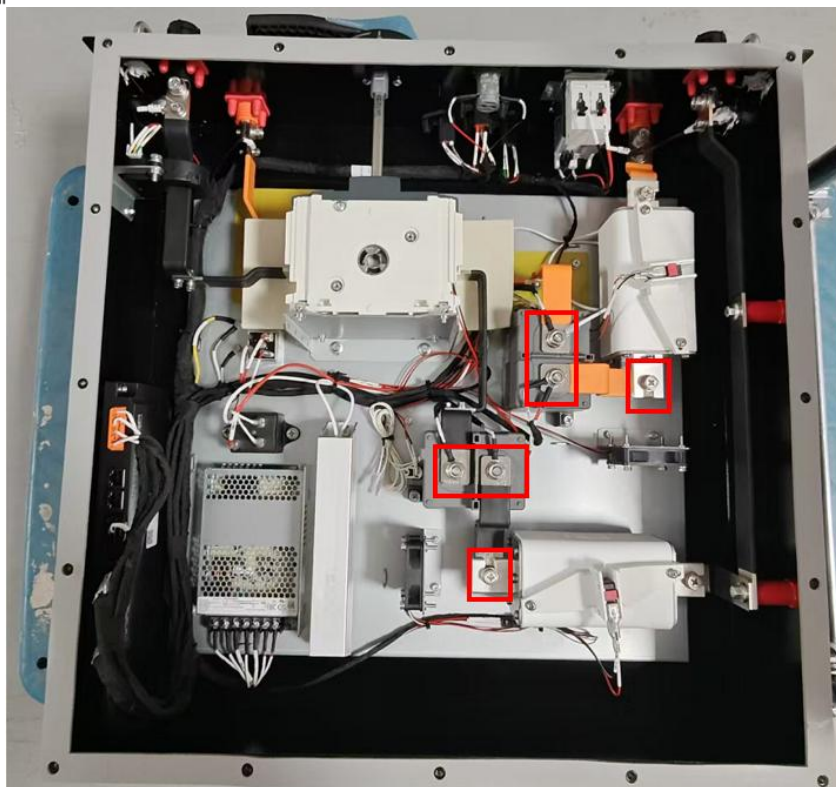
1. Unplug B+, B-, P+, P- on the high-voltage box and wrap them with insulating tape to prevent electric shock and short circuit. Unplug all communication plug-ins;
2. Remove the fixing screws on both sides of the high-voltage box; (as shown in the figure below)



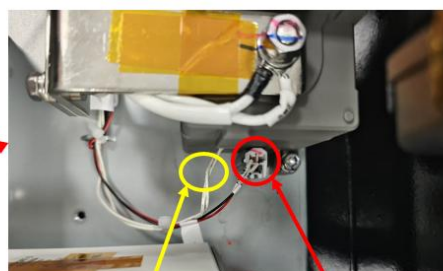
3. Place the disassembled high-voltage box on a flat table, protect the box body, and use an (electric) screwdriver to remove the fixing screws of the box cover in sequence (note that there is a screw under the anti-tear label), and keep the removed screws for later use; (as shown in the figure below)



4. Use the socket wrench to remove the fixing screws that connect the contactor to the copper busbar.



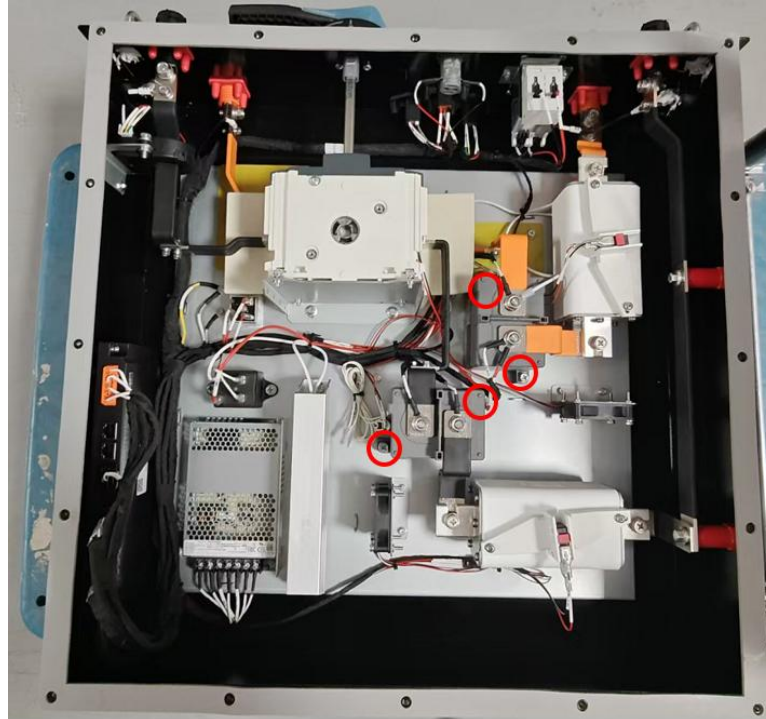
6. Remove the power cable connector terminals (one red and one black) of the contactor. Then, use scissors to cut open the two contactor feedback wiring harnesses (two white ones).



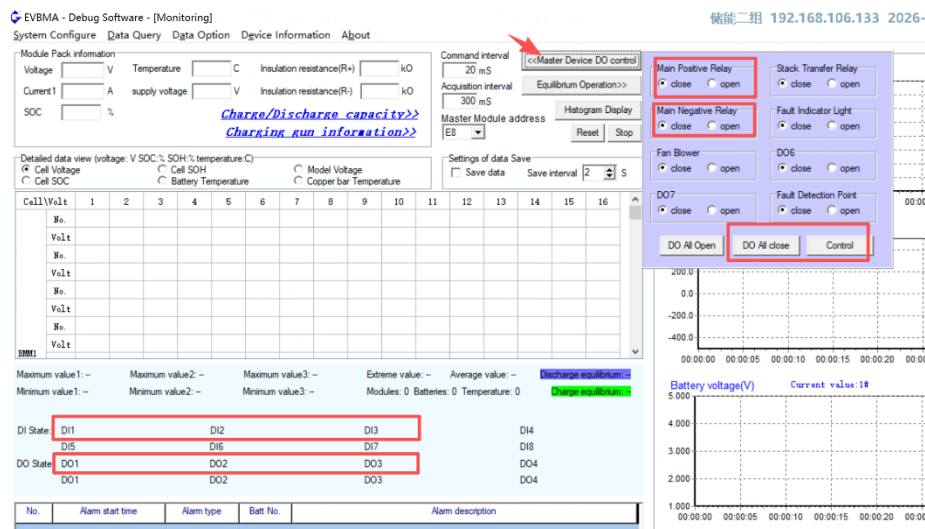
Contactor
feedback wiring
harness position

Location of the
contactor power
wiring harness

7. Remove the fixing screws of the contactor using a screwdriver, and then the old contactor can be removed.



8. Remove the old contactor, then replace it with a new one. Install the fixing screws for the contactor ——connect the power cable and feedback cable of the contactor ——and fix the cable and screws that connect the contactor to the copper busbar —— Close the BMS BOX cover and use a screwdriver to secure the screws on the cover——Complete the replacement of the contactor.
9. To confirm whether the contactor replacement was successful, the BMS software can be used to forcibly control the contactor. If the newly replaced contactor can be forcibly engaged and disengaged normally, it indicates that the contactor replacement was successful.



9 Maintenance Work

9.1 Battery Cabinet Maintenance

9.1.1 Battery Rack Visual Check (power-off)

- Check whether battery rack is distorted or bent;
- Check whether the welding of battery rack is damaged or loose;
- Check whether the mounted bolts on the battery rack is loose or missing;

9.1.2 BMS Control Box Visual Check (power-off)

- Check the BMS control box for visual defects such as dirt, distortion, damages and scratches on the enclosure;
- If visual defects are present, repair these immediately.
- Check whether DC switchgear handle and rocker switch is damaged; If it is damaged, replace it with spare parts immediately.

9.1.3 Battery Pack Visual Check (power-off)

- Check whether battery pack is mounted tightly;
- Check whether battery pack is swelling;
- Check whether there is obvious crystallization or electrolyte on the surface of battery pack shell;
- Check whether there is obvious aromatic flavor from the battery pack;
- Check whether battery jumper cable or copper-bar is damaged or burnt;
- Check whether the torque stamp of battery jumper copper-bar mounting is loose;

9.1.4 Battery Cabinet Cleaning (power-off)

Clean the dust on the surface of battery rack and module with a soft brush and vacuum.

9.1.5 Battery Cabinet Components Test (power-on)

9.1.5.1 BMS DC switchgear Test (power-on)

- Open the DC switchgear. Check whether alarm “DC breaker disconnected” shows up;
- Close the DC switchgear. Check whether alarm “DC breaker disconnected” is cleared;

9.1.5.2 Battery Contactor Test (power-on)

- Start battery. Check whether battery contactor in each string can close successfully;
- Charge or discharge battery. Check whether there is any abnormal noise in each BMS control box;

9.1.5.3 Battery fault Diagnosis (power-on)

- Inspect battery management system alarms.

9.1.5.4 Check electrical terminals (power-on)

- Visual inspection of all electrical terminations using thermal imager.

Note: This can be tested together with the capacity test.

9.2 DMC Maintenance

9.2.1 DMC Visual Check (power-off)

- If visual defects are present, repair these immediately.
- Check whether the door can open and close fluently; If not, lubricate all moving parts of the latch.
- Check whether box sealing joint strip is broken or damaged;
- Check whether the components inside the box are mounted tightly, no damaged or burned;

9.2.2 Auxiliary Power Connection Check (power-off)

Check the auxiliary power connection in DMC for visual torque confirmation. Make sure all the bolts and nuts are marked with obvious torque stamp. If not, referring to the Annex 2 for the prescribed requirement, test and tighten the bolts or nuts with torque wrench and mark it.

9.2.3 Wiring Connection Check (power-off)

Check whether there is any wiring connection of terminal, power supply, relay and controller inside the cabinet loose, broken or damaged. If there is, tighten or replace the wiring with screwdriver.

9.2.4 DMC Cleaning (power-off)

Open the box and clean the dust on the surface of the components with a soft brush and vacuum.

9.2.5 DMC Components Tests (power-on)

9.2.5.1 Power Supply Test (power-on)

Use multi-meter to test the DC output voltage of power supply in power control box. Check whether DC voltage is in the proper range. (For 24V power supply, the standard is $24 \pm 0.2V$; for 12V power supply, the standard is $12 \pm 0.2V$).

If the DC voltage is not in the proper range, adjust the voltage switch on the power supply.

9.2.5.2 UPS Battery Capacity Test (power-on)

Refer to the auxiliary power distribution drawing, open the MCB breaker to cut off the power input of UPS and record the time. UPS will go into the battery load support state. Record the time when UPS is shut down. The difference will be the load support time.

9.2.6 SolBank controller Tests (power-on)

9.2.6.1 SOC calibration (power-on)

The battery system needs a full charge and discharge at least once every three months to calibrate the SOC.

9.2.6.2 BMS measurement check (power-on)

Use the SolBank Controller's display interface to check the status of the battery system, fault conditions, etc., to check whether there is a system failure or a failure of the controller itself, and make a record.

9.2.6.3 Insulation resistance check (power-on)

Disconnect all BMS BOX disconnect switches to ensure that the system racks cannot be connected in parallel and then check the insulation detection of each rack via the SolBank Controller's display interface.

9.3 Junction Box Maintenance

9.3.1 Junction Box Visual Check (power-off)

- Check the junction box for visual defects such as dirt, distortion, damages and scratches on the enclosure;
- If visual defects are present, repair these immediately.
- Check whether the door can open and close fluently; If not, lubricate all moving parts of the latch.
- Check whether cabinet sealing joint strip is broken or damaged;
- Check whether the components inside the box are mounted tightly, no damaged;

9.3.2 Junction Box Main Power Circuit Torque Checking (power-off)

Check the junction box main power circuit for visual torque confirmation. Make sure all the bolts and nuts are marked with obvious torque stamp. If not, referring to the Annex 2 for the prescribed requirement, test and tighten the bolts or nuts with torque wrench and mark it.

9.3.3 Junction Box Cleaning (power-off)

Open the junction box and clean the dust on the surface of the components with a soft brush and vacuum.

9.4 Fire Safety System Maintenance

Note: For any function test, please contact the local fire contractor.

9.4.1 Fire Detection Components Check

- Check whether the temp and smoke detection sensors are mounted tightly;
- Check whether the temp and smoke detection sensors are blocked or dirty;
- Check whether the indicator of temp and smoke detection sensor is blinking periodically while powered on;

9.4.2 Fire Safety System Cleaning (power-off)

Clean the dust on the detection sensor with a soft brush and vacuum.

9.4.3 Gas detector Check

- Check the shielding and external damage of combustible gas detectors;
- Connect the combustible gas detector to check whether it has reached the calibration date and whether the equipment has faults;
- Spray combustible gas for actual linkage test to check whether it can linkage inlet and exhaust system;
- Equipment should be unpacked, installed, operated, maintained and otherwise used by qualified, trained and authorized technicians. Electrical installation and commissioning by authorized professionals.
- End-of-life Signal The GD-6 has a long life, non-replaceable catalytic bead sensor. Five (5) years after the GD-6 is installed the sensor end-of-life signal will be activated indicating that the GD-6 has reached the end of its typical usable life. The end-of-life signal will cause an error code t200 "Sensor expired". See Error Codes section. The end-of-life signal can be silenced for 48 hours by pressing the "ENTER/TEST" button or by temporarily dropping power to the unit. The end-of-life signal provides the user an opportunity to test and/or calibrate the sensor assuring that it is still performing within acceptable parameters though the sensor is nearing the end of its expected life. The silence function will continue to be available for 29 days after the GD-6 initiates the initial end-of-life signal. After these 29 days period the GD-6 can no longer be silenced and the sensor must be calibrated and the sensor life reset or the GD-6 detector replaced.

GD-6 Routine Maintenance				
Code	Fault Description	Description	Cause	Solution
t100 (t01 and t.00)	Under range. Reading is under -3% LEL for more than 15 seconds	Zero Drift: Reading below -3% LEL for more than 15 seconds	1. Excessive sensor drift causing reading below - 3% LEL in clean air (should be around 0% LEL);	1. Move device to clean air environment (no target gas, no solvent/spray interference), wait 30 minutes then observe reading;
			2. Zero calibration error (e.g., negative interference gas in calibration environment);	2. Perform "Zero Calibration (000)" in clean air without target gas, observe if calibration succeeds (displays "PAS"); if zero calibration succeeds, fault clears,

				perform regular calibration thereafter (at least annually); if zero calibration fails (displays "Fail") multiple times, check sensor for poisoning (discoloration, corrosion), replace detector if poisoned.
			3. Sensor aging or poisoning (e.g., exposure to silicone, halogen compounds, refer to manual section 5.2)	If zero calibration succeeds but fault persists or displays "dUE", span calibration (SPn) is needed; after span calibration fault clears, perform regular calibration thereafter (at least annually); if t100 still occurs frequently after multiple calibrations, sensor is aged and needs replacement.
t8000 (t80 and t.00)	Calibration Overdue	Calibration Overdue	Calibration not performed as scheduled (manual recommends at least once per year, or per local regulations).	1. Perform on-site calibration immediately (manual section 7.4): first zero calibration (requires clean air), then span calibration with 10% LEL target gas, ensure calibration succeeds (displays "PAS");
			When the detector's calibration interval function is enabled and the time since last calibration is approaching the due date, a "dUE" prompt will appear. This is because the sensor may drift over time, and regular calibration is needed to ensure accurate readings. The system issues a "dUE" reminder to alert the user to perform calibration.	2. If fault persists after calibration, enter "Configuration Menu" to restore factory settings then recalibrate;
			After a successful zero	3. Record calibration dates on schedule

			calibration, if the sensor's zero offset exceeds $\pm 3\%$ LEL, it will also trigger "calibration due" status, causing the display to alternate between "dUE" and the current gas reading.	thereafter to avoid recurrence.
dUE	Recalibration due	Recalibration Due	When the detector triggers a "dUE" prompt, it is reminding the user to perform calibration in a timely manner.	1. Perform "Zero Calibration (000)" in clean air without target gas, observe if calibration succeeds (displays "PAS"); after successful zero calibration the device displays "dUE" and "0"; 2. Perform "Span Calibration (SPn)" with 10% LEL hydrogen, ensure correct calibration gas and stable flow rate (0.2 LPM); displays "PAS" (success) → Enter to confirm, completing all calibration steps.

GD-6 Fault Code Maintenance				
Code	Fault Description	Description	Cause	Solution
t.01	Sensor missing	Sensor Missing	1. Sensor not physically installed properly;	1. Qualified technician opens device housing, confirms sensor is securely installed and terminal connections are not loose;
			2. Mainboard connector loose;	2. Check if mainboard connector is detached, re-seat firmly then power on, observe 1-minute self-test for pass;

			3. Sensor not recognized by device or sensor physically damaged.	3. After performing on-site calibration (zero and span calibration), if device still reports error then sensor is physically damaged or mainboard faulty, requires factory repair.
t.04	Bad EEPROM checksum	Bad EEPROM Checksum	1. EEPROM data (storing device configuration, calibration data) corrupted or checksum mismatch during data read/write;	1. Restart device, observe if fault clears;
			2. Possibly caused by data write during power loss, electromagnetic interference, or chip aging;	2. Restore factory settings. Enter "Configuration Menu (Con)" select "Default Settings (dEF)", restore factory configuration (operation: in normal mode press Next twice → Enter to enter Con → select dEF → press Next to change to "yES" → Enter to confirm), observe if recovered, reconfigure target gas, relay and other parameters (refer to manual section 4.5), and perform on-site calibration (section 7.4);
			3. Occasional software data anomaly.	3.If fault recurs after factory reset, EEPROM hardware failure, requires factory repair.
t.08	Sensor is shorted or has bad power supply	Sensor Shorted or Bad Power Supply	1. Sensor internal short circuit (e.g., moisture ingress, liquid ingress);	1. Power check: use multimeter to measure supply voltage, confirm compliance with section 2.4.1/2.4.2 specifications, rule out over/under voltage;
			2. Sensor power supply line short circuit or mainboard power module fault, causing sensor unable to receive normal power.	2. Sensor isolation test: disconnect sensor wiring, power on and observe if error persists (rule out sensor short circuit); if sensor is shorted, requires factory repair;

			3. Power supply voltage out of range (GD-6: 12-24 VAC/12-48 VDC; when connected to RS-603 refer to RS-603 voltage range)	3. If line short circuit or mainboard power module fault, both require factory repair.
t200 (t02 and t.00)	Sensor Expired	Sensor Expired	Device sensor has a design life of 5 years (from date of shipment); triggers "end-of-life signal" upon expiry, which is a normal aging notification.	1. Confirm whether device has exceeded 5 years; if so, the entire detector must be replaced; 2. If under 5 years, restart device to check if fault is a false alarm (rule out software timing error); pressing Enter/Test key or power cycling for 10 seconds can temporarily silence for 10 days, but if false alarms recur, factory repair is required.
t400 (t40 and t.00)	Bad current selected gas	Bad Current Selected Gas	The detection gas set by user does not match the actual gas in the environment, or device gas type identification error.	1. Recheck and correctly set the detection gas type, select target gas matching the sensor (operation: in GAS menu press Next to switch to correct gas → Enter to confirm → press Next to "End" → Enter to return to normal mode); 2. If t400 persists after selecting correct gas, device gas identification module may be faulty, requires factory repair.

9.4.4 Zero Calibration of Gas detector

1. Energize the combustible gas detector and keep it in a stable operating condition for at least 15 minutes.
2. Remove the front cover from the combustible gas detector by loosening screws.
3. In the normal mode, press the NEXT button four times to enter the calibration mode.
4. Press the ENTER button to enter the zero calibration, and the screen displays 000.
5. Press the ENTER button, and 0 alternating with 000 is displayed on the screen, indicating that the zero calibration is in progress.

6. When the calibration is complete, press the ENTER button first, and then press the NEXT button until the screen displays End.
7. Press the ENTER button, and the combustible gas detector returns to normal mode.
8. Restore the front cover for the combustible gas detector.

Note:

- If the calibration is successful, 0 alternating with PAS is displayed on the screen.
- If the calibration fails, 1 alternating with Fail. is displayed on the screen. Repeat steps 3 to 5 again for zero calibration. If the calibration still fails, contact the service provider for assistance.

9.4.5 Fire suppression System Inspection (If selected)

A periodic inspection of the aerosol fire extinguishers and fire extinguishing systems to check the following parts:

- electrical wiring
- electrical circuit
- thermal actuator port
- terminals of the electrical activator
- electrical contacts
- fixing bolts

9.5 Auxiliary System Maintenance

9.5.1 Safety Label Check (power-off)

- Check whether safety labels on enclosure is damaged, fallen or aging;
- Check whether nameplate is loose or fallen;

9.5.2 Enclosure Check (power-off)

- Check whether there is any flammable object or anything that could endanger operational safety inside or around the enclosure;
- Check whether enclosure is rusting or deformed and whether painting is fallen;
- Check whether enclosure door can be opened and closed easily;
- Check whether the sealing joint strip of enclosure is fallen or aging;

9.5.3 Grounding Check (power-off)

- Check whether grounding cables on both sides of enclosure is loose or damaged;
- Check whether the grounding copper bars on both sides of enclosure is rusted or oxidized;

9.5.4 Enclosure Sealing Check (power-off)

- Check whether the sealing of DC power cable interface is intact;
- Check whether the sealing of Auxiliary power cable interface (power control box) is intact;
- Check whether the sealing of communication cable interface is intact;
- Check whether there is any sign of water leak or dripping;

9.6 Thermal Management System Maintenance

Note: For Thermal Management System maintenance, please contact the local Thermal Management System contractor.

Below is a summary and description of Thermal Management System maintenance. For details, please refer to

< Thermal Management System User Manual>.

Table 8: Thermal Management System Check List

NO.	List	Initial status	Maintenance	Running status	Else	Requirements
1	Check the leak of cooling system.		Visual inspection,			No leakage in pipeline and connection
2	Check the electric control system including control board wiring box and any burnt/abraded/loose connection. Check the insulation of power supply.		Visual inspection			No damage to control board and Cable
3	Check the status of contactor. If there is abnormal noise and big current, tighten or replace the contactor.		Visual inspection			Contactor without abnormal noise
4	Check the status of pump and record the following running data.		Visual inspection			See the user manual :4.5 Status
4-1	Inlet pressure.		View the display screen			Except standby mode 0.4~1.0bar
4-2	Outlet pressure.		View the display screen			Except standby mode 1.0~2.0bar
4-3	Pressure difference between inlet and outlet		View the display screen			Except standby mode 0.3~1.0bar
5	Check the status of cooling system and record the following running data.		Visual inspection			See the user manual :4.6 Record
5-1	Outlet temperature.		View the display screen			Except standby mode 15°C~25°C

5-2	Inlet temperature.		View the display screen			Except standby mode 13°C~27°C
5-3	Temperature difference between inlet and outlet		View the display screen			Circulating mode $\Delta t: \leq 0.5^{\circ}\text{C}$ Cooling mode $\Delta t: \geq 0.6^{\circ}\text{C}$ Heating mode $\Delta t: \geq 0.5^{\circ}\text{C}$ Standby mode $\Delta t: \leq 0.3^{\circ}\text{C}$
5-4	Cooling system each phase input voltage.	L1&L2: L1&L3: L2&L3:	Use multimeter to measure the power supply	L1&L2: L1&L3: L2&L3:		L1&L2、L1&L3、L2&L3: 277VAC $\pm$ 10%
5-5	Cooling system each phase aggregate current.	L1: L2: L3:	Use multimeter to measure the power supply	L1: L2: L3:		Circulating mode L1、L2、L3: 0.8~1.3A Cooling mode L1、L2、L3: 3~9A Heating mode L1、L2、L3: 2.5~4A
6	Visual check and clean the system.		Visual inspection			See the user manual: 6.2 Unit Appearance Maintenance
7	Check and modify the parameter setting according to the manual.		View the display screen			See the user manual: 4.9 Setting
8	Record the ambient temperature.		View the display screen			-30°C~55°C
9	Check whether the condenser fan is running normally and check whether the speed needs to be modified.		Visual inspection			See the user manual: 6.5 Condenser Maintenance and 7.1 Fault of External Circulation Fan
10	Check whether the condenser coil is blocked, damaged or dirty. Clean it if needed.		Visual inspection			See the user manual: 6.5 Condenser Maintenance
11	Check and modify time setting. Clear the history alarm.		View the display screen			See the user manual: 4.9 Setting

9.7 Capacity Test

Follow the capacity test step on <Site Acceptance Test>, test the battery capacity.

10 Annex 1: Contact Information

Spare parts contact person:

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E-mail: dean.nguyen@csestorage.com

11 Annex 2: Torque Requirements

Torque

Bolt Torque Reference Table for Structural Fasteners

Metric Thread Size	Recommended metric bolt tightening torque	
	ft lbs	Nm
M4	2.1	2.8
M5	4.1	5.6
M6	7.2	9.8
M7	11.6	15.7
M8	18.1	24.5
M10	32.5	44.1
M12	57.9	78.5
M14	94.4	128
M16	144.6	196
M18	191.8	260
M20	275.1	373

Bolt Torque Reference Table for Electrical Wiring

Metric Thread Size	Recommended metric bolt tightening torque	
	ft lbs	Nm
M4	1.1	1.5
M5	2.4	3.2
M6	4.1	5.5
M8	7.4	10
M10	14.8	20
M12	25.8	35
M14	44.3	60
M16	59	80
M18	88.5	120
M20	125.4	170

12 Annex 3: SolBank Check List

Table 9: SolBank Check List

No.	Check items			Check records	Remarks
1	Battery Cabinet Maintenance	Battery Rack Visual Check (power-off)	/		
2		BMS Control Box Visual Check (power-off)	/		
3		Battery Pack Visual Check (power-off)	/		
4		Battery Cabinet Cleaning (power-off)	/		
5		Battery Cabinet Components Test (power-on)	BMS DC switchgear Test (power-on)		
6			Battery Contactor Test (power-on)		
7			Battery fault Diagnosis(power-on)		
8			Check electrical terminals (power-on)		
9	DMC Maintenance	DMC Visual Check (power-off)	/		
10		Auxiliary Power Connection Check (power-off)	/		
11		Wiring Connection Check (power-off)	/		
12		DMC Cleaning (power-off)	/		
13		DMC Components Tests (power-on)	Power Supply Test (power-on)		
14			UPS Battery Capacity Test (power-on)		
15		SolBank controller Tests (power-on)	SOC calibration (power-on)		
16			BMS measurement check (power-on)		
17			insulation resistance check (power-on)		
18	Junction Box Maintenance	Junction Box Visual Check (power-off)	/		
19		Junction Box Main Power Circuit Torque Checking (power-off)	/		
20		Junction Box Cleaning (power-off)	/		
21	Fire Safety System Maintenance	Fire Detection Components Check (power-off)	/		

22		Fire Safety System Cleaning (power-off)	/		
23		Gas detector Check	/		
24		Fire suppression System Inspection (If selected)	/		
25	Auxiliary System Maintenance	Safety Label Check (power-off)	/		
26		Enclosure Check (power-off)	/		
27		Grounding Check (power-off)	/		
28		Enclosure Sealing Check (power-off)	/		
29	Thermal Management System Maintenance	/	/		
30	Capacity Test	/	/		

13 Annex 4: Container and Fire Safety System Layout Changes

① The Container is design as a whole mirror the container fan changed from near the back to near the door side, as figure 12 shown

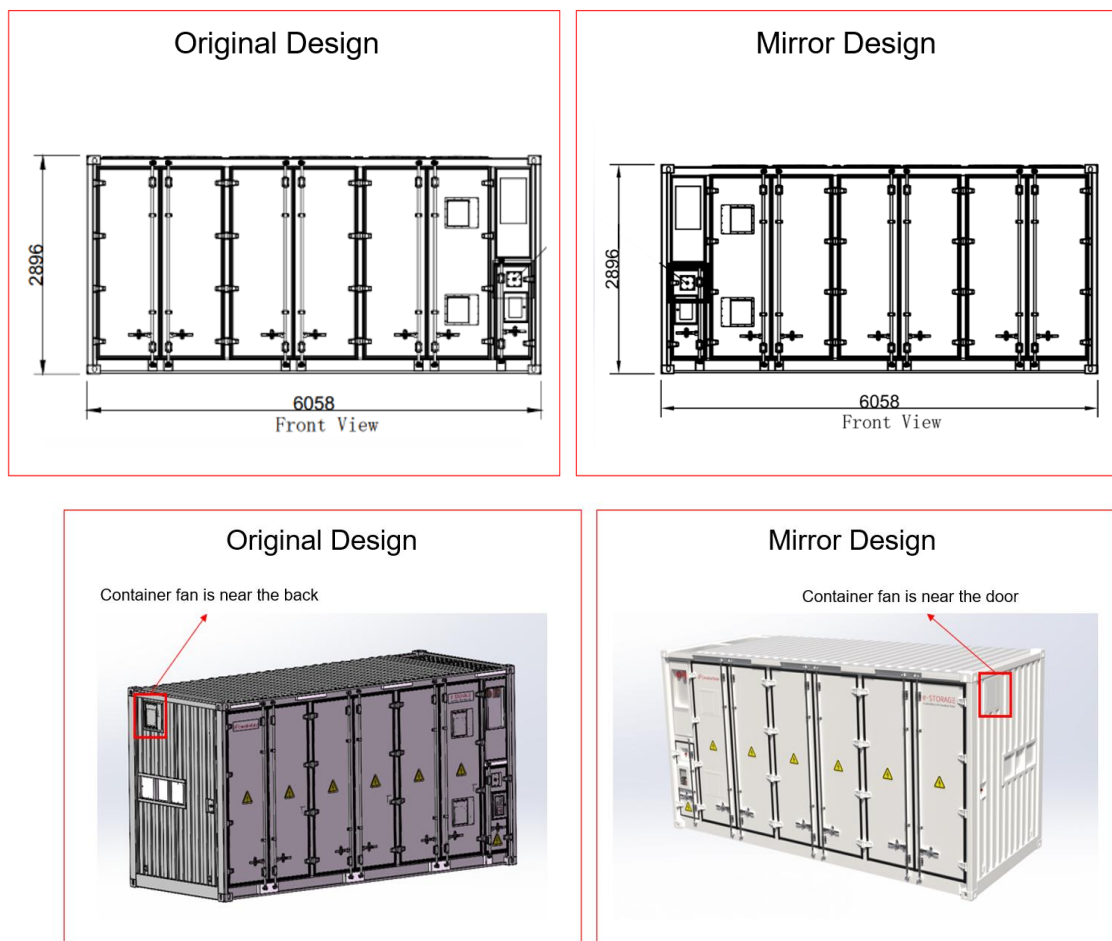


Figure 12 –The container and container fan mirror design

②the electrical and fire safety system device inside SolBank3.0&SolBank3.0 PL are mirrored accordingly, but there is no change in device used

Liquid Cooling and Heating system changes

①Chiller mirror design (shown as figure 13), the supplier to re-provide certification (product materials, key device, performance, functionality without change)

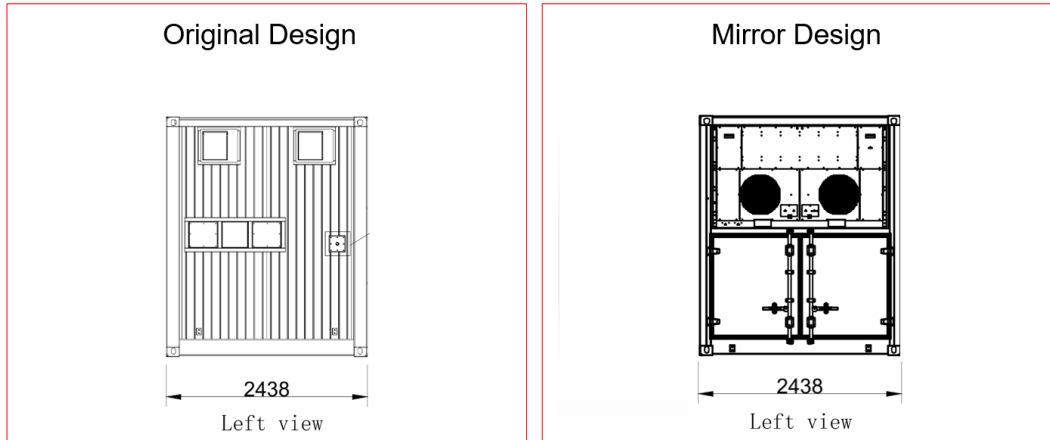


Figure 13 –The chiller mirror design

②Liquid cooling piping mirror design (shown as figure 14) (product materials, key device, performance, functionality without change)

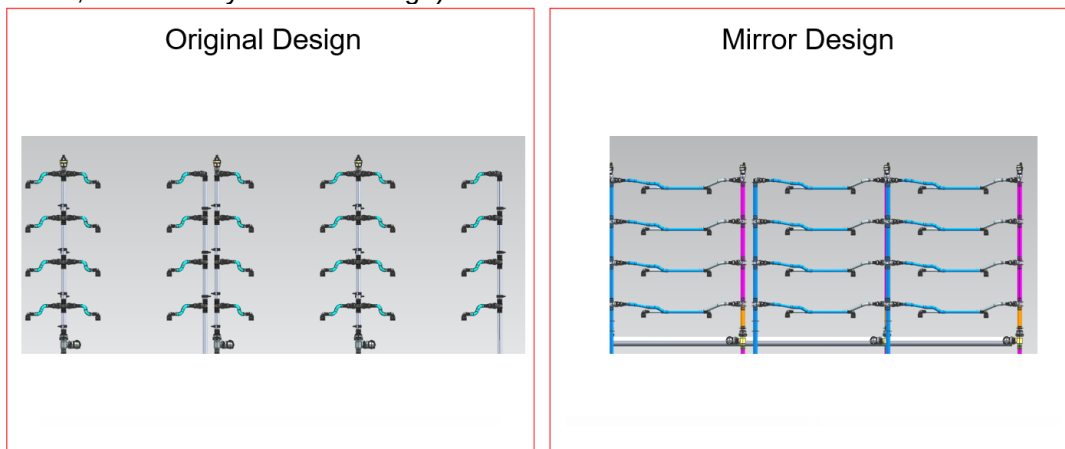


Figure 14 –The liquid cooling piping mirror design

③No change in dehumidifier and 600W air conditioner

Cable Length Changes

DC cable length will be more, no change in communication cable