Product Specification

KJ-BESS-125-261L

Liquid-Cooled All-in-One Battery Energy Storage Cabinet



KONJA POWER

Shenzhen Konja Green Power Technology Co.,Ltd

Version Record

Version	Change Content	Revised by	Revision Date
V1.0	First Edition		2024/01/12
V1.1	Second Edition		2025/1/9
V1.2	Third Edition		2025/12/29

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1 Overview

This document introduces the functions and specifications of the 125kW/261kWh energy storage cabinet from Shenzhen Konja Green Power Technology Co., Ltd. For normal operation of the product, the user manual must be followed. We reserve the right to modify the product specifications at any time without prior notice.

1.1 Production Introduction

The system consists of 5 units of 166.4V/314Ah modules with a rated energy of 261.248kWh, high voltage box, 125kW PCS, EMS controller, liquid cooling unit, fire protection system, using outdoor design with IP55 protection level. This system is applicable to a variety of industrial and commercial scenarios, such as peak shaving and valley filling, renewable energy accommodation, dynamic electricity pricing, ancillary services, backup power supply and off-grid application etc.

1.2 Abbreviation of Terms

No.	Abbreviation	Term
1	Cell	Battery Cell
2	Pack	Battery Pack
3	Cluster	Consist of multiple battery packs and high voltage control box
4	BMS	Battery Management System
5	PCS	Power Conversion System
6	EMS	Energy Management System
7	CAN	Controller Area Network
8	SOC	State of Charge
9	SOH	State of Health

2 System Introduction

2.1 System Technical Parameters

Table 2.1.1 System Parameters

No.	Items	Specification
1	Nominal energy	261kWh
2	Usable energy	≥242kWh
3	Nominal output power	125kW
4	Rated DC charging and discharging current	157A
5	Working environment temperature	-20℃~50℃
6	Design life	15 years
7	Degree of protection	IP55
8	Anti-corrosion grade	C4
9	Dimension（W*H*D）	1000*2250*1350mm
10	Weight	≈2500kg
11	Fire suppression medium	Aerosol
12	Certification	IEC62477/IEC61000/IEC62619/UN38.3
DC parameters		
13	Voltage range	728V～949V
14	Nominal DC power	130kW
15	Voltage regulation accuracy	≤±2%
16	Steady current accuracy	≤±5%
17	Protection	Voltage & Current & Temperature etc.
AC parameters（on-grid）		
18	Nominal output current	180A
19	AC access method	Three-phase four-wire
20	Grid voltage range	400V(-15%～+10%)
21	Grid frequency range	50Hz/60Hz ±2.5Hz
22	THDi	≤3%(Full load)
23	Power factor	-1～+1
24	DC component of current	≤0.5%
25	On and off-grid switching time	Minimum 20ms
AC parameters（off-grid）		
26	AC off-grid voltage	400V
27	AC voltage range	400V±3%
28	AC off-grid frequency	50Hz/60Hz
29	Off-grid output THDu	≤3%(linear load)
30	Unbalanced load capacity	100%

2.2 System Components

Table 2.2.1 Checklist of System Components

No.	Components	Quantity	Remark
1	Cell	260	LFP 314Ah , 1004.8Wh
2	Pack	5	Configuration: 1P52S, 52.2496kWh
3	Cluster	1	Configuration: 1P260S, 261.248kWh
4	High Voltage Control Box	1	Functions: Data collection of cluster voltage and current, cluster power circuit management, protection control, etc.
5	Power Conversion System	1	125kW
6	Battery Management System	1	Two-tier Architecture: BMU, BCU
7	EMS	1	Energy Management System
8	Liquid Cooling Unit	1	Rated input power 3600W
9	Fire Protection System	1	Gas (aerosol) fire protection
10	Cabinet	1	1000*2250*1350mm

2.3 System Layout

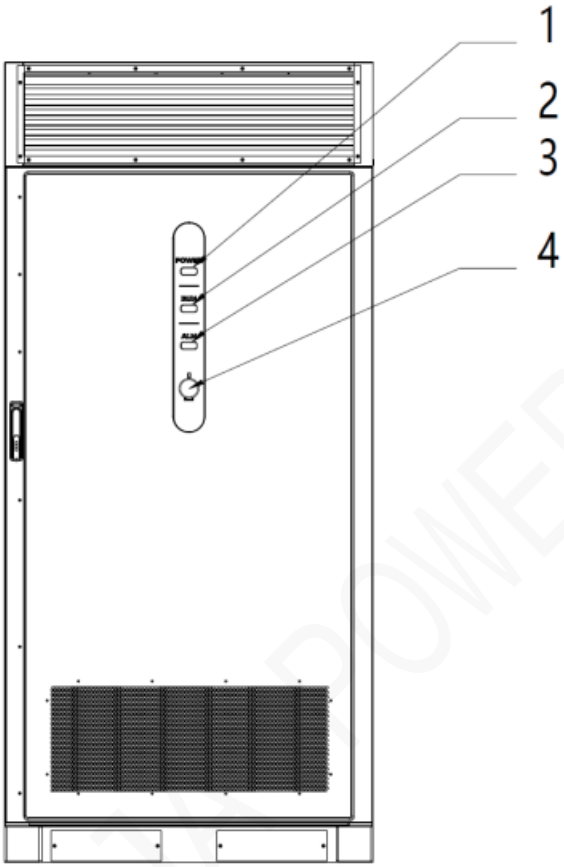


Figure 2.3.1 Closed door status

No.	Description	Explanation
1	Power Indicator	Displays mains power status (light is on when mains power is present, off when absent)
2	Run Indicator	Displays running status (light blinks every 0.5s during system charging, stays on during system discharging/standby)
3	Alarm Indicator	Displays fault alarms
4	Emergency Stop Switch	Used for emergency power-off

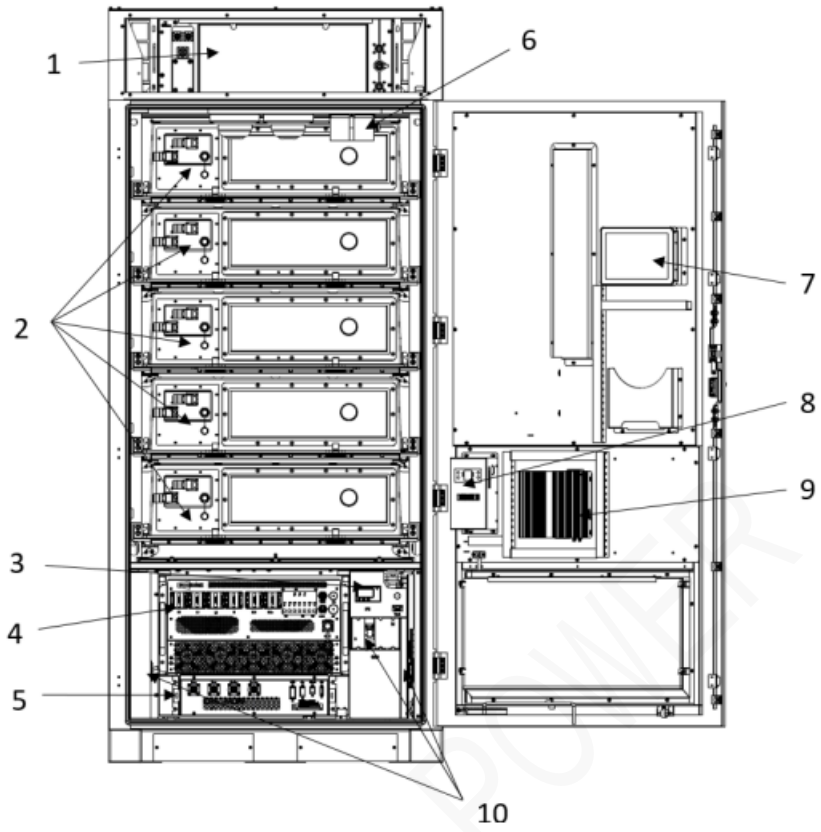


Figure 2.3.2 Opened front door status

No.	Description	Explanation
1	Liquid Cooling Unit	Used for heat dissipation and heating
2	Liquid Cooling Module	5 liquid cooling modules
3	PM	Power Meter
4	PCS	Bidirectional conversion between DC and AC
5	High-Voltage Box	Controls power-on/off of battery modules, detects information of each module
6	Fire Suppression Device	Used for fire prevention and control
7	Display Screen	Used for local data monitoring and O&M
8	Dehumidifier	Reduces humidity on the battery side
9	EMS	Energy Management System
10	User Operation Switches	Power distribution area operations

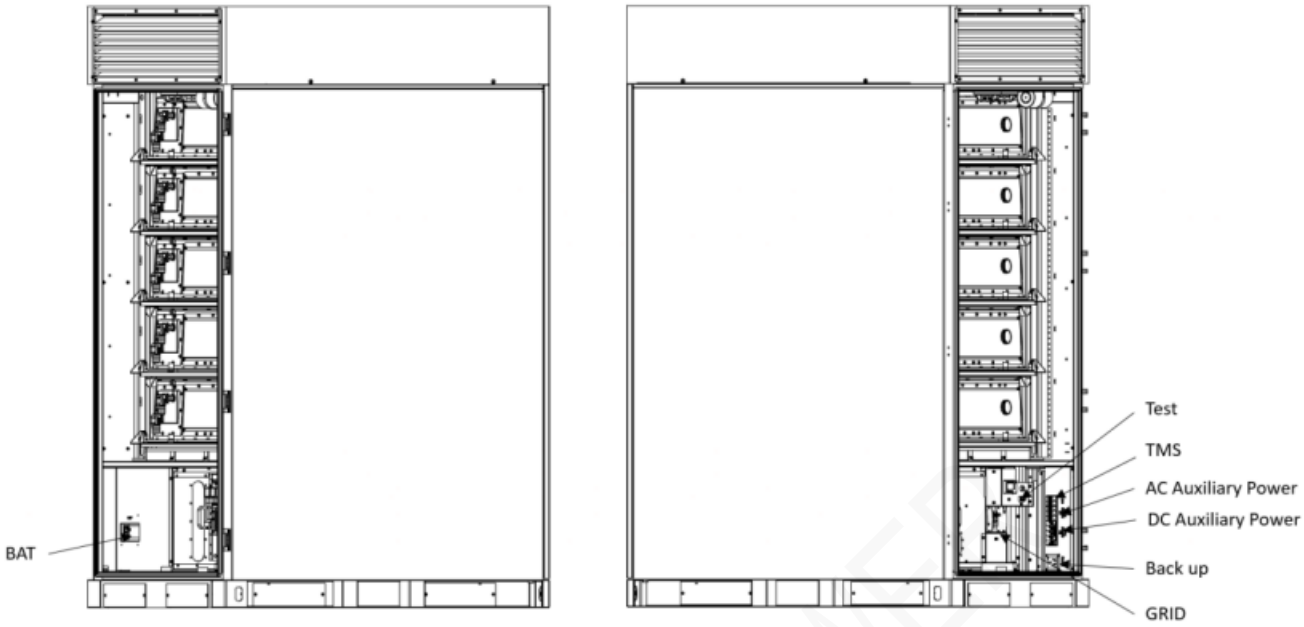


Figure 2.3.3 Distribution Compartment Panel

No.	Description	Explanation
1	Test	BMS debugging interface
2	TMS	Liquid cooling unit power switch
3	AC Auxiliary Power	AC auxiliary power switch
4	DC Auxiliary Power	DC auxiliary power switch
5	Backup	Backup power socket
6	GRID	Grid power switch
7	BAT	Battery cluster DC switch

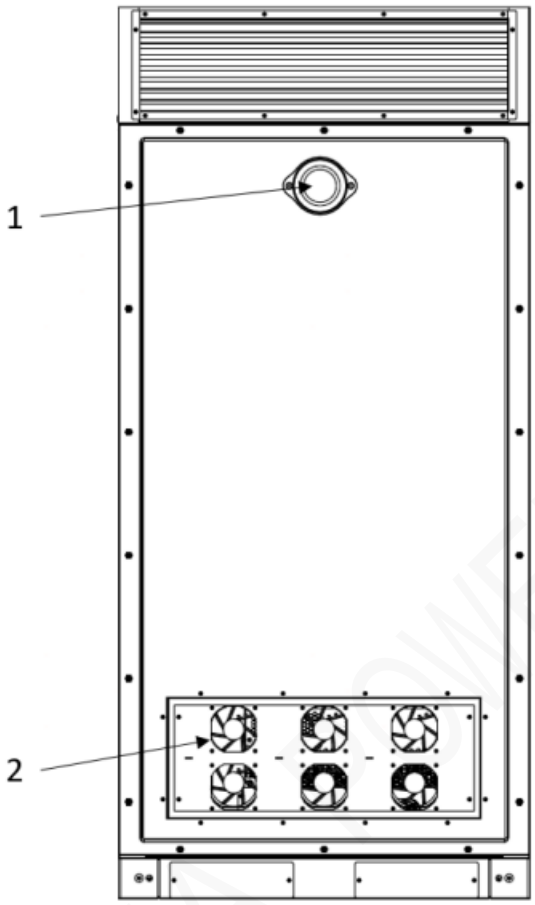


Figure 2.3.4 Opened back door status

No.	Description	Explanation
1	Pressure Relief Valve	Emergency pressure relief to prevent excessive internal cabinet pressure
2	Fan	Used for heat dissipation in the power distribution compartment

3 Introduction of System Components

3.1 Battery System

3.1.1 Battery Cell

This product uses lithium iron phosphate cells with a capacity of 314Ah. The technical parameters are as follows:



Table 3.1.1 Battery Cell Parameters

No.	Item	Specification
1	Nominal capacity	314Ah
2	Nominal energy	1004.8Wh
3	Nominal Charge and Discharge Power	502.4W
4	Nominal voltage	3.2V
5	Cut-off Voltage	3.65V
6	End-off Voltage	2.5V (T>0℃) 2.0V (T≤0℃)
7	Operating temperature	Charging:0～60℃ Discharging:-30～60℃
8	Dimensions (W*H*D)	(173.7±0.5m)*(207.2±0.5)*(71.7±0.8)mm
9	Weight	5.6±0.3kg

3.1.2 Battery Pack

The battery pack is the smallest removable energy storage unit in the battery system. It is configured by battery cells, acquisition wires, BMU, safety valve, fuse, cooling plate and other components. The case adopts die-casting process, liquid cooling channels are molded integrally with the case, with mature technology, consistency,high reliability, light weight and no risk of coolant leakage. The outline diagram is as follows.

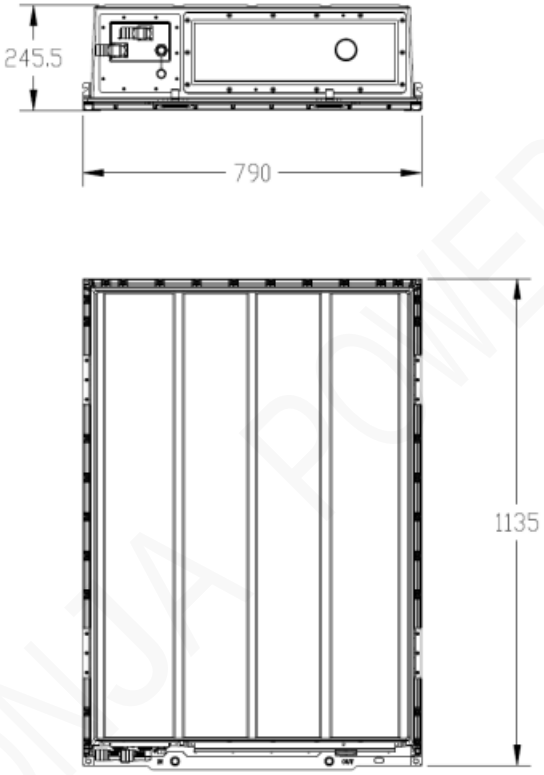


Table 3.1.2 Battery Pack Parameters

No.	Item	Specification
1	Configuration	1P52S
2	Rated energy	52.2496kWh
3	Rated voltage	166.4V
4	Operating voltage range	145.6~187.2V
5	Rated power	26.1248kW
6	Storage temperature	-30～50℃ （Recommended: 0～35℃, 30~40%SOC）
7	Storage humidity	≤95%, no condensation
8	Dimensions（W*H*D）	(790±2)*(245.5±2)*(1135±2)mm
9	Weight	≈330kg

3.1.3 Battery Cluster

The whole battery cluster consists of 5 units of 166.4V 314Ah battery modules, which results in energy of 261.248kWh.

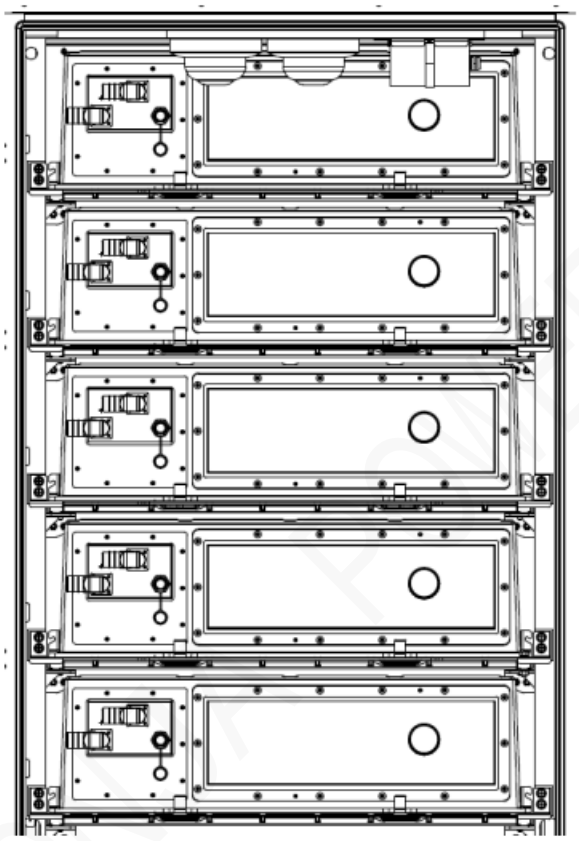


Table 3.1.3 Battery Cluster Parameters

No.	Item	Specification
1	Configuration	1P260S
2	Rated energy	261.248kWh
3	Rated voltage	832V
4	Operating voltage range	728V~949V
5	Rated power	130.624kW
6	Storage temperature	-30~50℃ （Recommended: 0~35℃, 30~40%SOC）
7	Storage humidity	≤95%, no condensation
8	Weight	≈1650kg

3.2 High Voltage Control Box

The high-voltage control box is an intermediary unit connecting the battery cluster and PCS. It integrates components such as circuit breakers, fuses, circulation control circuits, current sensors, battery cluster control management modules (BCU), and switch power supplies. It has the functions such as management of high-voltage power circuits, data collection of battery cluster voltage and current, and control of battery cluster circuit contactors, etc. Its appearance and interfaces are shown below.

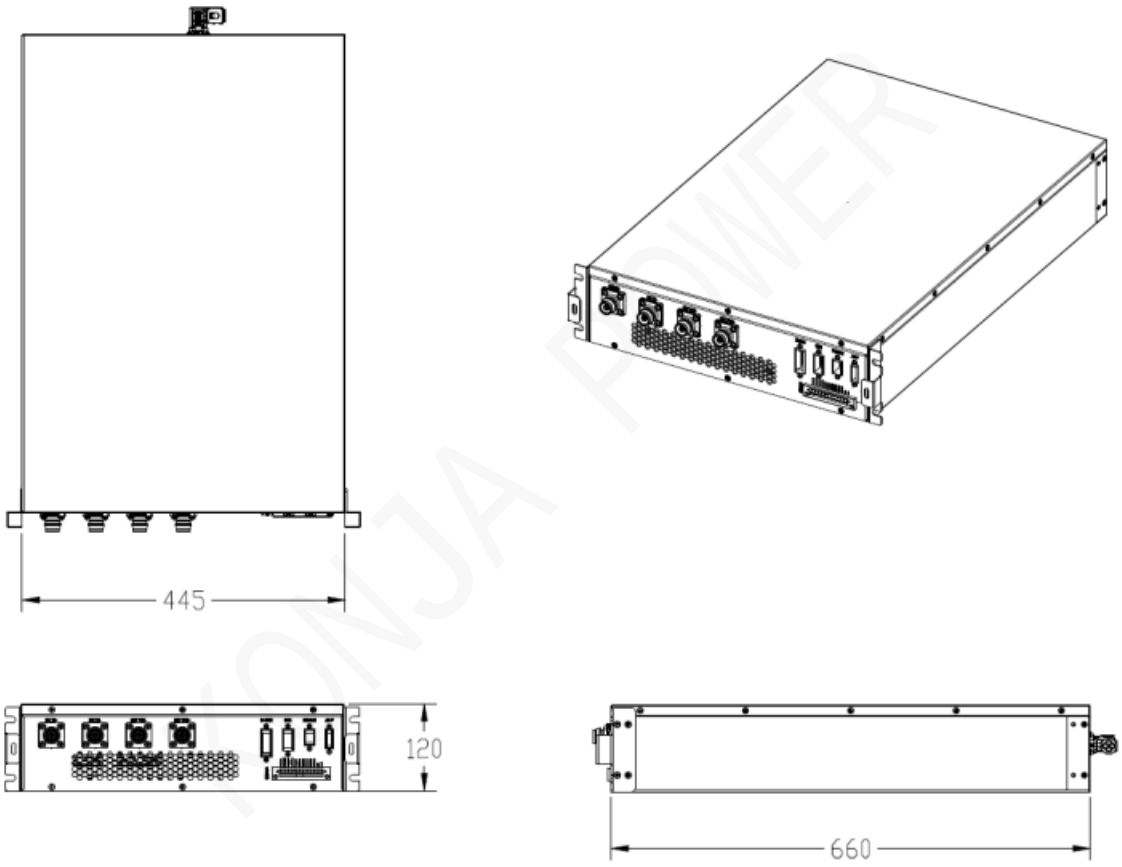


Table 3.2.1 Interfaces of High Voltage Control Box

No.	Item	Specification
1	Max. Operating Voltage	1000V
2	Max. Operating Current	200A
3	Communication to EMS	RS485
4	Communication to PCS	CAN
5	Communication to Module	CAN

6	Panel Terminals	BAT IN+/BAT IN-：DC Input Connector
		OUT PUT+/OUT PUT-：DC Output Connector
		M-COM：Lighting Board Control Interface
		BMU：Module Communication Interface
		COMM2：EMS 24V Interface
		AC-P：AC/DC 24V Interface
		COMM1:BMS external communication interface
7	Operating Temperature	-20~55°C
8	IP Rating	IP20
9	Dimensions（W*H*D）	(445±2)*(120±2)*(660±2)mm
10	Weight	≈30kg

3.3 Power Conversion System

This product is configured with a modular converter with a rated power of 125kW, supporting bidirectional energy flow and a wide range of battery voltages, meeting the needs of different application scenarios with flexible installation and use.

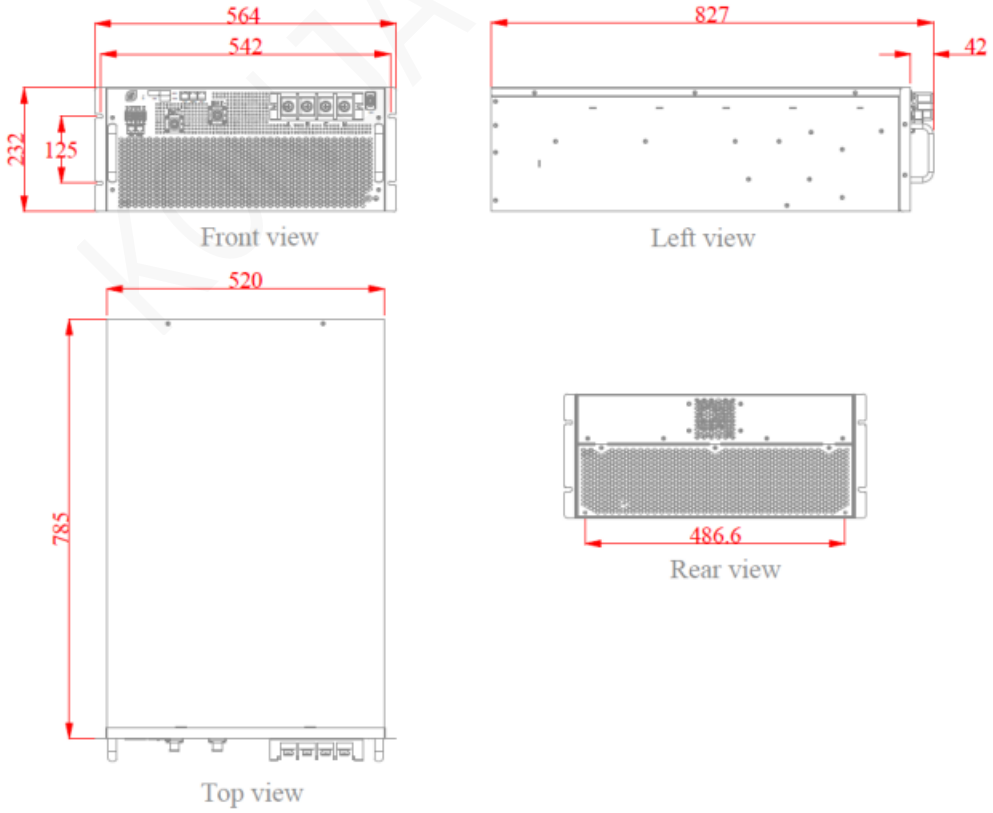


Table 3.3.1 PCS Technical Parameters

No.	Item	Specification
DC parameters		
1	DC voltage range	615V~950V
2	DC Maximum current	198A
3	Rated DC power	125kW
AC on-grid parameters		
4	Rated AC Power	125kW
5	Overload Capability	110% (continuous), 120% (1 min)
6	Rated Voltage	400V
7	Rated AC Current	180A
8	AC Connection Type	Three-phase four-wire
9	Grid Voltage Range	340V~440V
10	Grid Frequency Range	50Hz/60Hz ±2.5Hz
11	THDi	≤3% (Full load)
12	Power Factor	-1~1
13	DC Component of Current	≤0.5%
14	Charge/Discharge Switching Time	<100ms
Other parameters		
15	Max. Conversion Efficiency	≥98.5%
16	Allowable Ambient Temperature	-30°C ~55°C (≥45°C derating)
17	Allowable Relative Humidity	≤95%
18	Noise	≤75dB
19	IP Rating	IP20
20	Max. Operating Altitude	3000m (>2000m derating)
21	Cooling Method	Smart air cooling
22	BMS Communication Interface	RS485 / CAN
23	EMS Communication Interface	Enthernet / RS485

3.4 Energy Management System

The local EMS all-in-one unit is a specialized device for the energy storage industry. It can simultaneously interface with BMS, PCS, power meters, cooling systems, fire suppression systems, temperature and humidity sensors, and other devices. Combined with AI algorithms, it intelligently handles strategy management and control mechanisms at the edge, performing statistical analysis of data. It also supports interfacing with a cloud-based EMS platform, uploading necessary data to the cloud EMS system, and receiving strategies and control commands from the platform.

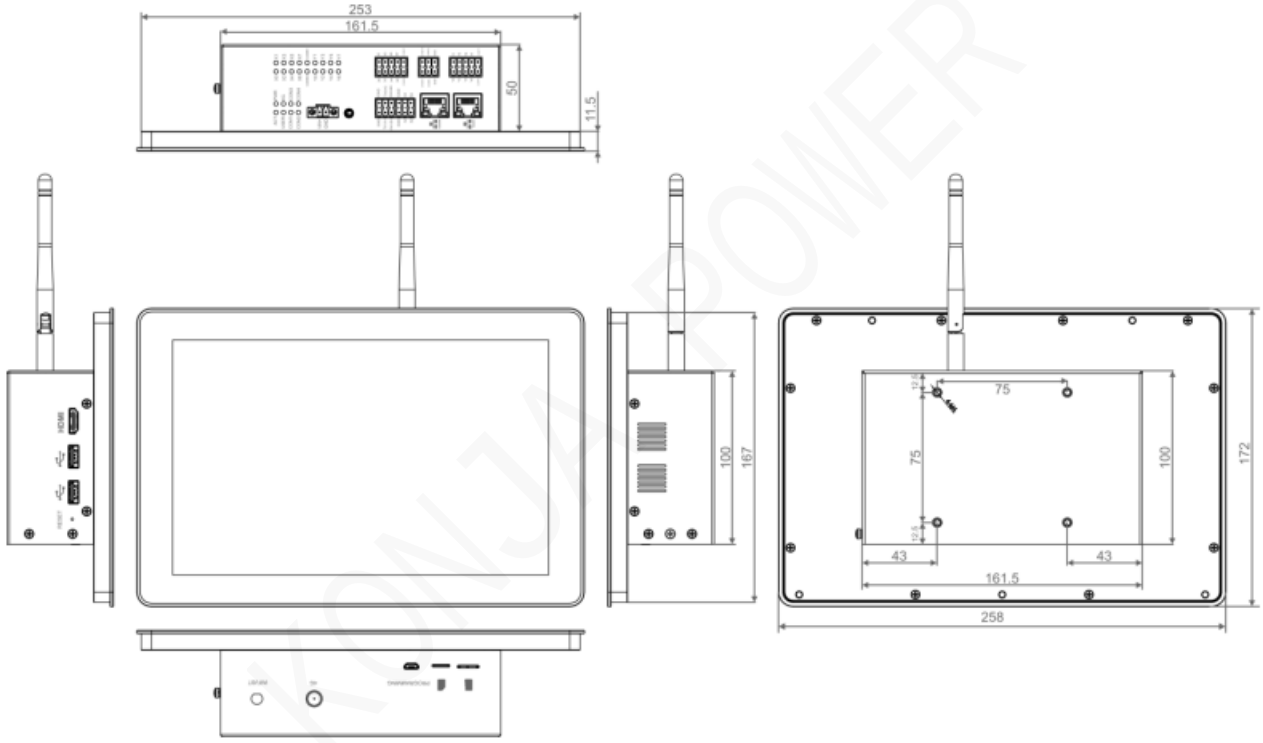


Table 3.4.1 EMS Technical Parameters

No.	Item	Description
System Parameters		
1	CPU	Broadcom BCM2711, 4 Core, Cortex-A72 (ARM v8), 64bit, 1.5GHz SoC
2	Memory	4 GB
3	Storage	eMMC 16 GB
4	Operating System	Raspberry Pi OS

Interface Types		
5	Ethernet	2 ports (100M, 1000M)
6	RS-485	4 ports, with signal indicators
7	DI	8 channels, supports both dry and wet contacts, with isolation protection
8	DO	8 channels, relay isolated, normally open
9	CAN	2 ports
10	4G	Default CAT1 (optional CAT4 and global version)
Hardware Parameters		
11	Operating Voltage	Main power input DC 12V, supports DC 9–36V wide range; reverse polarity and overcurrent protection included
12	SD Card	1 slot
13	USB 2.0	2 port
14	SIM Card	Nano SIM
15	Installation	Bracket mounting
16	Dimensions	258*172*61.5mm (L*W*H, excluding antenna base)
Environmental Parameters		
17	Operating Temperature	-20°C ~60°C
18	Storage Temperature	-25°C ~60°C
19	Operating Humidity	5%–95% RH (non-condensing)

3.5 Liquid Cooling Unit

The liquid cooling unit injects a certain amount of water into the machine's internal water tank. The refrigeration system cools the water, and then the internal circulation water pump injects the low- temperature chilled water into the equipment that needs cooling. The chilled water carries away the heat from inside the equipment, and the high-temperature hot water flows back into the water tank for cooling again.

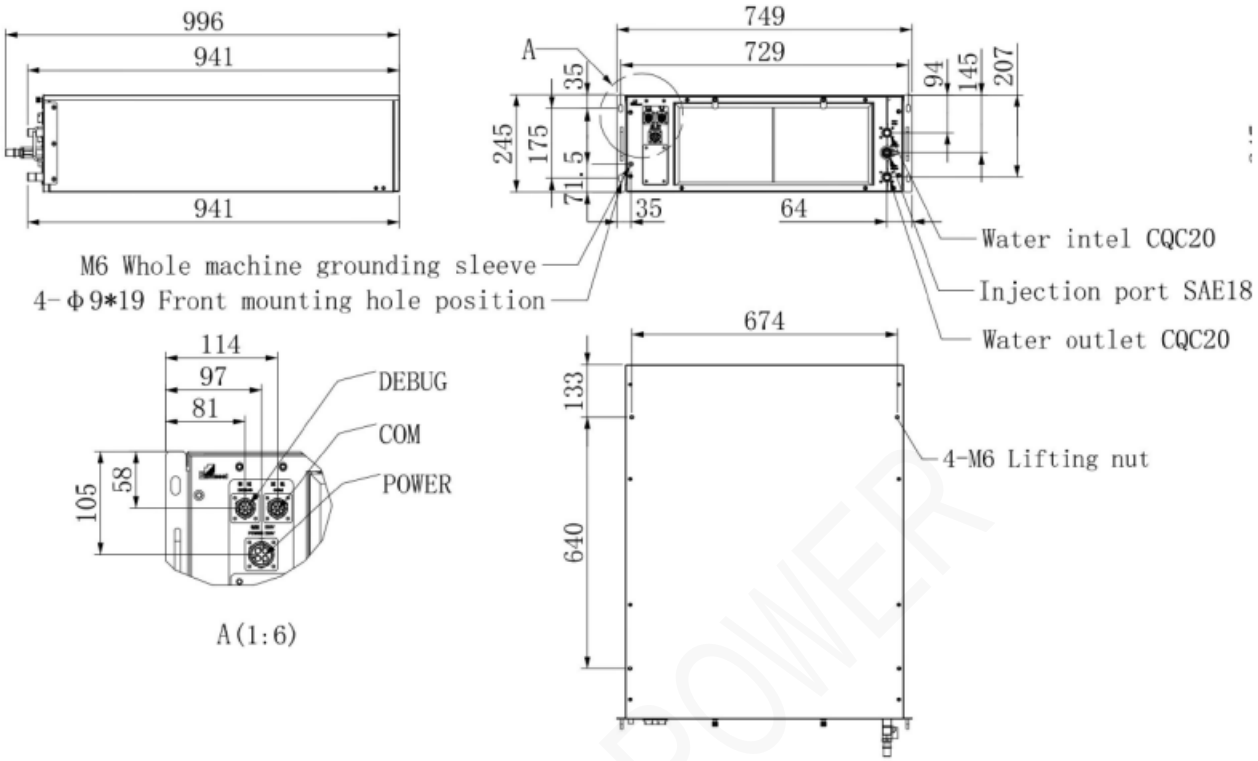


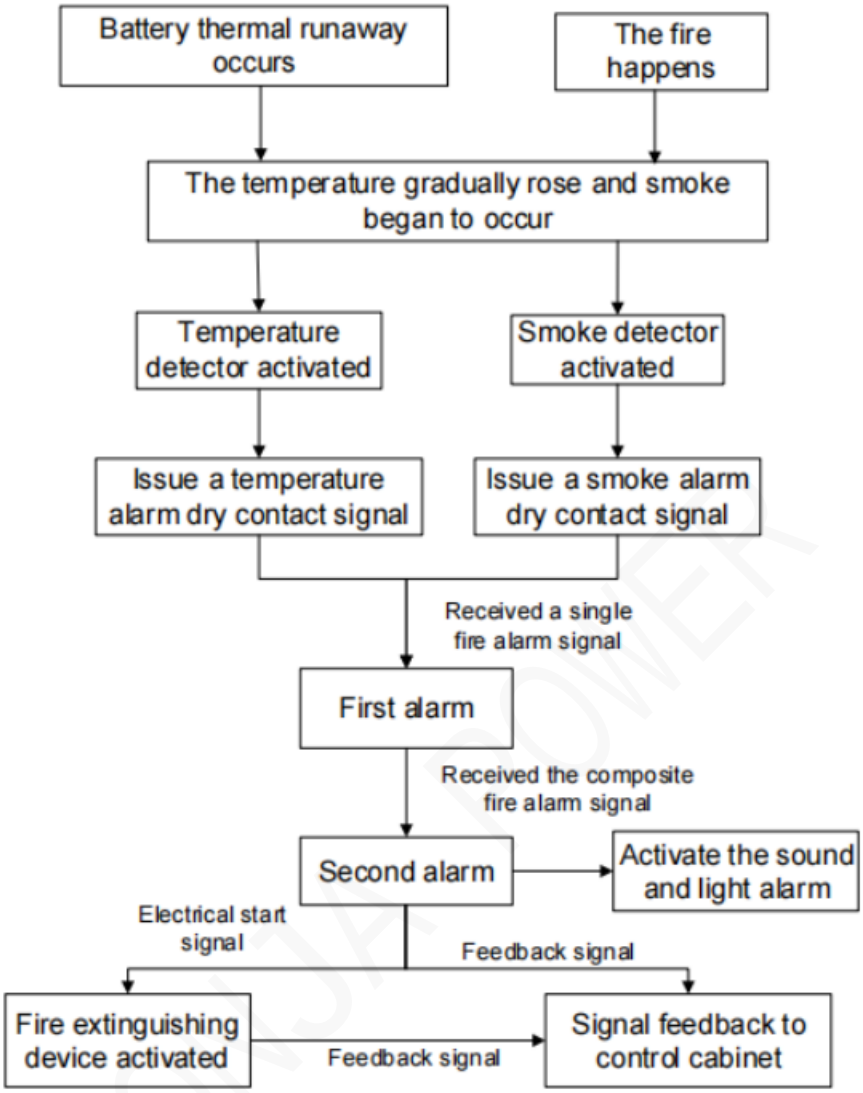
Table 3.5.1 Liquid Cooling Unit Parameters

No.	Item	Description
Dimensions, Weight & Installation		
1	Dimensions (W*D*H)	700*900*245mm
2	Weight (without coolant)	75kg
3	Installation Method	Drawer type
4	Application Environment	Outdoor
Environmental Protection & Performance		
5	Operating Environment Range	-30°C～+55°C
6	Storage Environment Range	-40°C～+70°C
7	Operating Altitude	0~4000m (≥1000m, derating 3% per 1000m)
8	Noise Level @L45/W18	75dB(A)
9	IP Rating	IPX5, meets outdoor IP55 environment operation
10	Refrigerant	R134a
11	Coolant	50% ethylene glycol aqueous solution
12	RoHS Certification	Yes

Cooling/Heating Capacity		
13	Cooling Capacity	5.0kW
14	Heating Capacity	2.0kW
15	Outlet Water Temperature	18°C
Circulating Water Flow		
16	Rated Circulating Water Flow	46.5@60kPa L/min
Power Consumption		
17	Cooling Input Power @L35/W18	2.50kW
18	Heating Input Power @Tu=10°C	2.35kW
19	Self-circulation Mode Input Power (single water pump operation)	0.25kW
20	Max. Power Consumption	3.60kW
Power Supply		
21	Rated Operating Voltage	220～240V 50/60Hz
22	Supported Voltage Range	220±15%, 50/60±3Hz
23	Max. Operating Current	19.2A

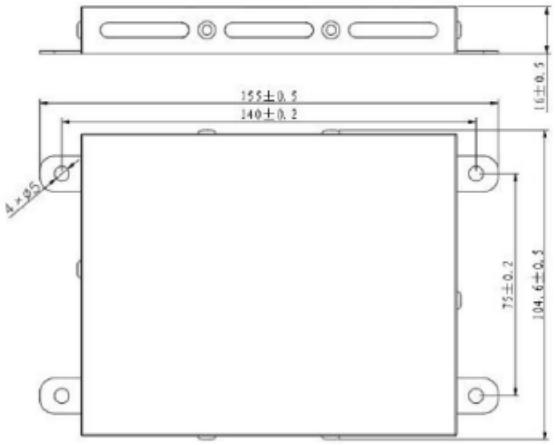
3.6 Fire Suppression System

This fire suppression system is a pack-level + cluster-level aerosol automatic fire extinguishing system. The system workflow is as follows:



3.6.1 Pack-level Fire Suppression System

The pack-level fire suppression system uses a thermal activation solution. When a fire occurs due to battery thermal runaway or a short circuit in electronic components, the temperature inside the box rises rapidly to about 185°C or an open flame appears. The thermal sensitive wire detects the fire in the first instance and activates the suppression device inside the box to extinguish the fire, while simultaneously sending feedback to the BMU.



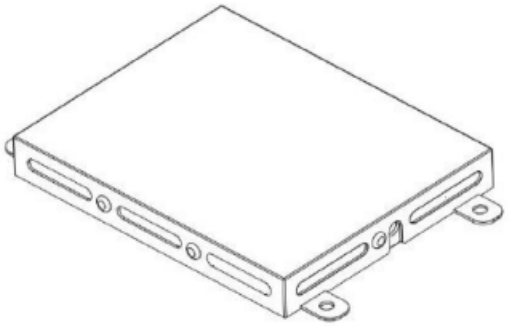


Table 3.6.1 Pack-level Fire Suppression Controller Parameters

No.	Item	Description
1	Operating Environment Temperature Range	-40°C～+70°C
2	Activation Method	Dual electric-thermal start (no separate electric start)
3	Discharge Time	≤15s
4	Oxidizer Name and Content	Strontium nitrate, potassium nitrate 50%～58%
5	Nozzle Thermal Spacing at 400°C, 200°C, 75°C	0.2m, 0.3m, 0.4m
6	Net Weight per Unit	380±40g
7	Dimensions	155×104×16mm
8	Protection Volume	2m³
9	Thermal Initiator Activation Temperature	185±10°C
10	Validity Period	10 years

3.6.2 Cluster-level Fire Suppression System

The cluster-level fire suppression system uses an electrical activation solution for active detection. When battery thermal runaway spreads outside the module or a wiring harness catches fire, the smoke and temperature detectors respond in a timely manner, performing detection, alarm, and extinguishing actions.

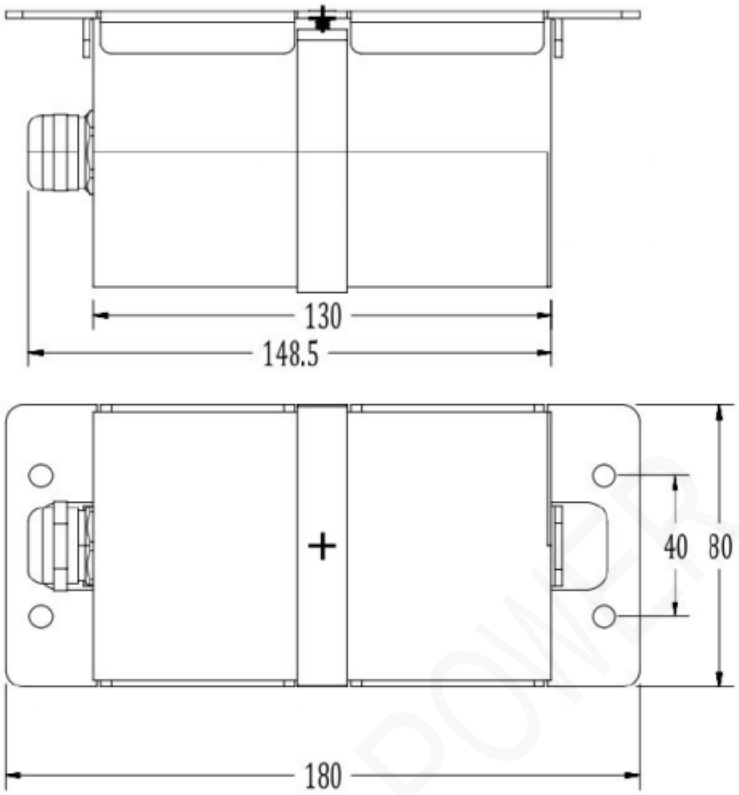


Table 3.6.2 Cluster-level Fire Suppression Controller Parameters

No.	Item	Description
1	Operating Environment Temperature Range	-50°C～+95°C
2	Dimensions	Φ76mm*130mm
3	Weight	1.5kg
4	Protection Volume	1.5m³
5	Discharge Delay Time	≤5s
6	Discharge Duration	≤15s
7	Extinguishing Concentration	100g/m³
8	Effective Lifespan	10 years
9	Thermal Activation Temperature	180°C±10°C
10	Activation Current	≥700 (mA, DC)
11	Safe Current	≥150 (mA, DC)