



All-in-one Liquid-cooled Battery Cabinet

BESS-P418

Specifications

Change Resume

Edition	Content	Compile	Date updated	Remarks
A/1	New release	Li Sailei	2025. 12. 08	
A/2	New release	Li Sailei	2025. 12. 15	

Catalogue

I. Scope of Application.....	1
II. Implementation Standards.....	1
III. Product Introduction.....	2
IV. System Technical Parameters.....	3
V. Product Introduction.....	4
5.1 cell PACK.....	4
5.2 high-voltage compartment.....	7
5.3 control cabinet.....	9
5.4 liquid cooling unit.....	11
5.5 PCS (Power Conversion System).....	12
VI. Product Packaging, Transportation, and Storage.....	13
6.1 product packaging.....	13
6.2 Product transportation.....	13
6.3 product accumulation.....	14
VII. Warranty Statement.....	14
VIII. Product Safety Usage Guidelines.....	15

I. Scope of Application

This product specification document specifies the performance parameters, transportation and storage requirements, operating conditions, precautions, and risk warnings for the liquid-cooled integrated cabinet designed for energy storage applications, manufactured by SAIL SOLAR Energy Co., Ltd. (hereinafter referred to as SAIL SOLAR).

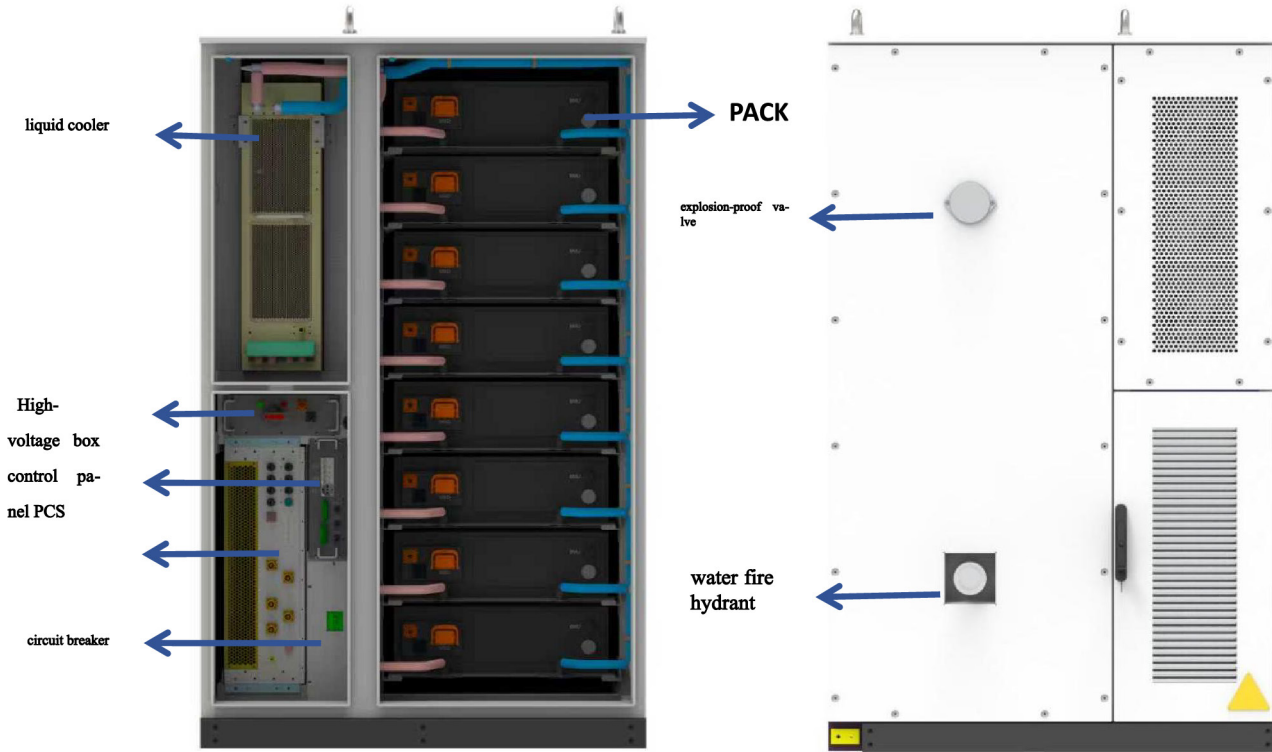
II. Implementation Standards

IEC 62619-2022 Safety requirements and test methods for industrial (including stationary) lithium batteries and lithium battery packs

IEC63056-2020 Secondary batteries and battery packs containing alkaline or other non-acid electrolytes. Safety requirements for secondary lithium batteries and battery packs used in energy storage systems

IEC62477-1	Safety requirements for power electronic converter systems and equipment Part 1: General
GB/T 36276-2023	Lithium-ion Battery for Electric Power Storage
GB34131-2023	Battery Management System for Electric Power Storage
GB/T 34120-2017	Technical Specification of Energy Storage Converter for Electrochemical Energy Storage System
GB/T 36547-2018	Technical Specification for Grid Connection of Electrochemical Energy Storage System
GB 4208-2008	IP code
GB/T 17626	Electromagnetic Compatibility Test and Measurement Technology
GB 14048.1-2006	Low-voltage switchgear and control equipment Part 1: General principles
IEC60068-2-6	<small>Environmental test of electrical and electronic products</small> Parts 2-6: Vibration (sine)
IEC62619-2022	
Safety requirements for batteries	Secondary batteries and accumulators containing alkaline or other non-acid electrolytes. Industrial secondary lithium batteries and accumulators

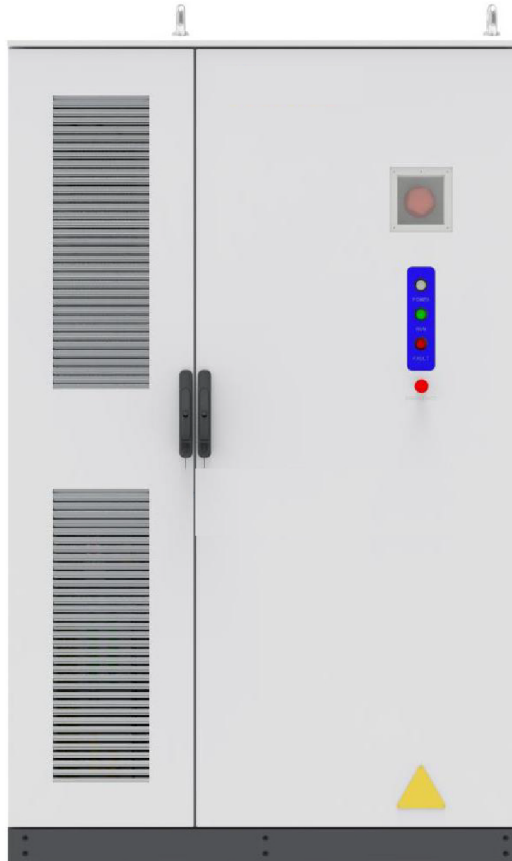
III. Product Introduction



Schematic diagram of energy storage cabinet layout

Order number	Component	Quantity	Remarks
1	PCS (Power Conversion System)	1	210kW
2	High-voltage compartment	1	/
3	Fire fighting component	1	Smoke, heat, aerosol, and water fire protection interfaces
4	PACK	8	The serial-parallel configuration of a single PACK is 1P52S.
5	Liquid cooling unit	1	8kW (W18/L45)
6	Cabinet	1	1500 (width) * 1350 (depth) * 2400 (height) (mm)
7	Explosion-proof valve	1	/
8	Water fire hydrant	1	DN65

IV. System Technical Parameters



Physical Image of Energy Storage Cabinet

Project	Specifications			Remarks
DC side parameters				
Battery type	LFP 314Ah			
System grouping	1P416S			
Rated energy	417.996kWh			100%DOD, (25±2) °C, 0.5P
Rated capacity	314Ah			
Rated voltage	1331.2V			
Recommended operating voltage	DC 1164.8~1497.6V			The lower limit of the voltage for a single unit is 2.8V.
				The upper limit of the voltage of the monomer is 3.6V.
AC side parameter				
Output rating	105kW	210kW	210kW	

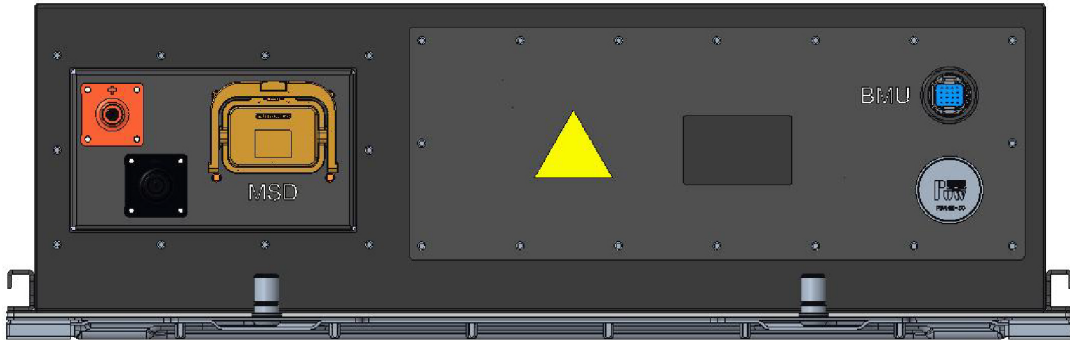
Rated voltage of power grid	400V AC/3W	690V AC/3W	800V AC/3W	
Rated grid frequency	50Hz/60Hz ± 5Hz			
AC distortion rate	≤3%			
Power factor adjustable range	-1~+1			
System parameter				
Energy conversion efficiency	≥89%			Excluding auxiliary power consumption of the energy storage cabinet
Charge-discharge rate	≤0.25P	≤0.5P	≤0.5P	
Depth of discharge	95%DOD			
Levels of protection	IP55			
Cooling-down method	Active liquid cooling			
Working temperature	-25~55℃			
Relative humidity	0~95%RH			
Working altitude	≤2000m			The rated capacity is reduced for applications above 2000m, with the maximum applicable altitude ≤ 4000m.
Dimensions (W*D*H)	1500*1350*2400mm			
Full container weight	Approximately 3800kg			
Fire extinguisher system	PACK-class aerosol + space-class aerosol fire extinguishing + water fire fighting interface			
Communication interface	Ethernet/RS485/CAN			
Meet a criterion	UN38.3 IEC 62619、 IEC 62477、 IEC 63056、 、CE-EMC			

V. Product Introduction

5.1 Battery PACK

Each 418kWh liquid-cooled cabinet contains 8 battery PACKs, with the topmost PACK being 8#PACK and the numbers decreasing sequentially from 8#PACK down to 1#PACK. Each 1P52S

liquid-cooled PACK consists of 52 LFP-314Ah cells arranged in series and parallel.



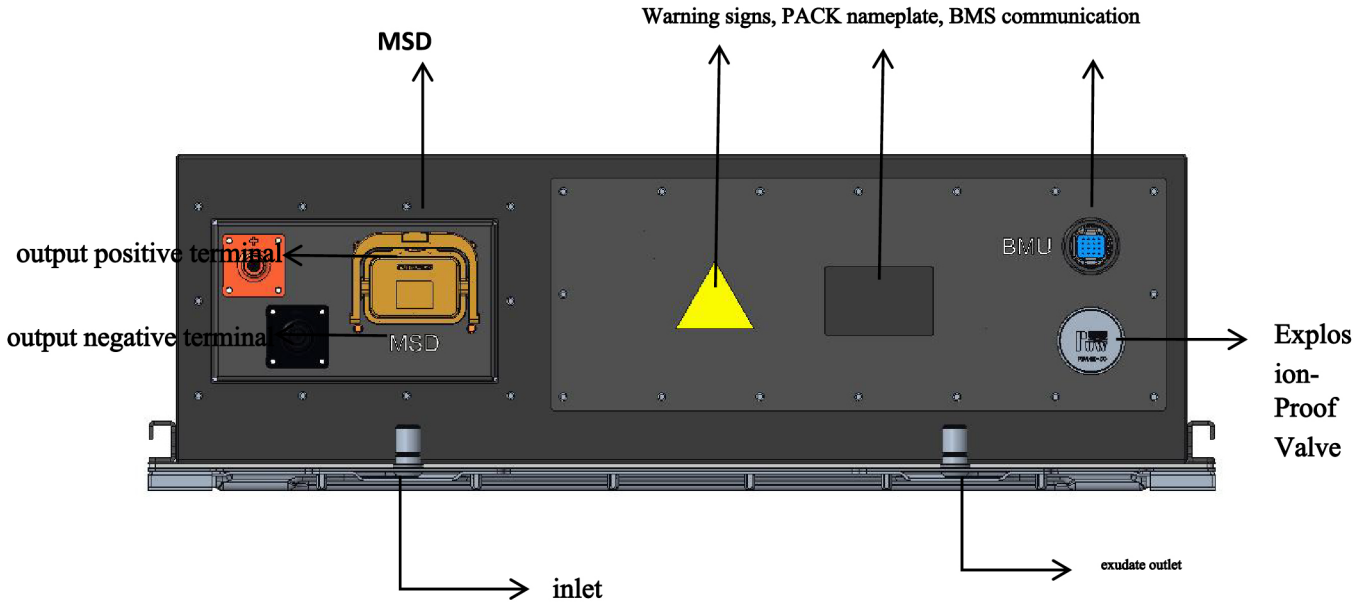
Schematic Diagram of the 1P52S Liquid-Cooled PACK Package

See the Table Below for Specific Parameters:

Order number	Project	Parameter	Condition
1	Model	BESS-P418	/
2	Cell capacity	LFP314Ah	Standard charge and discharge
3	Serial mode	1P52S	/
4	Nominal energy	52.249kWh	Standard charge and discharge
5	Nominal voltage	DC 166.4V	Standard charge and discharge
6	Recommended voltage range	DC145.6~187.2	The voltage of the monomer is 2.8~3.6
7	Charge rate	0.5P	Constant power
8	Cooling-down method	Liquid cooling	
9	Size (W*D*H)	780*1140*245mm	View drawing
10	Weight	Approximately 352kg	With connecting busbar
11	Levels of protection	IP65	
12	Operating temperature range	-25 to 55°C (discharge)	Cell temperature
13		0~55°C (charging)	
14	Recommended ambient temperature range	15~35°C	
15	Storage temperature range	-25~55°C	After 3 months of storage, charge once for maintenance
16	Storage humidity	<75% RH, no condensation	
17	Applicable system voltage	≤1500V DC	

	level		
--	-------	--	--

18	Communication mode	CAN	/
19	Shipment SOC	30%~50%	(25±2) °C
20	Product life guaranteed operating condition	(25±2) °C	/



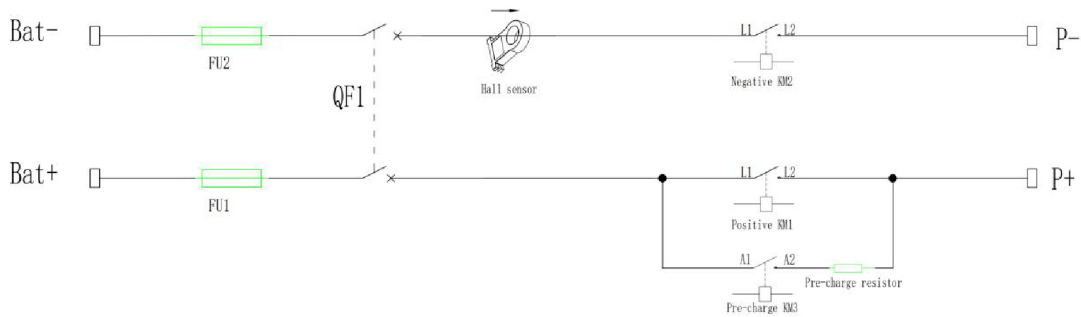
Schematic diagram of 1P52S liquid-cooled PACK panel

Order number	Component	Model	Quantity	Remarks
1	Output positive terminal	ES-FT-BPC-B/S 35-70 OG	1	PACK Package B+
2	Output negative terminal	ES-FT-BPC-B/S 35-70 BK	1	PACK Package B-
3	MSD	FMSD2602T01-M61Z	1	Manual maintenance switch
4	BMU communication interface	Communication socket USCM 012-R03_A	1	BMU communication interface
6	Blast-hole	CQC18	1	Blast-hole
7	Delivery port	CQC18	1	Delivery port

5.2 High-Voltage Compartment

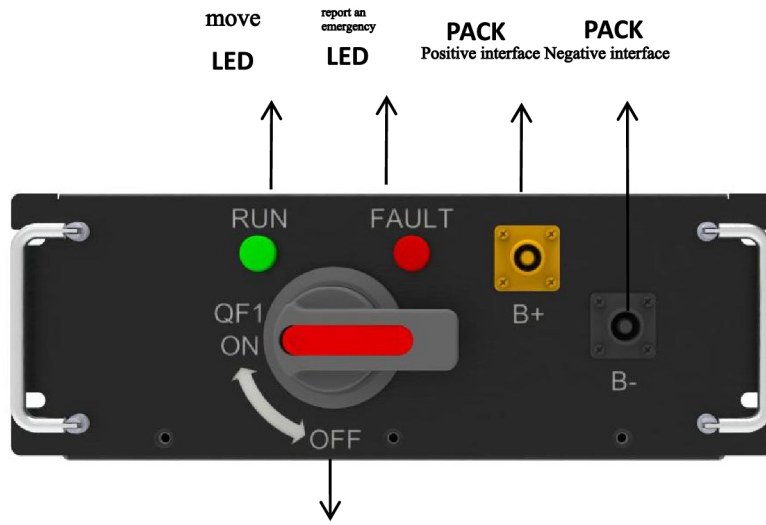


Physical appearance of high voltage box



high voltage box schematic

Order number	Project	Parameter	Remarks
1	Size (W*D*H)	350×840×140mm	View drawing
2	Weight	About 40kg	
3	Power input	AC 220V	High voltage box power supply
4	Low voltage output	DC 24V	High voltage box control power supply output
5	Rated high voltage output	DC 1331.2V	DC 1164.8~1497.6V
6	Working temperature	-25~55℃	
7	Current accuracy	±1%FSR	
8	Voltage accuracy	±1%FSR	
9	Levels of protection	IP20	



DC Main Switch

Diagram of Front Panel Layout of High Voltage Box

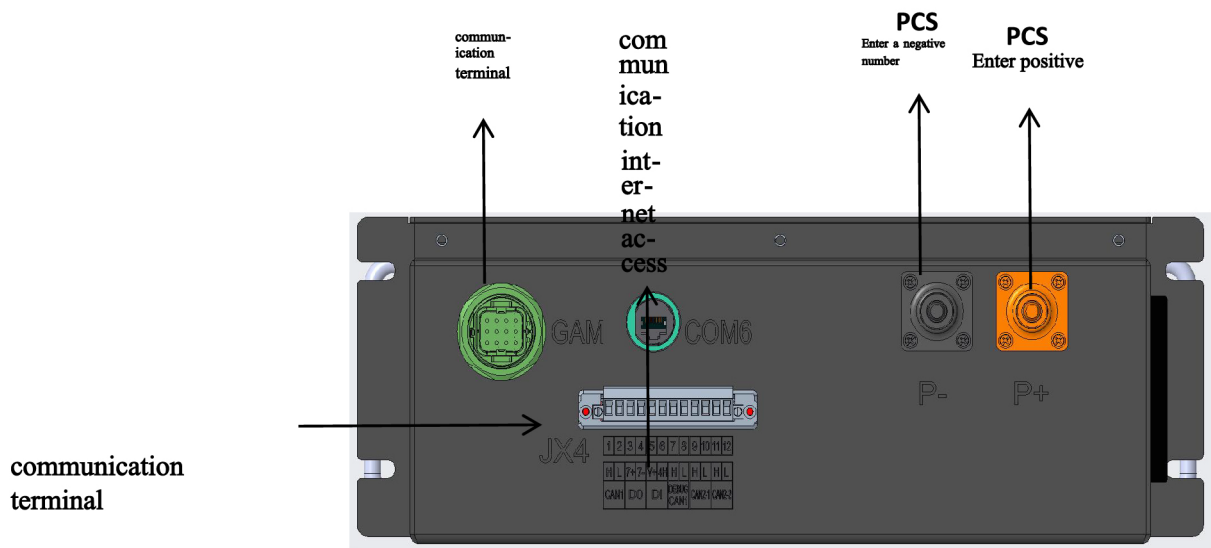


Diagram of Rear Panel Layout of High Voltage Box

Order number	Component	Model	Quantity	Remarks
1	P+	ES-FT-BPC-B/S 35-70 OG	1	Primary Central Station PCS
2	P-	ES-FT-BPC-B/S 35-70 BK	1	Main to PCS
3	B+	ES-FT-BPC-B/S 35-70 OG	1	Main Daypack
4	B-	ES-FT-BPC-B/S 35-70 BK	1	Main responsible for PACK

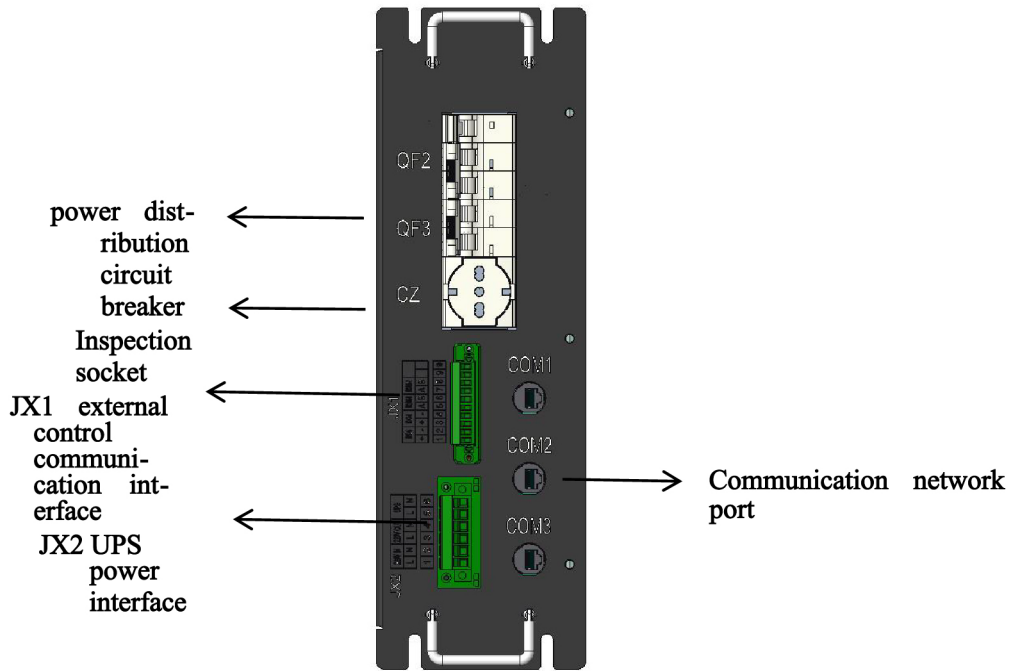
5	GAM	USCM016-R03_A	1	BMU communication interface
6	COM6	SPRJS-5EPFFJ-TC7002	1	BCU network interface communication
7	JX4	PLB2. 5-12-5. 08-01F	1	BMU/PCS/Debug Communication Interface
8	QF1	CGD3-315/2S02W1F11	1	DC side main switch
9	Move	XB6EAV3BF	1	BCU output running signal
10	Hitch	XB6EAV4BF	1	High voltage box alarm indication

5.3 Control Cabinet

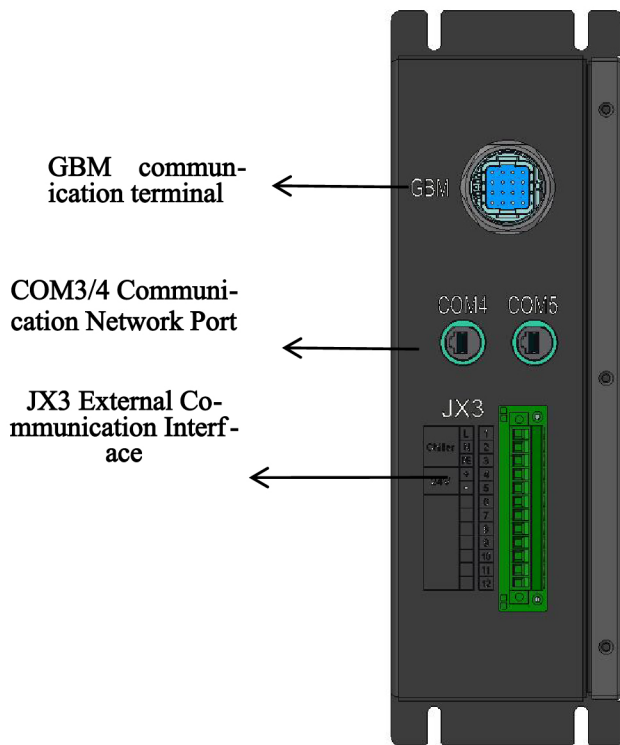


Physical appearance diagram of control box

Order number	Project	Parameter	Remarks
1	Size (W*D*H)	360×840×130mm	View drawing
2	Weight	About 30kg	
3	Low voltage output	DC 24V	Control box control power output
4	Working temperature	-25~55℃	
5	Levels of protection	IP20	



Schematic diagram of front panel layout of control box



Schematic diagram of rear panel layout of control box

Order number	Component	Model	Quantity	Remarks
1	GBM	USCM016-R03_A	1	Communication Terminal B
2	JX1	LB2. 5-10-5. 08-01F	1	External communication wiring
3	JX2	LC10UMG-7. 62-6P-1Y-00A	1	Terminals for power supplies
4	JX3	LC10UMG-7. 62-12P-1Y-00A	1	Power terminal
5	QF2	SFB1-63HC32/2P	1	220V power switch for the entire cabinet
6	QF3	SFB1-63HC10/2P	1	24V power switch
7	CZ	AC30-10530 10A	1	Inspection socket
8	COM1	SPRJS-5EPFFJ-TC7002	1	DHCP
9	COM2	SPRJS-5EPFFJ-TC7002	1	4G gateway communication
10	COM3	SPRJS-5EPFFJ-TC7002	1	Obligate
11	COM4	SPRJS-5EPFFJ-TC7002	1	PCS communication
12	COM5	SPRJS-5EPFFJ-TC7002	1	BCU communication

5.4 Liquid Cooling Unit



physical appearance of chiller

The 418kWh liquid-cooled integrated cabinet features an 8kW AC-powered drawer-type

chiller. With its compact design, the unit houses all components within a single enclosure, ensuring easy installation and maintenance. It supports RS485 communication and power interruption protection.

The liquid-cooled unit is equipped with a variable frequency compressor and a variable frequency water pump, which can realize the double frequency conversion of the refrigeration system and the coolant circulation system, and achieve high efficiency and energy saving in the operation process.

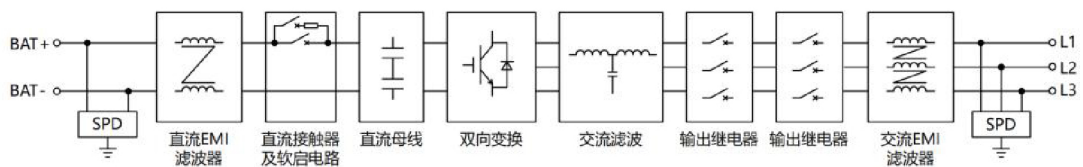
The liquid cooling method has the advantages of small temperature difference and fast cooling, which can effectively prolong the battery life and delay the decay.

5.5 PCS(Power Conversion System)



PCS Physical Appearance Diagram

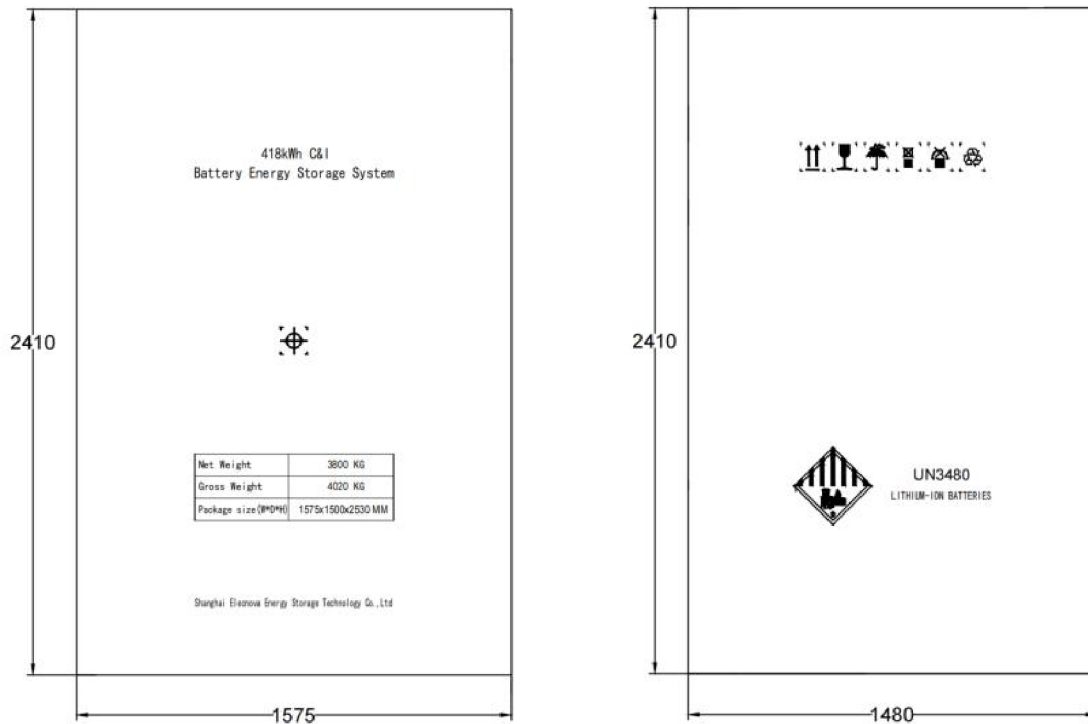
A Power Conversion System (PCS) is a bidirectional current-controlled converter that connects energy storage battery systems to the power grid, with primary functions including... It is to realize the energy exchange between lithium battery and power grid, and to control and manage the charge and discharge of lithium battery system.



PCS schematic diagram

VI. Product Packaging, Transportation, and Storage

6.1 Product Packaging



The product comes in factory-packaged wooden crates by default.

- ① After disconnecting the connecting wires between battery packs (PACK), they should be individually packaged with corresponding documentation.
- ② Place the entire cabinet on the prepared wooden pallet and secure it with bolts to the corresponding base feet of the cabinet.
- ③ On the fixed wooden box, the corresponding information of the energy storage cabinet is affixed.

6.2 Product Transportation

- travel position

The SOC of this product at factory release ranges from 30% to 50%. During shipment, all power circuit switches/MSDs must be disconnected, and the positive/negative power cables between battery packs (PACK) as well as the power cables of the high-voltage box and control box should be removed to ensure transportation safety. This cabinet product is transported as a single unit.

- Transportation requirements

- 1) The transportation of liquid-cooled integrated cabinet assemblies must comply with the

relevant requirements of UN 3536.

-
- 2) The special lifting point of liquid-cooled integrated cabinet assembly is located at the top lifting ring, and the lifting equipment has the required load capacity.
 - 3) The liquid-cooled cabinet should be protected from being inverted, violently vibrating, and being impacted or squeezed during transportation.
 - 4) The liquid-cooled integrated cabinet can be transported by trucks, trains, ships, and other means of transportation.
 - 5) When transporting liquid-cooled integrated cabinets, the speed should not exceed 80 km/h on first and second-class highways, and 36 km/h on third-class highways. The cabinet and its equipment must not deform or suffer functional damage that could affect their shape compatibility.
 - 6) All spare parts and components shipped with the cabinet must be properly packaged, clearly labeled with their names, quantities, and other essential details, and meet maritime shipping requirements.

6.3 Product Accumulation

The SOC of EC0-E418LP liquid-cooled integrated cabinet storage should be maintained within 30% to 50%. For storage periods exceeding 1 month but not exceeding 3 months, customers should perform a full charge-discharge cycle in advance to adjust the SOC to 30%–50%. Illinois will not be liable for any capacity loss or other damages caused by customers failing to follow the manufacturer's recommended storage conditions.

VII. Warranty Statement

The shelf life of the product is determined by the commercial contract. During this period, if safety issues, performance degradation, or abnormal deterioration occur due to factors beyond the manufacturer's control (e.g., design, production process, or quality control), Illinois only provides technical consultation support and paid replacement or repair services. It does not guarantee free repairs or replacements.

- 1、 Unauthorized disassembly or installation of the EC0-E418LP liquid-cooled unit and its accessories is strictly prohibited without prior authorization from Illinois. Should customers proceed with unauthorized modifications, Illinois shall not be liable for any resulting accidents or warranty services.
 - 2、 Elianova shall not be liable for any issues or accidents caused by unauthorized personnel operations or non-product-related abnormalities.
- All issues and accidents arising from violations of laws, industry standards, technical

agreements, the safety guidelines herein, or usage restrictions.

- Abnormalities caused by non-Illinois personnel during installation and use;
- Problems caused by improper use of electrical equipment when combined with this product.
- Exceeding the battery's performance limits, resulting in issues from overuse.
- Do not connect this product directly to batteries of other types, models, or manufacturers.
- Do not modify this product without the manufacturer's permission.

VIII. Product Safety Guidelines

To prevent equipment damage or personal injury caused by misuse of the liquid-cooled integrated cabinet, please carefully read the safety guidelines below before using this product.

- Improper use and storage of batteries in liquid-cooled integrated cabinets pose risks of fire, explosion, and burns. Do not disassemble, crush, incinerate, heat, or dispose of batteries in open flames.
- When replacing batteries or battery PACKs, always use those of the same specifications manufactured by Illinois. Mixing batteries from different manufacturers may degrade performance and even pose risks of fire or explosion.
- Do not immerse the battery, battery pack, or this product in water or allow it to become wet.
- Do not short-circuit, overcharge, or over-discharge the battery, battery pack, or this product.
- Do not install, use, or store liquid-cooled integrated cabinets near heat sources (e.g., fire or heaters). It is strictly prohibited to pile any combustible or flammable materials around such cabinets.
- Do not puncture the battery or battery PACK housing. Avoid any impact, throwing, striking, stepping on, heavy pressure, or rolling the battery.
- Do not disassemble, repair, or modify this product without authorization.
- If the device emits an odor, heats up, deforms, changes color, or exhibits any other abnormal behavior, immediately stop using it and move the faulty battery component to the emergency disposal site.
- In the event of a battery fire, immediately disconnect the high and low voltage circuits, and prioritize the use of dry powder fire extinguishers or sand for suppression. If water is used for firefighting, ensure an absolutely sufficient amount of water is applied to maintain prolonged submersion. The use of insufficient water to spray the battery assembly is strictly prohibited.
- Unauthorized disassembly of the liquid-cooled integrated cabinet's main unit, modification or alteration of its system design and architecture without Illinois consent is prohibited to avoid compromising battery performance.



www.sailsolarpv.com



www.sailsolaress.com

ADD: Building 7, Cross Border E-Commerce Supervision Zone Hefei, China