

REVO-2.5

Product Expert User Manual

The User Manual is suitable for qualified person & expert users who may need to view technical information.

Update Date	Prepared By	Checked By	Approved By	Version
2023. 12. 05	Albert	Ben	Neil	V1.0

Term Definition

The following acronyms and their meanings are used in this Manual.

BMS	Battery Management System
SOC	State of Charge
SOH	State of Health
UPS	Uninterruptible Power Supply
OT	Over Temperature
OV	Over Voltage
UV	Under Voltage
HMI	Human Machine Interface
Charge OC	Charge Over Current
Discharge OC	Discharge Over Current
Cell OV	Cell over voltage
Pack OV	Pack Over Voltage
LFP	LiFePO4
CBMS	Cabinet Battery Management System
GBMS	Group Battery Management System
TP	Ten-or-Fifteen-min Backup Time Solution for Three-phase UPS
TPH	Five-min Backup Time Solution for Three-phase UPS
TPL	Over One Hour Backup Time Solution for Three-phase UPS

Contents

Term Definition	2
Contents	3
1 Overview	7
Range of application	7
For the reader	7
User Manual	7
2 Product description	8
2.1 Brief introduction	8
2.2 Solution introduction	8
2.3 Product functions and advantages	8
3 Safety instruction	10
3.1 Label description	10
3.2 Installation tools	11
3.3 Attention items	12
3.3.1 Manual custody	12
3.3.2 Identity protection	12
3.3.3 Safety warning label	13
3.3.4 Personnel requirement	13
3.3.5 Battery protection	13
3.3.6 Electric measurement	14
3.3.7 Expert Users Measuring Instrument	14
3.3.8 Maintenance and repairing	14
3.3.9 Safety notice	15
4 Module	20
4.1 Module description	20

4.2 Module specification	20
5 CBMS	21
5.1 CBMS description	21
5.2 CBMS specification	22
5.3 CBMS function panel	23
5.4 LED indicator status and definition	25
5.5 Breaker	26
5.6 Battery system safety monitoring module	28
6 GBMS	28
6.1 GBMS description	28
6.2 GBMS specification	29
6.3 GBMS function panel and definition	30
7 Cabinet	32
7.1 Cabinet description	32
7.2 Cabinets specification	32
8 Communication	33
8.1 Communication with UPS	33
9 System installation	34
9.1 Unpacking and inspection	34
9.2 Loading list	42
9.3 Mechanical installation	43
9.3.1 Installation place	43
9.3.2 L-shaped rails disassembly	49
9.3.3 Module detection before installed	51
10 Cable Connection	52
10.1 Connection overview	52

10.2 Ground connection	53
10.3 Module installation	55
10.4 GBMS installation	57
10.5 interconnection inside the cabinet	58
10.5.1 Module connection	58
10.5.2 Connect the B- power cable	60
10.5.3 Module communication cable connection	63
10.5.4 GBMS 24V power connection	67
10.5.5 CBMS parallel communication connect	69
10.5.6 AC power connection	73
10.5.7 Set the dial switch	75
10.5.8 CAN/RS485 with UPS	78
10.5.9 Dry contact connection	79
10.5.10 GBMS DIP switch setting	80
10.6 UPS Parameter Setting	83
11 Running Test	84
11.1 Starting up examination	84
11.1.1 Starting up examination	84
11.1.2 SOC validation and calibration	84
11.2 Startup steps	84
11.3 Troubleshooting	93
11.3.1 LED display fault	93
11.3.2 Troubleshooting	93
11.3.3 Routine maintenance	97
12 System monitoring	99
12.1 HMI monitoring	99

12.1.1 Product specifications	99
12.1.2 Performance	99
12.1.3 Homepage	100
12.1.4 Real-time monitoring	101
12.1.5 Cell data	102
12.1.6 Alarm/protection page	103
13 REVO 2.0 & REVO2.5 Mixed	104
13.1 Mixed use restriction	104
13.2 Using method after mixing(TP200/TP100)	104
13.3 Attention	105
14 Appendix	105
14.1 Factory warranty	105
14.2 Limitation of Liability	105
14.3 About VISION	106
14.4 About storage	106

1 Overview

Range of application

This Manual introduces VISION REVO series product, its installation, operation and other relevant aspects. VISION REVO system developed by **SHENZHEN CENTER POWER TECH.CO., LTD.** is suitable for high-voltage lithium battery system, and widely used in UPS backup power, large energy storage and other applications.

For the reader

This Manual of installation, operation and maintenance is suitable for every kind of user - commons users, qualified person & expert users who may need to view technical information. [This Manual is suitable for the installation & Operation & Maintenance of all lithium batteries cabinet for the TP, TPH and TPL series of REVO.](#)

User Manual

The User Manual should be carefully consulted before using the product. Please properly store and put the Manual at an accessible place. All the information in the Manual, including the Figures and symbols, is owned by **SHENZHEN CENTER POWER TECH.CO., LTD.** Such information should not be used by non-internal personnel of **SHENZHEN CENTER POWER TECH.CO., LTD.** without authorization.

The Manual will be constantly updated and revised, and the users shall refer to the purchased products for the latest updates. For more details, please browse www.vision-batt.com or get the latest User Manual through the sales channel.

2 Product description

2.1 Brief introduction

REVO series lithium battery system is developed by **SHENZHEN CENTER POWER TECH.CO., LTD.** It is suitable for high-voltage lithium battery system and is mainly used in UPS backup power or energy storage, high-precision multi-string (16S) cell voltage and temperature acquisition. The module adopts passive equalization, and the maximum equalization current reaches 300mA. The external communication interface adopts isolated CAN bus to realize the cascade communication of up to 15 BMU. This Manual describes the type and size, performance, technical characteristics, warnings and precautions of REVO series lithium battery system. This specification applies only to backup battery products provided by **SHENZHEN CENTER POWER TECH.CO., LTD.**

2.2 Solution introduction

REVO series uses VISION high-rate LFP batteries and self-developed BMS system, integrated remote cloud management system and intelligent fire protection module, **with high reliability, good stability, long service life and excellent safety performance.**

2.3 Product functions and advantages

REVO series has four levels of safety protection to ensure the safety and reliability of the system throughout the life cycle; it adopts a three-level management architecture design to accurately monitor the status of each component in the system, which ensures stable system performance and ensure the safety of user load power supply.

2.4 product list

Items below are the cabinet carton Units we send directly.

Item	Name	Description
1	LIBVIS8×50250IEC	8 * 50AH modules cabinet
2	LIBVIS10×50250IEC	10 * 50AH modules cabinet
3	LIBVIS12×50250IEC	12* 50AH modules cabinet
4	LIBVIS8×100630IEC	8* 100AH modules cabinet
5	LIBVIS10×100630IEC	10* 100AH modules cabinet
6	LIBVIS12×100630IEC	12 * 100AH modules cabinet
7	LIBVIS8×200250IEC	8 * 200AH modules cabinet
8	LIBVIS10×200250IEC	10 * 200AH modules cabinet
9	LIBVIS12×200250IEC	12 * 200AH modules cabinet









3 Safety instruction

3.1 Label description

In order to ensure the users safety while using this product, the Manual provides pertinent identification information and corresponding symbols.

Please read carefully the following list of symbols used in this Manual.

Table 3.1 Safety symbols

	Low potential danger: it may result in mild or moderate injury
	High risk of serious injury or death
	High voltage inside the cabinet: a touch may lead to electric shock danger
	Wear safety goggles all the time during installation or maintenance
	Service by properly trained and qualified personnel only Disconnect charger and Verify no-voltage before maintenance Turn off the battery system and Lock-out/Tag-out before maintenance
	Recycle lithium-ion batteries
	Firmly ground to ensure the safety of operators and protect the grounding terminal (PE)
	Emphasis and supplement: a quick way to master this step



Wear professional protective equipment to prevent personal injury.



Do not dispose in trash, follow local regulations and manufacturers instruction



Servicing of batteries must only be performed or supervised by qualified personnel knowledgeable of batteries and the required precautions. Keep unqualified personnel away from batteries.



Wear professional protective equipment to prevent personal injury.










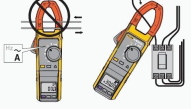

Do not dispose of batteries in a fire as they can explode

3.2 Installation tools

Table 3.2 Tools

Tools prepared before installation are as follow:

Items	Tools		
Protection	Multimeter 	Protective gloves 	Insulated shoes 
	ESD wrist strap 	Safety goggles 	

Installation	<p>Electric screwdriver</p> 	<p>Cross head screwdriver</p> 	<p>Socket spanner</p> 
	<p>slot type screwdriver</p> 	<p>wire stripper</p> 	
Test	<p>Clamp meter</p> 	<p>Laptop</p> 	

3.3 Attention items

3.3.1 Manual custody

This Manual contains important information about REVO series lithium battery. Reading carefully before the operation of REVO series product will help you get familiar with it.

- ❖ This Manual should be put at an accessible place to ensure that maintenance personnel and others have easy access to it.
- ❖ Please strictly follow the Manual while operating REVO series products.
Otherwise, it is possible to cause equipment damages, casualties, property loss and so on.

3.3.2 Identity protection

- ❖ The warning labels on the REVO series contain important safety protection information of the product. Tearing or damaging is strictly prohibited.
- ❖ REVO series back panels and front doors are equipped with nameplates that

contain important information of the product. Tearing or damaging is strictly prohibited.

3.3.3 Safety warning label

In the process of installation, daily maintenance, overhaul and other operations of REVO series products, to prevent improper operation, by not skilled person and accidents, the following agreements must be noticed:

- ❖ The front and rear DC-breaker of REVO products should be clearly marked to prevent accidents caused by false switching.
- ❖ Set up warning signs or safety warning belts near the operation area to keep irrelevant personnel out.
- ❖ After maintenance and overhaul, pull out the key to the cabinet door and keep it properly.

3.3.4 Personnel requirement

- ❖ Only qualified personnel can carry out various operations on the product.
- ❖ Operators should be fully familiar with the system composition and working principles of entire REVO series products.
- ❖ The operator should be fully familiar with the User Manual of the product.

3.3.5 Battery protection



There is a deadly high voltage in the energy storage backup battery between the positive and negative poles of the battery system!
During installation or maintenance, make sure that the connection between the battery pack and the UPS is completely disconnected.

3.3.6 Electric measurement



After the installation of the energy storage backup battery, there is a high voltage. An accidental contact with the positive and negative poles may lead to deadly injury. Therefore, please watch out when you need to measure the power.

- ❖ Prepare for insulation protection (e.g. wearing insulating gloves, etc.)
- ❖ To ensure personal safety, one must be accompanied by others.

3.3.7 Expert Users Measuring Instrument

To ensure that the electrical parameters meet the requirements, relevant electrical measuring equipment should be used during the electrical connection and trial operation of the **REVO** system.



The measuring equipment with appropriate measuring range should be in line with the on-site working conditions.

- ❖ Ensure correct and standard electrical connection of the instrument. Avoid the arc danger.

3.3.8 Maintenance and repairing



After disconnecting the energy storage battery cabinet and UPS, confirm the disconnection again before opening the front door for maintenance or overhaul.

In the maintenance and overhaul, the following items should be concerned:

- ❖ Ensure that the energy storage battery cabinet is not accidentally recharged.
- ❖ Ensure no electricity in the energy storage battery cabinet with a Multimeter.
- ❖ Insulate the possible electric part of REVO with insulation materials. Insulate

the bare metal part of the operating tool and the positive and negative terminal of the battery module with insulating tape.

- ❖ Ensure necessary ground connection.

3.3.9 Safety notice



DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Read all instructions in the installation manual before installing or working on this product.

Failure to follow these instructions will result in death or serious injury.



DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Install the product in a temperature controlled indoor environment free of conductive contaminants and humidity.

Install the product on a non-flammable, level and solid surface (e.g. concrete) that can support the weight of the system.

Failure to follow these instructions will result in death or serious injury.



DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Batteries can present a risk of electric shock and high short-circuit current.

The following precautions must be observed when working on batteries

Remove watches, rings, or other metal objects.

Use tools with insulated handles.

Wear protective glasses, gloves and boots.

Do not lay tools or metal parts on top of batteries.

Disconnect the charging source prior to connecting or disconnecting battery terminals. Only expert personnel can open the module.

Determine if the battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electric shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).

Failure to follow these instructions will result in death or serious injury.



DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not drill or cut holes for cables or conduits with the gland plates installed and do not drill or cut holes in close proximity to the product.

Failure to follow these instructions will result in death or serious injury



DANGER

The product is not designed for and must therefore not be installed in the following unusual operating environments:

- Damaging fumes
- Explosive mixtures of dust or gases, corrosive gases, or conductive or radiant heat from other sources
- Moisture, abrasive dust, steam or in an excessively damp environment
- Fungus, insects, vermin
- Salt-laden air or contaminated cooling refrigerant



DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

When replacing battery modules, always replace them with the same battery module type

Failure to follow these instructions will result in death or serious injury



DANGER

Electrical equipment must be installed, operated, serviced, and maintained only by expert users.

Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.

Turn off all power supplying the UPS system before working on or inside the equipment.

Before working on the UPS system, check for hazardous voltage between all terminals including the protective earth.

The battery cabinet contains an internal energy source. Hazardous voltage can be present even when the UPS system is disconnected from the utility/ mains supply. Before installing or servicing the UPS system, ensure that the units are OFF and that utility/mains and batteries are disconnected.

A disconnection device (e.g. disconnection circuit breaker or switch) must be installed to enable isolation of the system from upstream power sources in accordance with local regulations. This disconnection device must be easily accessible and visible.

The battery cabinet must be properly earthed/grounded and due to a high leakage current, the earthing/grounding conductor must be connected first.

Failure to follow these instructions will result in death or serious injury.

NOTICE**RISK OF EQUIPMENT DAMAGE**

Batteries should not be stored beyond 12 months from the date of production. If they are stored for longer the calendar degradation will cause the batteries to be irreversible degraded beyond what is expected-a reduced runtime will be the consequence.

If the UPS system remain DE-energized for a long period, VISION recommends to shut down the batteries cabinet completely.

Failure to follow these instructions can result in equipment damage.

4 Module

4.1 Module description

VISION REVO TP series back up batteries adopt the high capacity, high safety LFP battery pack integration in the industry. Modules are structured in TP series, TPH series, and TPL series. Within the module, integrated high-precision BMU units monitor and gather real-time module voltage and temperature, to realize intelligent temperature control at electric core level and intelligent balance of battery cell, which improves system efficiency and battery cycle life. The module is designed by filling the inside of the cold-rolled sheet metal shell, achieving high safety and reliability. At the same time, the module is designed with high stability and disturbance immunity, to ensure the safe and reliable operation of the battery cluster after it is integrated into the system.

4.2 Module specification

Table 4.2.1 Modules spec

Item	TP-10:51.2V50AH	TP-20:51.2V100AH
Commercial Ref ID	LIBVISMOD50	LIBVISMOD100
Nominal capacity	51.2V50Ah	51.2V100Ah
Cells configuration	16S1P	16S2P
Size(W*H*D):mm	442*106.5*700	442*149*800
Weight	36kg	70kg

Max discharging current	245A	510A
Max charging current	50A	100A
Recommended operating temperature	15- 35° C	15- 35° C
Operating ambient temperature	0 ~ 40° C	0 ~ 40° C
Humidity	0~95% non-condensing	0~95% non-condensing
Resistance	4~6m Ω	3~4.5m Ω
Voltage	52.5~53.2V	52.5~53.2V

5 CBMS

5.1 CBMS description

BMS system consists of three levels of architecture. **The cabinet-level management system is Cabinet BMS, hereinafter referred to as CBMS.** CBMS is responsible for battery current detection, data collection and analysis, alarm and protection control, communication with upper and lower levels, etc. CBMS consists of main circuit breaker, charging and discharging double-loop control switch circuit, high-voltage isolation detection circuit, parallel processing circuit, high-voltage power supply and DC starting circuit, CBMS chassis and related wiring harness. State management and action protection of over charge, over discharge, over current, short circuit can realize and ensure the safety and reliability of the whole system.

5.2 CBMS specification

Table 5.2.1 CBMS spec

Item	50AH CBMS	100AH CBMS
Commercial Ref ID	LIBVISSG250IEC	LIBVISSG630IEC
Output configuration	2/3 wires	2/3wires
Rated Power: kw	100	200
Modules in configuration	8-14	8-12
Range of Voltage	(8-14)*51.2V	(8-12)*51.2V
Max discharging current	245A	510A
Size(W*H*D):mm	442*600*178.5 mm	442*650*222.5 mm
Weight:kgs	29Kg	43.4Kg
Short Circuit current	5000/15ms	9000/15ms
Recommended operating temperature	15- 35° C	15- 35° C
Operating ambient temperature	0 ~ 40° C	0 ~ 40° C
Humidity	0~95% non-condensing	0~95% non-condensing
Size with Package (W*H*D):mm	600*800*200 mm	600*880*230 mm
Weight with Package:kgs	29.5	45

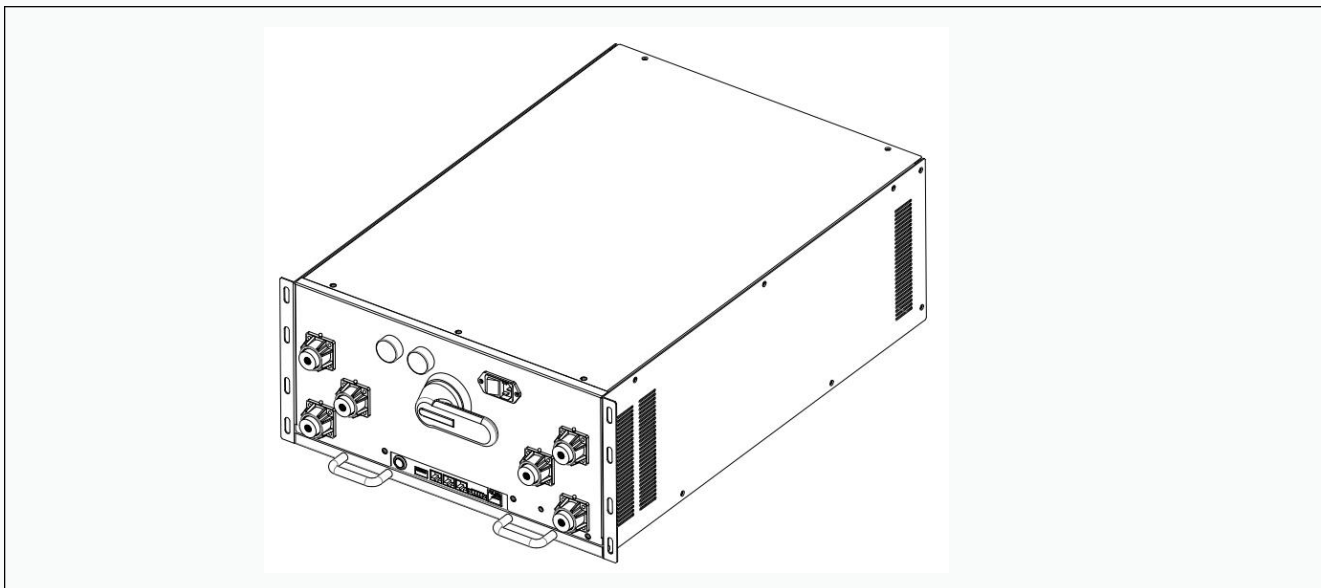
SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

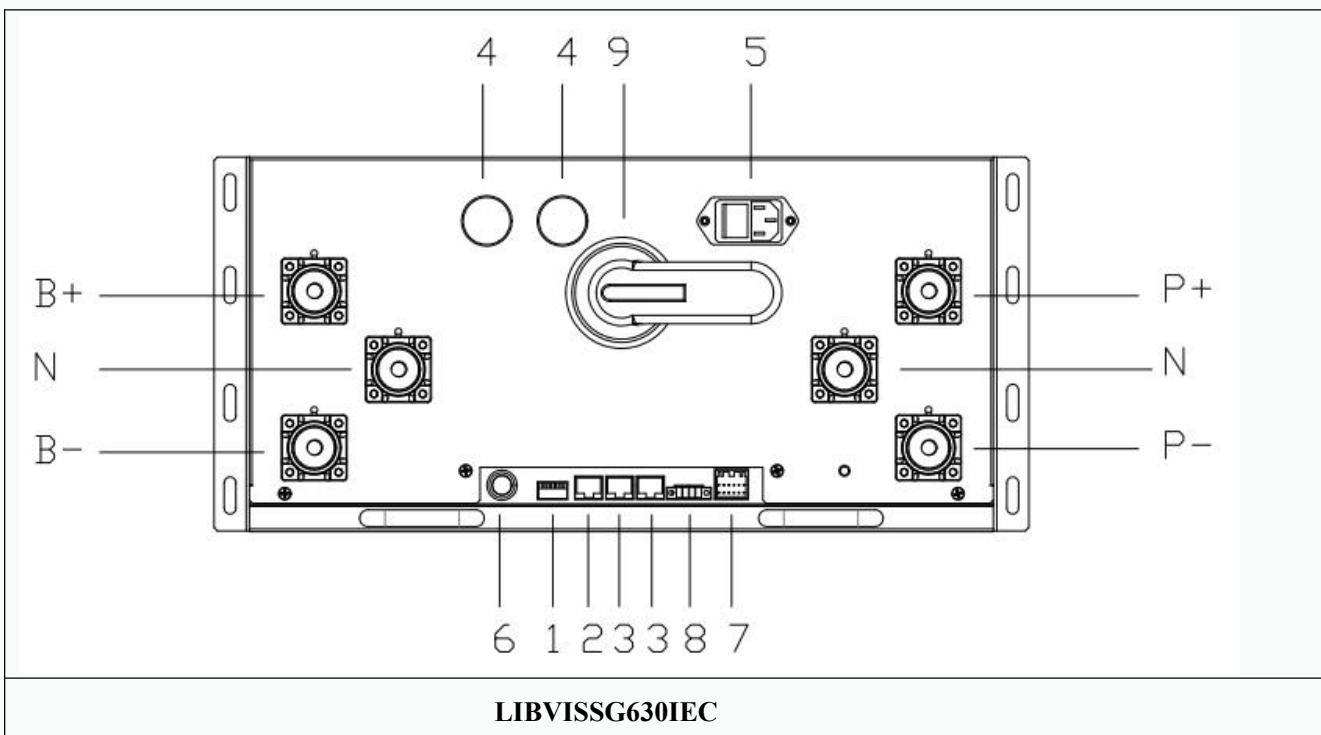
Green Our Earth Power Your Vision

Figure 5.2.2 CBMS appearance



5.3 CBMS function panel

Figure 5.3.1 CBMS define mark



SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

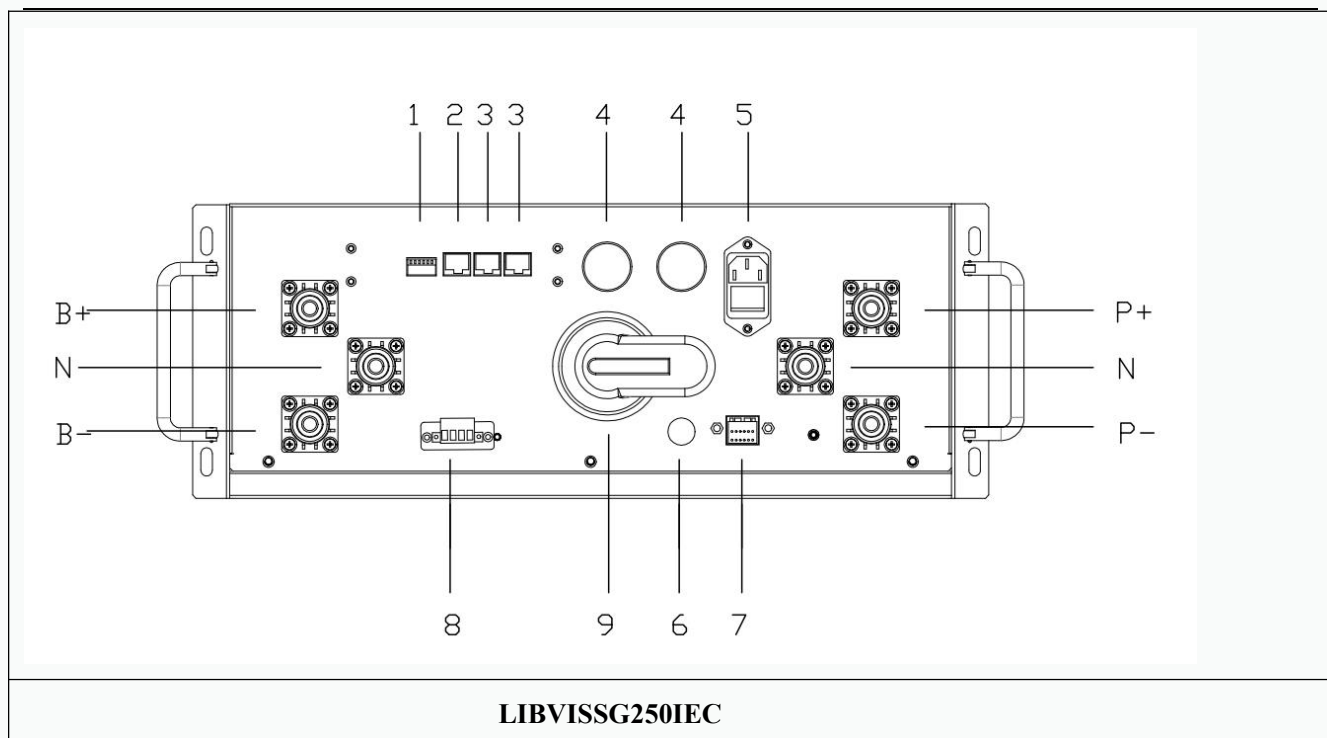


Table 5.3.2 CBMS panel function definition & description

Item	Name	Description	Remark
1	Dial switch	Set up CBMS ID address	Address field 0-15
2	LAN	LAN interface	update BMS firmware and monitor software
3	COM	COM1 COM2 interface with GBMS (Parallel use)	CAN communication
4	Indicator light	Indicates the current working status of CBMS	Charge and discharge, static, fault state
5	AC input	CBMS AC power supply interface	AC power supply for public electricity
6	DC Switch	DC start switch	Startup press at least 3s
7	BMU	Interface for communication with battery	CAN Communication

	Communication interface	modules	interface
8	24V	24V DC output for GBMS power supply	24VDC output and used for GBMS power supply
9	Breaker	Used to control dc output shutdown	Shunt trip, short circuit protection function

5.4 LED indicator status and definition

LED indicator indicates the current working status of lithium battery system. The explanation is as follows:

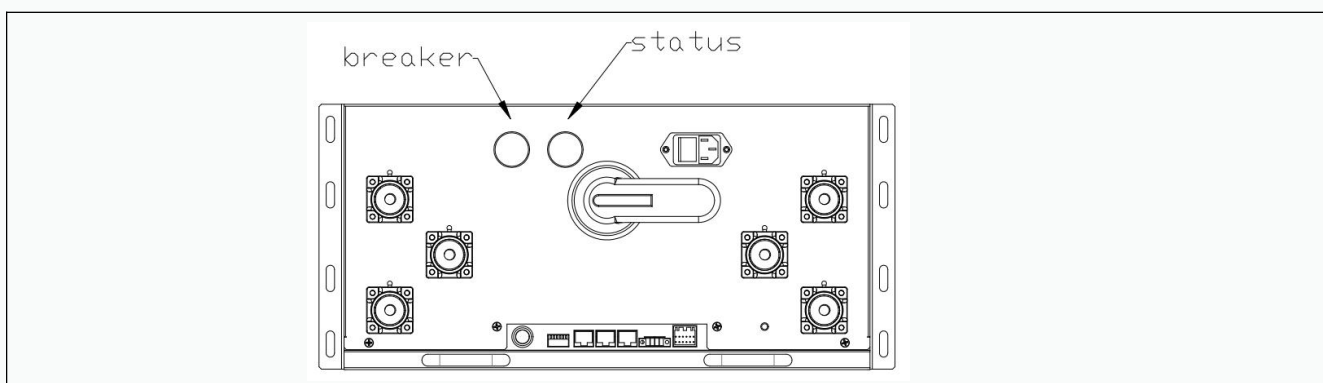


Table 5.4 LED Indicator status

Status	Type	Switch ON	Status
		●	●
Power off	Dormant	●	●
Standby	Normal	●	●
	Warning	●	●
Charge	Normal	●	●
	Warning	●	●
	Protect	●	●

Discharge	Normal	●	●
	Warning	●	●
	Protect	●	●
Failure	Breaker trip	●	●



- Black out, ● red light is always on, ● green light is always on
- Red light flashing ● Green light flashing ● yellow light is always on

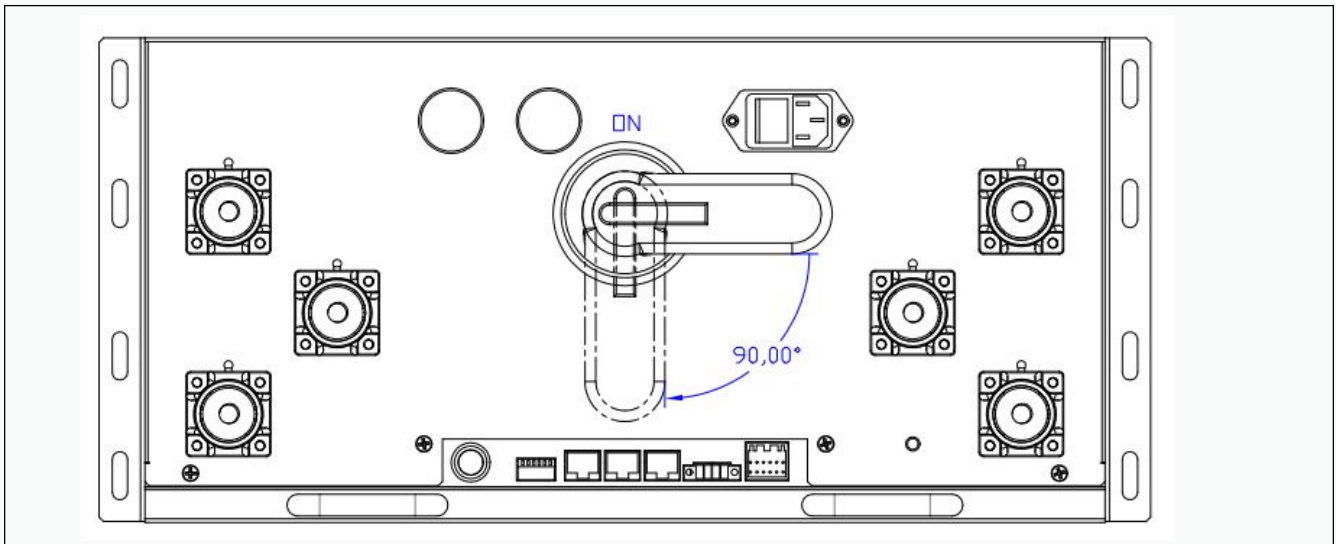
5.5 Breaker

Each CBMS models are equipped with a circuit breaker to control the DC output terminal (P+/P-/N). The circuit breaker switch can safely disconnect electrical connections with UPS.

ON: Normally Close circuit breaker: rotate clockwise to Vertical position.

Off: Normally Open circuit breaker: rotate counterclockwise to Horizontal position.

Figure 5.5.1 MCB ON





There are two ways to turn on CBMS, AC and DC.

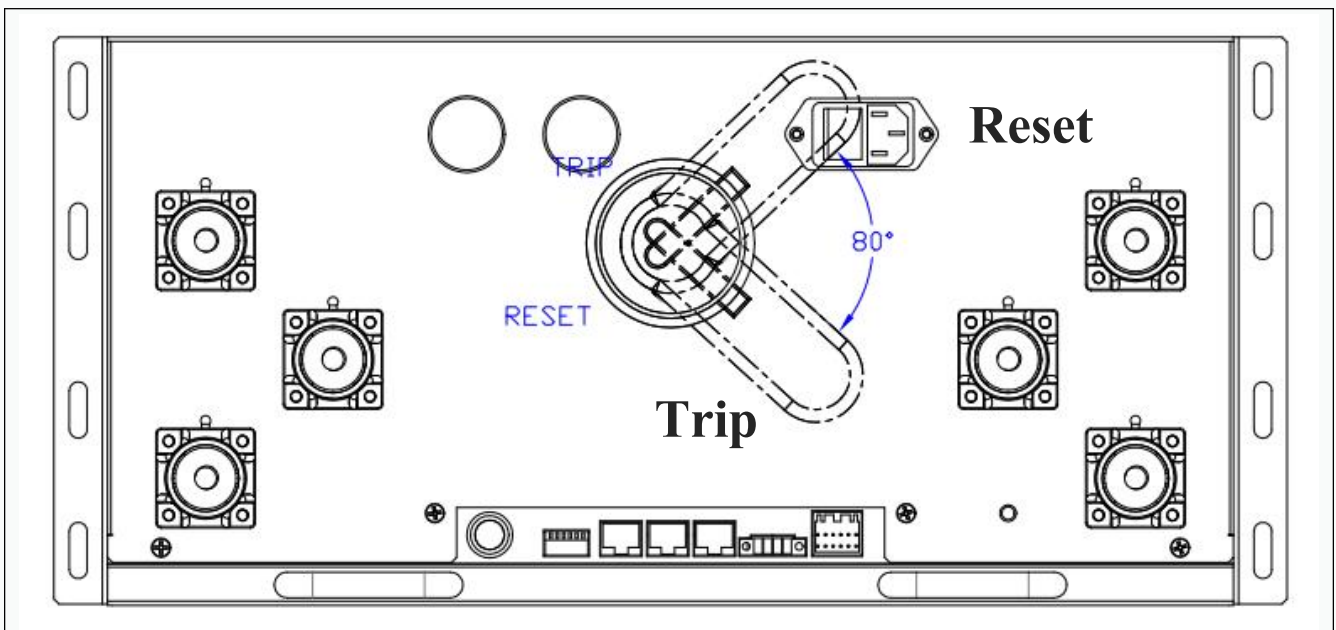
No matter which way to start, before turning on the CBMS, you should close the MCCB, and then press the DC or AC button.

1): Close MCCB (Indicate the MCCB with a number)

2) press DC or AC Button indicate the buttons with a number

Figure 5.5.2 MCB reset

RESET: When tripping, rotate MCB counterclockwise to the reset position; turn the breaker to its normal position as follows:



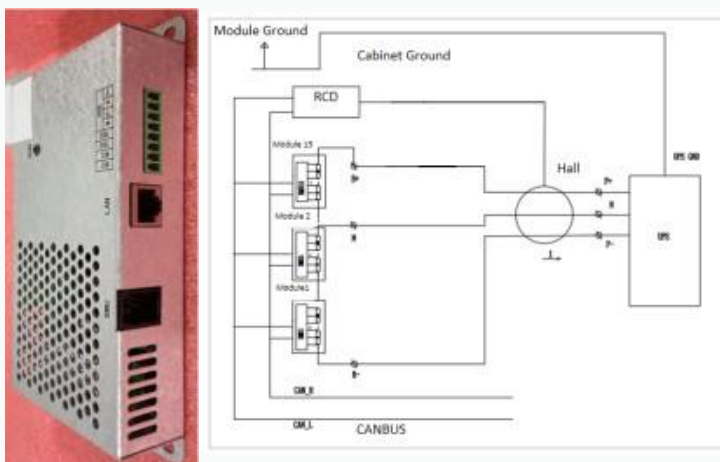
To prevent the circuit breaker from being damaged, it is forbidden to switch on again within 5 minutes after the circuit breaker trips.

5.6 Battery system safety monitoring module

The safety monitoring component of the battery system is composed of main control box, NTC temperature probe, CO sensor, leakage current sensor, etc; With temperature, leakage current and CO density monitoring function. It can provide early warning and control of the battery system.

When leakage current is detected, the circuit breaker will be disconnected in time to prevent serious accidents; When the battery system leaks electricity, the current passing through the current sensor

$$I = I_{++} + I_N + I_{-} = I_R \neq 0$$



6 GBMS

6.1 GBMS description

GBMS is the top layer BMS of lithium battery system and an integrated display for the system. It is responsible for the data collection and processing of its lower layer CBMS. With real-time analysis, GBMS displays the CBMS operation status on the screen at the control cabinet level. It interacts with UPS through CAN/RS485/dry contact to ensure the reliability and safety of the system operation in its life cycle.

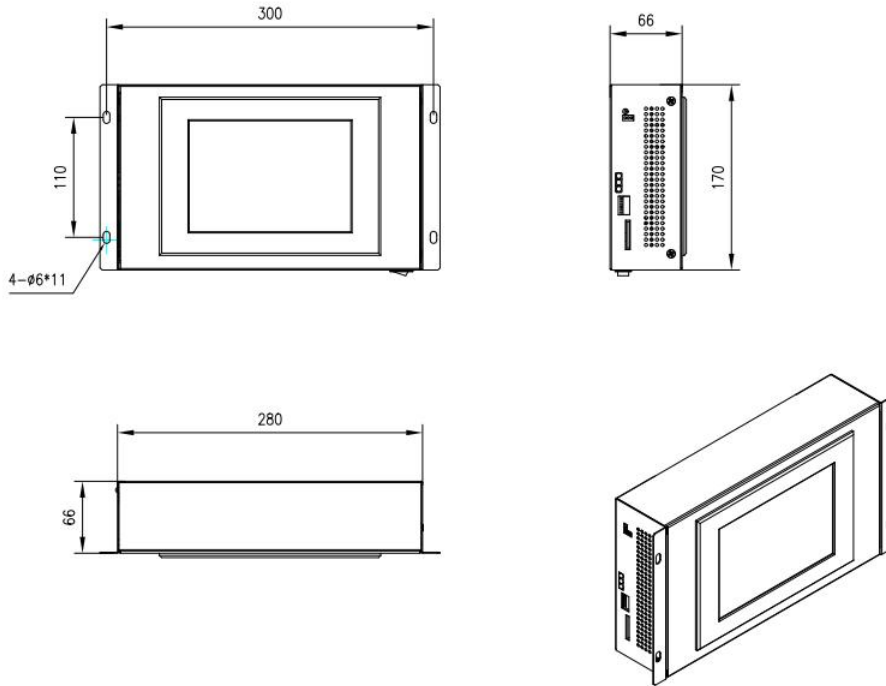
6.2 GBMS specification

Table 6.2.1 GBMS spec

Item	Description
Commercial Ref ID	LIBVISGBMS
Dry contact	3 output;1 input
Size(W*H*D):mm	300*170*66
Weight: kg	2.2
Recommended operating temperature	15- 35° C
Operating ambient temperature	0 ~ 40° C
Humidity	0~95% non-condensing
Size with Package: mm	350*200*75 mm
Weight with Package:kgs	2.5

Figure 6.2.1 GBMS description:

Unit of measurement: mm



6.3 GBMS function panel and definition

Figure 6.2.2 GBMS description

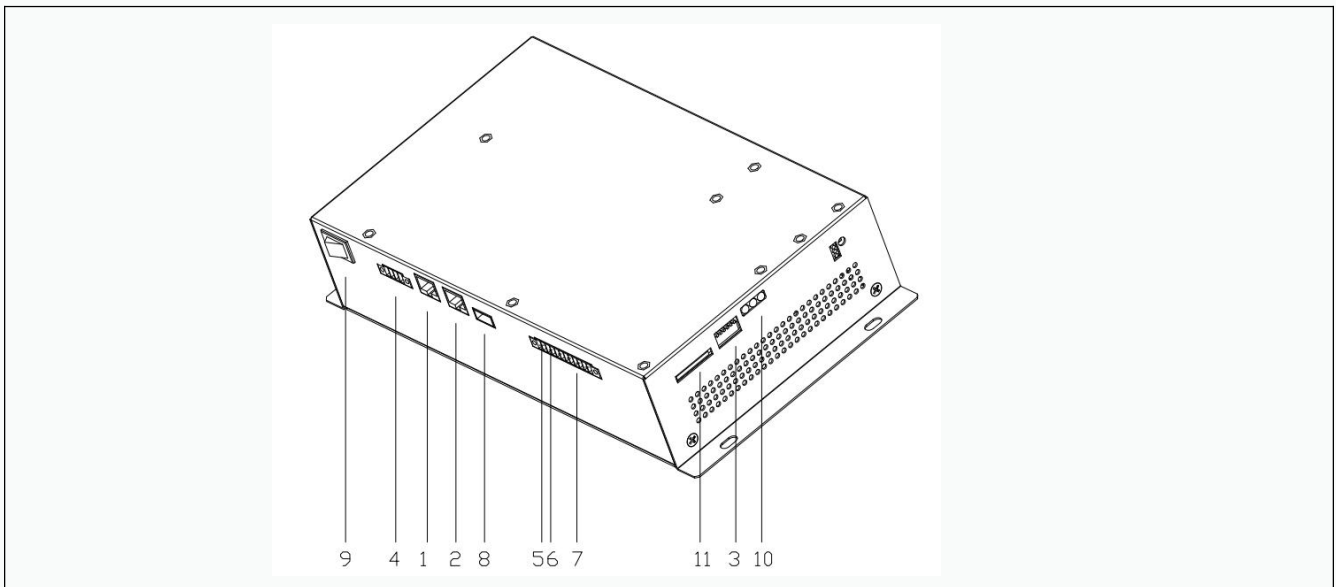


Table 6.2.2 GBMS panel function definition description

SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

Item	Designation	Description	Remarks
1	CBMS interface	The connector port with CBMS	CAN Communication
2	LAN	LAN interface	Updating GBMS program
3	Dial switch	Reserved function	GBMS in parallel
4	DC24V-IN	Supply power port to GBMS	Supplied by CBMS
5	CAN	Communicate port with UPS	CAN2.0
6	RS485	Communicate port with UPS	Mod bus RTU protocol
7	Dry contact	Input dry contact I1, Output dry contact D1~3	D1: Charger shutdown signal D2: Breaker ON signal D3: Secondary protection signal I1:EPO(input) When EPO active, closed
8	HMI update	Update the HMI interface	
9	ON/OFF	GBMS DC power supply switch	
10	Indicator	GBMS running indicate	
1	SD card	GBMS running data store 10000 records	

7 Cabinet

7.1 Cabinet description

Designed with high strength framework, REVO series Li-ion battery system cabinet meets the IP20 Criterion. Inside the batteries cabinet, galvanized trails are designed to connect the bus bar and used in conjunction with galvanized batteries module, which supports the grounding of the cabinet. Besides, the size is compatible with the standard 19-inch.

7.2 Cabinets specification

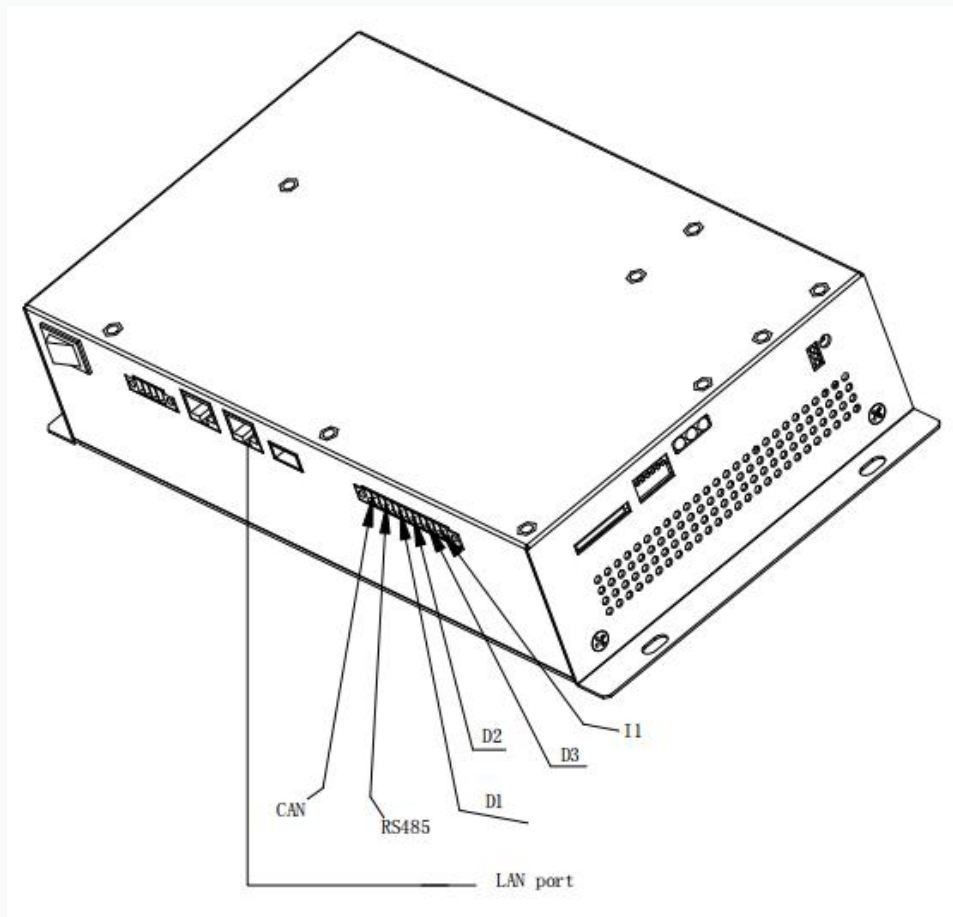
Table 7.2.1 Cabinets spec

Item	50AH Cabinet	100AH Cabinet	100AH Cabinet (12 modules)
Commercial Ref ID	LIBVISRAC50AH	LIBVISRAC100AH	LIBVISRAC100AH
Size(W*H*D):mm	600*1000*2000	600*1000*2000	600*1000*2300
Weight: kgs	145	150	178
IP Level	20	20	20
Recommended operating temperature	15- 35° C	15- 35° C	15- 35° C
Humidity	0~95% non-condensing	0~95% non-condensing	0~95% non-condensing
Size with Package	660*1060*2160	660*1060*2160	660*1060*2460
Weight with Package	160kg	165kg	193kg

8 Communication

8.1 Communication with UPS

REVO series Li-ion battery system communicates with UPS through the top integrated GBMS, which transfers all the working status of lithium battery (overcharge, discharge, over current, short circuit, over temperature, etc.) to UPS. According to the alarm or protection status of lithium battery system, UPS ensures the safety of the whole working system. Such communication is through CAN and RS485. RS485 protocol supports the MODBUS RTU MODBUS/TCP protocol. The communication signals of REVO lithium battery system is as follows:



9 System installation

9.1 Unpacking and inspection

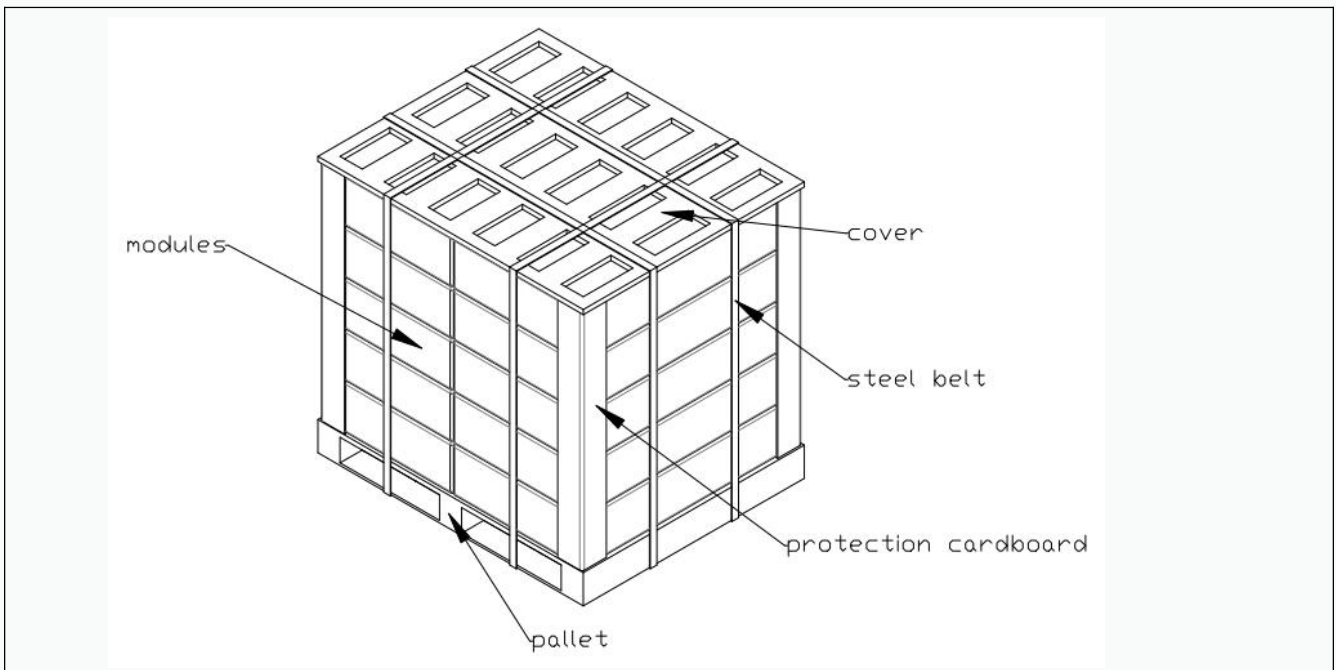
REVO lithium battery system has passed the strict and comprehensive testing and quality examination before being put into use. Please make a detailed inspection of the products before accepting the goods. If anything is damaged, please contact Vision and provide details.

Suggestions for inspection are as follows:

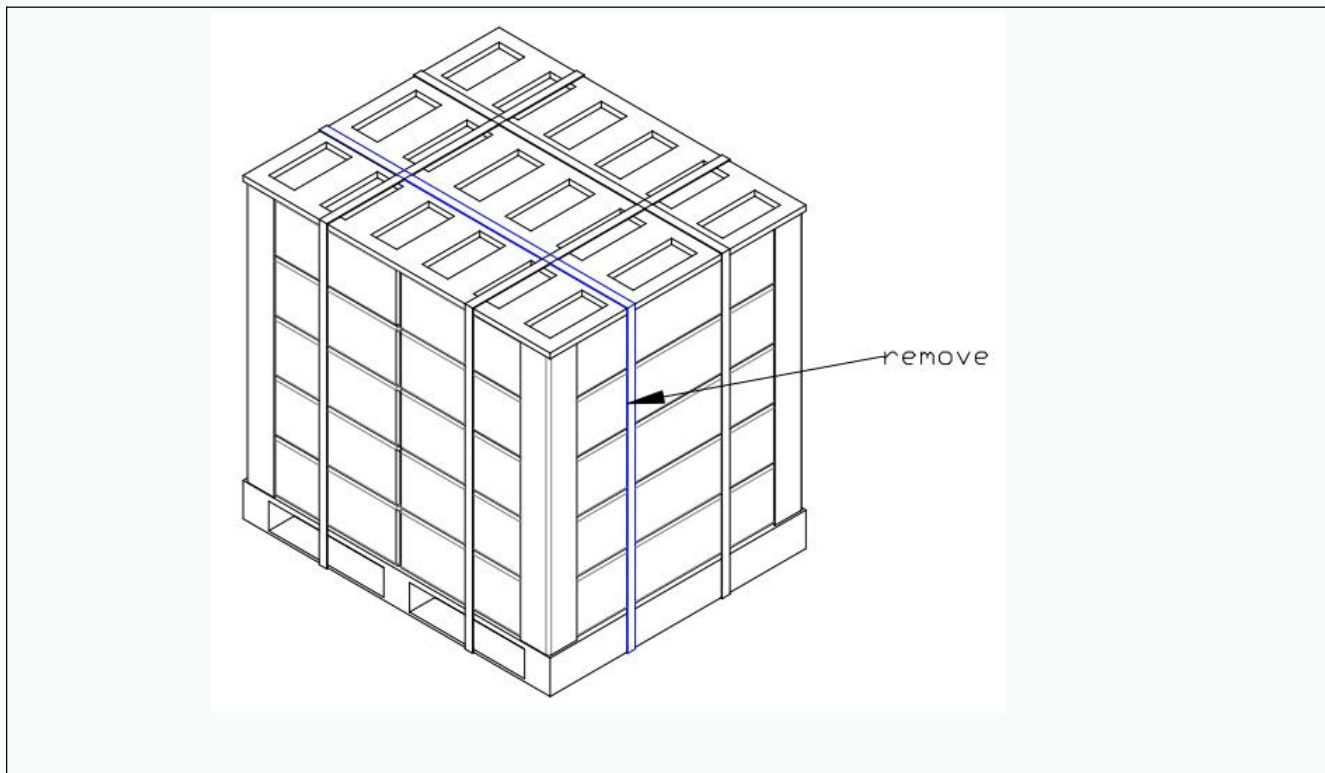
- ❖ Please check whether the package is intact.
- ❖ Please check the quantity and type of products on the packing list.
- ❖ Please check whether the equipment (including modules, CBMS, GBMS, etc.) inside the package is intact. The cabinet and battery modules are shipped separately.

Unpacking steps

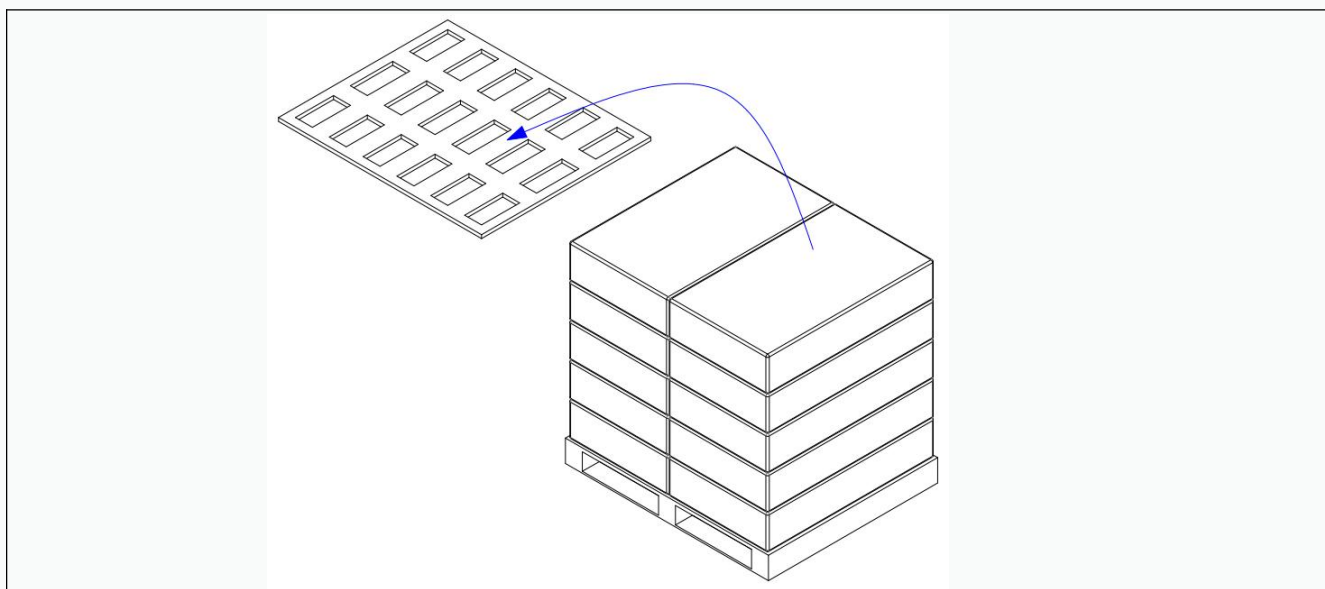
Step 1: Overview of the packing



Step 2 : Remove the protection cardboard and loosen the steel belt

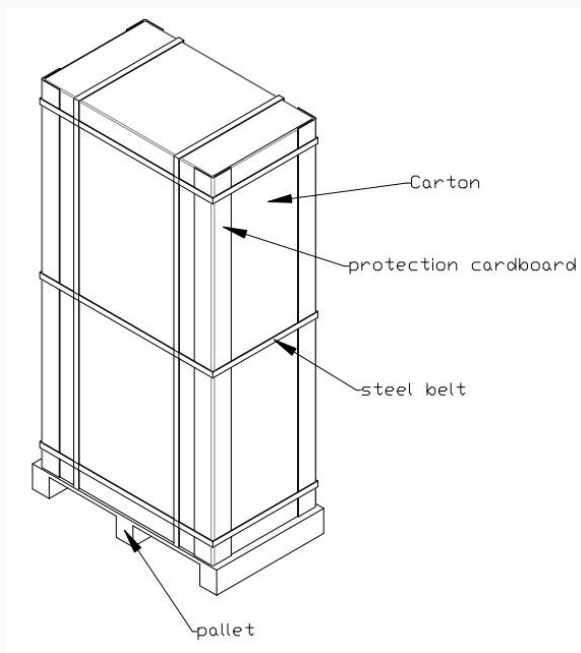


Step 3: Remove the cover of top

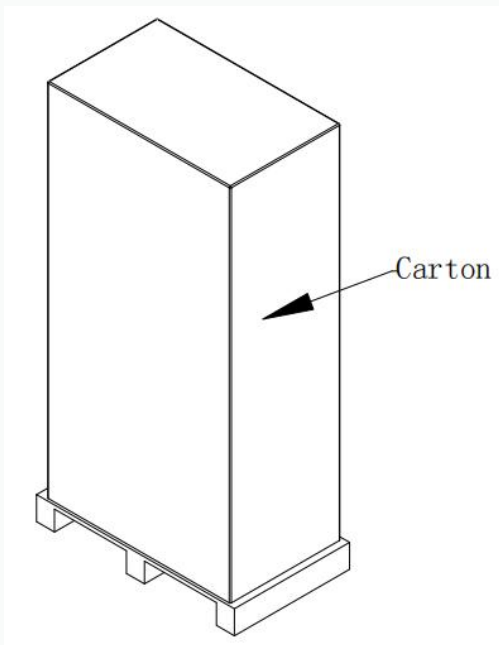


Step 4: Unpacking the cabinet

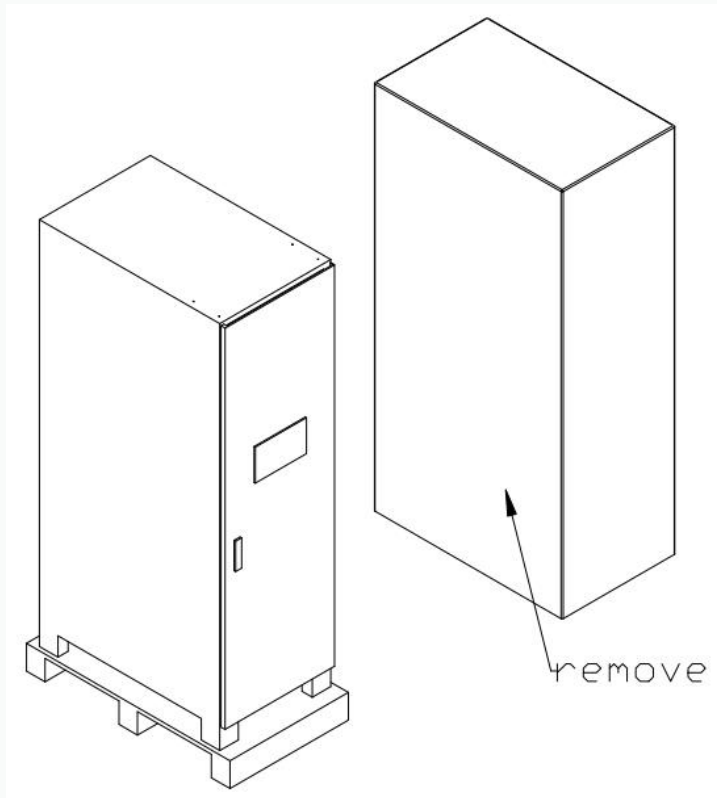
overview



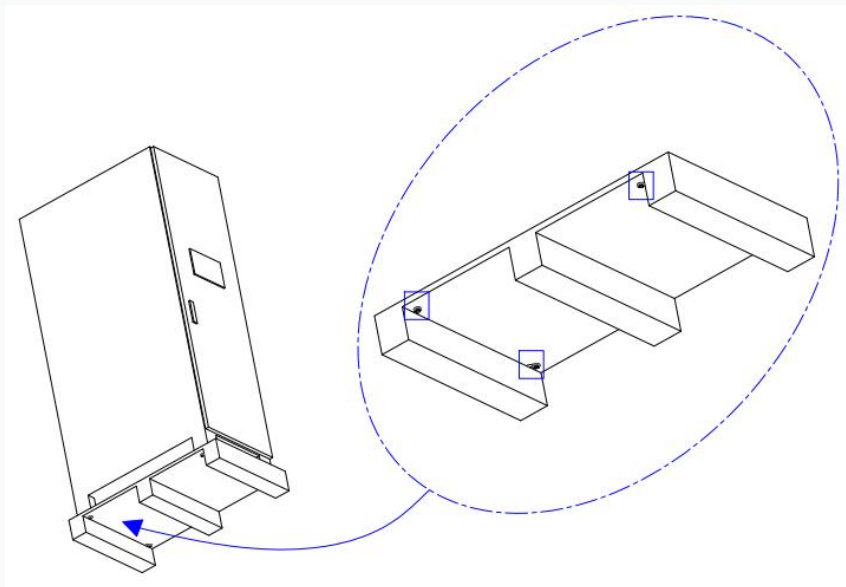
Remove the protection cardboard and loosen the steel belt



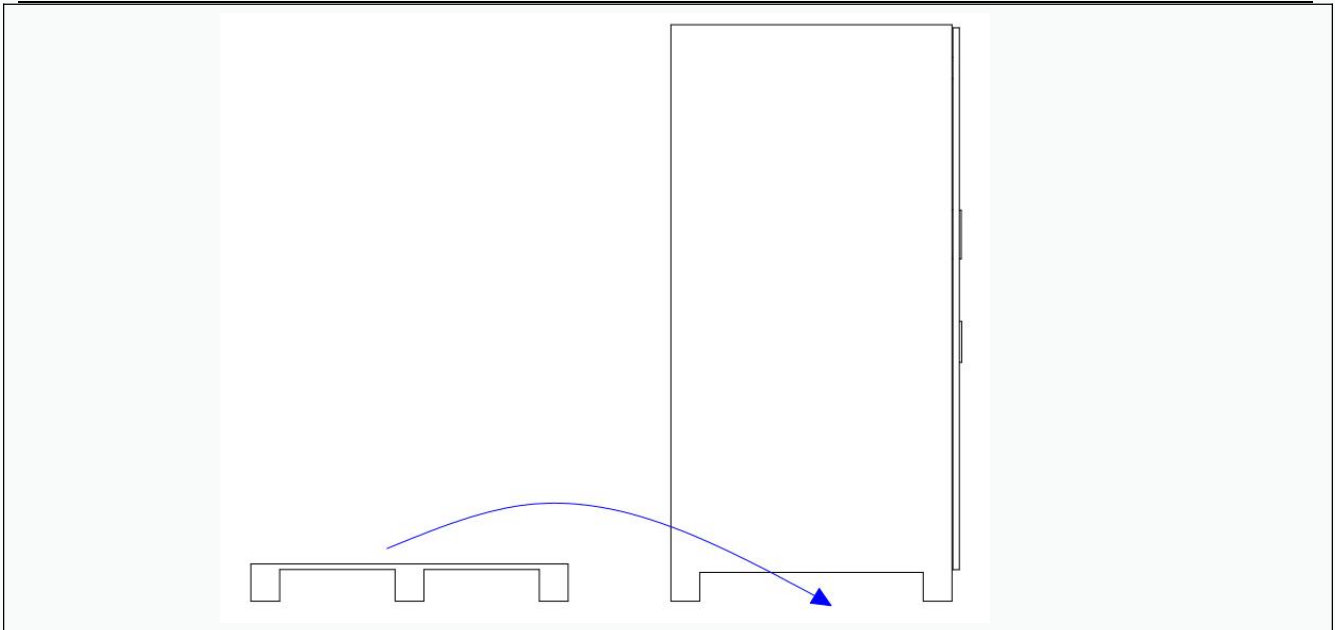
Remove the carton



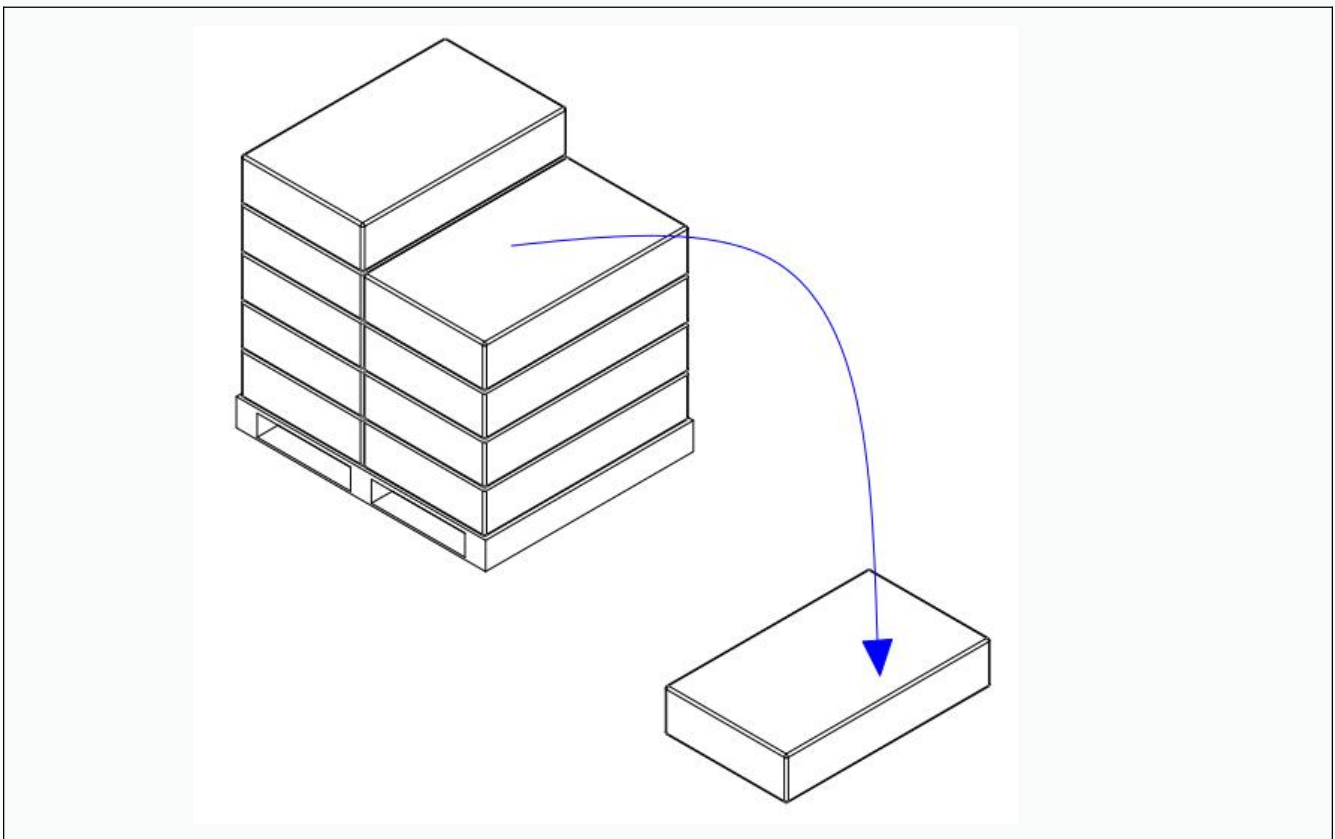
Remove the fixing bolts from the bottom of the cabinet



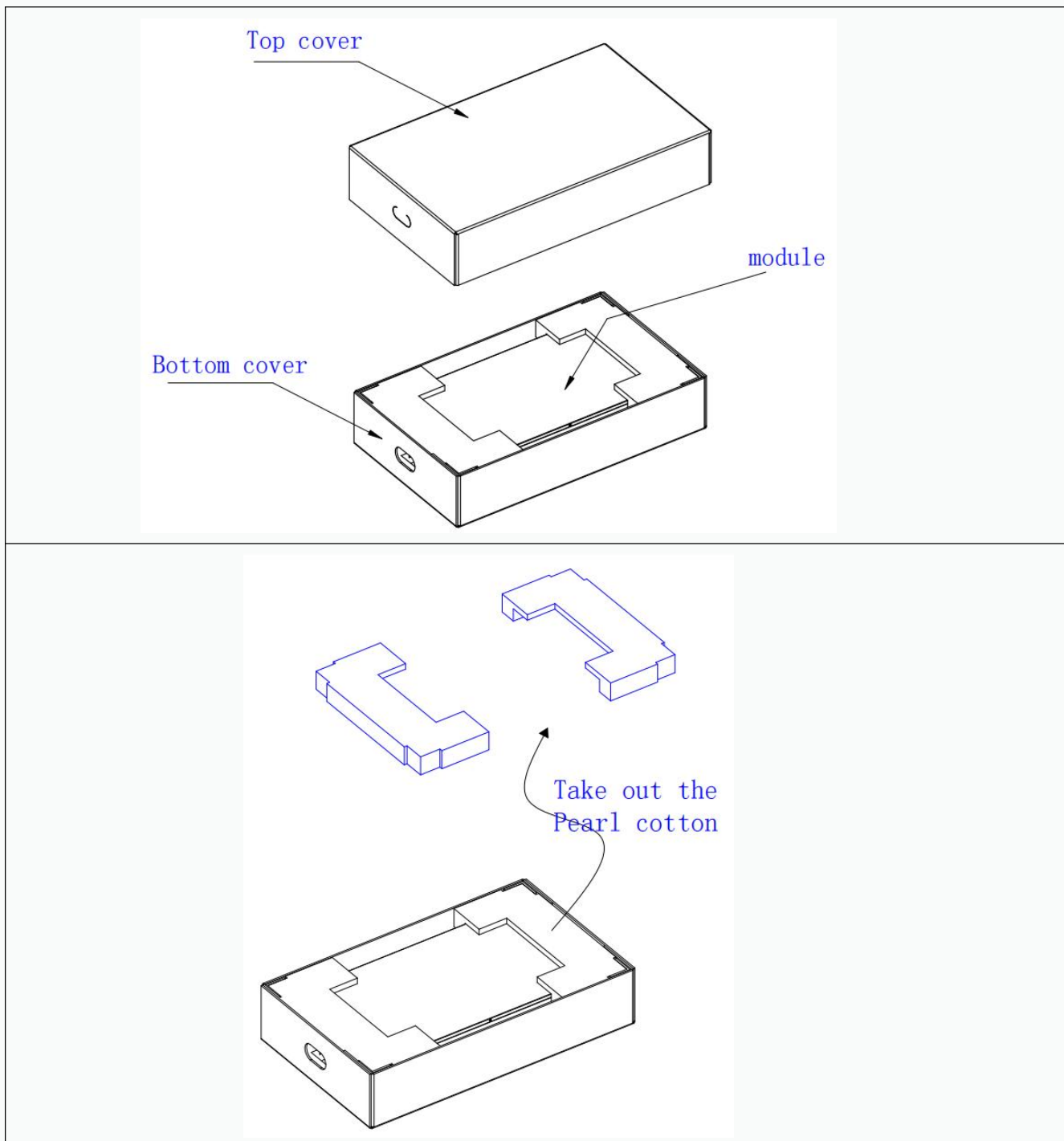
Use a forklift to unload the cabinet to the installation site

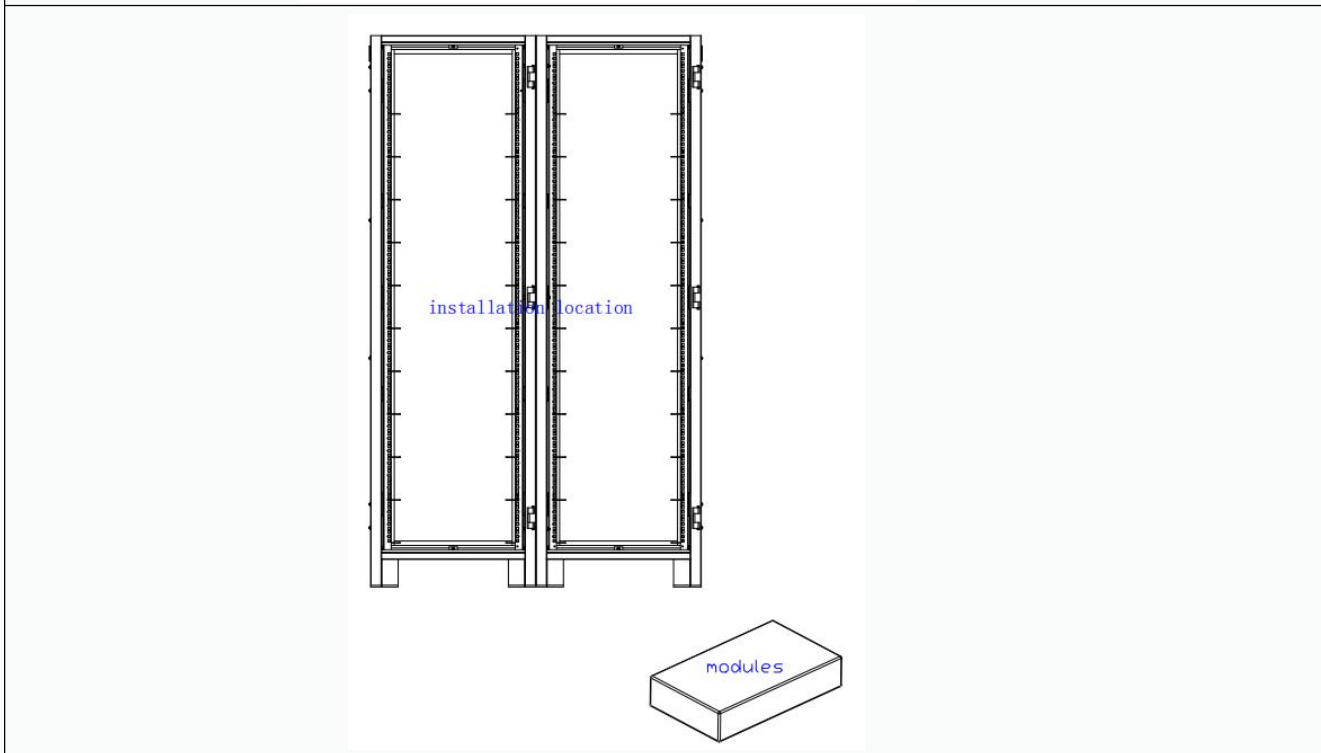
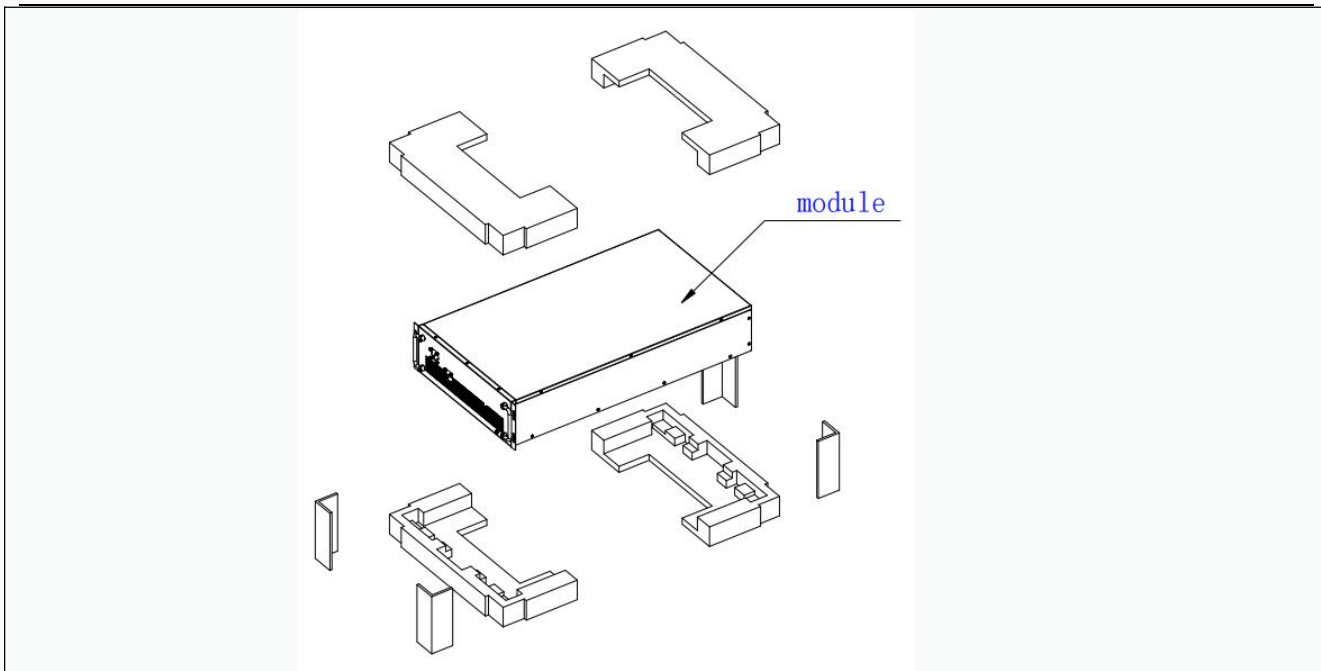


Step 5: Move the module to the designated installation location



Step 6: Disassemble the module packaging



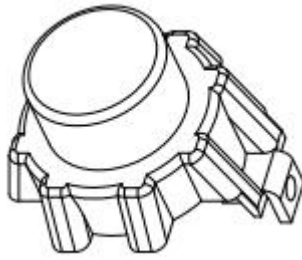


SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

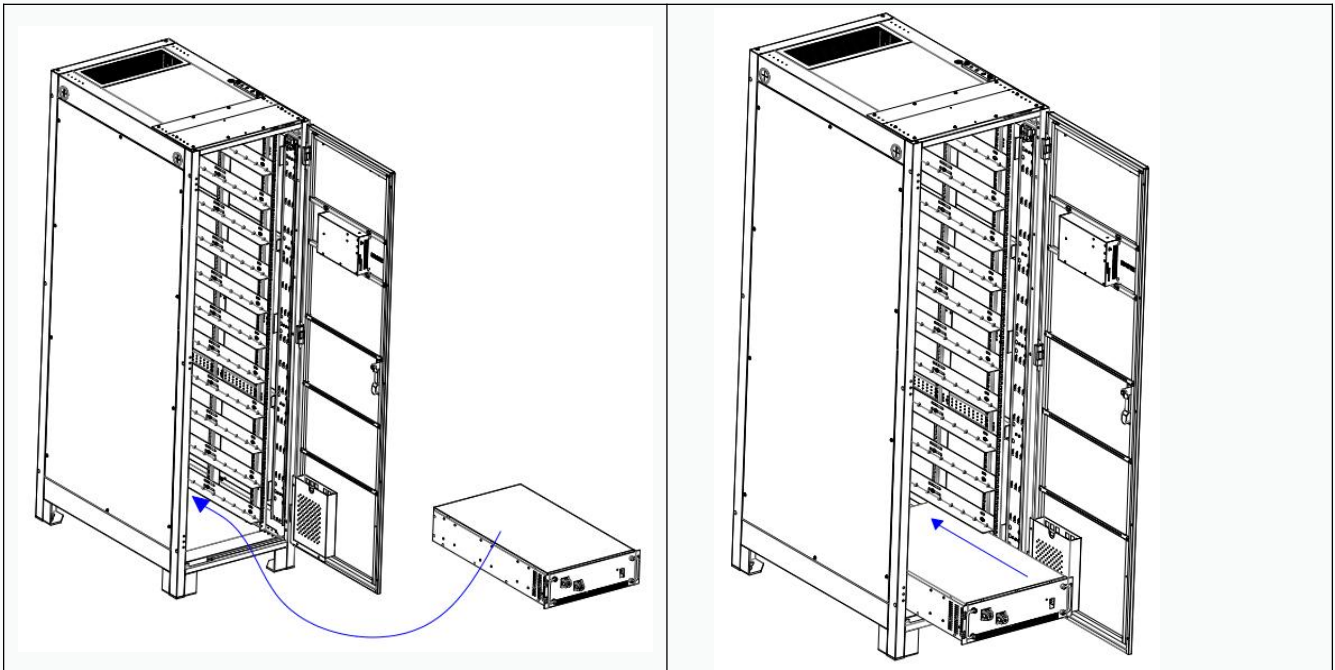
Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

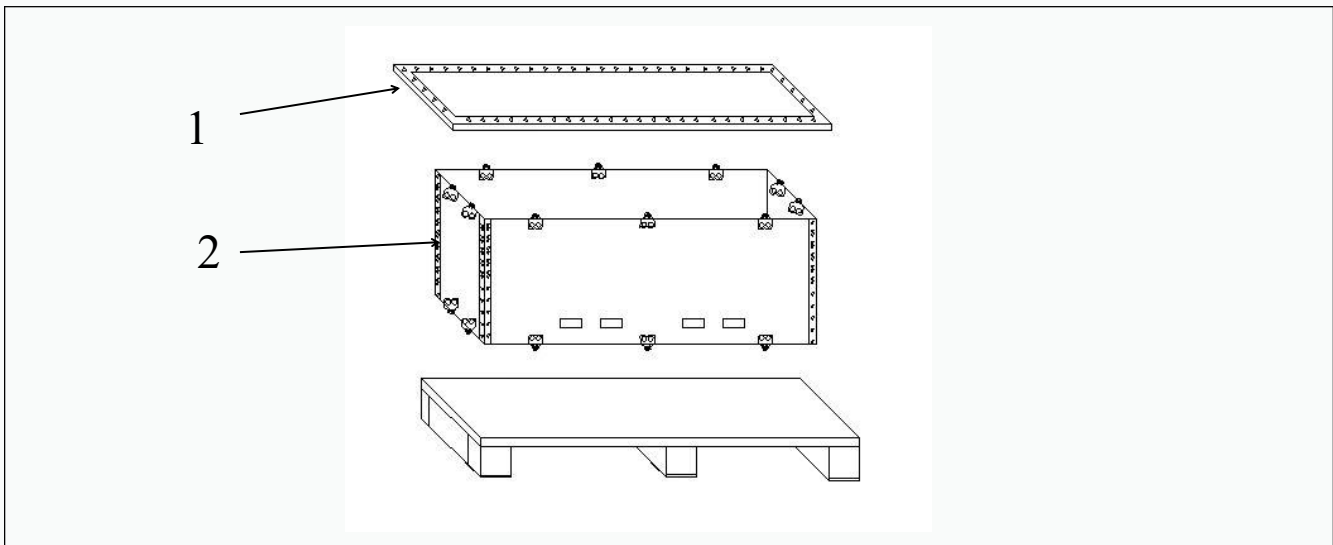


This insulating caps should keep on the modules terminal until connected with cables. Please keep the insulating caps of the module properly for later use when the module needs maintenance.

Step 7: Use a lift truck or at least two people to move the module to the cabinet for installation



Unpacking wooden case



Note:

Step 1: Use a tool to straighten the top, bottom and side plate fasteners.

Step 2: Remove the upper cover plate and side plate in turn

9.2 Loading list

Table 9.2.1 Loading list

Item	Name	Description	Ref.
1	LIBVIS8×50250IEC	Vision 2000mm LIB rack with 8 x	LIBVISRAC50AH2000 qty: 1
		50Ah battery modules and 250A	LIBVIMOD50 qty: 8
		CBMS IEC	LIBVISSG250IEC qty : 1
2	LIBVIS10×50250IEC		LIBVISRAC50AH2000 qty: 1
		10 * 50AH modules cabinet	LIBVIMOD50 qty: 10
			LIBVISSG250IEC qty : 1
3	LIBVIS12×50250IEC	12* 50AH modules cabinet	LIBVISRAC50AH2000 qty: 1

SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

			LIBVISMOD50 qty: 12
			LIBVISSG250IEC qty : 1
4	LIBVIS8×100630IEC	8* 100AH modules cabinet	LIBVISRAC100AH2000 qty: 1 LIBVISMOD100 qty: 8 LIBVISSG630IEC qty : 1
5	LIBVIS10×100630IEC	10* 100AH modules cabinet	LIBVISRAC100AH2000 qty: 1 LIBVISMOD100 qty: 10 LIBVISSG630IEC qty : 1
6	LIBVIS12×100630IEC	12 * 100AH modules cabinet	LIBVISRAC100AH2300 qty: 1 LIBVISMOD100 qty: 12 LIBVISSG630IEC qty : 1
7	LIBVIS8×200250IEC	8 * 200AH modules cabinet	LIBVISRAC200AH2000 qty: 1 LIBVISMOD200 qty: 8 LIBVISSG250IEC qty : 1
8	LIBVIS10×200250IEC	10 * 200AH modules cabinet	LIBVISRAC200AH2000 qty: 1 LIBVISMOD200 qty: 10 LIBVISSG250IEC qty : 1

9.3 Mechanical installation

9.3.1 Installation place

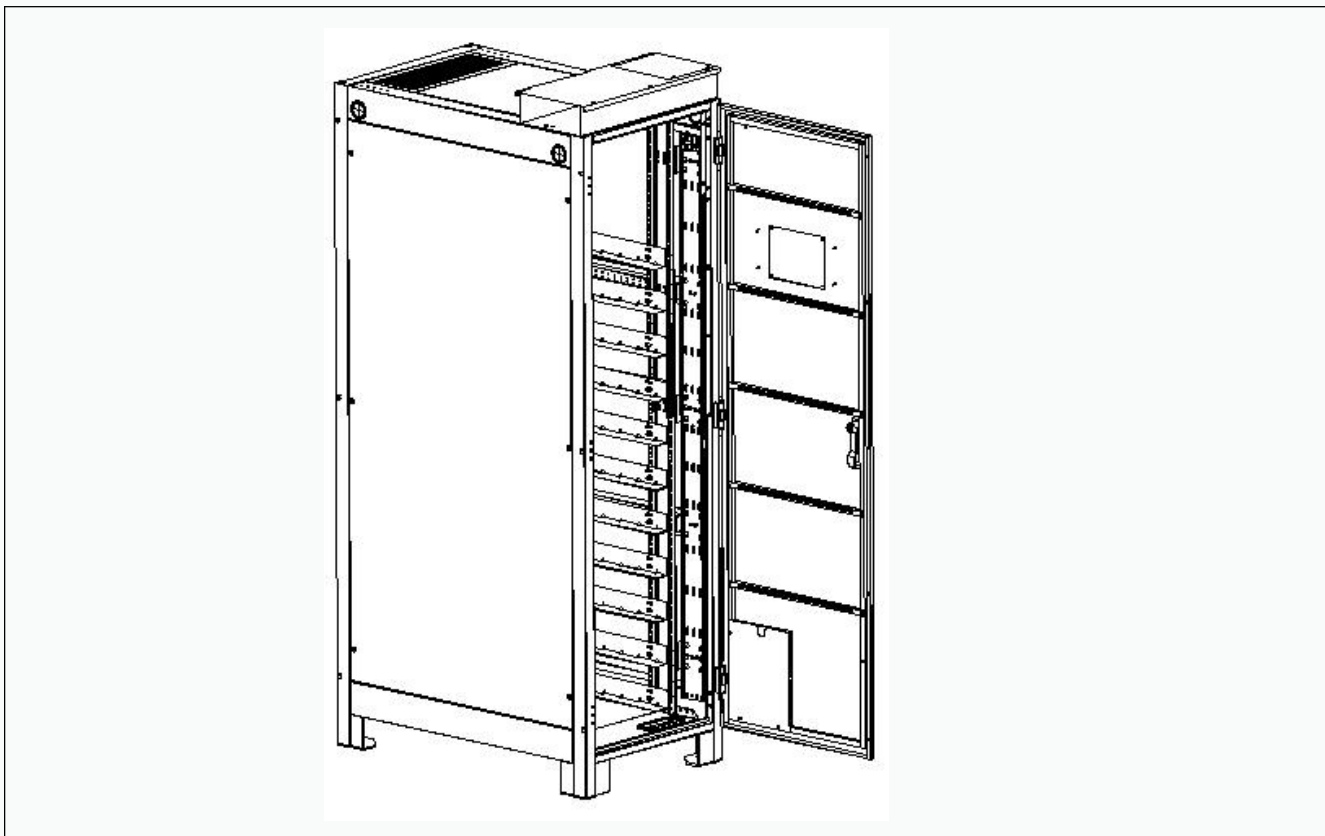
The installation location of lithium battery plays a key role in its safety, service lifetime and performance. It is recommended to install the lithium battery in an air-conditioned room. The system should be installed in a place allowed for convenient wiring, easy maintenance and easy operation.

SHENZHEN CENTER POWER TECH CO., LTD

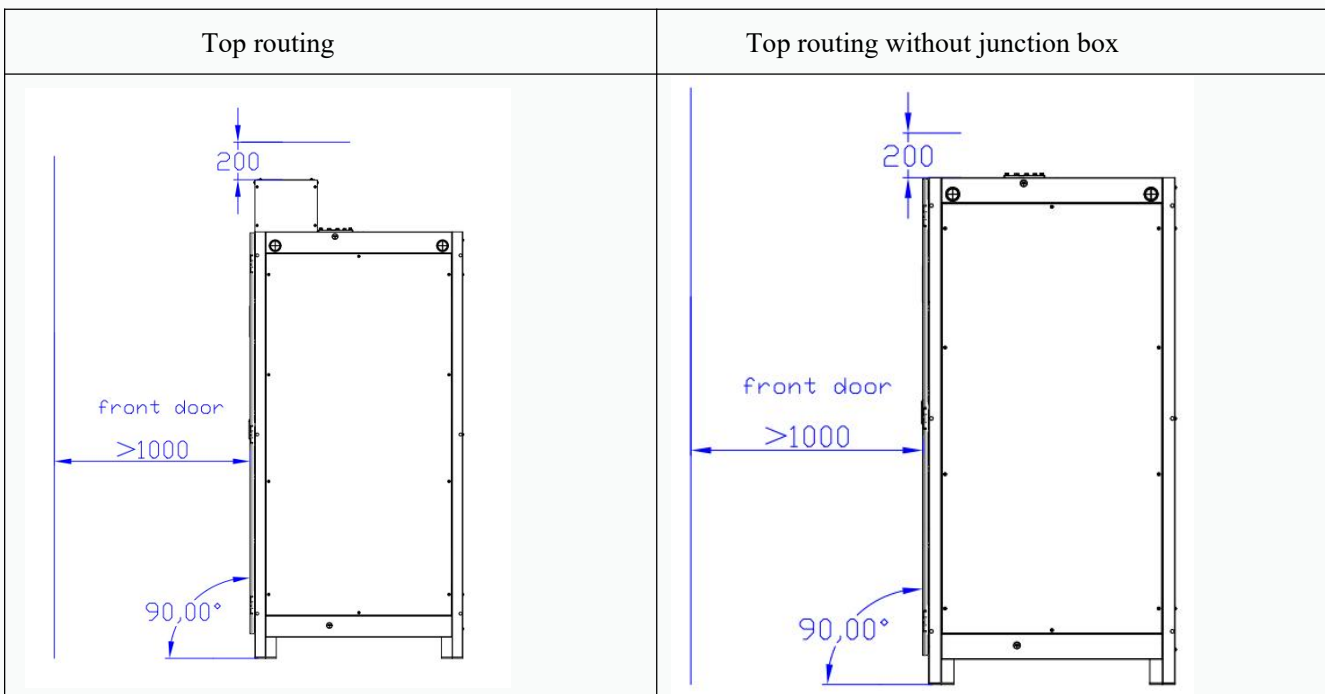
Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision



Picture 9.3.1.1 cabinet clearance



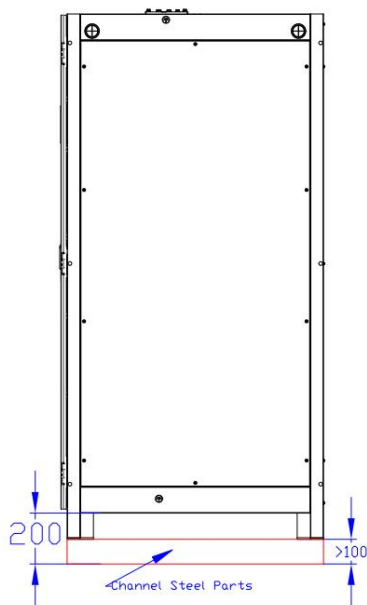
SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

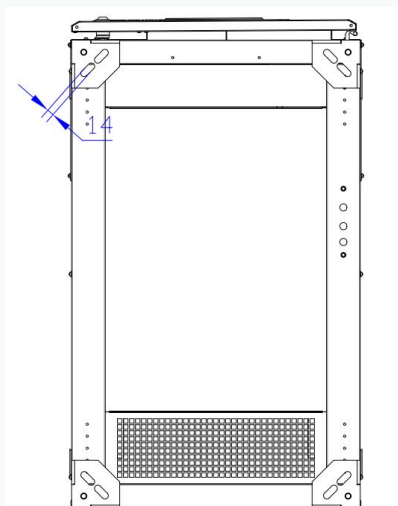
Green Our Earth Power Your Vision

Bottom routing



Note: Clearance dimensions are published for airflow and maintenance access only. Consult local safety codes and standards for additional requirements in your local area.

Picture 9.31.2 Fixed foot installation



SHENZHEN CENTER POWER TECH CO., LTD

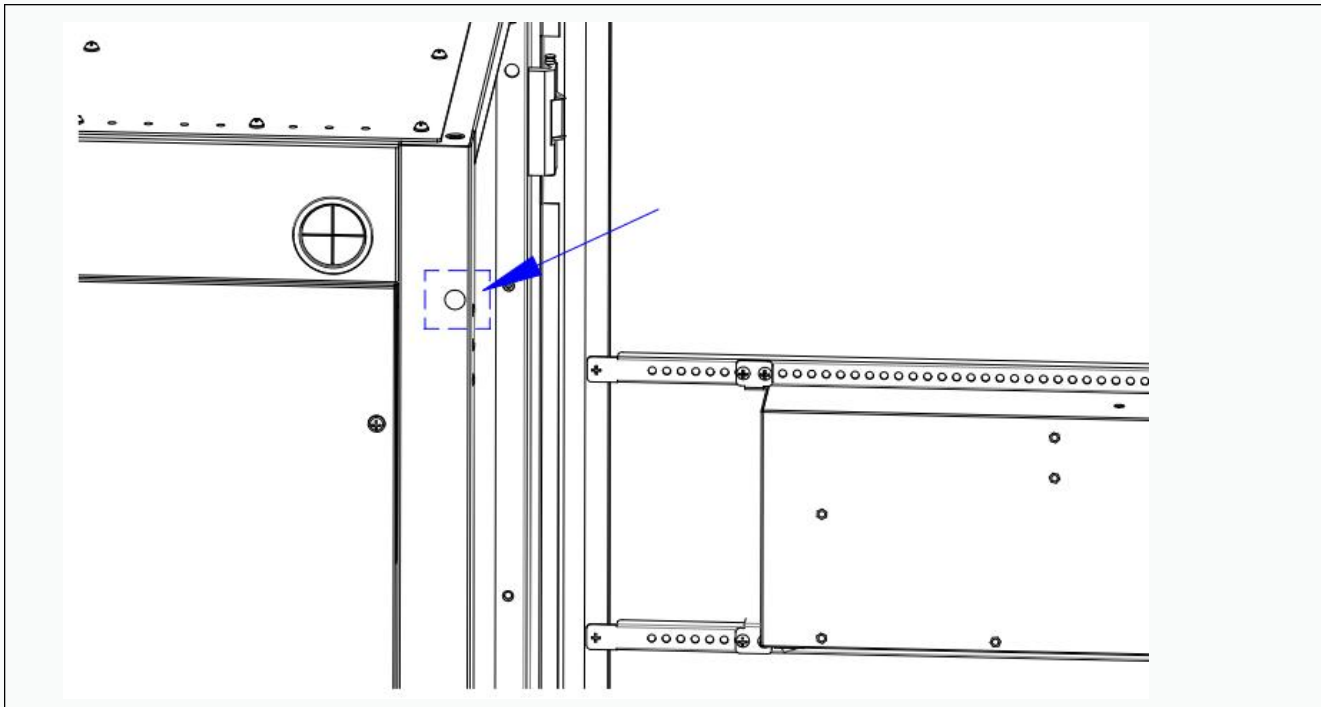
Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

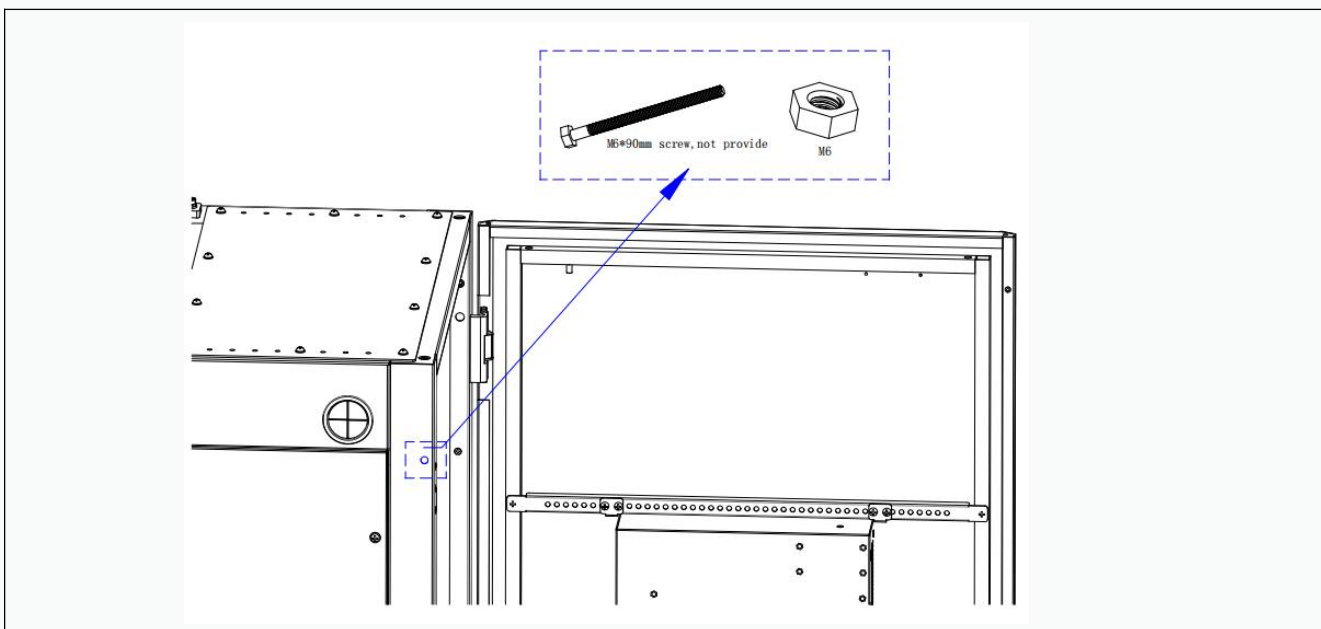
Green Our Earth Power Your Vision

Picture 9.3.1.3 cabinet Fixed together

Step 1: Remove the cap of the fixing hole



Step 2: Screw and nut specifications



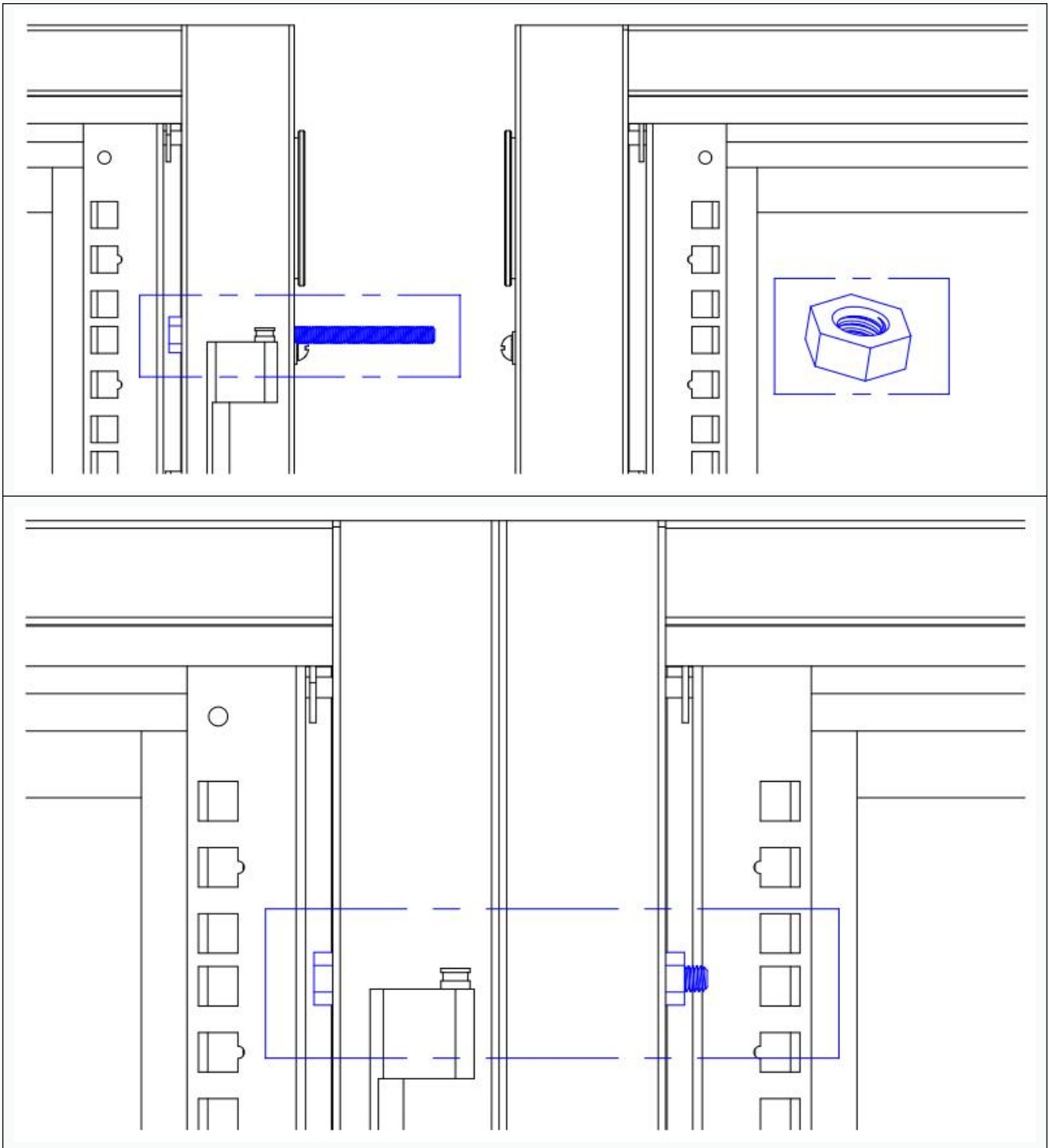
SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

Step 3: Use recommended screws and nuts to fix through the mounting holes



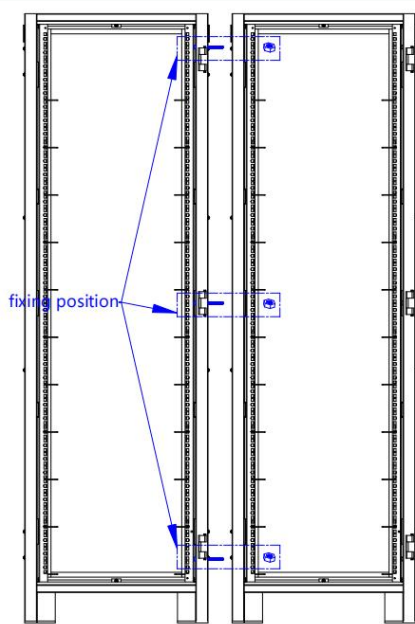
Step 4: three installation positions that need to be fixed

SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision



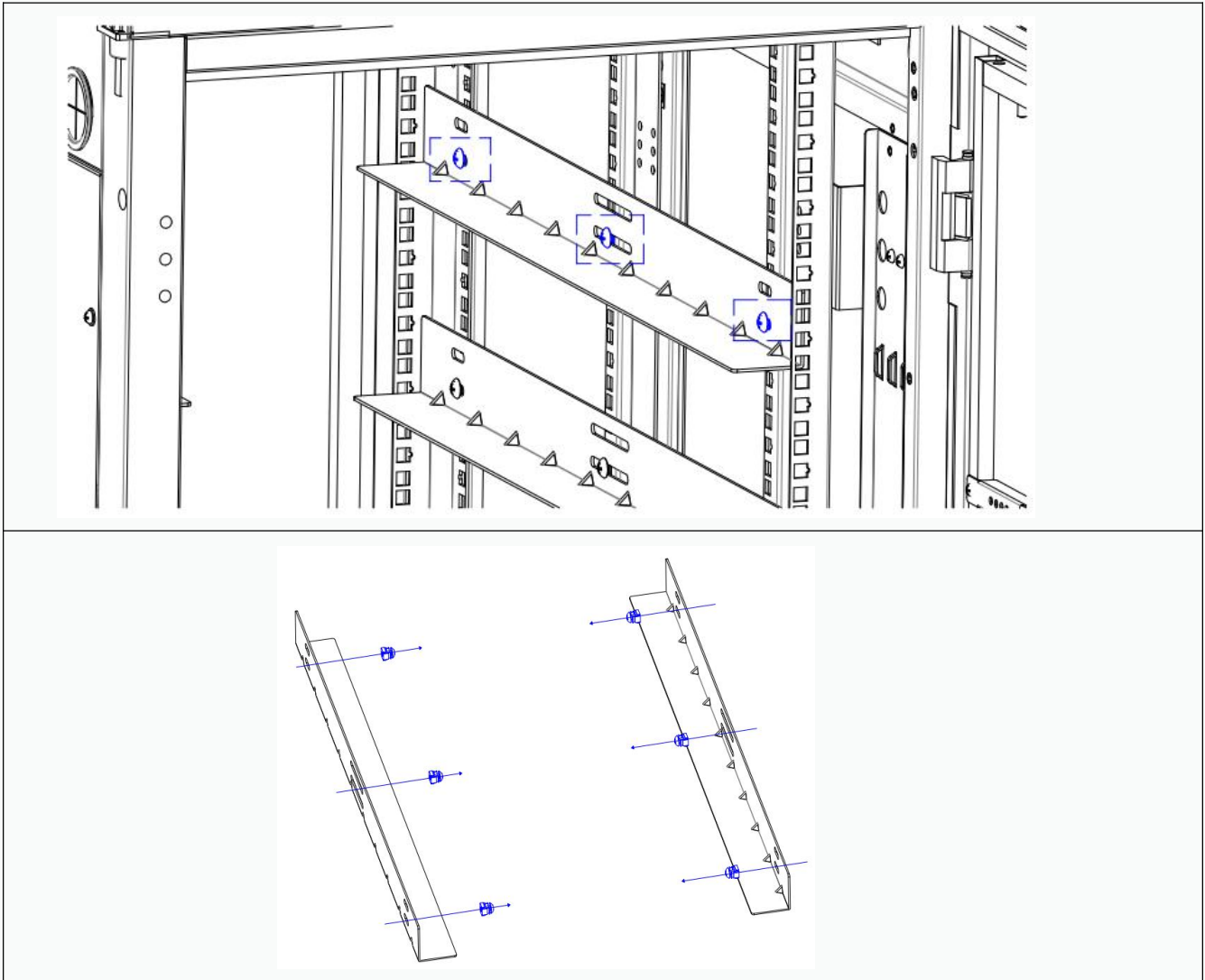
9.3.2 L-shaped rails disassembly

cabinet	Default rail qty	Number of rails required		
		8 modules	10 modules	12 modules
LIBVISRAC50AH	13	9	11	13
LIBVISRAC100AH	11	9	11	/
LIBVISRAC100AH2300	13	9	11	13
LIBVISRAC200AH	11	9	11	/
LIBVISRAC200AH	13	9	11	13

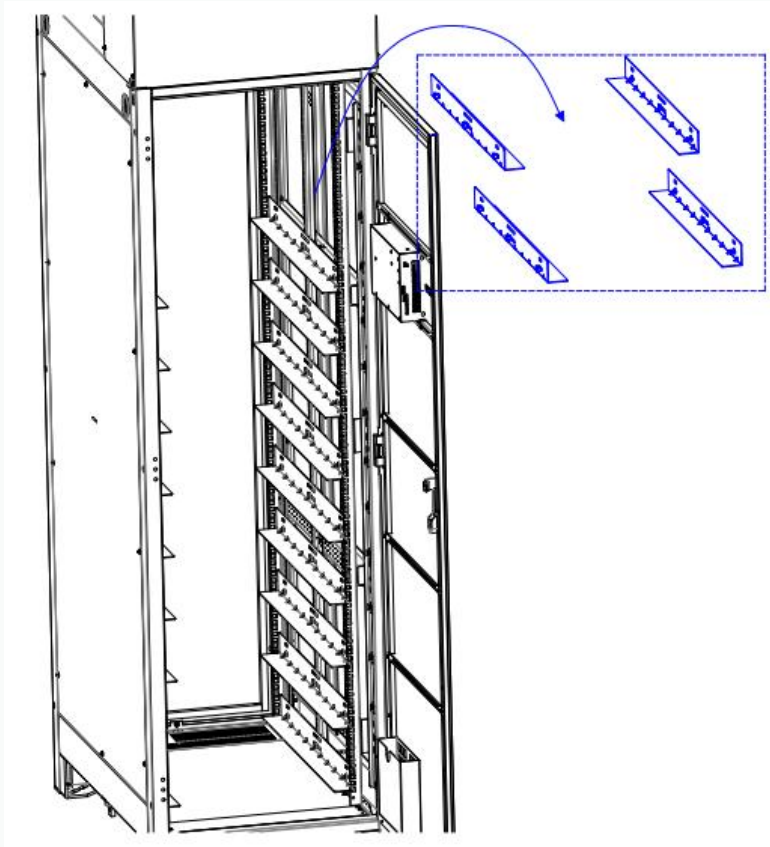
Remark: As the standard cabinet with fixed number of rail, the top rails must be removed in order to install the CBMS.

Figure 9.3.2.1 L-shaped shelf disassembly

Use a cross screwdriver to loosen the screws and remove the L-shaped shelf



Change from 10-module to 8-module L-shaped shelf



9.3.3 Module detection before installed

Item	TP-10:51.2V50AH	TP-20:51.2V100AH
Commercial Ref ID	LIBVISM0D50	LIBVISM0D100
Resistance	4~6m Ω	3~4.5m Ω
Voltage	52.5~53.2V	52.5~53.2V

SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

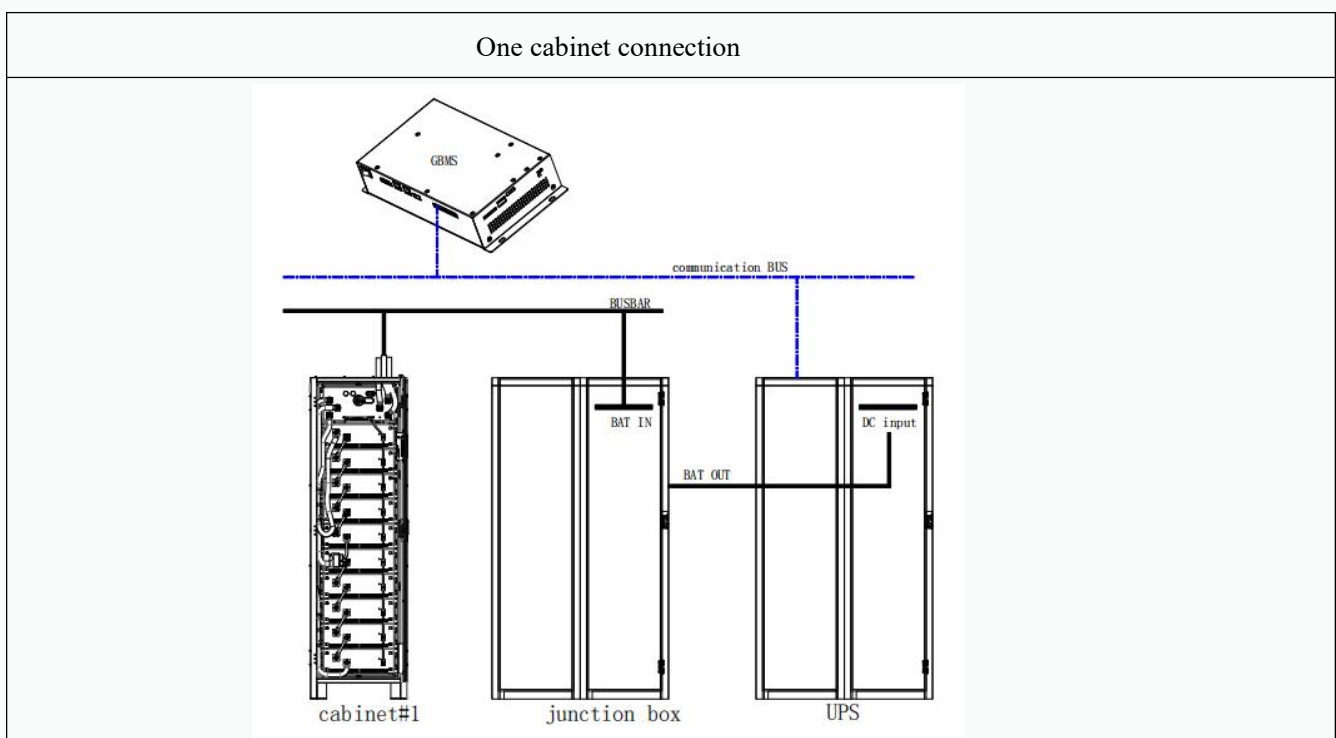
Remarked: If it was done by experienced personnel. Live measurements can be done by only expert users

10 Cable Connection

10.1 Connection overview

The system is electrically connected to the UPS, including the lithium system to the bus cabinet, and the communication cable connection is shown below, take TP200 as example.

Figure 10.1 connection overview



Cable connection overview includes power cable, communication cable, BMS ID dial code, etc.

The battery module terminal figure as below:

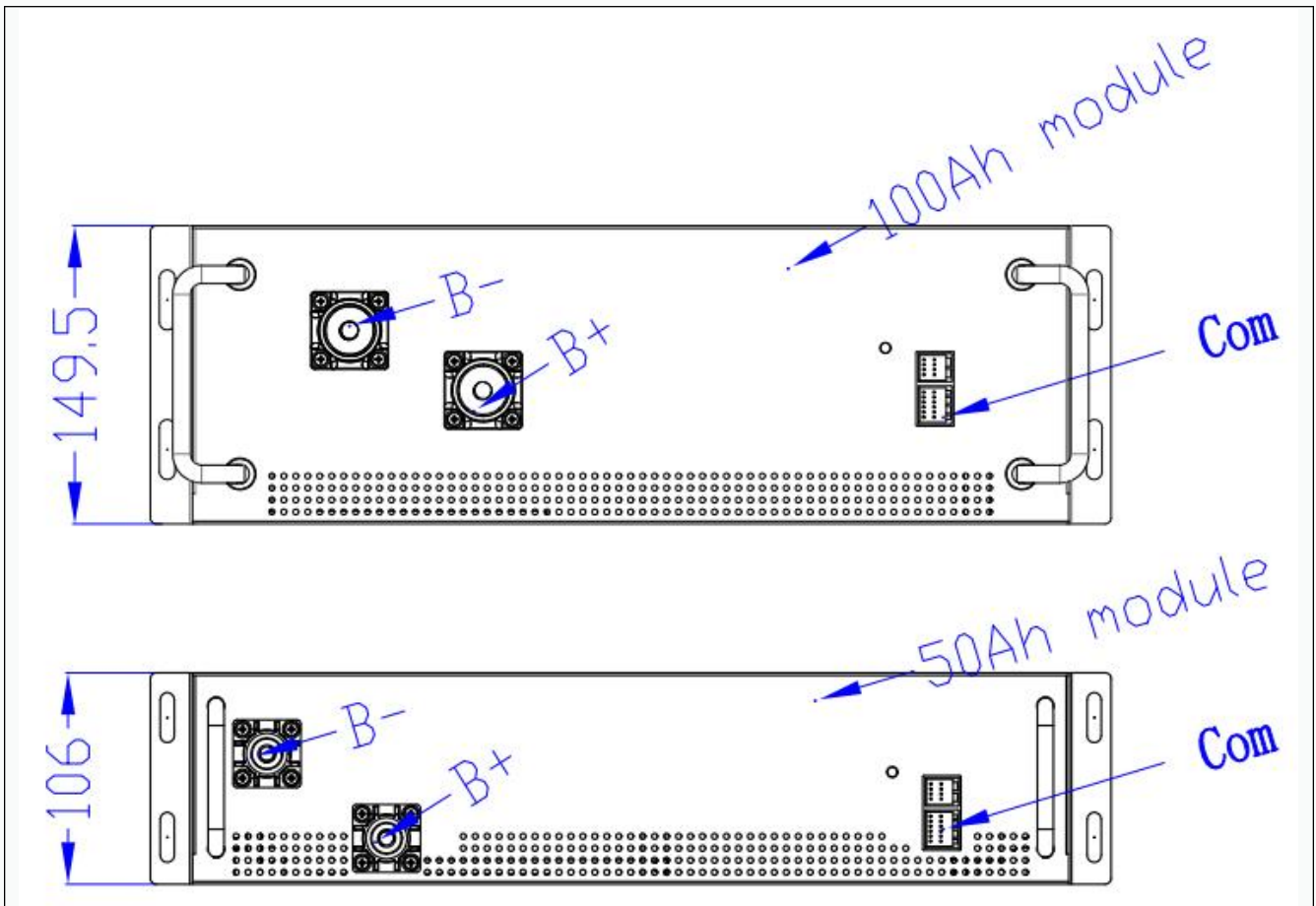
SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

Figure 10.2 .1 Over view of battery module and CBMS



10.2 Ground connection

In a lithium-ion power system, all non-current-carrying metal components and equipment casings must be connected to the ground and nearby. In each device with protective connection. In the case of multi-system parallel operation, the main grounding terminal of each device shall be connected to the conductor. The grounding conductor shall be copper conductor, and follow the recommended external cable installation ground cable, copper terminal must be installed, and must be firmly pressed.

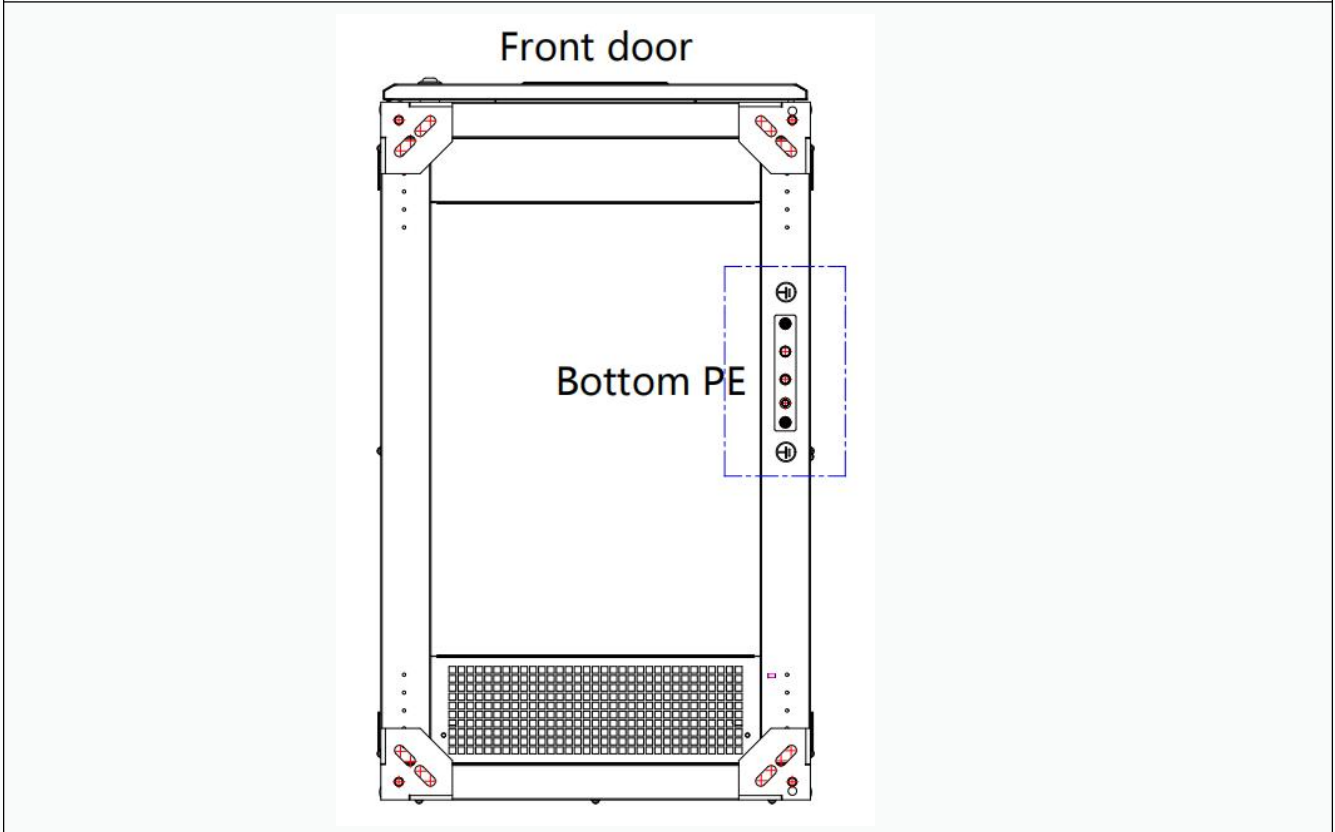
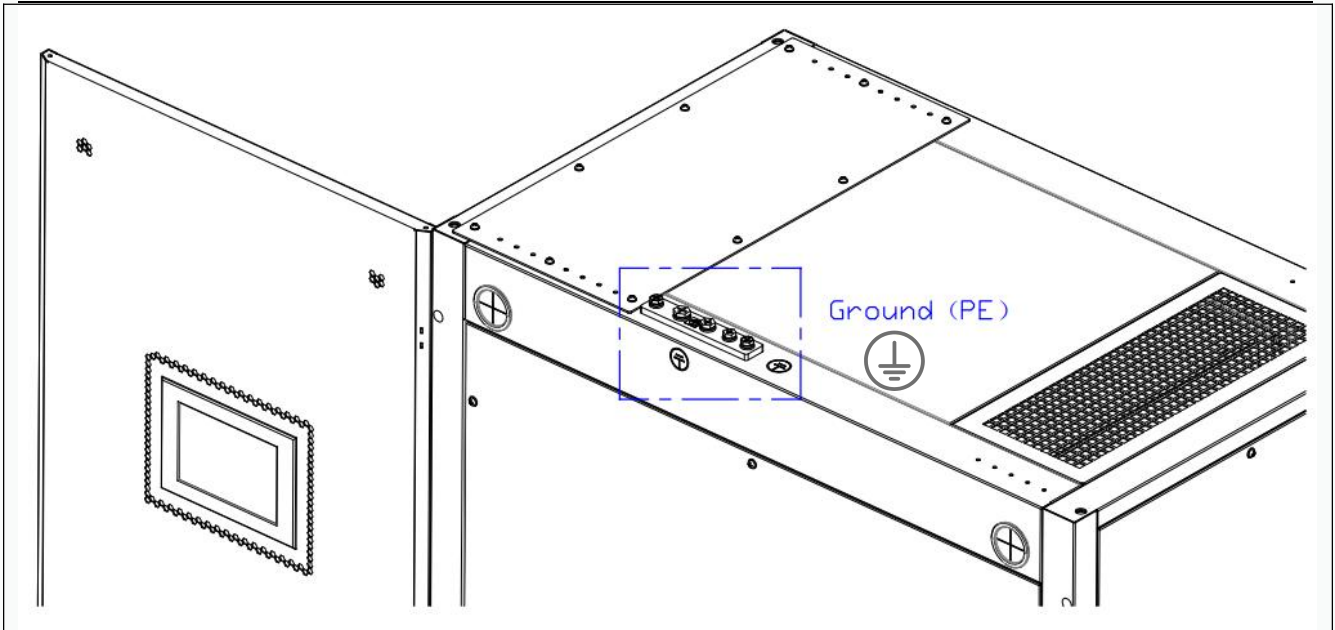
Ground(PE) connect

SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision



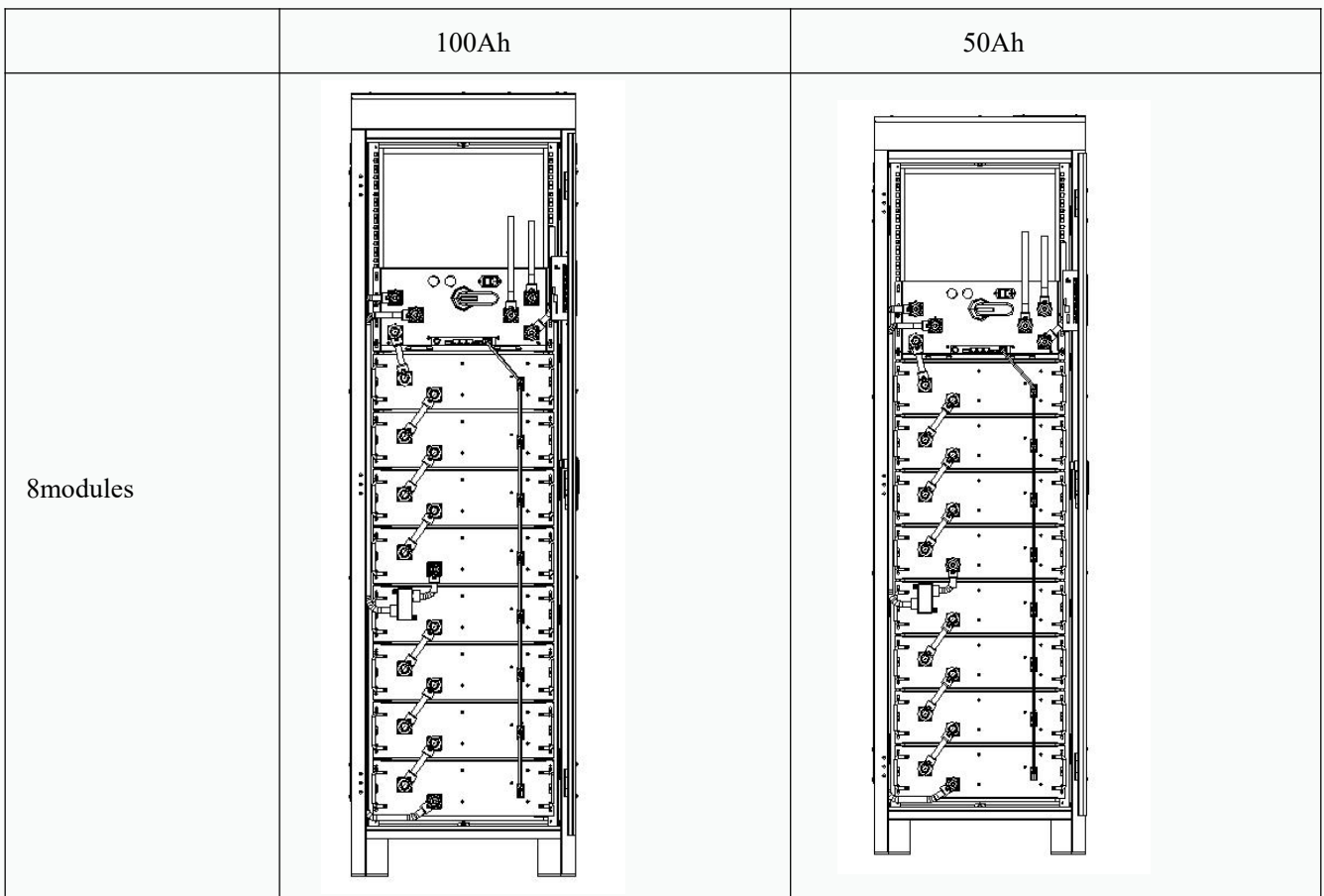
10.3 Module installation

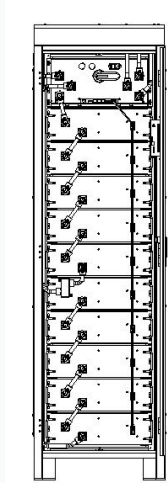
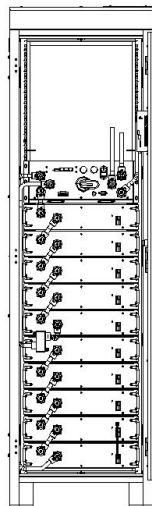
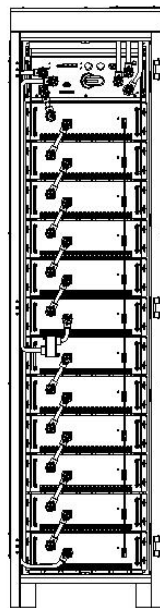
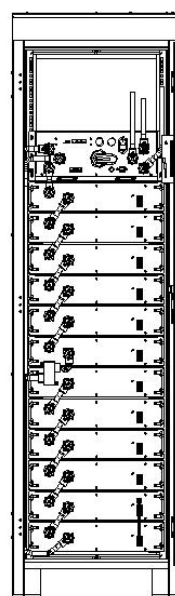
Install the main control CBMS and the battery modules from bottom to top on the specified cabinet, and **fix modules on the cabinet with cross head bolts with screw bolts provided with 7 Nm**, as shown below



Pay attention to the weight of the module during transportation.

Picture 10.3.1 install overview



<p>10modules</p>		
<p>12modules</p>		

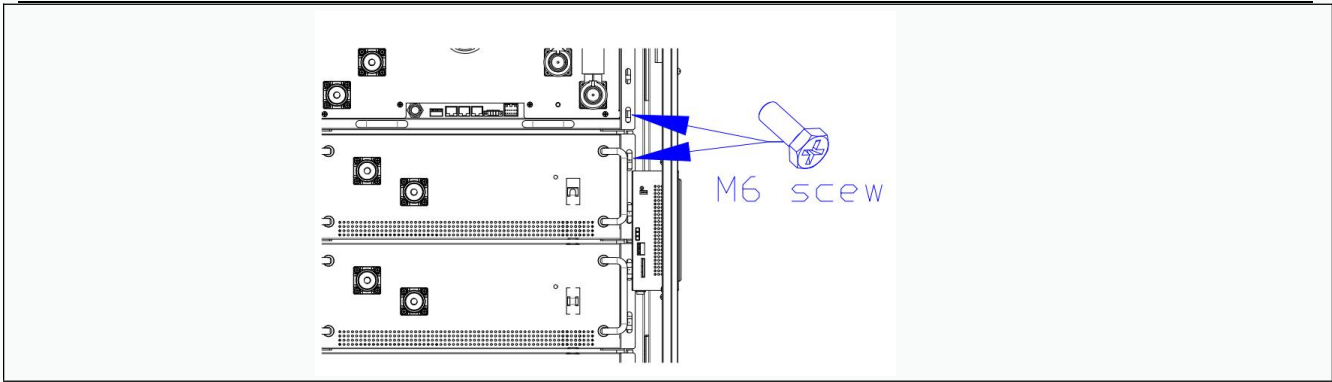
❖step2 fix the modules with screws provided, 4pcs M6 each module, torque 7Nm

SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

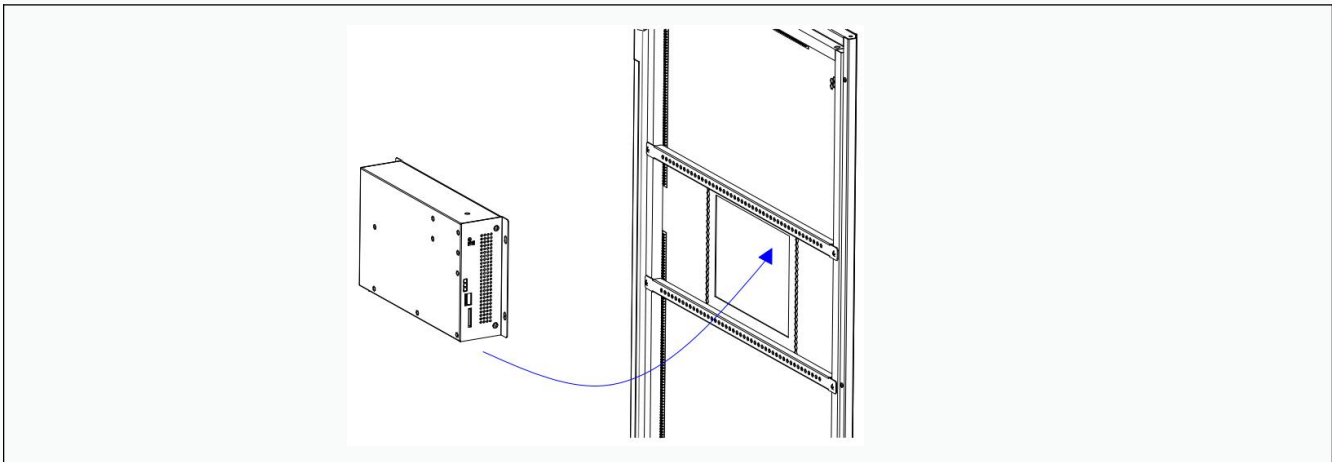
Green Our Earth Power Your Vision



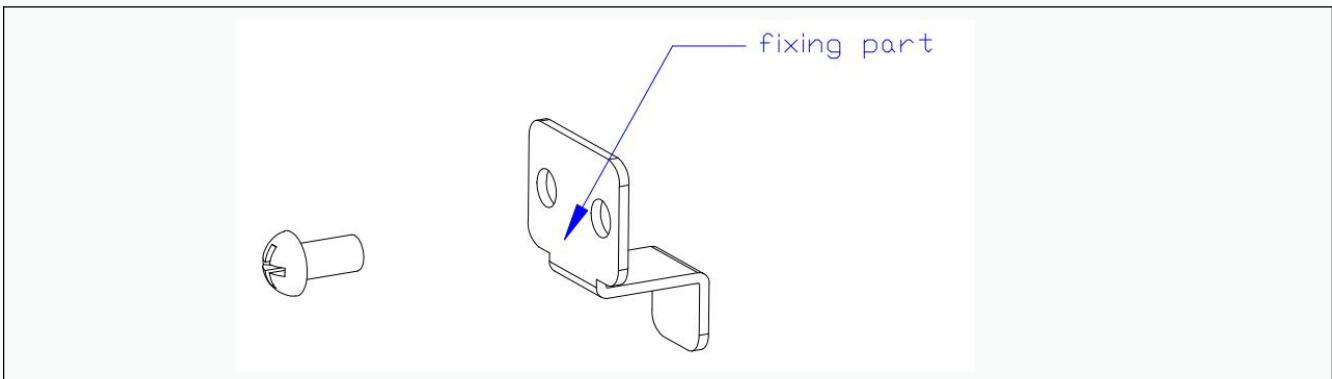
Note that after the module is installed, the insulation cap of the module should be kept, and it may be used in the future.

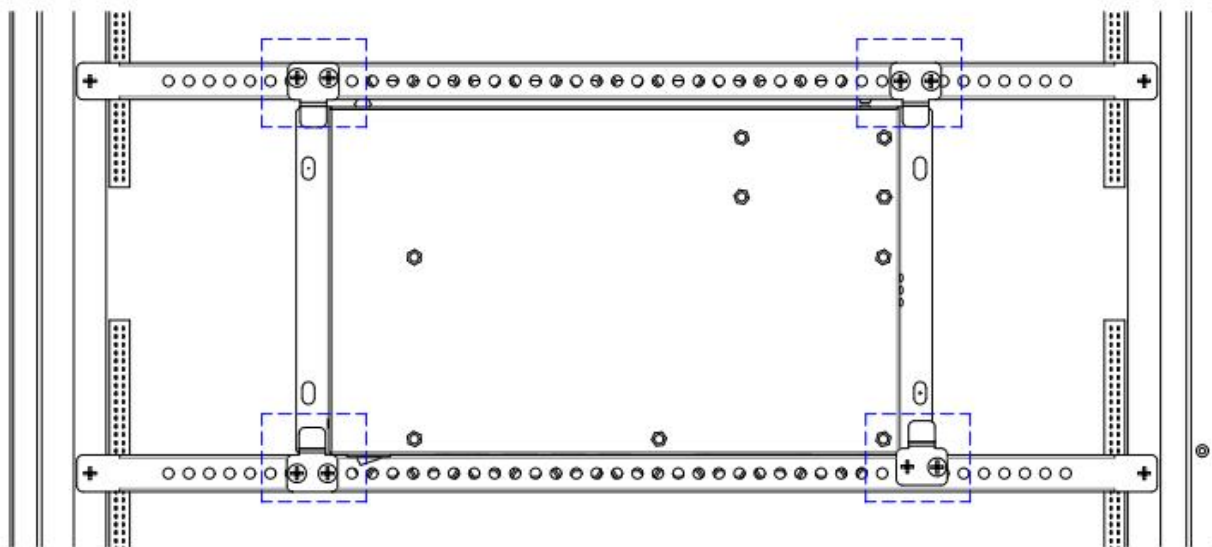
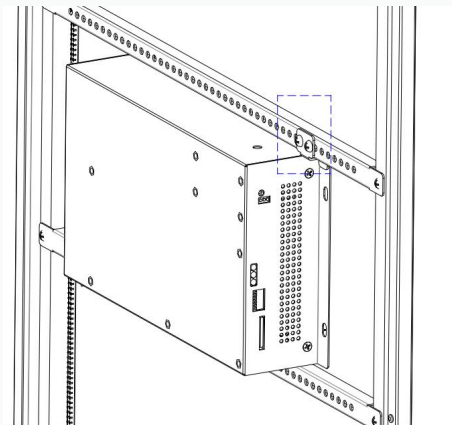
10.4 GBMS installation

- ① Place GBMS on the installation location



- ② Install the GBMS fixing parts with screws





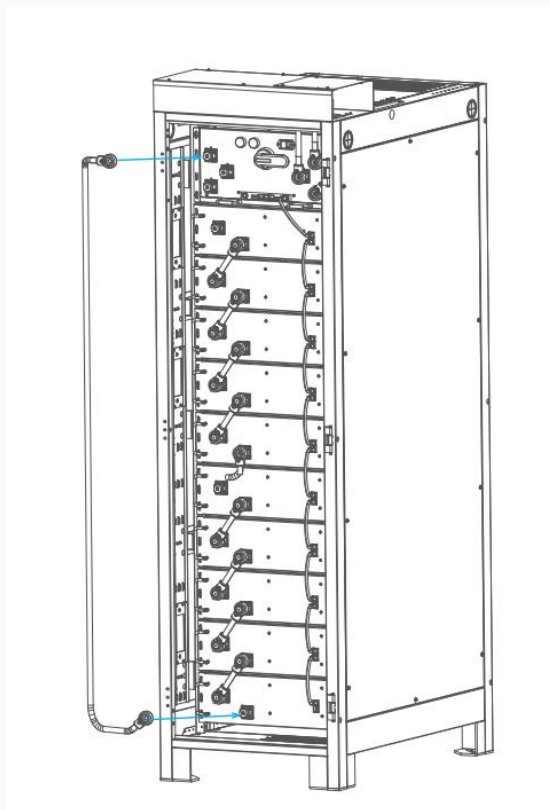
10.5 interconnection inside the cabinet

10.5.1 Module connection

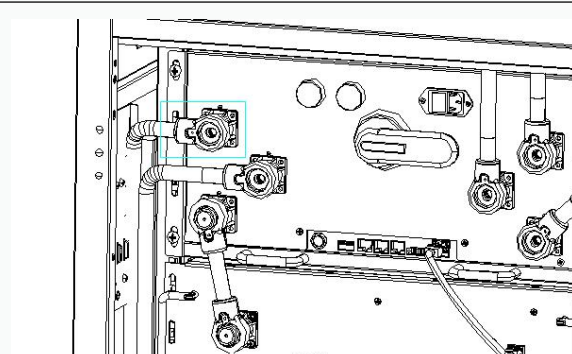
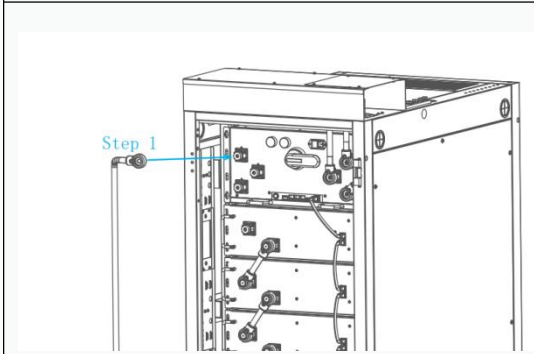
Use the provided power cable to connect as shown in the figure. Wear insulation gloves when connecting and use insulated torque wrench to tighten the bolts. The standard torque is 30NM (M10) .

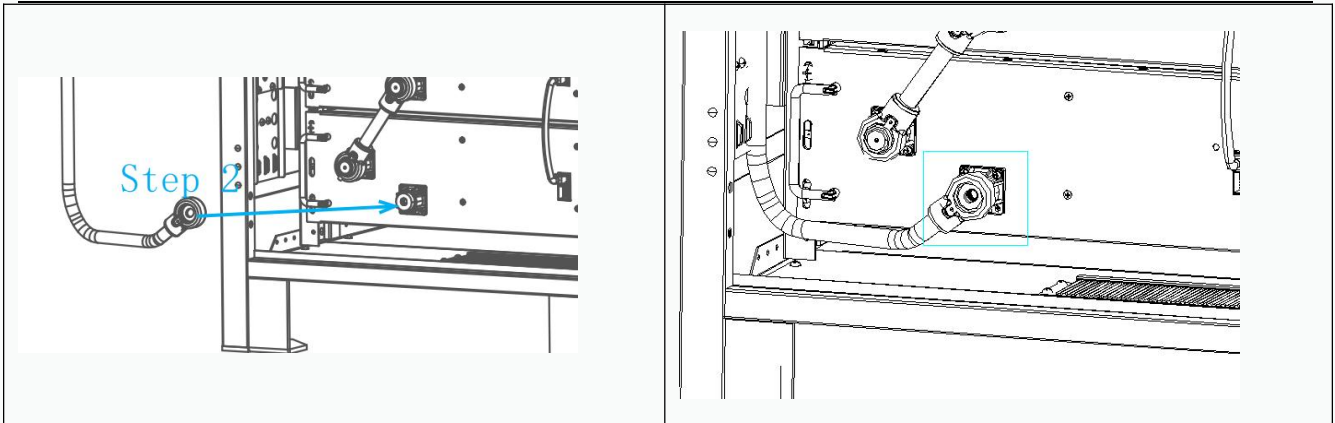
1. connect the B+ power cable

1.Connection location



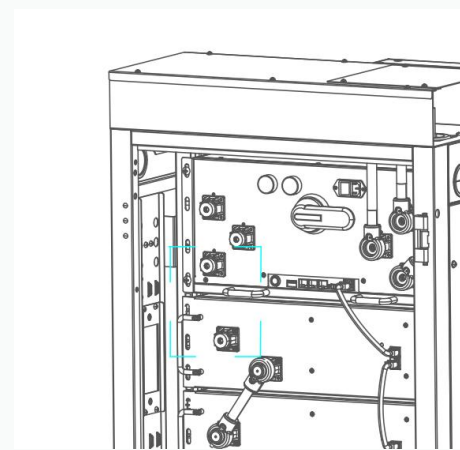
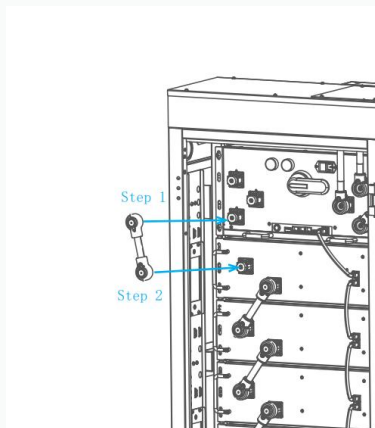
2.B+ Connection steps





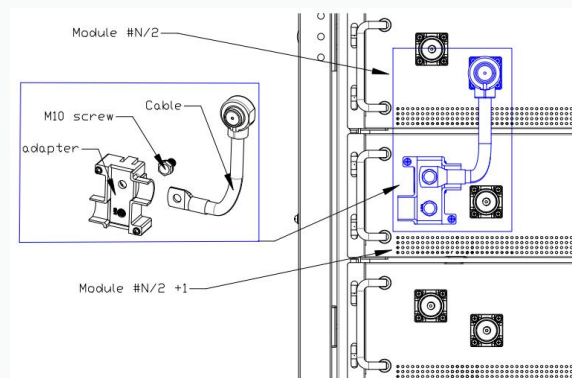
10.5.2 Connect the B- power cable

Follow the steps to connection

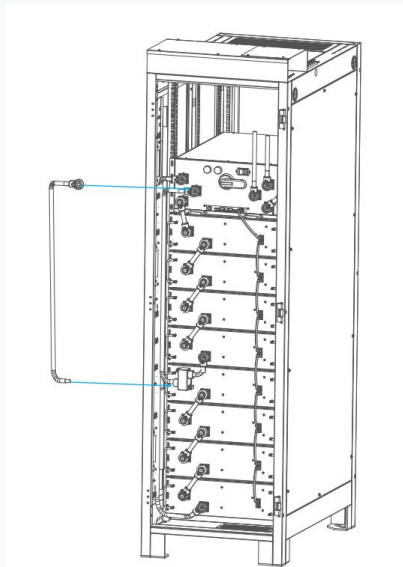


Install the adapter board mid-point

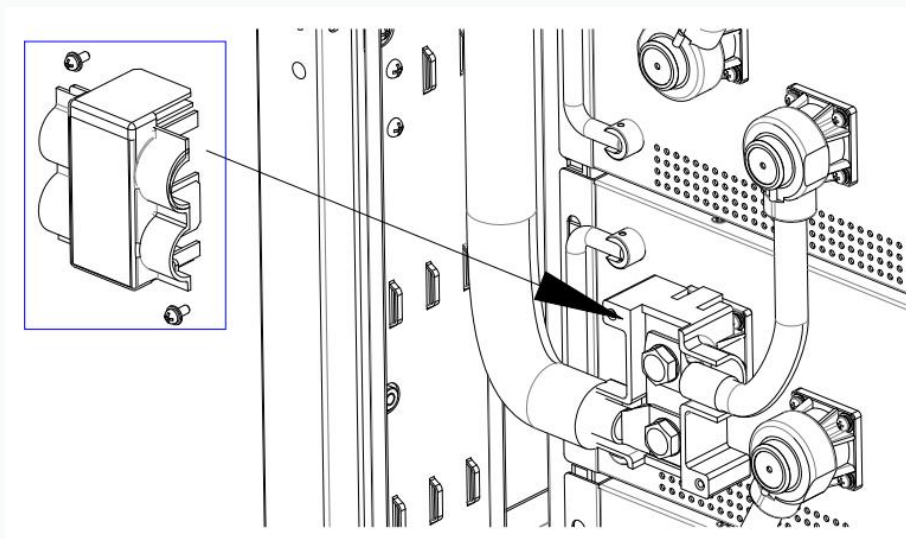
1. Fix the cable and adapter to the negative terminal of $N/2 + 1$ with M10 screws



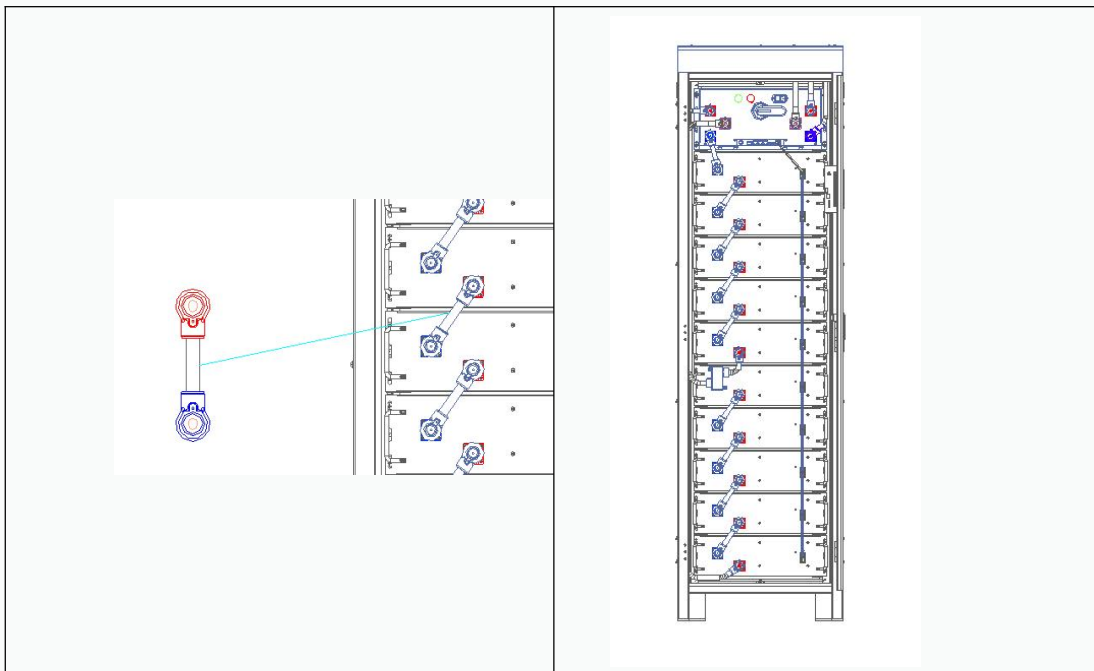
2. Use M10 screws to connect the neutral cable between the adapter and the N point of the CBMS



3. Lock the insulation cover of the adapter with M5 screws

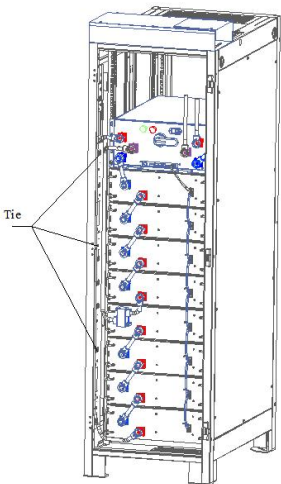
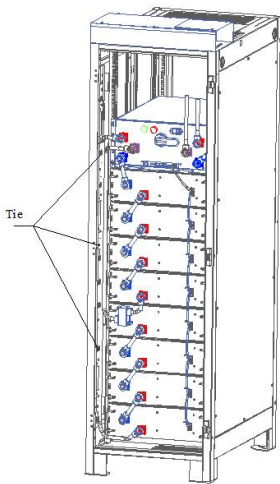


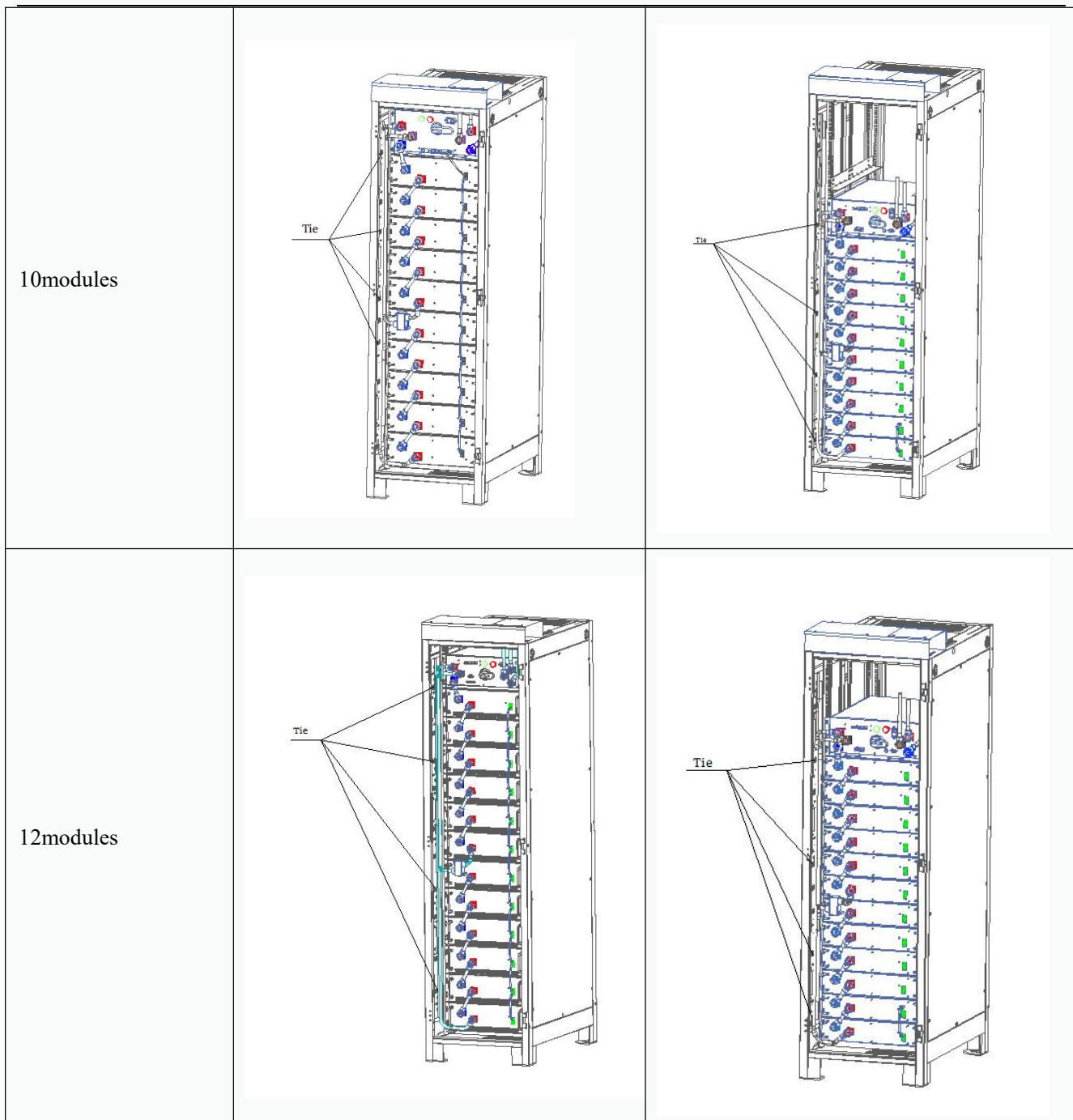
Connect the power cable between modules



Tie position

Use cable ties to fix the cables at the cable tie position

	100Ah	50Ah
8modules		



10.5.3 Module communication cable connection

The double twisted shielded wire communication cable is shown in the figure below:

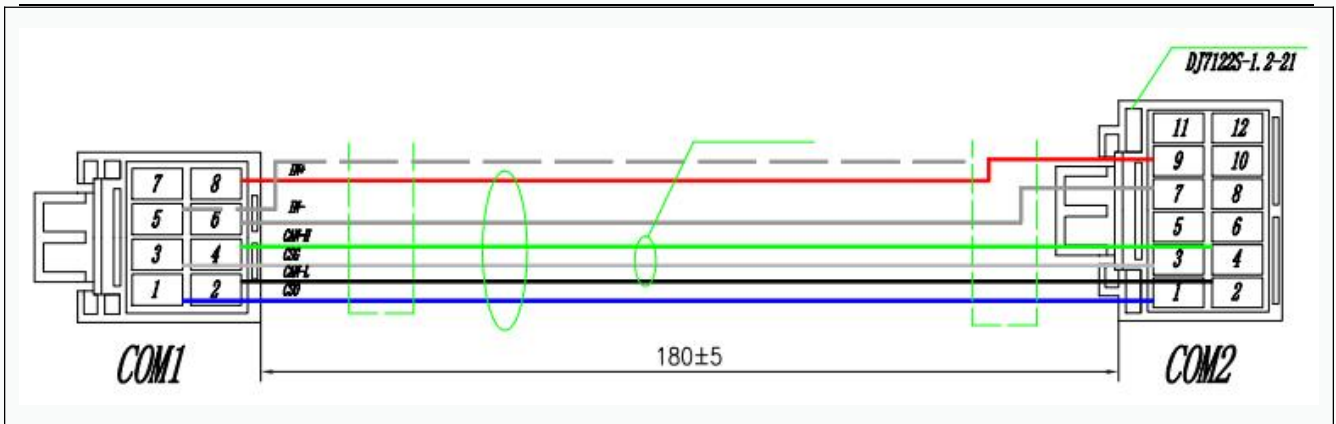
communication cable overview

SHENZHEN CENTER POWER TECH CO., LTD

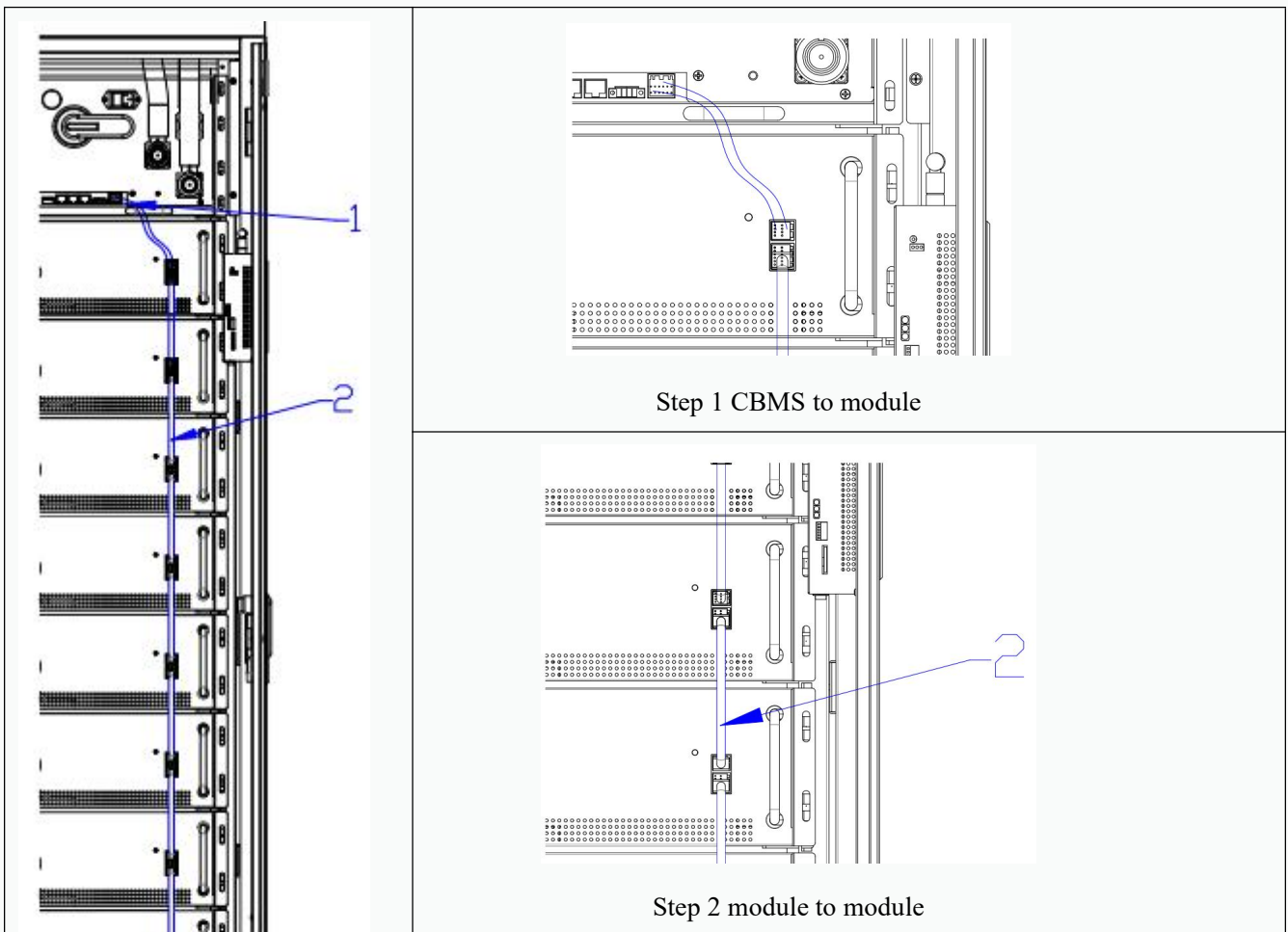
Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision



Connect to CBMS from bottom to top according to the communication line connection as shown below, and pay attention to the order of **COM1\COM2**.



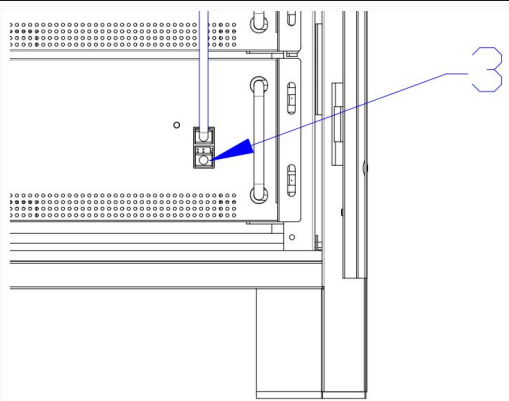
SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

Over view



Step 3 connect the 120 Ω terminal resistance

To reduce the signal reflection of the communication cables, a terminal resistor of 120ohm must be installed in COM2 of the last module."



- ❖ When multiple cabinets are used in parallel, the battery cabinets should be connected separately, and after the self-checking is successful, confirm that each battery cabinet is normal, then connect to the UPS.

❖ Power cable routing diagram



Note: LIBVIS8×50250IEC、LIBVIS10×50250IEC、LIBVIS12×50250IEC、
LIBVIS8×100630IEC、LIBVIS10×100630IEC、LIBVIS12×100630IEC、

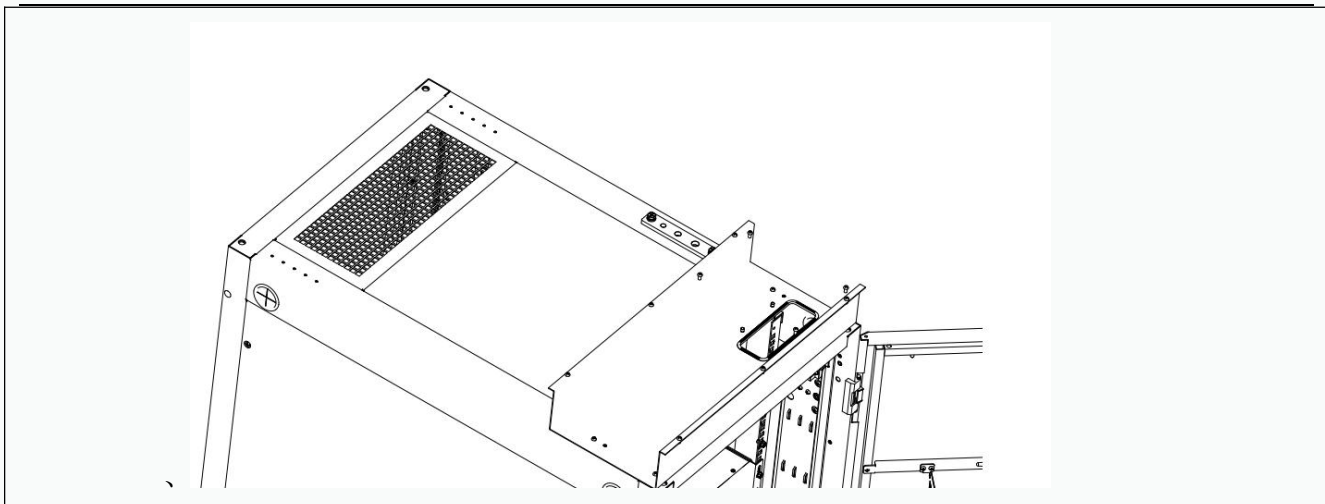
Step 1: Open the cable trough onsite and determine the position of the cable outlet hole.

SHENZHEN CENTER POWER TECH CO., LTD

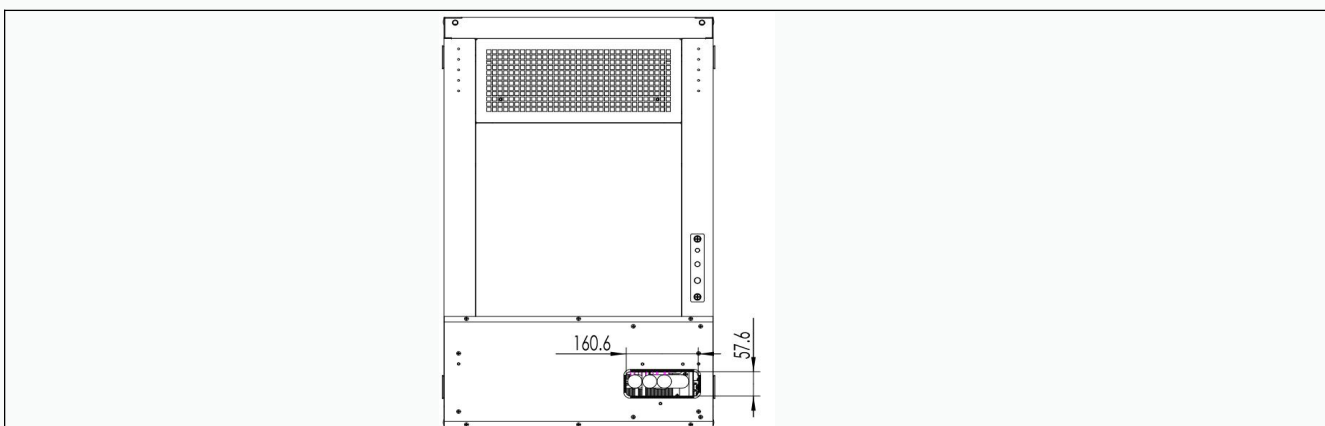
Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

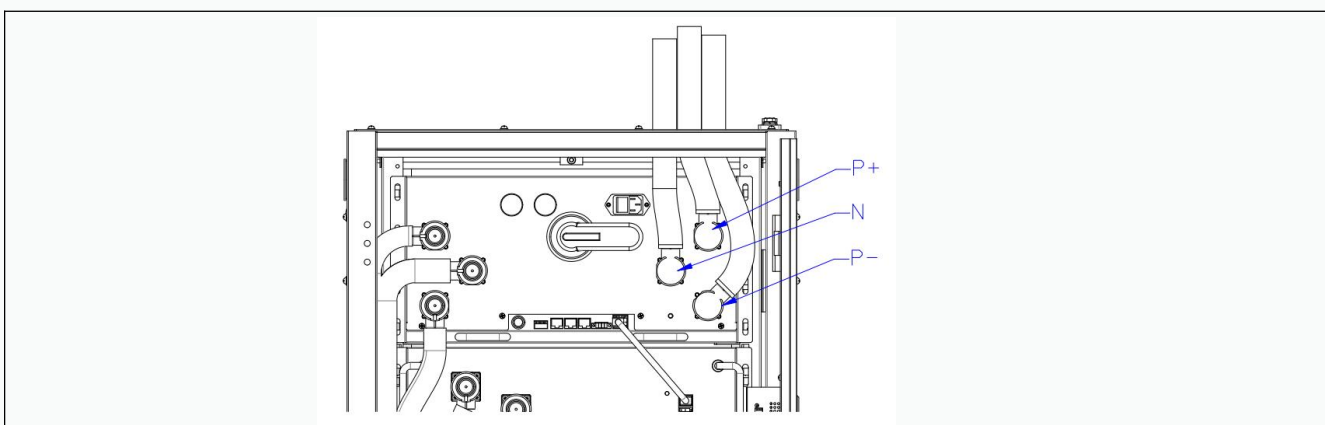
Green Our Earth Power Your Vision



Step 2: Punch holes in aluminum plate



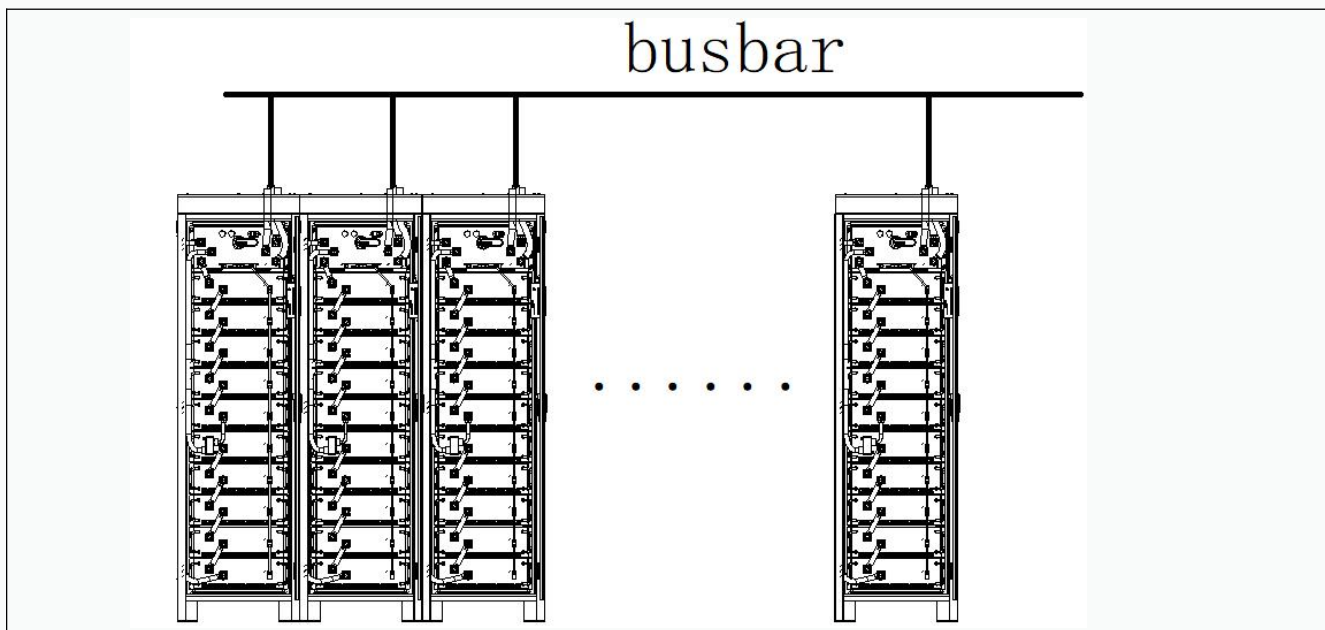
Step 3: Connect the output power cable





Before connecting the output power cable, remember to put on the battery terminal covers.

① the copper busbar review



10.5.4 GBMS 24V power connection

Integrated GBMS has been provided in section 6.2.

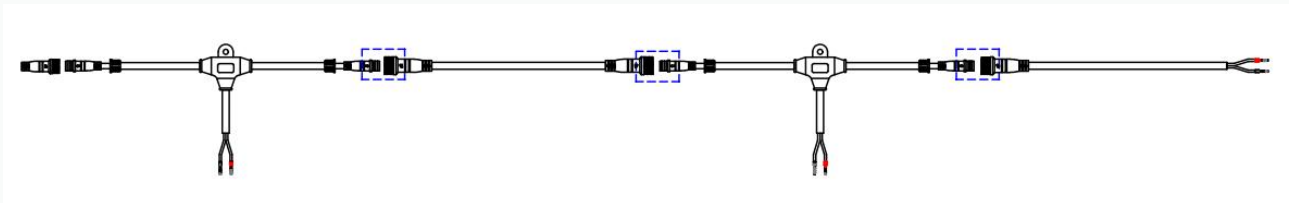
The GBMS power supply cable is connected from CBMS(dc24v-out) to GBMS (dc24v-in).

Pay attention to the sequence of 24V positive and negative poles to avoid the risk of burning GBMS, and make sure to tighten the wire with Slotted screwdriver.

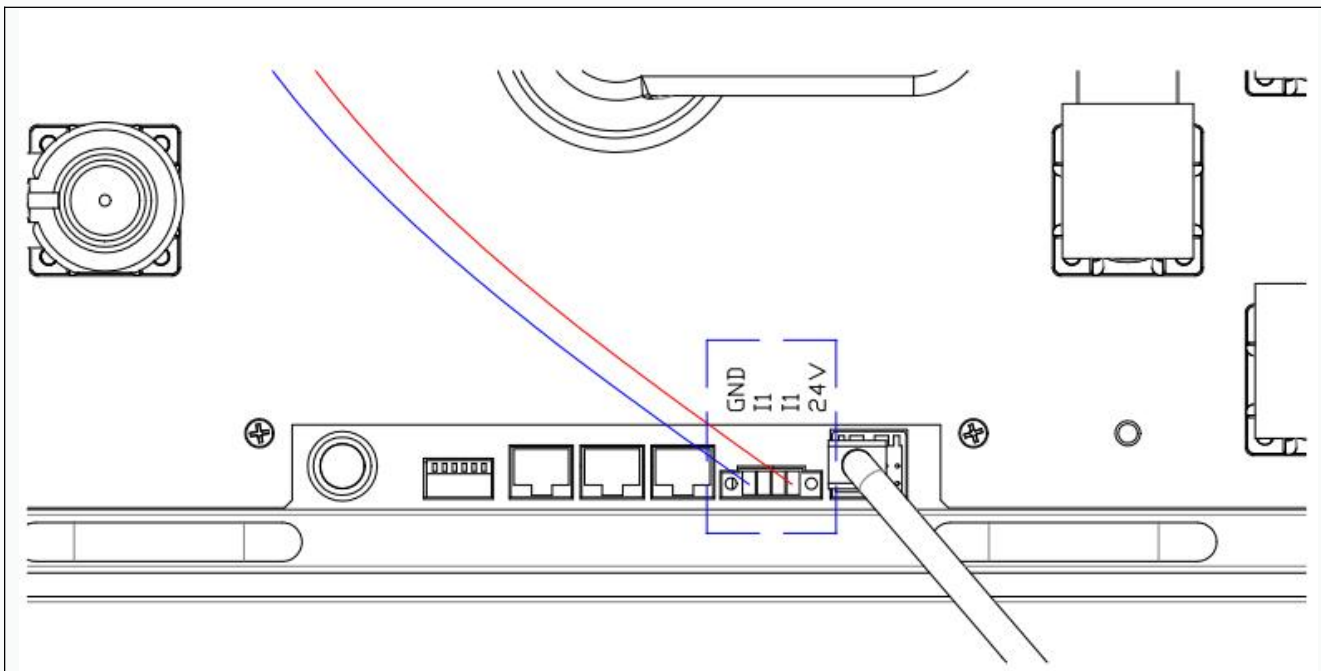


❖ The 24V power supply of GBMS is controlled by an isolating switch with fuse.

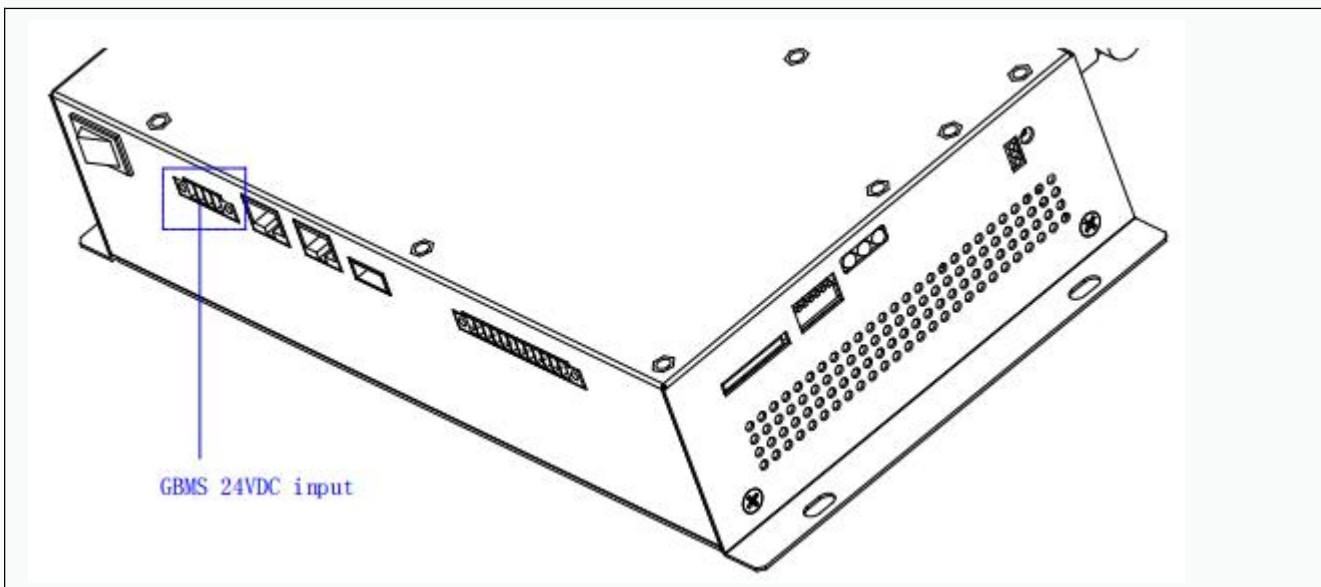
●24VDC cable spec



●CBMS 24VDC output



●GBMS 24VDC input



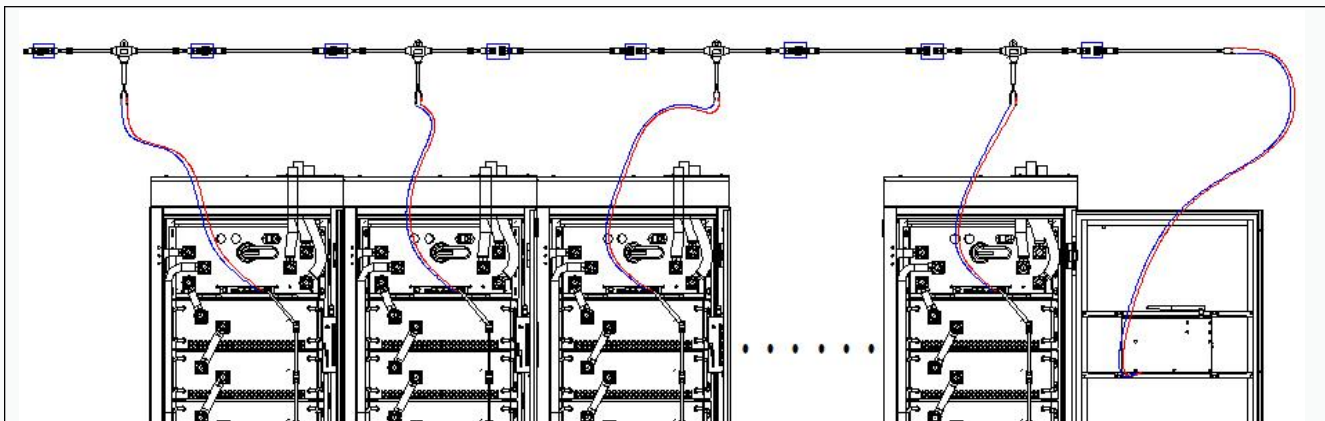
SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

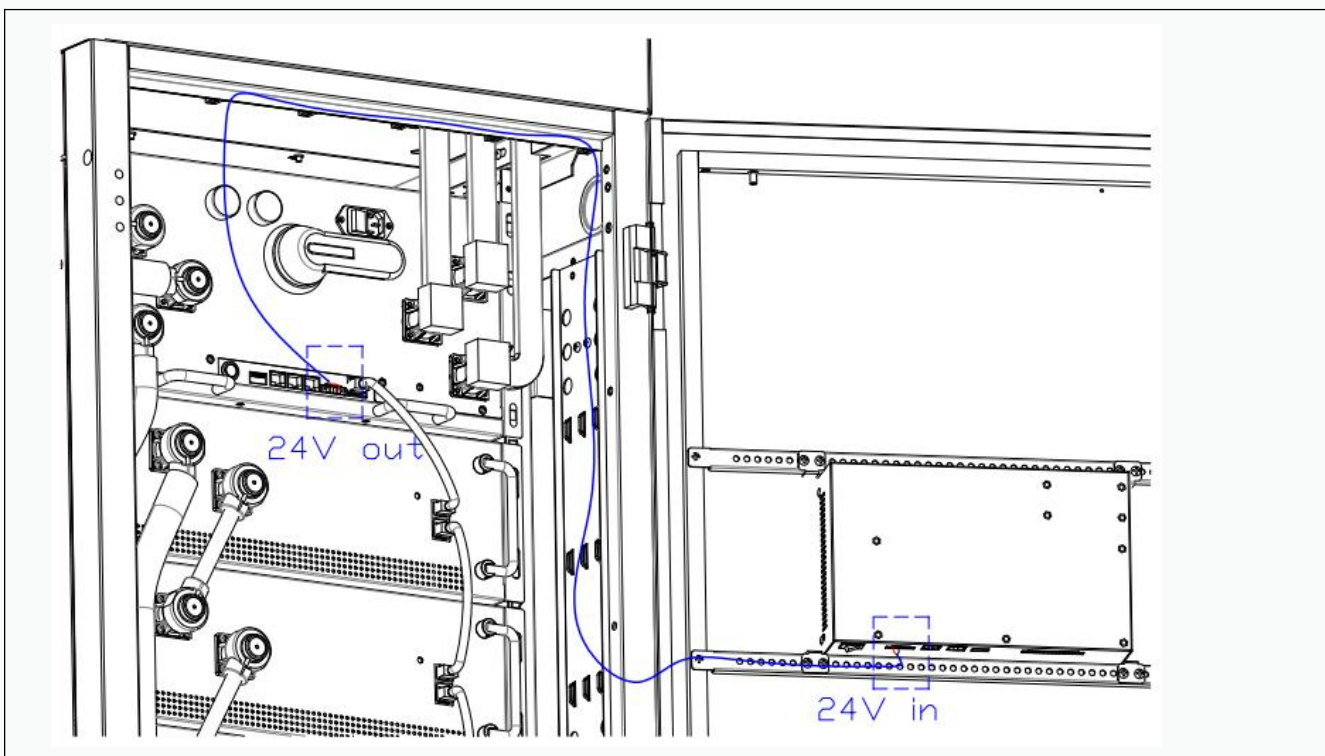
Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

DC24V connect for parallels



- 24VDC cable routing



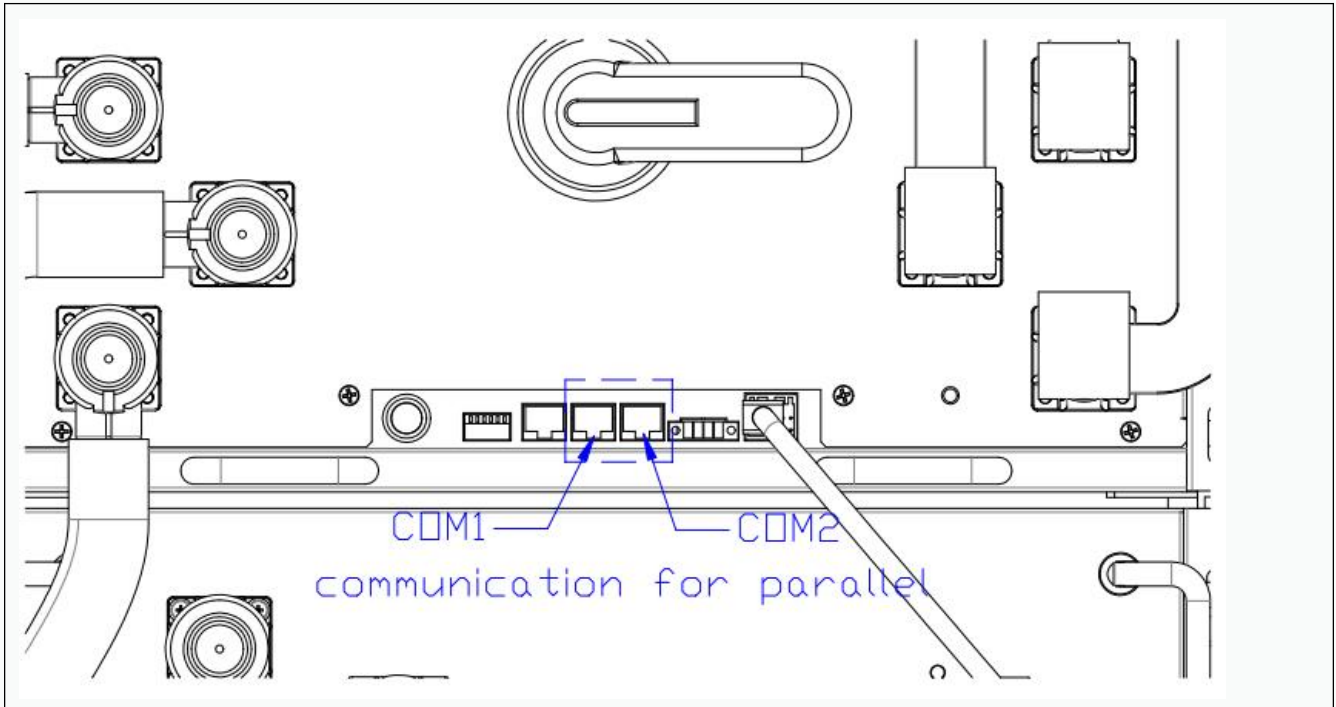
10.5.5 CBMS parallel communication connect

CBMS parallel communication adopts RJ45 physical interface, which is realized by COM1/COM2 of CBMS. Refer to section 5.3 for an introduction to the CBMS interface.

The figure below is the schematic diagram of REVO series for parallels. The system

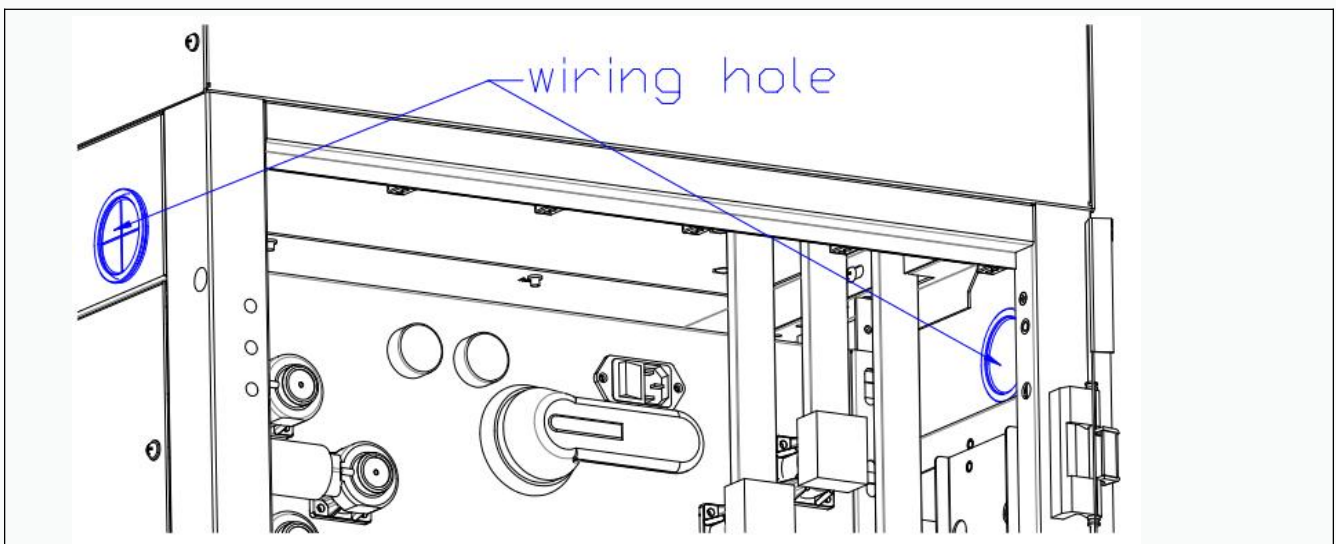
realizes communication connection in the form of communication Daisy chain. the parallel number shall be ≤ 15 cabinets

Picture CBMS parallels communication connection



Picture CBMS parallels communication connection

●hole details



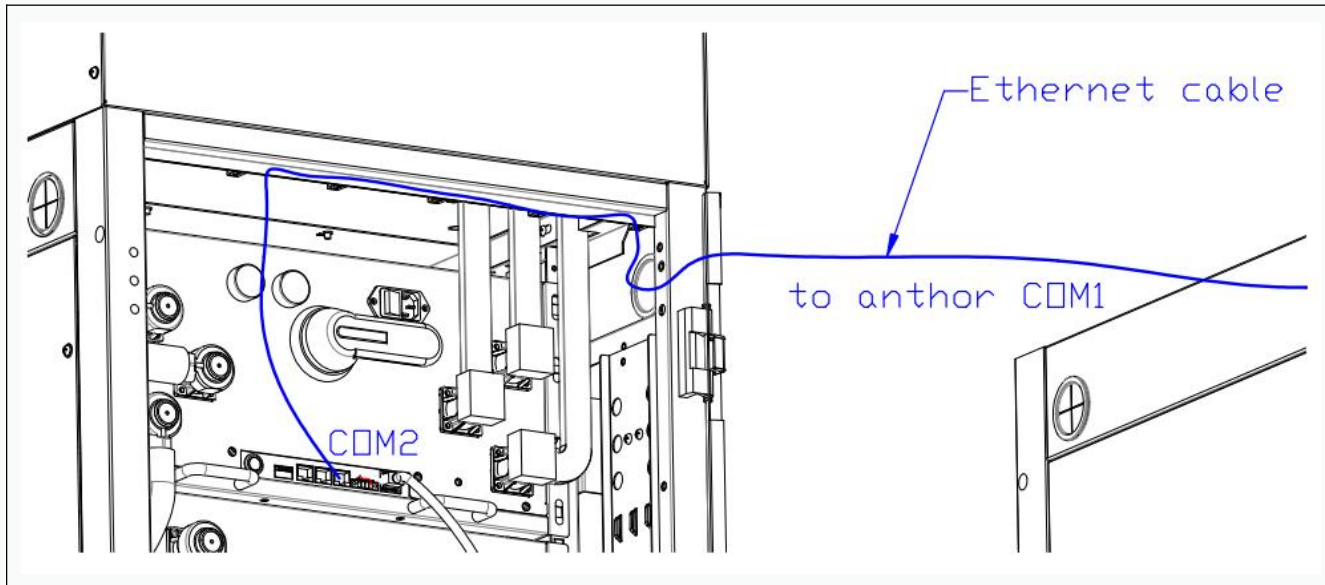
SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

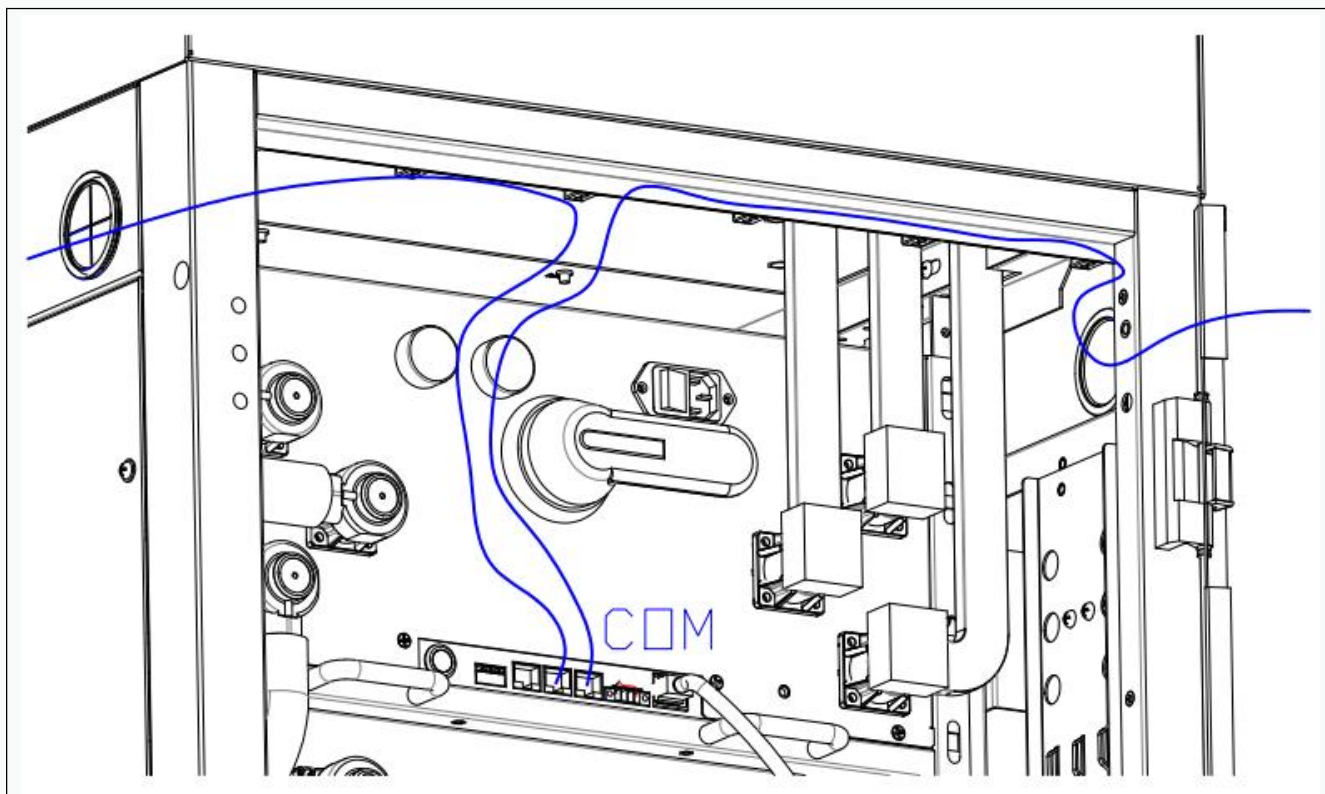
Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

● Communication connect detail for parallels



● Cable routing



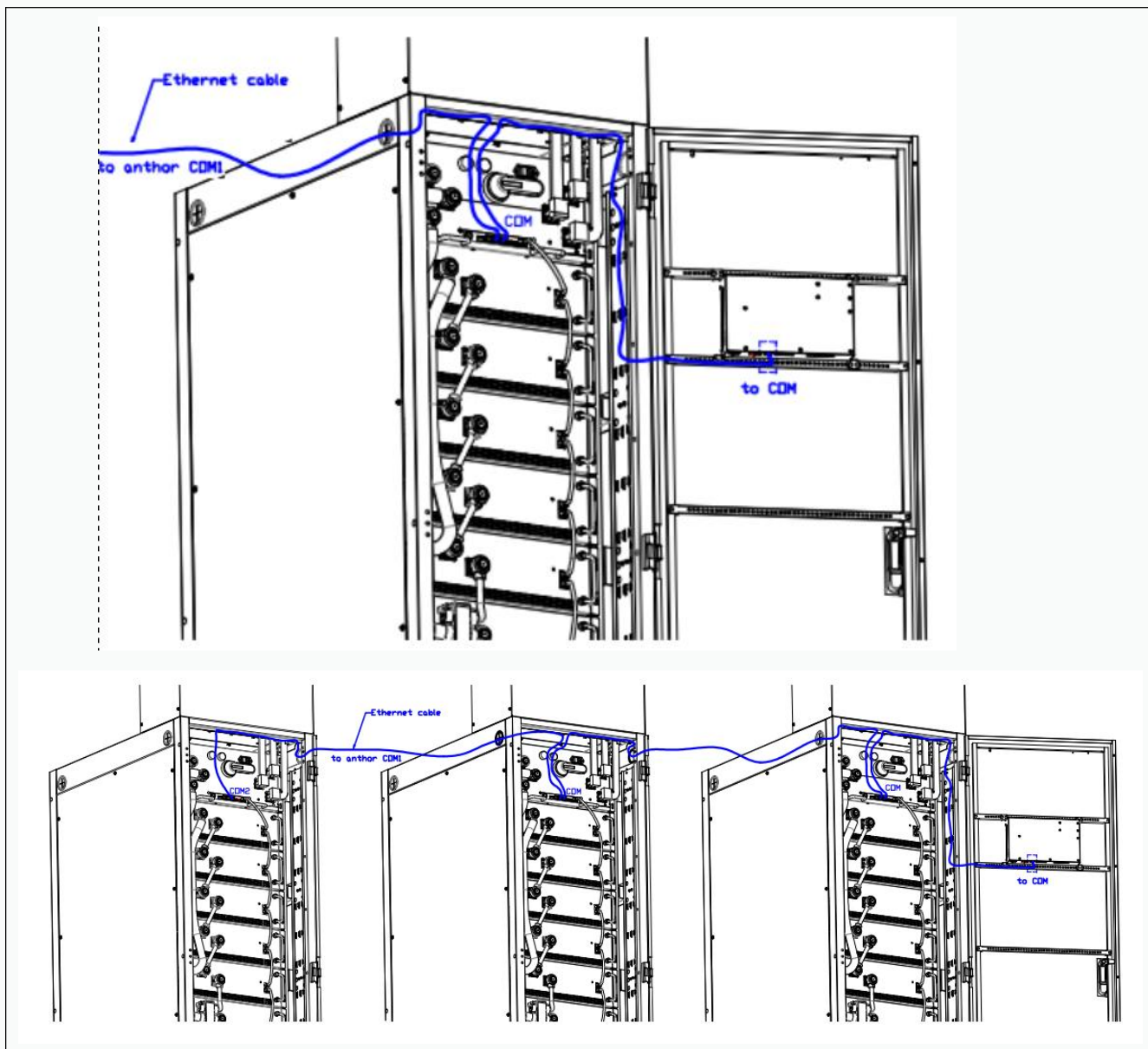
SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

● Communication Cable for 1 cabinet & parallel for 3 cabinets



When multiple cabinets are in parallel, the above method has been deduced by analogy, pay attention to enable the CAN/RS485 terminal resistance of CBMS and GBMS is ON

SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

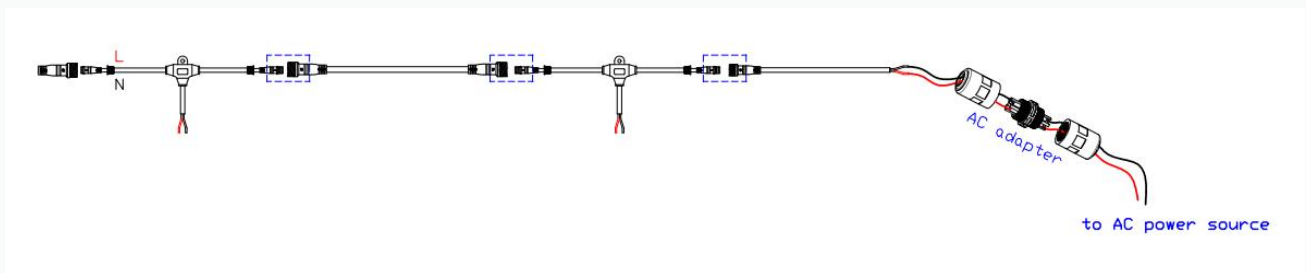
Green Our Earth Power Your Vision

10.5.6 AC power connection

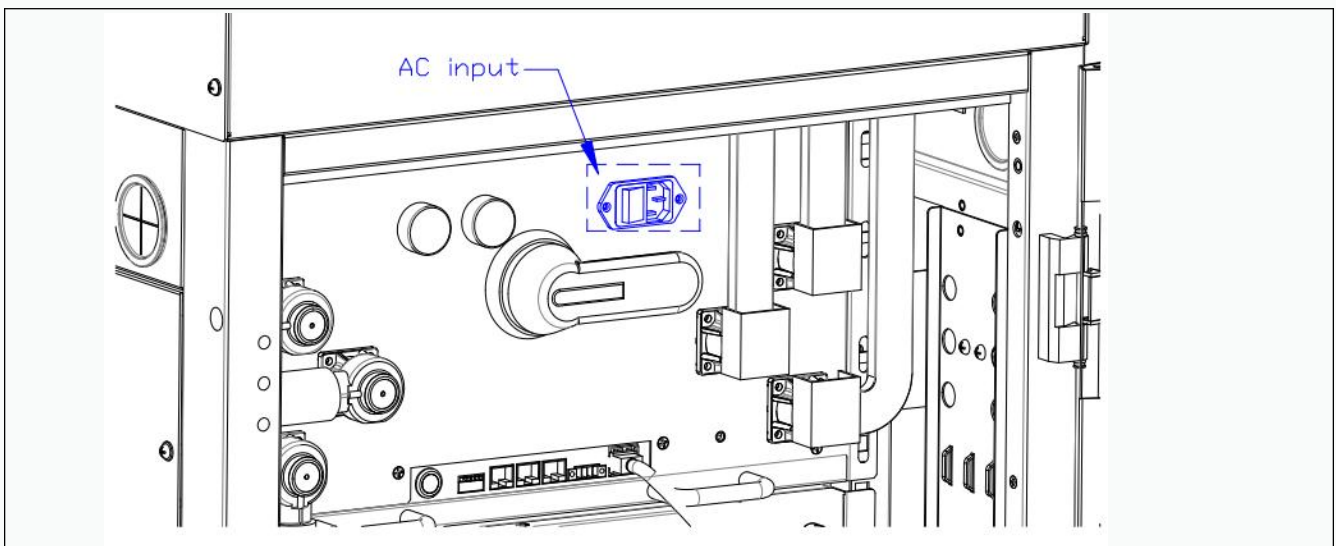
The CBMS main control unit of REVO series system adopts DC and AC double safety power supply mode. When the mains power is normal, the mains power will be supplied by AC first. The specification is 85~264VAC ($\pm 5\%$ variation range), and the frequency is 47~63Hz.

AC connection source can be from UPS output or other mains AC. (Only expert users can connect UPS output and AC source)

- AC cable spec



CBMS parallels AC power connection (only expert users could make a plug and connect the power source to the CBMS)



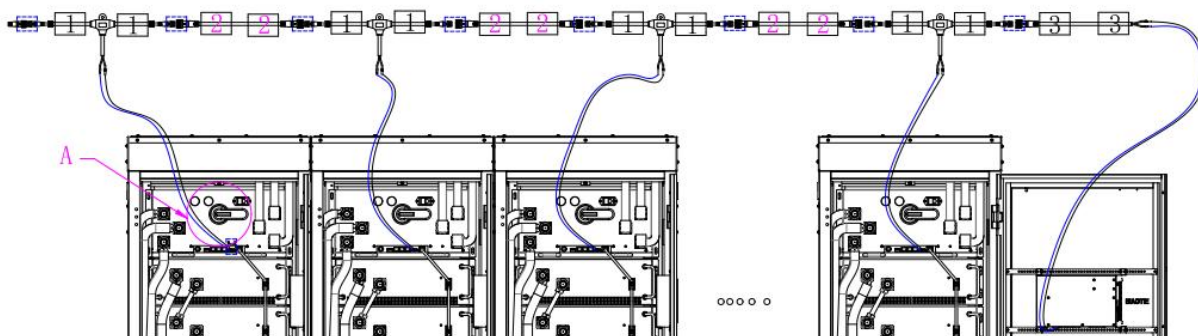
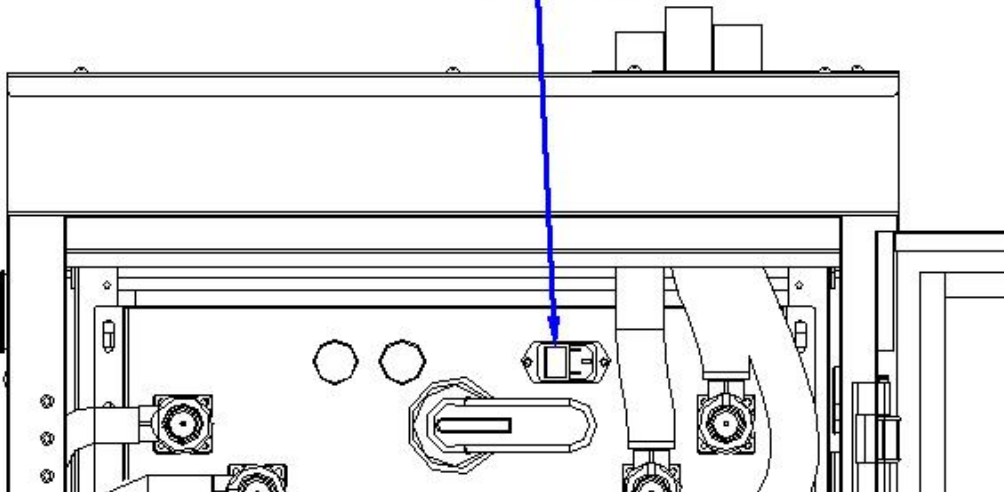
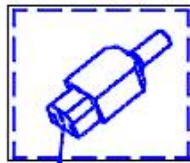
SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

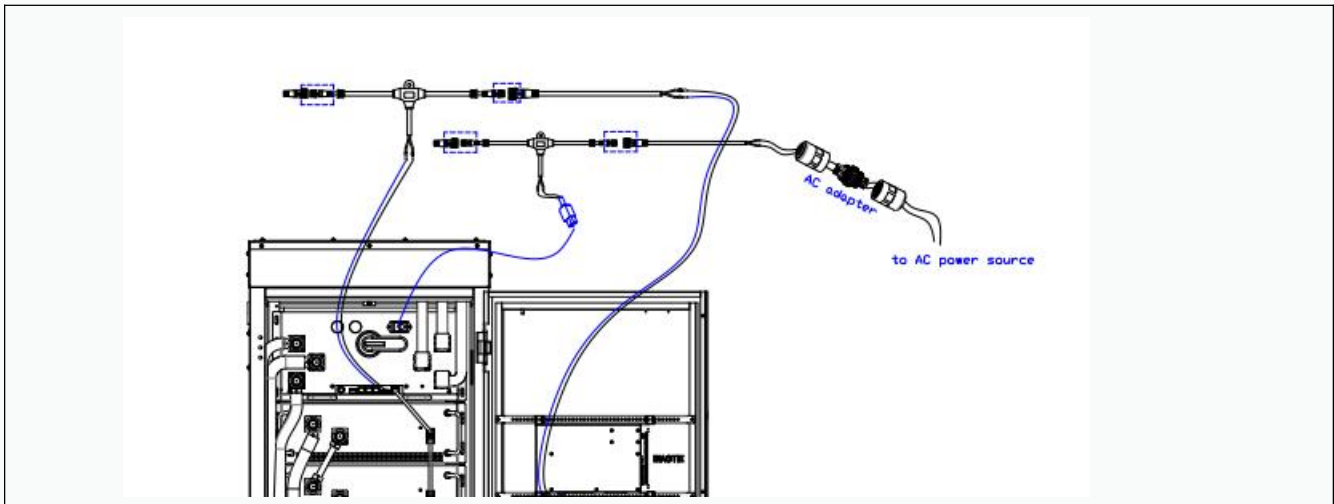
AC power plug



The AC input of CBMS from AC power source should be connected with a miniature circuit breaker to ensure safety. The recommended model is as follows

Model	IC65L 2P C16A (AC adapter model number)
Pole number	2
Rated Voltage	400VAC
Rated current	16A

●24V and AC connect for single cabinets



Note that the unconnected interface on the left end needs to be connected with a cap

10.5.7 Set the dial switch

In order to ensure the overall stability of the system, the parallel communication of lithium battery system adopts CANBUS mode. In order to distinguish the address access of its equipment for communication during the parallel state, it is necessary to set reasonable addresses of different equipment through the dial code switch on the CBMS panel to ensure the communication quality so as to facilitate the differential access of GBMS/ upper computer, as shown in the figure.

SHENZHEN CENTER POWER TECH CO., LTD

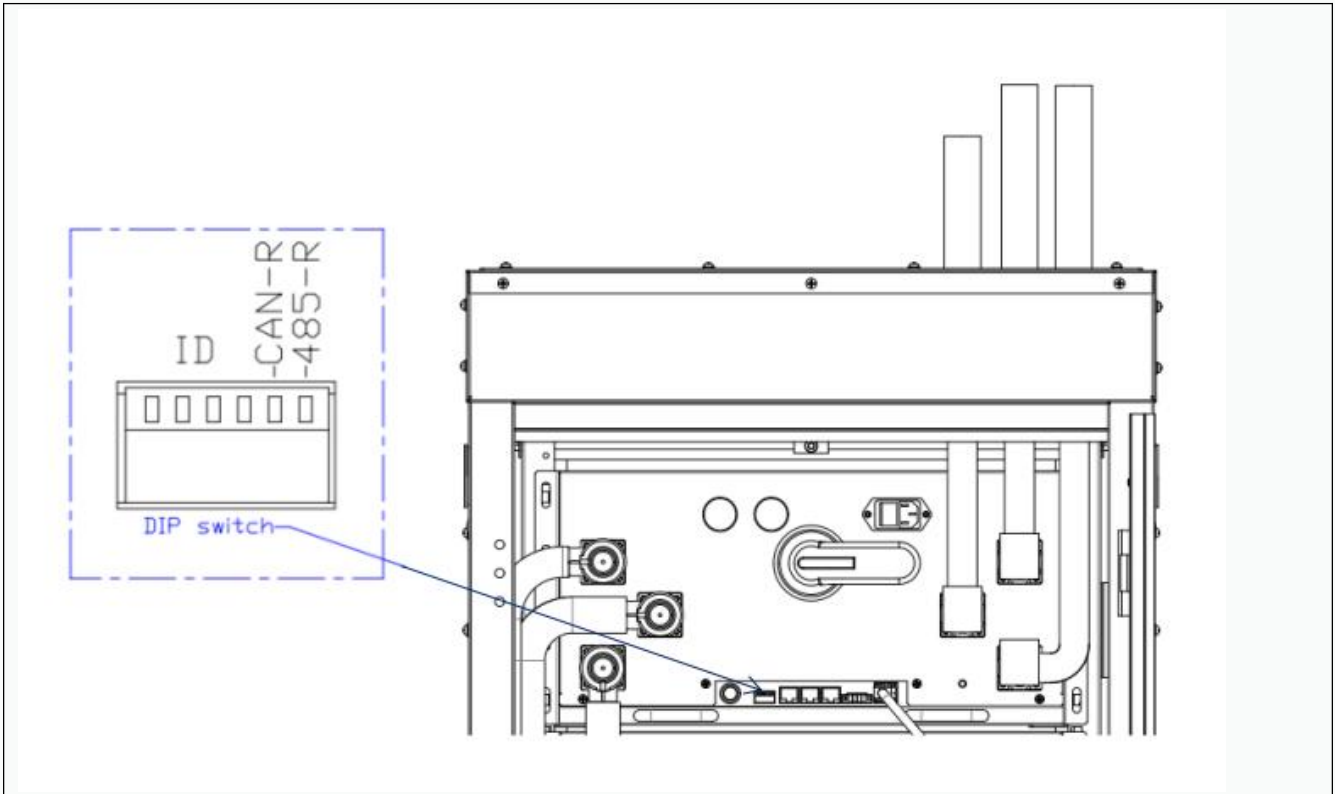
Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

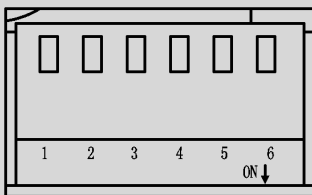
Green Our Earth Power Your Vision

The dialing address of CBMS and GBMS should start from 1, because 0 is used as the broadcast address

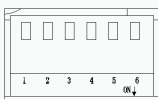
DIP switch overview



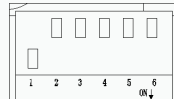
DIP dial code



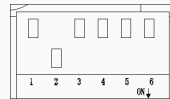
The dial-code switch is DIP switch, which is effective when dialed to ON side, indicating that the switch is ON, The four ID dial code keys are independent, for 0/1 binary encoding, 4 ID dial code a total of 16 encoding definition address.



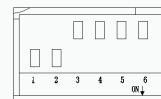
ID: 0



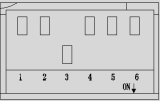
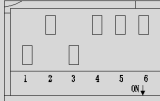
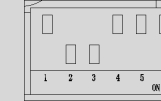
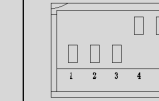
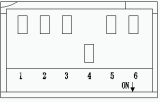
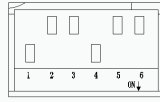
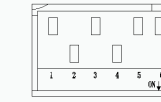
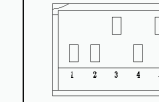
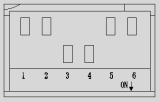
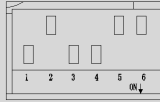
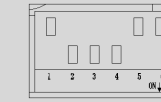
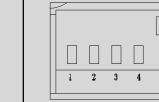
ID: 1



ID: 2

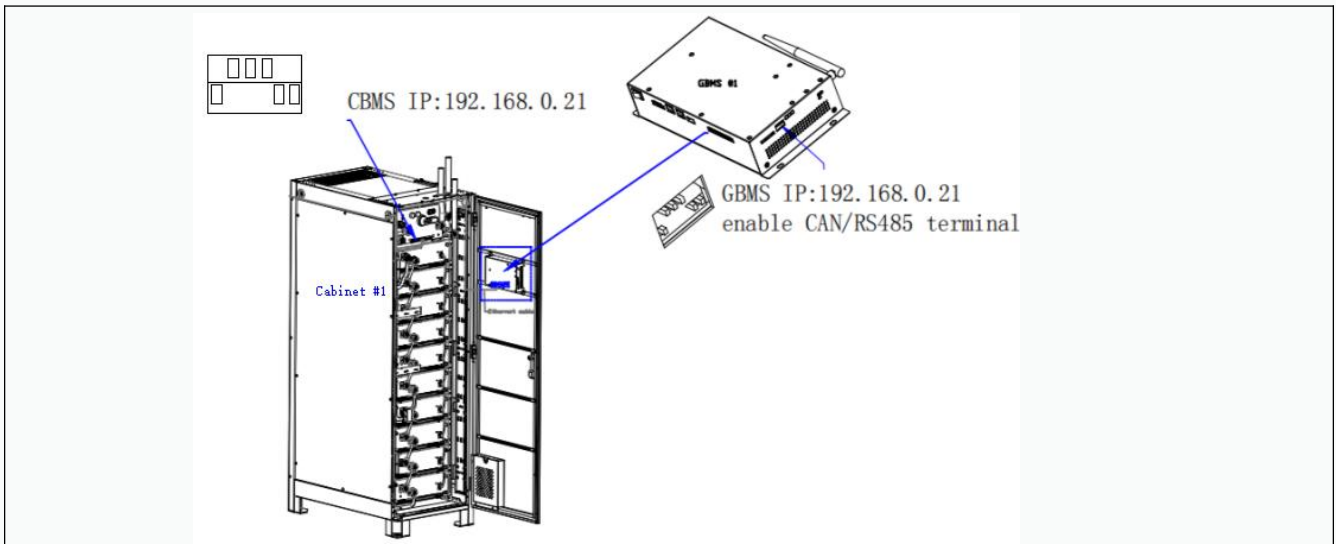


ID: 3

			
ID: 4	ID: 5	ID: 6	ID: 7
			
ID: 8	ID: 9	ID: 10	ID: 11
			
ID: 12	ID: 13	ID: 14	ID: 15

In general, the dial code of the lithium battery system connected to GBMS is 1, and the addresses of other cabinets are increased successively according to the above table. The system of the last address should enable can-r / 485-r functions, as shown in the figure below

CBMS DIP switch setting for single cabinet & parallel cabinets

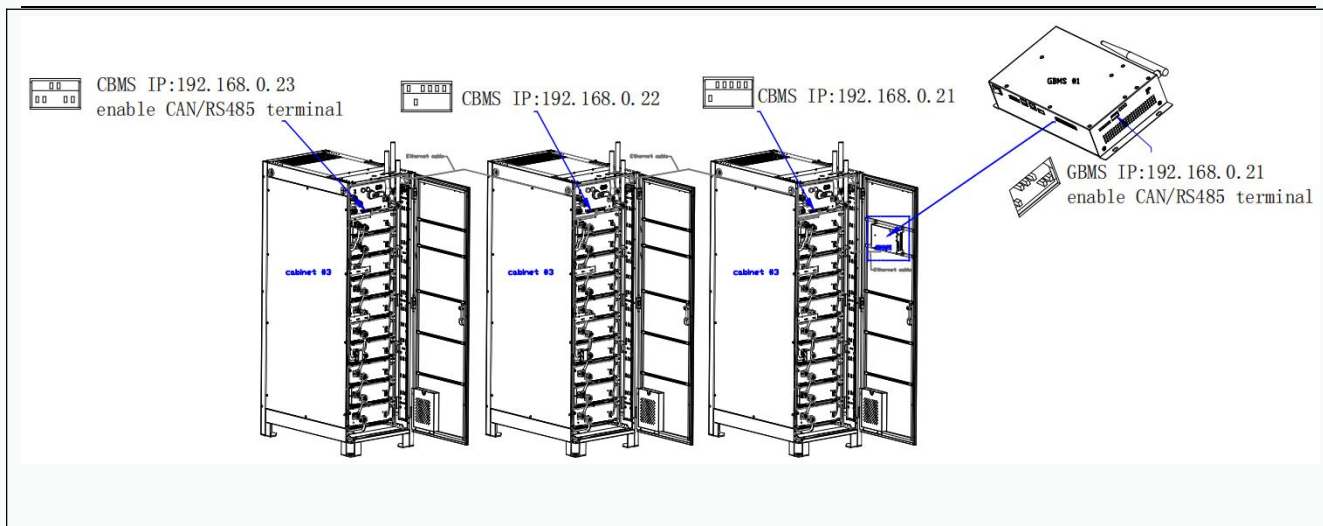


SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

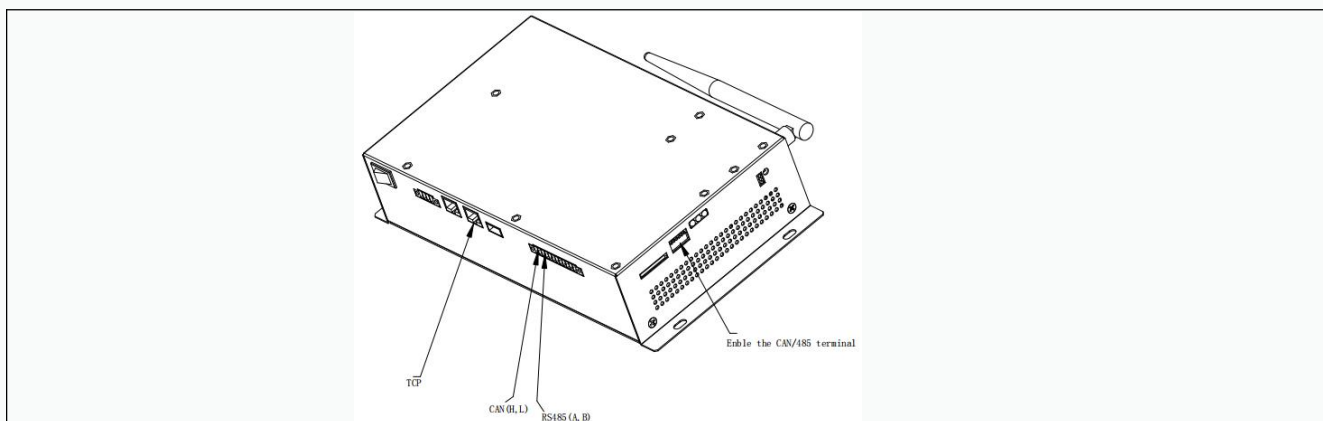


Dial the code switch to the ON direction effectively, at the same time pay attention to address the system through dial code CAN-R /485 - R 120Ω terminal resistance enabler-dial code under power supply, need to restart **CBMS**

10.5.8 CAN/RS485 with UPS

REVO series lithium battery system provides a variety of communication methods to meet the needs of users: CAN/RS485. The communication interface is unified and integrated on the integrated GBMS. GBMS is responsible for communicating with external equipment to realize information sharing.

communication connect (CAN/MODBUS)



SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

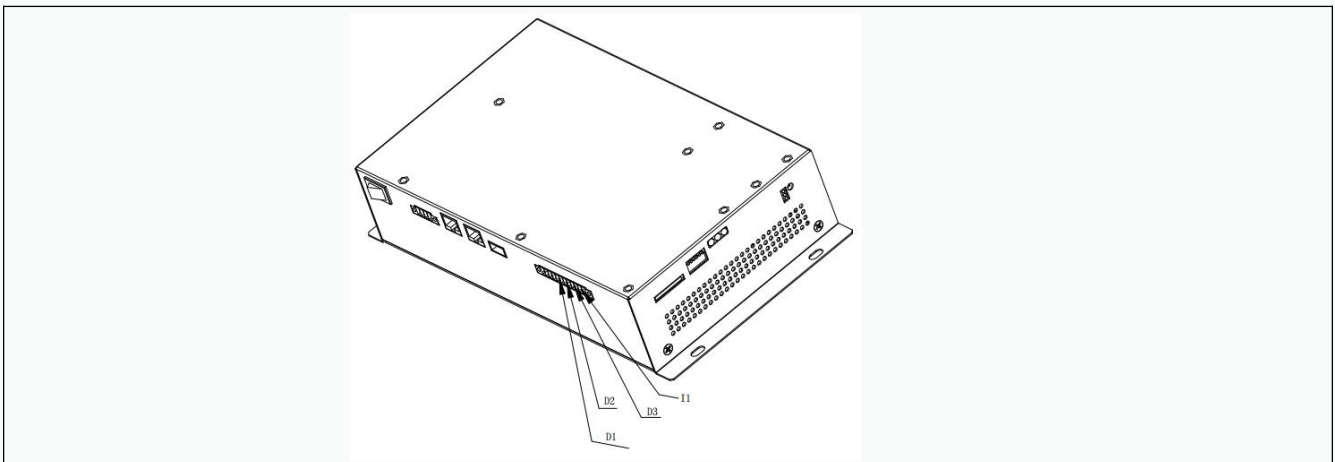


The specification of CAN/RS485 communication cable shall be A shielded twisted pair, and the communication terminals are at the bottom of GBMS, respectively printed with B A/H L. Please select according to the actual communication requirements. If you have any questions about the communication protocol provided by our company, please contact our technical personnel in time.

10.5.9 Dry contact connection

In order to provide or accept quick response fault/danger protection actions, our REVO system provides 1 input dry contact I1 and 3 output dry contact D1 D2 D3. Its fault input and output dry contacts are shown in the figure below

Dry contact defines



DO dry contact is passive dry contact, normally open in normal state. I1 dry contact can be defined as EPO, and dry contact fault is defined as factory mode by default. Please refer to relevant documents of our company. If you have special needs, please contact us.

Dry Contact definition

Item	Definition	Description
D1	Charger shutdown signal	When Normally fully charged battery voltage > 3.38V* total number of cells in a single battery cabinet & total current <1.5% of the current sensor ,also when battery high temperature prohibit charging, the D1 dry contact will turn from open to close to let UPS know that charging should be stopped.
D2	BCB close signal	when the number of abnormal discharge circuits of all battery cabinets is greater than the redundant number, which means that the BCB is disconnected ,and the BCB signal will be enable because the remaining battery cabinets are insufficient to support full load power.
D3	MCB trip signal	when the CBMS circuit breaker is manually disconnected or trip is greater than the redundant number, the dry contact will be enabled and at the same time all the breakers will trip, which is to remind the UPS that there is a battery cabinet breaker that is disconnected for some reason
I1	EPO(input)	When GBMS received this signal from UPS , all the breakers of the CBMS will trip to disconnect from the UPS.

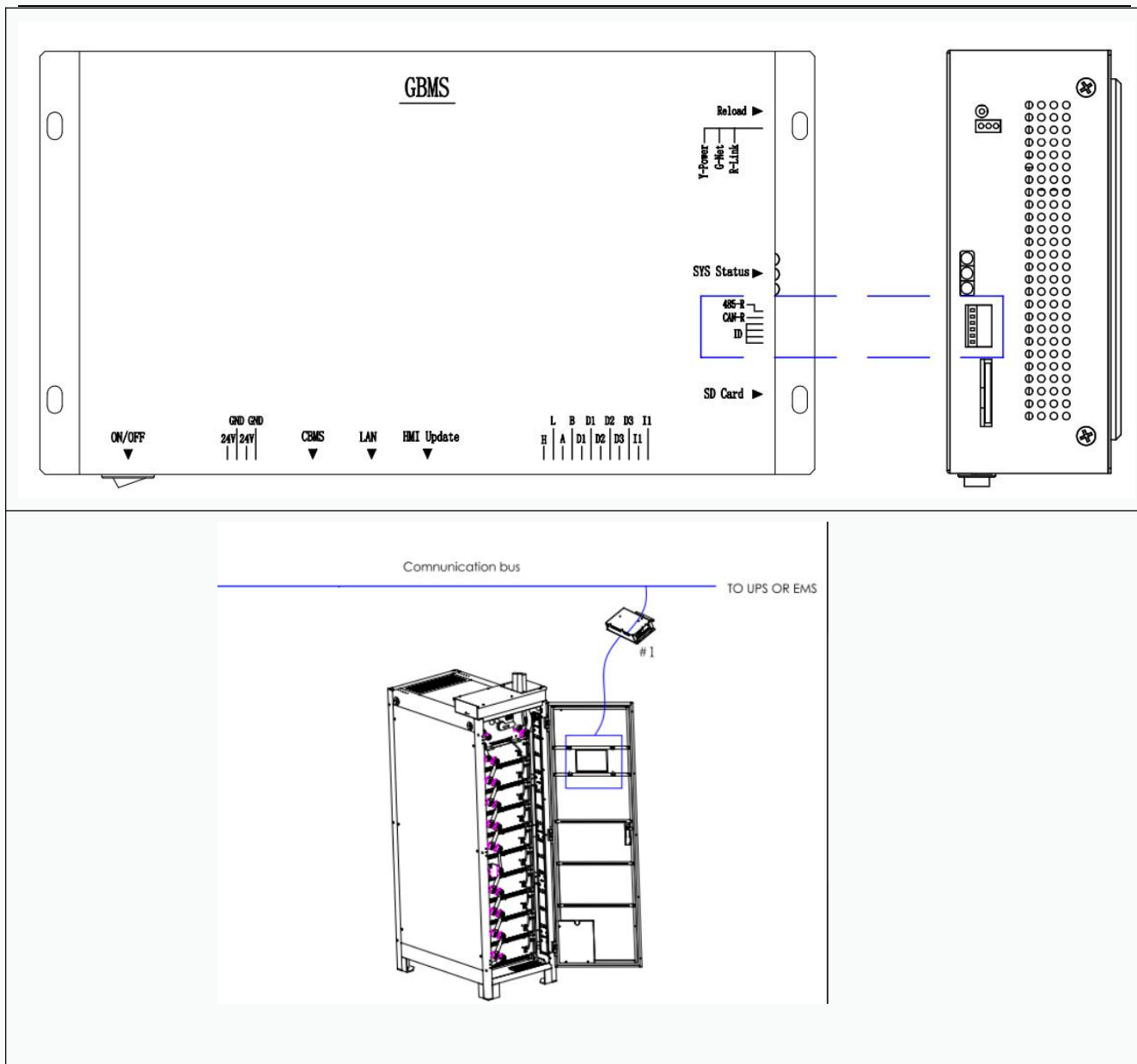


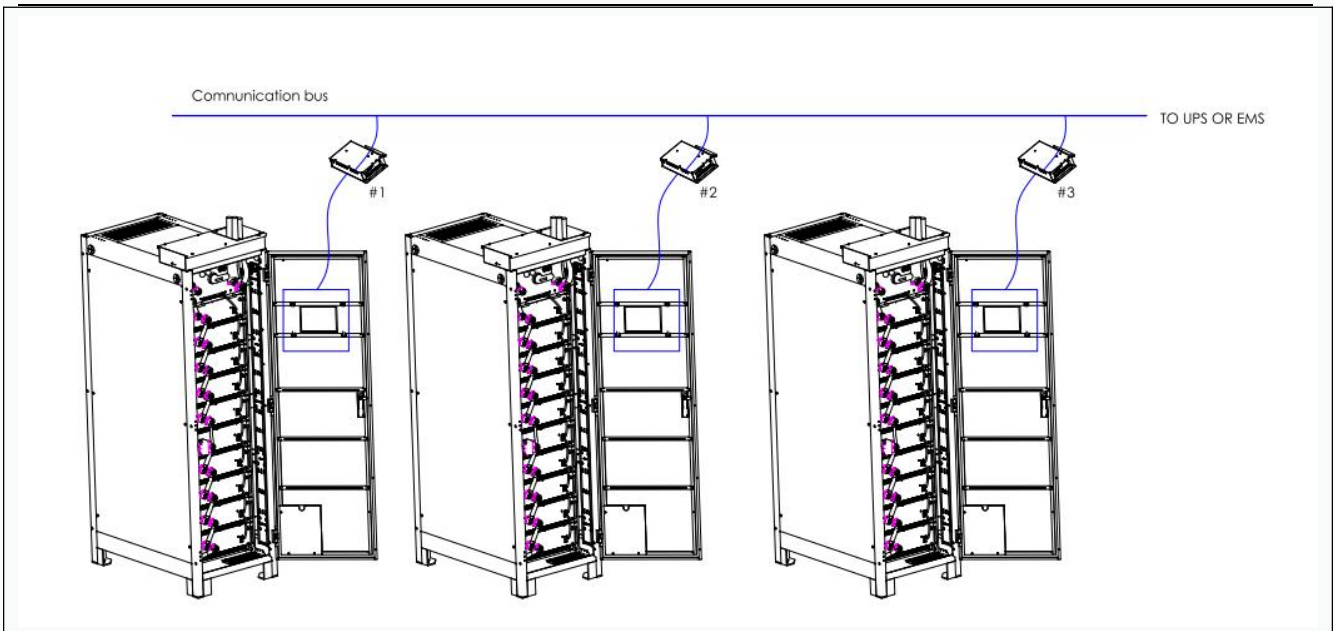
The cross-sectional area of dry contact cable should be between 1mm² and 1.5mm²

10.5.10 GBMS DIP switch setting

When multiple GBMS need to communicate in parallel, the address of the GBMS DIP switch determines the GBMS slave address or IP address. For parallel communication, the 485-R/CAN-R terminal resistance of the last cabinet (#3) needs to be enabled.

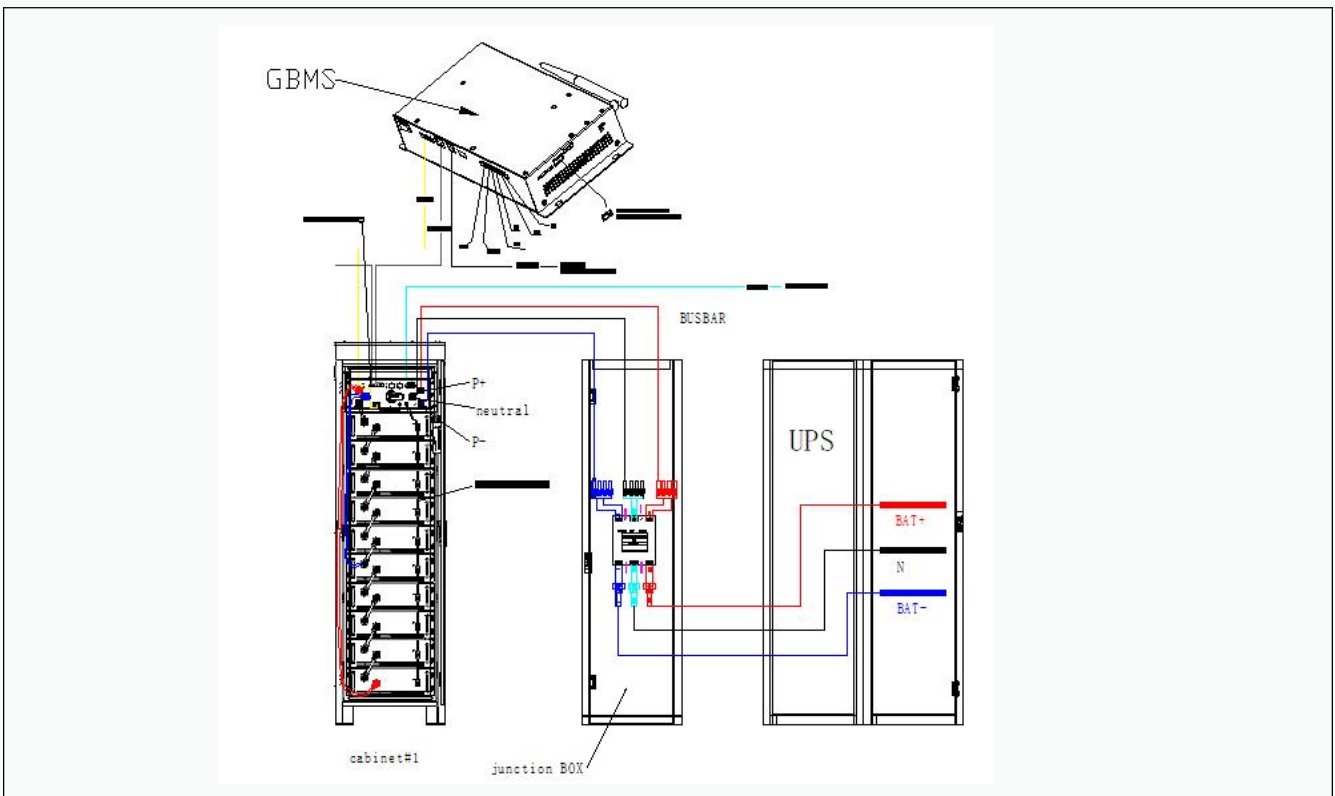
GBMS DIP switch setting for single cabinet & parallel for 3 Cabinets.





DIP dial code

●Figure for connect for parallels

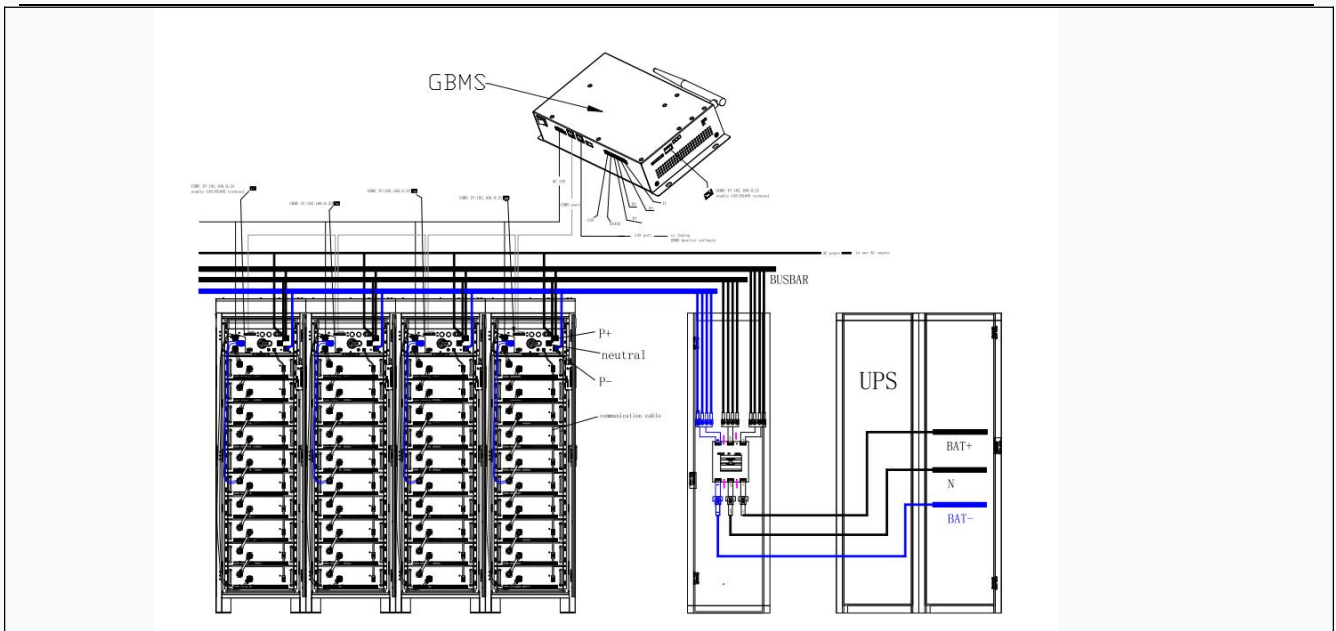


SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision



10.6 UPS Parameter Setting

Item	Description	Value	Remarkd
1	Battery Block per string setting as VRLA	32	50/100/200 AH Lithium Module No is 8
2	Battery Block per string	40	50/100/200 AH Lithium Module No is 10
3	Battery Block per string	48-50	50/100/200 AH Lithium Module No is 12
4	Battery block capacity	50/100Ah	Depends on the batteries cabinet
5	Recommended charging current	0.2C-0.5C	50AH cabinet:10A-25A 100AH cabinet :20-50A 200AH cabinet:40A-100A
6	Float Voltage(V)	54*n	n=Lithium batteries module Qty in cabinets
7	Boost Voltage(V)	54.4(55.2)*n	n=Lithium batteries module Qty in cabinets
8	EOD Voltage(V)	44.8*n	n=Lithium batteries module Qty in cabinets

SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

11 Running Test

11.1 Starting up examination

11.1.1 Starting up examination

- ❖ After installation or maintenance, the lithium battery system must be started up. Before that, please check the following notes carefully to avoid any error.
- ❖ All electrical connections must follow the electrical diagram in this Manual.
- ❖ The junction box must be turned on.
- ❖ Reasonable distribution of cables, zero mechanical damage, correct connection and fastening are demanded.
- ❖ Any extraneous parts or conductive materials are prohibited to be left in each cabinet.

11.1.2 SOC validation and calibration

- ❖ Check the SOC after the first boot. The SOC generally ranges 30%~50%.
- ❖ Calibrate the SOC with a charge/discharge cycle. 1. Charge the new assembled battery to the UPS cut-off voltage. 2. Discharge the battery to the UPS cut-off voltage. 3. Fully charge the battery. SOC display is operating.
- ❖ If the SOC does not change while charging or discharging the battery, please contact the manufacturer.

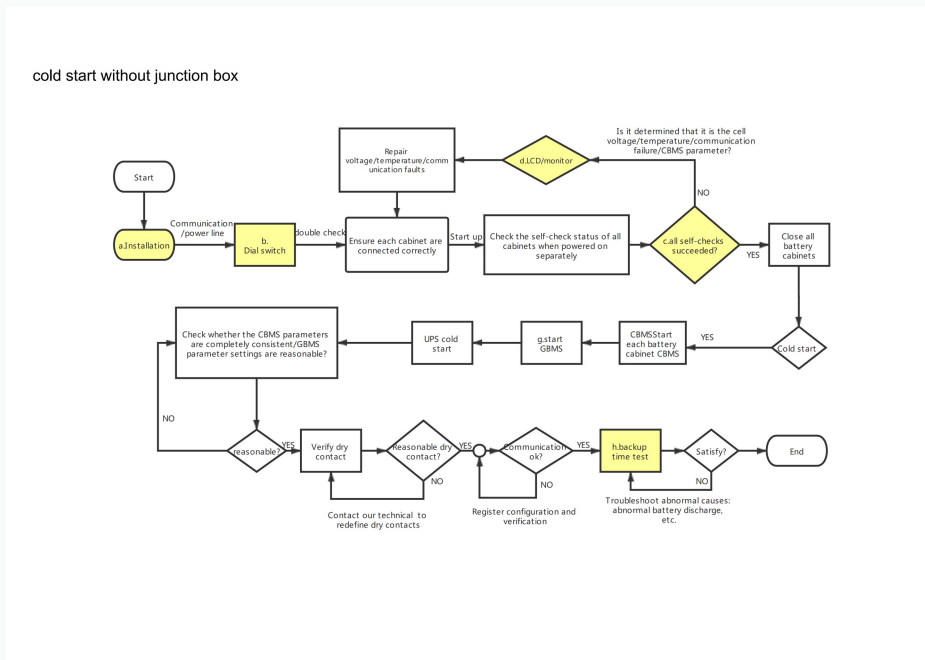
11.2 Startup steps



When the lithium battery system works, it is controlled by BMS intelligently without the need for manual interference or control. When the lithium battery cabinet is working, the cabinet door should be locked tightly and the key of the door should be pulled out.

According to different on-site installation conditions, please refer to the following flowcharts to start up.

Flow Chart 11.1.2.

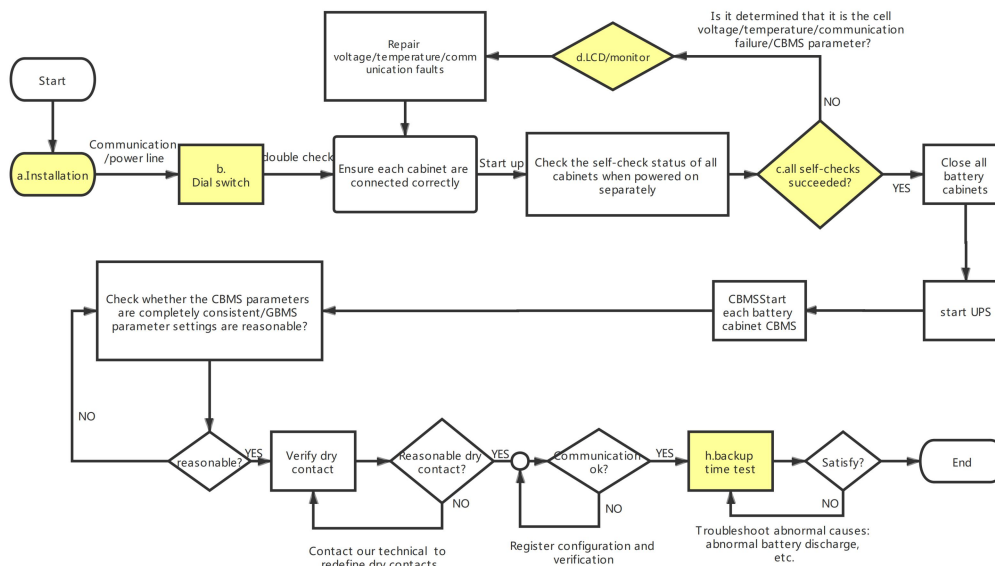


- ❖ Step 1: Start installing batteries, ensure the battery power cables are correctly connected and the communications cables have an anti-freeze mechanism. Connect the cables according to COM1/COM2.
- ❖ Step 2: Before starting the system, set the DIP codes of CBMS and GBMS. Dip rules have been put in the manual.
- ❖ Step 3: Double check the connection of cabinets are corrected
- ❖ Step 4: Start the cabinets. Check the self-check status of all cabinets when powered on separately.
- ❖ Step 5: When the self-test is successful, a sound will appear, and the indicator light will turn green and keep on. Proceed to step 6.
- ❖ If self-check fails, the indicator will keep red on. If the self-test fails, you need to check it.
- ❖ Is it determined that it is the cell voltage/temperature/communication failure/CBMS parameter?

-
- ❖ The alarm information can be observed on the monitor and display screen
 - ❖ Detect and repair voltage/temperature/communication faults, return to step 3 and retest in order
 - ❖ Step 6: Close all battery cabinets
 - ❖ Step 7: Cold start
 - ❖ Step 8: Start each battery cabinet CBMS
 - ❖ Step 9: Start GBMS
 - ❖ Step 10: Check whether the CBMS parameters are completely consistent/GBMS parameter setting are reasonable. If it makes sense, go to the next step. If it doesn't, recheck and make changes.
 - ❖ Step 11: Check the dry contacts and verify that are reasonable. If it makes sense, go to the next step. If it doesn't, re-check and confirm the cause (Contact our technical to redefine dry contacts)
 - ❖ Step 12: Check whether the communication is normal, if it makes sense, go to the next step. If it doesn't, check the register configuration and verification and retest.
 - ❖ Step 13: Test the backup time, if it is satisfying, end the test. If not, troubleshoot abnormal causes: abnormal battery discharge, etc and retest.

Flow Chart 11.1.2.2

Normal start without junction box



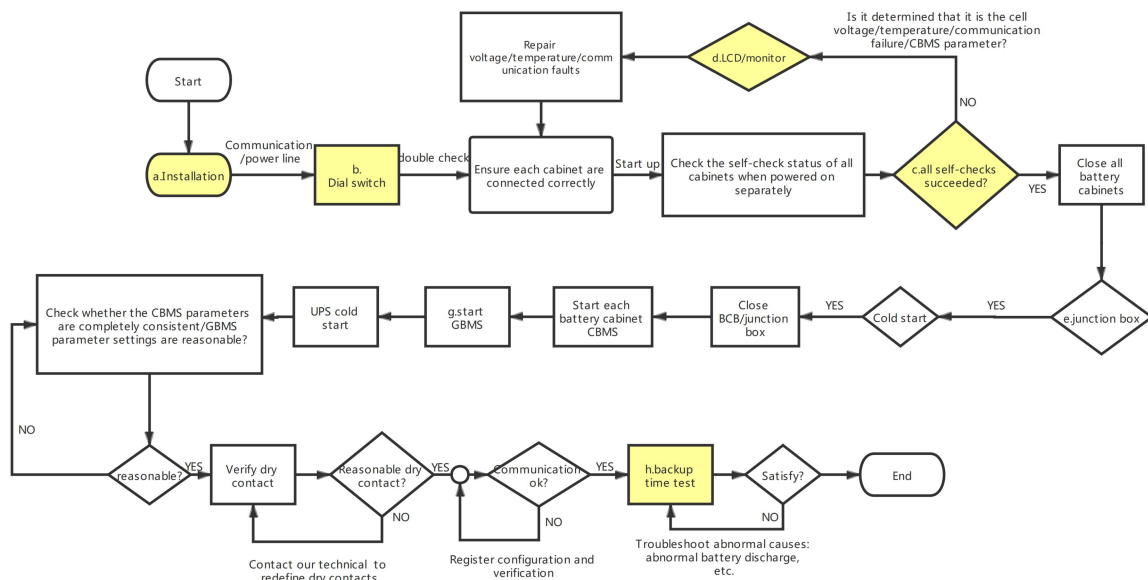
- ❖ Step 1: Start installing batteries, ensure the battery power cables are correctly connected and the communications cables have an anti-freeze mechanism. Connect the cables according to COM1/COM2.
- ❖ Step 2: Before starting the system, set the DIP codes of CBMS and GBMS. Dip rules have been put in the manual.
- ❖ Step 3: Double check the connection of cabinets are corrected
- ❖ Step 4: Start the cabinets. Check the self-check status of all cabinets when powered on separately.
- ❖ Step 5: When the self-test is successful, a sound will appear, and the indicator light will turn

green and keep on. Proceed to step 6.

- ❖ If self-check fails, the indicator will keep red on. If the self-test fails, you need to check it.
- ❖ Is it determined that it is the cell voltage/temperature/communication failure/CBMS parameter?
- ❖ The alarm information can be observed on the monitor and display screen
- ❖ Detect and repair voltage/temperature/communication faults, return to step 3 and retest in order
- ❖ Step 6: Close all battery cabinets
- ❖ Step 7: Start UPS
- ❖ Step 8: Start each battery cabinet CBMS
- ❖ Step 9: Check whether the CBMS parameters are completely consistent/GBMS parameter setting are reasonable. If it makes sense, go to the next step. If it doesn't, recheck and make changes.
- ❖ Step 10: Check the dry contacts and verify that are reasonable. If it makes sense, go to the next step. If it doesn't, re-check and confirm the cause (Contact our technical to redefine dry contacts)
- ❖ Step 11: Check whether the communication is normal, if it makes sense, go to the next step. If it doesn't, check the register configuration and verification and retest.
- ❖ Step 12: Test the backup time, if it is satisfying, end the test. If not, troubleshoot abnormal causes: abnormal battery discharge, etc. and retest.

Flow Chart 11.1.2.3

cold start with junction box

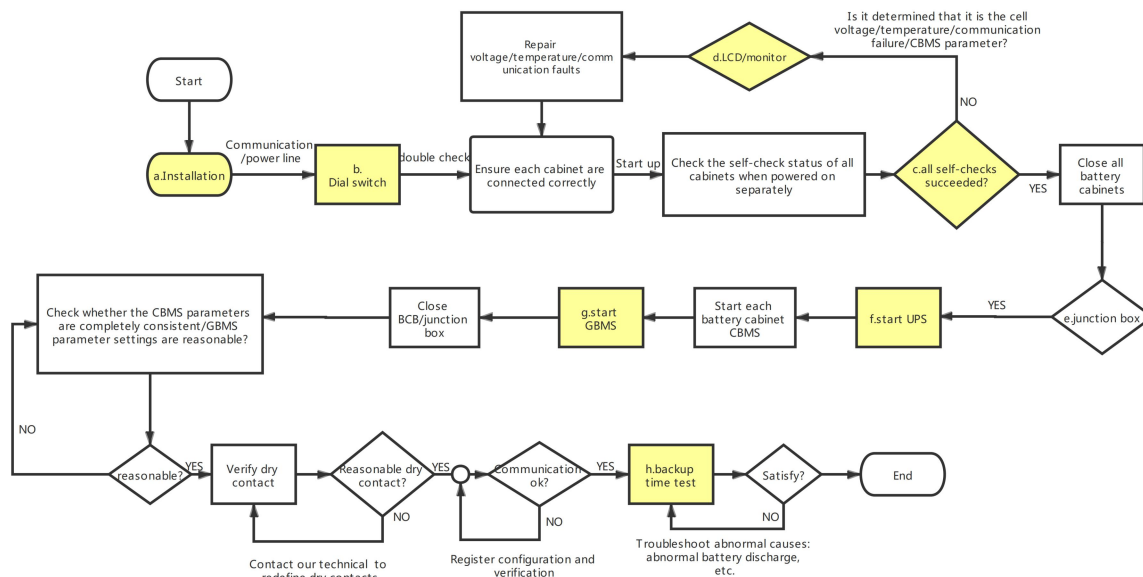


- ❖ Step 1: Start installing batteries, ensure the battery power cables are correctly connected and the communications cables have an anti-freeze mechanism. Connect the cables according to COM1/COM2.
- ❖ Step 2: Before starting the system, set the DIP codes of CBMS and GBMS. Dip rules have been put in the manual.
- ❖ Step 3: Double check the connection of cabinets are corrected
- ❖ Step 4: Start the cabinets. Check the self-check status of all cabinets when powered on separately.
- ❖ Step 5: When the self-test is successful, a sound will appear, and the indicator light will turn green and keep on. Proceed to step 6.

- ❖ If self-check fails, the indicator will keep red on. If the self-test fails, you need to check it.
- ❖ Is it determined that it is the cell voltage/temperature/communication failure/CBMS parameter?
- ❖ The alarm information can be observed on the monitor and display screen
- ❖ Detect and repair voltage/temperature/communication faults, return to step 3 and retest in order
- ❖ Step 6: Close all battery cabinets
- ❖ Step 7: Connect the junction box
- ❖ Step 8: Cold start
- ❖ Step 9: Close BCB/junction box
- ❖ Step 10: Start each battery cabinet CBMS
- ❖ Step 11: Start GBMS
- ❖ Step 12: UPS cold start
- ❖ Step 13: Check whether the CBMS parameters are completely consistent/GBMS parameter setting are reasonable. If it makes sense, go to the next step. If it doesn't, recheck and make changes.
- ❖ Step 14: Check the dry contacts and verify that are reasonable. If it makes sense, go to the next step. If it doesn't, re-check and confirm the cause (Contact our technical to redefine dry contacts)
- ❖ Step 15: Check whether the communication is normal, if it makes sense, go to the next step. If it doesn't, check the register configuration and verification and retest.
- ❖ Step 16: Test the backup time, if it is satisfying, end the test. If not, troubleshoot abnormal causes: abnormal battery discharge, etc and retest.

Flow Chart 11.1.2.4

Normal start with junction box



- ❖ Step 1: Start installing batteries, ensure the battery power cables are correctly connected and the communications cables have an anti-freeze mechanism. Connect the cables according to COM1/COM2.
- ❖ Step 2: Before starting the system, set the DIP codes of CBMS and GBMS. Dip rules have been put in the manual.
- ❖ Step 3: Double check the connection of cabinets are corrected
- ❖ Step 4: Start the cabinets. Check the self-check status of all cabinets when powered on separately.
- ❖ Step 5: When the self-test is successful, a sound will appear, and the indicator light will turn green and keep on. Proceed to step 6.

SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

- ❖ If self-check fails, the indicator will keep red on. If the self-test fails, you need to check it.
- ❖ Is it determined that it is the cell voltage/temperature/communication failure/CBMS parameter?
- ❖ The alarm information can be observed on the monitor and display screen
- ❖ Detect and repair voltage/temperature/communication faults, return to step 3 and retest in order
- ❖ Step 6: Close all battery cabinets
- ❖ Step 7: Connect the junction box
- ❖ Step 8: Start UPS
- ❖ Step 9: Start each battery cabinet CBMS
- ❖ Step 10: Start GBMS
- ❖ Step 11: Close BCB/junction box
- ❖ Step 12: Check whether the CBMS parameters are completely consistent/GBMS parameter setting are reasonable. If it makes sense, go to the next step. If it doesn't, recheck and make changes.
- ❖ Step 13: Check the dry contacts and verify that are reasonable. If it makes sense, go to the next step. If it doesn't, re-check and confirm the cause (Contact our technical to redefine dry contacts)
- ❖ Step 14: Check whether the communication is normal, if it makes sense, go to the next step. If it doesn't, check the register configuration and verification and retest.
- ❖ Step 15: Test the backup time, if it is satisfying, end the test. If not, troubleshoot abnormal causes: abnormal battery discharge, etc. and retest.

11.3 Troubleshooting

11.3.1 LED display fault

Table 11.3 .1 LED fault

LED status	Remarks
Breaker on the indicator light is off	If the light is off, the breaker has been off or disconnected, and the CBMS has not received high voltage power supply. Please check whether there is any abnormality in the electrical connection, and try to restore the DC voltage in the system. If the light is still off, please contact our after-sales service.
Status indicator light is off	Off yellow light means normal status; red light means fault protection status; flashing yellow light means charging; flashing red light means discharging. If the light is off, CBMS has failed to power the indicator light. Try to connect the power again. If the light is still off, please open the box for inspection and contact our after-sales service.

11.3.2 Troubleshooting

The following table shows possible faults and troubleshooting methods provided by our company in the REVO series products.

Protection level	Activities in batteries cabinet
Warning	No activities
Primary protection-1	Open circuit in the contactor
Secondary protection	Breaker trip
Protection and restoration	Primary protection-1 and warning protection levels can be automatically restored to normal status once internal value of the batteries decreases.

Table 11.3.2 Troubleshooting list

fault type	Cause	Process mode
Over voltage	The DC voltage in the system exceeds the maximum setting value.	1、 Check whether the charging voltage of the UPS terminal is reasonable. If the charging voltage of UPS exceeds the setting value, please contact the UPS manufacturer for solution. 2、 Check the maximum setting voltage of battery terminal, and check the protection parameters setting through LCD or VISION APP.
Under voltage	The DC voltage in the system is below the minimum setting value.	Check the minimum setting voltage of the battery terminal, and check the protection parameters setting through LCD or VISION APP.
Charging over current	The system charging current exceeds the maximum setting current	1. Check whether the charging current of the UPS terminal is reasonable. If the charging current of UPS exceeds the setting value, please contact the UPS manufacturer for solution. 2. Check the maximum setting charging current at the battery end, and check the protection parameters setting through LCD or VISION APP.
Discharging over current	A short circuit occurs in the master control CBMS, or its internal components are damaged.	1. Check whether the output power of UPS terminal is overloaded, and whether the actual power conforms to the setting value. If the output power of UPS exceeds the setting value, please contact UPS manufacturer for solution. 2、 Check whether there is any problem with the internal control circuit of the master control CBMS. Please also contact our company.
Low temperature charging	Module temperature is below the minimum charging temperature.	Check whether the indoor environment temperature is reasonable. If it is, check the minimum charging temperature parameters set in the system, and check the protection parameters setting through LCD or VISION APP. When the temperature rises to the reasonable value, the battery will be recharged. After the above process, if the same problem repeats, completely power off

		the system and then check the battery module.
Low temperature discharging	The module temperature is below the minimum discharging temperature	<p>Check whether the indoor environment temperature is reasonable. If it is, check the minimum discharging temperature parameters set in the system, and check the protection parameters setting through LCD or VISION APP.</p> <p>When the temperature rises to the reasonable value, the battery will be recharged and discharged. After the above process, if the same problem repeats, completely power off the system and then maintain the battery module.</p>
Over voltage of cell	The voltage of cell exceeds the maximum setting voltage.	<p>1、 Check the charging voltage of the UPS terminal and check whether the setting value is reasonable. If the charging voltage of UPS does exceed the setting value, please contact the UPS manufacturer for solution.</p> <p>2、 Check the maximum setting voltage of cell, and check the protection parameters setting through LCD or VISION APP.</p> <p>After the above process, appropriately reduce the charging voltage to alleviate this phenomenon. Over voltage of cell is a normal phenomenon. Due to battery differences.</p>
Under voltage of cell	The voltage is cell is below the minimum setting voltage.	Check the minimum setting protection voltage of cell, and check the protection parameters setting through LCD or VISION APP. If it is confirmed that setting parameters are reasonable and the single under-voltage protection occurs prematurely, please contact Vision.
Charging high temperature	Module temperature exceeds the maximum charging temperature.	<p>Discharge and check whether the charging time of the system is reasonable.</p> <p>If it is, completely power off the system, and overhaul the module and the cooling fan.</p>
Discharging high temperature	The module temperature exceeds the maximum discharging temperature.	Check whether the maximum setting discharging protection temperature of the battery is reasonable and check the protection parameters settings through LCD or VISION APP. If the setting discharging protection

		temperature is reasonable, completely power off the system, and overhaul the module and the cooling fan.
CBMS Fault	Parallel communication faults occur.	Check whether the network cable connected by CBMS is loose or correctly connected. If the connection is normal but the communication does not work, please contact Vision.
Self-check failure after power on/ self-check failed	Internal communication faults occur.	Completely power off, and maintain the failure of communication between modules.
Fan error	Fan is blocked or does not work.	1、 Check whether the system works and whether there is blockage near fans. If so, remove the foreign material. If it still cannot work, completely power off the system and replace the fan.
Insulation impedance alarm	Ground insulation is poor or the environment is damp.	1、 Check the insulation impedance protection parameters setting through LCD or VISION APP; 2、 Check the impedance of the module and the DC cable to the ground, and confirm whether the voltage to the ground or the insulation impedance is below the specified alarm value. 3、 Check the BMS insulation impedance to the ground, and confirm whether the voltage to the ground or the insulation impedance is less than the specified alarm value. 4、 Confirm whether there is a short circuit or mechanical damage on the cable shielding of cable. 5、 If the cable is not damaged, the insulation fault occurs in wet weather. Please confirm again when the weather is not wet.
The LCD screen cannot start up or work	The power supply line of the display screen is loose. The communication cable is wrongly connected or loose.	Check whether all wiring works and is firmly connected (power supply line and communication line). Confirm whether the A/B line is connected correctly. If the above things are fine, please replace the LCD display screen or contact

		manufacture Vision.
Dynamic dropout voltage: when discharging a single cell, a relatively great difference of dropout voltages	Copper strip of battery connection is loose or the welding nickel strip is weak. Self-discharge of the cell is over discharge, and differences exist between the capacity of other cells.	<ol style="list-style-type: none"> Determine the position of the defective cell module. Unpack and inspect the welding of the battery copper strip or nickel strip, and tighten the bolts. Charge and discharge the battery or replace the module. This is the only operations that the users could do or contact the manufacturer.

11.3.3 Routine maintenance

Table 11.3.3.1 Maintenance

Maintain Items	Methods and standards	Maintenance period
Connection of power cable	<ul style="list-style-type: none"> ❖ Check whether there is mechanical damage on the power cable; If the insulation wrapping of the terminal is falling off. If there is, it must be repaired or replaced. ❖ If the connection is loose, re-tighten it with standard torque. ❖ Check whether any screw is loose; whether there is color change in wiring copper bar. 	Once every six months
Connection of communication terminal	<ul style="list-style-type: none"> ❖ Check whether the parallel communication network cable is loose. Please tighten it again with a screwdriver. ❖ Check whether there is any peeling or color change on communication cable. If so, it must be replaced. 	Once every year
Fan	<ul style="list-style-type: none"> ❖ Check whether there is noise, fan clog or mechanical defect of the fan blade during operation. If so, replace the fan. 	Once every year
Cleaning system	<ul style="list-style-type: none"> ❖ Check whether the front and back doors of the cabinet and modules are attached with dust. Please clean the outlet and the CBMS panel in time. 	Once every six months to one year

Running status of system	<ul style="list-style-type: none"> ❖ Check the monitor LCD panel for any abnormal faults. ❖ Expert users check whether all parameters are normal when the system is working (total voltage, insulation, etc.). ❖ Check whether the main components of the system are normal: the mechanical closure of circuit breaker switch works; the contactor is in good mechanical condition (including auxiliary switch), etc. ❖ Check whether the inlet and outlet ventilation duct of the system is normal and clean it in time. 	Once every six months
Charge and discharge maintenance	<ul style="list-style-type: none"> ❖ Check whether SOC and SOH status of lithium battery system are normal, light load or shallow discharge and charge. Shallow discharge DOD: 10% is recommended. Check whether charging and discharging current and voltage collected by the system are consistent. 	Once every six months



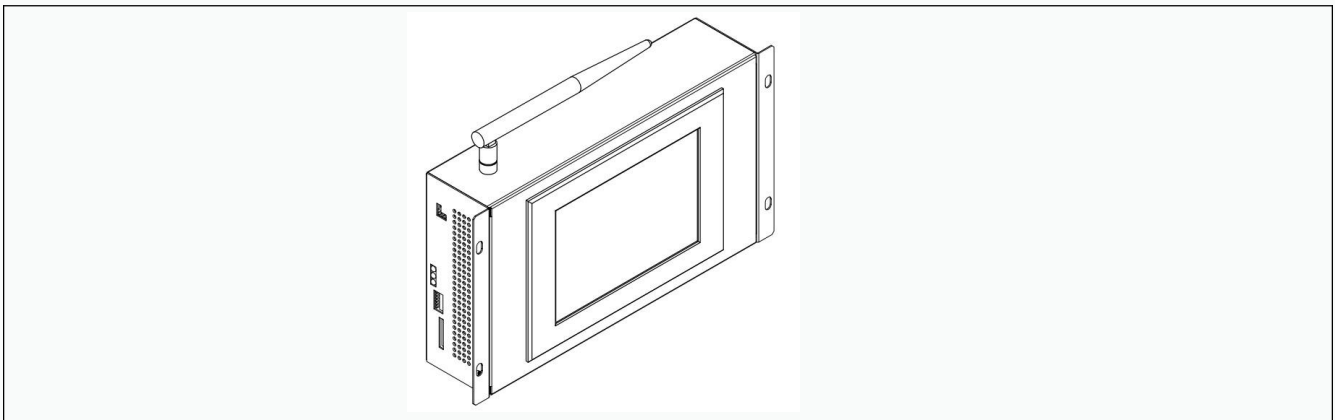
- ❖ Take good protective measures during maintenance. Wear insulating gloves and use insulating metal tools.
- ❖ At the end of maintenance, ensure the restoration of the objects that need to be removed, and ensure that all screws are fastened in place.

12 System monitoring

12.1 HMI monitoring

12.1.1 Product specifications

Table 12.1.1 BMS parameter overview



12.1.2 Performance

Table 12.1.2 GBMS performance specification

Item	Designation	Description
1	Communication interface with CBMS	CAN/RS485
2	Communication interface with UPS	CAN/RS485
3	Support IAP upgrade	Y
4	Support HMI display and parameter setting	Y
5	Dry contact output	3 output (1A@24VDC)
6	Dry contact input	1 input
7	Number of CBMS supported for management	≤15

SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision

8	Powered by	24VDC(18~28V)
9	Power consumption	15W MAX.4.8W Normal
10	Dimensions	66*280*170mm


12.1.3 Homepage

Figure 13.3.3.1 GBMS homepage preview



After the HMI starts, the home page will be displayed, and the content of the home page is as follows:

Table 12.1.3.2 HMI interface overview

Item	Description
Check	Display system self-check status: red cross means self-check failure, green tick means self-check success
Status	Display real-time charge and discharge status
Power	Display real-time power
Current	Display real-time system current
Voltage	Display real-time system voltage
 Monitor	Click to display the system monitoring page

SHENZHEN CENTER POWER TECH CO., LTD

Address: Rooms 9-12, 7F, Block B, Building 7, Zone 2, Shenzhen Bay Technological and Ecological Park, Nanshan District, Shenzhen, China

Tel: 0755-66851118 Fax: 0755-66850678 Email: sales@vision-batt.com

Green Our Earth Power Your Vision



Cell Data

Click to view the system cell data



Warning

Click to view the alarm status of the system and each CBMS



Setting

Click to set system related parameters

12.1.4 Real-time monitoring


Click the icon  on the homepage to enter the real-time monitoring page.

Figure 13.3.4.1 GBMS homepage preview

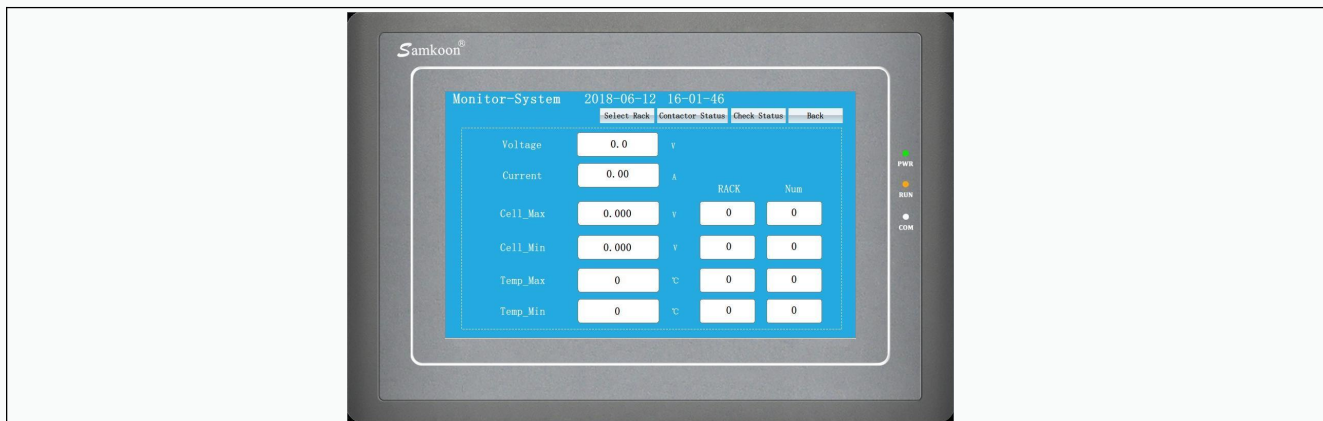


Table 12.1.4.1 HMI homepage overview

Item	Description
Voltage	System voltage
Current	System current
Cell_Max	Maximum cell voltage
Cell_Min	Minimum cell voltage
Temp_Max	Maximum cell temperature
Temp_Min	Minimum cell temperature
RACK	CBMS number of Maximum value
Num.....	Module number of Maximum value

12.1.5 Cell data


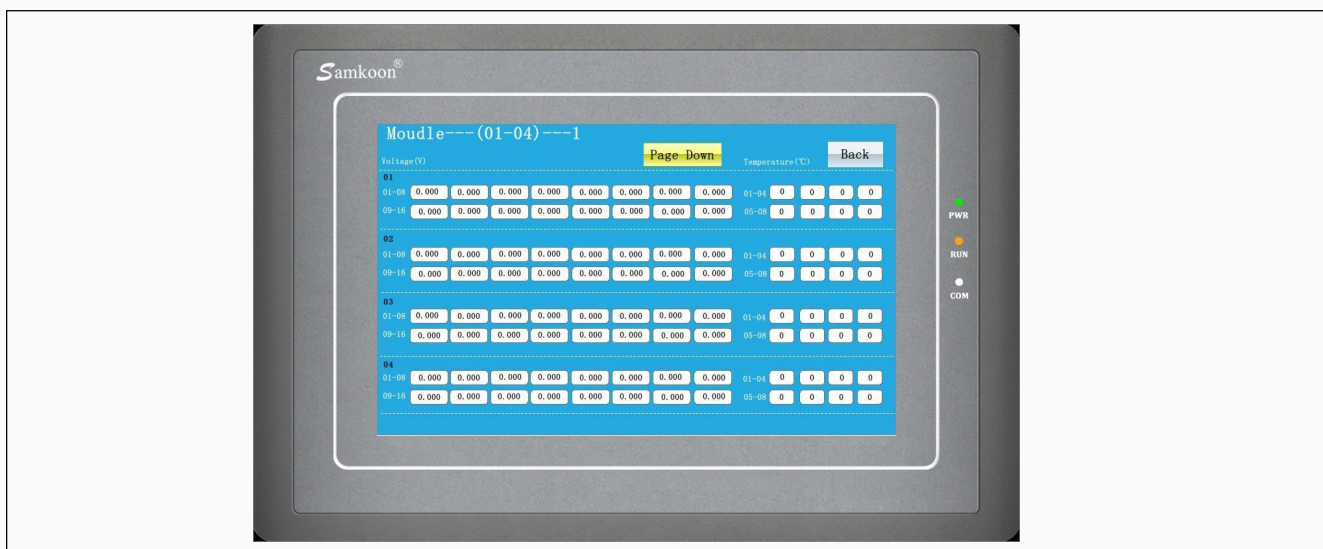
After clicking the icon  on the homepage and entering the cabinet selection page, users can click "+" or "-" to select the cabinet. Users can also directly enter the cabinet number, and click the "View" button to enter the single battery data page. Each page displays data of 4 group single battery modules. Users can click "Page Down" to view the data of the next 4 modules, and click "Page Up" to view the data of the previous 4 modules. Each module has up to 16 voltage values and 8 temperature values. If the actual number of battery cells in the module is less than 16, the unconnected battery will be displayed as empty and its temperature displayed as 200.

Figure 12.1.5 Cell data preview



12.1.6 Alarm/protection page


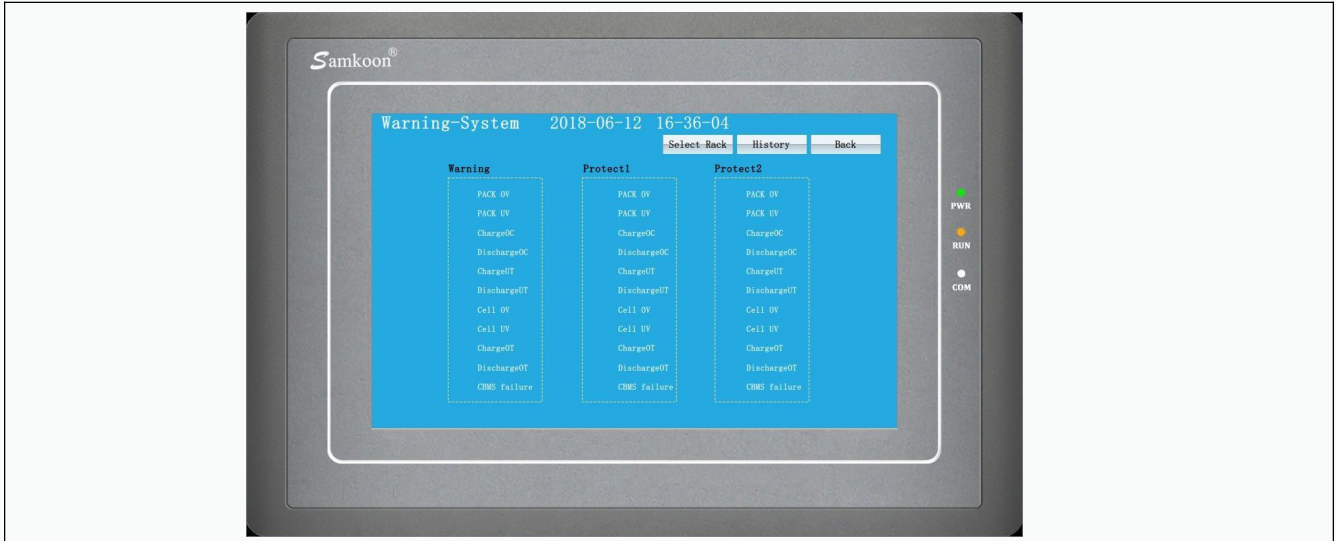
Click the icon  on the homepage to enter the alarm protection page.

Figure 13.3.6.1 Alarm/protection preview



12.1.7 Parameter setting page


Click the icon  on the homepage, and enter the password: 8888 in the pop-up login box to enter the parameter setting page. Currently, it only supports parameters setting of GBMS itself. The rated capacity of the system, the number of modules in a single cabinet, the number of battery strings in the module, the temperature of the module, and the managing number of CBMS need to be set.

Table 12.1.7.1 GBMS parameter setting overview

Item	Name	Description
1	Rated capacity	The total parallel capacity of the entire system
2	Module Num.	Number of modules connected in series
3	Cell In Module	Number of batteries in series in the module
4	Temp sensor in Module	Number of temperature sensors in the module
5	CBMS Num.	CBMS parallel number of the system
6	Redundant Num.	Number of battery rack redundancy
7	Intermittent Charging	System recharge time, the default is 28 days, usually shown as reset D1 dry contact

13 REVO 2.0 & REVO2.5 Mixed

13.1 Mixed use restriction

Ensure that the battery power of the REVO 2.0 battery system is consistent with that of the REVO 2.5 battery module.

(It is recommended that the module be full charge-SOC is 100%)

13.2 Using method after mixing(TP200/TP100)

●Charging procedure:

Recommended Charging voltage: 544V

Recommended Charging current: 0.2~0.5C

Charge cut-off current: 9A

● Discharging procedure:

Discharging Rate: According the specification of TP200/TP100

Discharge Cut-off Voltage :480V

13.3 Attention

The terminal positions of REVO 2.5 and REVO 2.0 battery modules are different, special power cables need to be used for connection.

14 Appendix

14.1 Factory warranty

14.2 Limitation of Liability

Liability exemption:

- ❖ In the following cases, our company has the right not to provide quality assurance.
- ❖ Customers does not install, use or modify properly following this Manual.
- ❖ Product is damaged in transit.
- ❖ Product failure is caused by installation, replacement or unloading by non-relevant technical personnel or personnel not from our company.
- ❖ Product failure and damage caused by operating environment beyond manual specification or abnormal natural environment, such as floods, typhoons, earthquakes, etc.
- ❖ Product failure or damage caused by wrong operation or installation not in accordance with relevant standards.
- ❖ The products exceed the warranty period.

For product failure or damage caused by the above reasons, if the customer requires replacement or maintenance services, we can provide corresponding paid services when our after-sales service confirm and evaluate the extent of damage.

14.3 About VISION

If you have any questions during the use or installation of the product, please contact the relevant personnel of Vision in time. Our company will arrange relevant after-sales service in time.

Contact information is as follows

Shenzhen Center Power Tech Co., Ltd.

CenterPower technology park, tongfu industrial zone, dapeng town, dapeng new district, shenzhen city

Tel: +86-755-66851118 Fax: +86-755-66850678

Email: sales@vision-batt.com

Web: www.senry-batt.com www.vision-batt.com

14.4 About storage

- a. Short-term lithium storage: if the lithium battery is not used for a short period of time(≤ 6 months), the battery should be stored in $20^{\circ}\text{C}\sim 35^{\circ}\text{C}$ & $35\%\sim 85\%$ non-denying environment;
- b. Long-term lithium storage: if the lithium battery is not used for a long time(≥ 12 months), the battery should be stored in $20^{\circ}\text{C}\sim 35^{\circ}\text{C}$ & $35\%\sim 85\%$ non-denying environment;
- c. Any batteries stored for longer than 12 months should be maintained, for an inspection the batteries voltage. Batteries whose voltage is less than 50.32V ($3.145\text{V}/\text{Cell}$), with the SOC less than 10%, need to be charged for $0.2\text{C}/15$ mins with 55.2V voltage.
- d. Storage period starts from the date of entry into the warehouse;
- e. Refer to the batteries maintenance for charging method.