risen

C&I ESS
PRODUCT MANUAL

SI261A125LM

Document Version A/0[2026]
Release Date February 11, 2026

Catalogue

Risen C&I ESS Product Manual _SI261A125LM

1. Product Principle

The product design adopts a liquid-cooled cabinet configuration with integrated battery energy storage units, designed for applications such as peak shaving, valley filling, and backup power supply. The internal structure of the liquid-cooled cabinet includes the PCS, battery modules, HVAC, fire suppression system, power distribution system, etc. Each energy storage system supports parallel operation of up to five liquid-cooled cabinets, comprising one main cabinet and up to four slave cabinets.

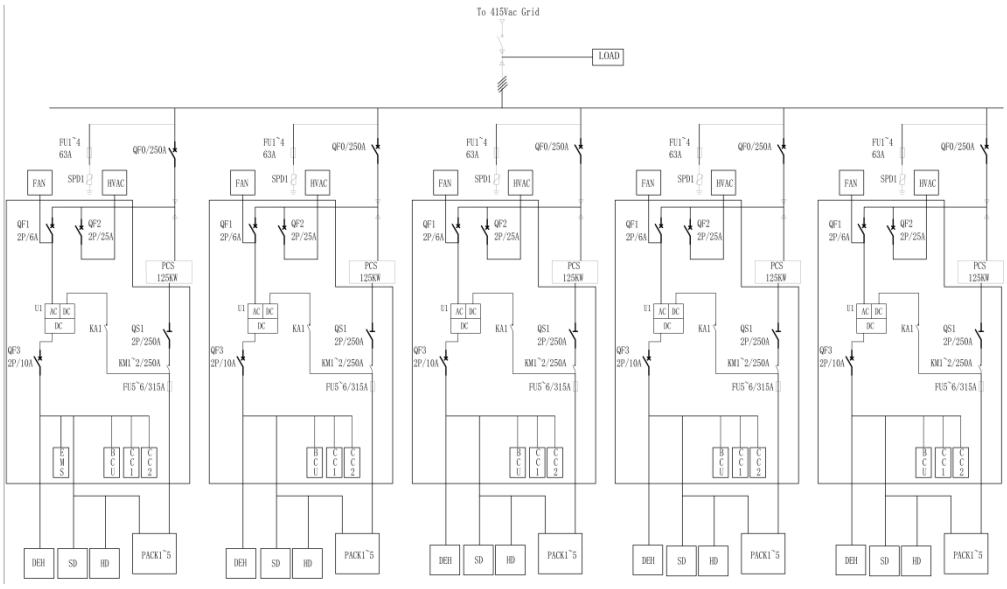


Figure 1-1: Main Circuit Schematic (1 Master Cabinet + 4 Slave Cabinets)

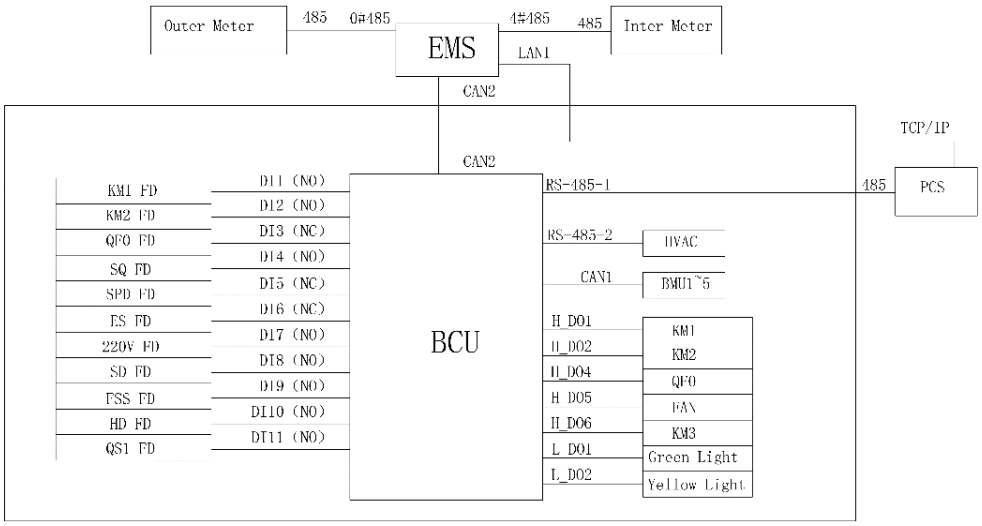


Figure 1-2: Communication Architecture

2. Nameplate Descriptions

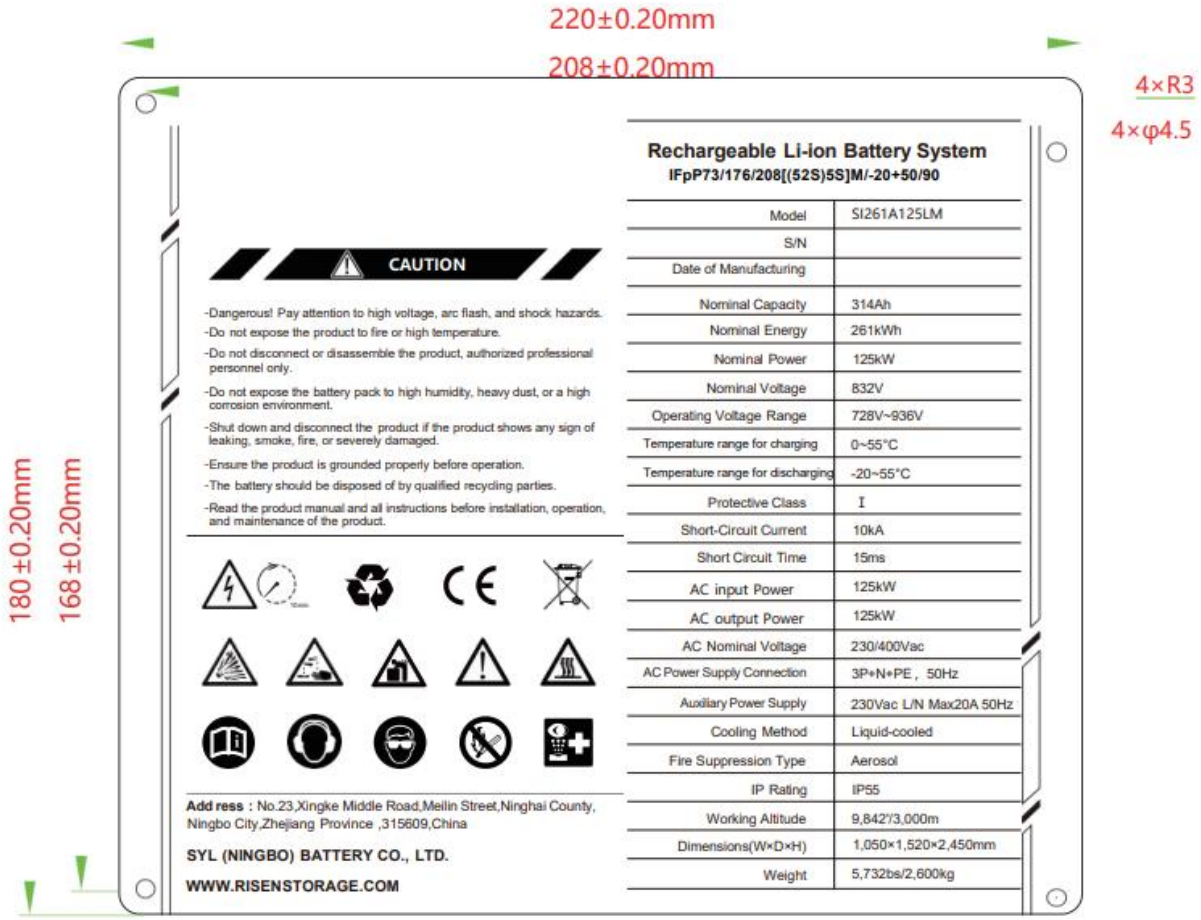


Figure 2-1: Nameplate Illustration

3. Product Specifications

Table 3-1: Technical Specifications

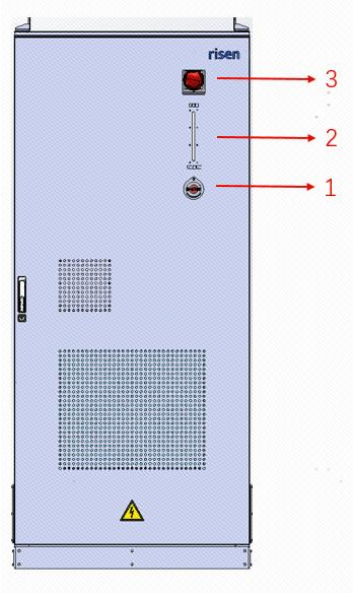
System Model	SI261A125LM
System Specifications	
Rated AC Power	125kW
Rated Capacity	261kWh
Battery Specifications	
Cell Type	LFP
Capacity	314Ah
Configuration	260S1P
Rated Voltage	832V
Voltage Range	728~949V
Charge/Discharge Rate（C）	≤0.5C
Depth of Discharge	98%
PCS Specifications	
Max. AC Power	125kVA
Operation Mode	In-grid/Off-grid compatible
Rated In-/Off-Grid Voltage	400Vac
Grid Voltage Range	323~456V
Power Factor	-1…+1
Rated Grid Frequency	50Hz
Topology	None
Wiring Method	3P4W
Operating Conditions	
Protection Degree	IP55
Noise Emission	≤85dB@1M
Operating Temperature	-30~55℃
Relative Humidity	0% to 95% RH
Max. Operating Altitude	3000m(>2000m derating)
General Information	
Dimensions (W×H×D)	1050x2450x1520mm
Weight	2.6t
Battery Cooling Method	Intelligent Liquid Cooling
PCS Cooling Method	Forced Air Cooling
Fire Suppression System	Aerosol + Water Fire Protection + Optional PACK-level Fire Protection
Communication Protocol	Ethernet/CAN/RS485
Certifications	IEC62619,IEC61000，IEC62477，IEC63056，IEC62040，UN38.3

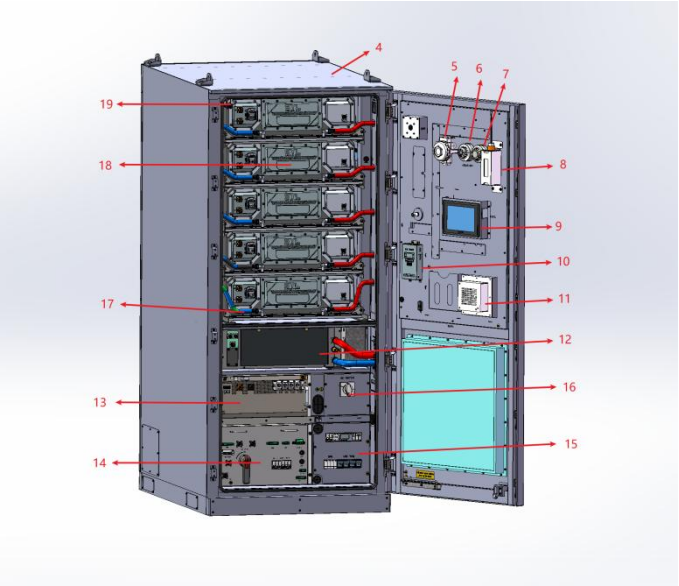
4. Key Component Description

Table 4-1: Key Components Description

NO.	Item	Qty	Description
1	Emergency Stop Switch	1	Used to quickly cut off the power supply or stop operation in an emergency to ensure the safety of personnel and equipment.
2	LED Indicator	1	Reflects the working or positional status of electrical circuits and equipment, typically indicates whether a circuit is powered, whether equipment is running, stopped, or in test mode, and whether switches are open or closed..
3	Audible-Visual Alarm	1	Emits both sound and light signals to alert personnel, designed for high visibility and audibility in diverse environments.
4	Cabinet	1	The main housing unit that integrates and encloses all components in one physical structure..
5	Heat Detector	1	Detects ambient temperature changes to prevent fire hazards. Adopts high-quality linear sensors and SMD technology.
6	Smoke Detector	1	Detects fire by monitoring smoke concentration and employs an ionization sensor, which is widely used in fire suppression systems due to superior reliability compared to gas-sensitive resistor fire alarms.
7	Hydrogen Detector	1	Detects hydrogen leaks by measuring hydrogen concentration in air using hydrogen-sensitive sensors.
8	Aerosol	1	A suspension of solid or liquid particles in a gaseous medium (particle size: 0.01–1000μm). Examples include pollen, combustion particles, or engineered aerosols.
9	EMS	1	The EMS serves as the local monitoring and management unit for containerized energy storage systems or distributed energy storage cabinet systems, capable of real-time integrated aggregation, display, and coordinated control of information from various components within the energy storage system.
10	Dehumidifier	1	A dehumidifier that actively condenses and exhausts air through a dehumidifying duct, heats to reduce humidity, effectively achieving comprehensive moisture control for the enclosed electrical cabinets.
11	Exhaust Fan	2	Ventilation device for indoor/outdoor air exchange.
12	Air-Cooled	1	A chiller system that cools water via refrigeration cycles for

	Chiller Unit		equipment cooling. Includes three subsystems: refrigerant circulation, water circulation, and electrical control.
13	Power Conversion System	1	Controls battery charging/discharging, performs AC/DC conversion, and supply power to AC loads under off-grid. It comprises a bi-directional DC/AC converter and control unit. Communicates with BMS via CAN for safe battery operation.
14	High-Voltage Cabinet	1	Central control unit for high-voltage circuits in energy storage systems. Contains isolators, fuses, contactors, relays, BCU (Battery Cluster Unit), and power supplies.
15	Power Distribution Unit	1	Integrated unit for AC power distribution, control, and monitoring.
16	Main Circuit Breaker	1	Controls power supply to the entire system, used to turn the system on or off..
17	Liquid Cooling Pipe	1	Piping system for circulating coolant to dissipate heat.
18	Battery Pack	5	A modular unit composed of multiple battery cells, which connected in series/parallel to increase voltage/capacity. Supports scalable energy storage configurations.
19	Limit Switch	1	A low-current control switch triggered by contacts of moving mechanical components to open or close the circuit, thereby achieving specific control functions.





4.1 Battery & Battery Management System

4.1.1 Battery Module

The battery module features a modular design, where each module is composed of 52 LFP (Lithium Iron Phosphate) cells connected in series. These battery modules equipped with a Battery Management Unit (BMU) to create mountable modular unit. Multiple battery modules are then integrated into a RACK, with each rack incorporating a rack-level Battery Management System (BMS) to monitor and manage performance, safety, and thermal conditions across the entire energy storage unit.

Table 4-1-1-1: Module Specifications

Item	Unit	Specification	Example/Note
Manufacturer	-	SYL	
Configuration	-	1P52S	
Key Components	-	52 cells，module BMU	
Dimensions (W×H×D)	mm	1160x243x790	
Weight	Kg	330	
Cell Capacity	Ah	314	
Rated Capacity	kWh	52.24	
Rated Voltage	Vdc	166.4	
Voltage Range	Vdc	145.6~187.2	
Max Power	kW	26kW	
Storage Temperature	℃	-30~60	
Storage Humidity	%	≤85	

（For reference only）

Note：The positive and negative terminals of the battery module are clearly marked to facilitate connection, visual inspection, maintenance, and repair.

4.1.2 Battery Management System

The self-developed Battery Management System (BMS) is designed for medium- to large-scale energy storage systems. It comprises a Battery Control Unit (BCU) and Battery Management Unit (BMU), with the following core functions:：

- Cluster battery data acquisition
- Fault Diagnosis & Alarm
- Battery balancing strategy analysis
- State of Charge (SOC) Calculation
- Insulation Detection
- Relays Control
- Relay Adhesion Detection
- Communication with BMU

Table 4-1-2-1 BCU Parameters

Function	Parameter	Specifications	Description
Power Supply Voltage	Voltage Range	24V	16~30V
Operating Mode Power Consumption	3W	Pure BCU consumption without peripheral loads	
Current Detection	Range	±800A	Adjustable with shunt
		±350A	Hall sensor
	Accuracy	±0.5%FSR	Shunt
		±0.5%FSR+0.1%RD	Hall sensor
Cluster Voltage Detection	Range	0~1500V	
	Accuracy	±0.5%FSR	
Temperature Detection	Range	-30℃~100℃	
	Accuracy	±1℃	
	Channels	5 channels	
Insulation Detection	Range	0~65MΩ	
	Accuracy	≤±10%RD/±10KΩ	
State Estimation	SOC	±5%	0%~100%
	SOH	±5%	0%~100%
Communication Interfaces	RS485	3 channels	
	CAN	3 channels	Default Baud Rate: 250 kbps
	BMU Daisy-Chain	1 channel	Communication with Specific BMU
Input/Output	Dry Contact Output	1 channel	

	High-Side Switch Output	8 channels	
	Low-Side Switch Output	2 channels	
Operation Conditions	Temperature	-30℃~65℃	
	Humidity	5~95%RH	
	Altitude	≤3000m	

4.1.3 Interface Definition

Interface Definition J1

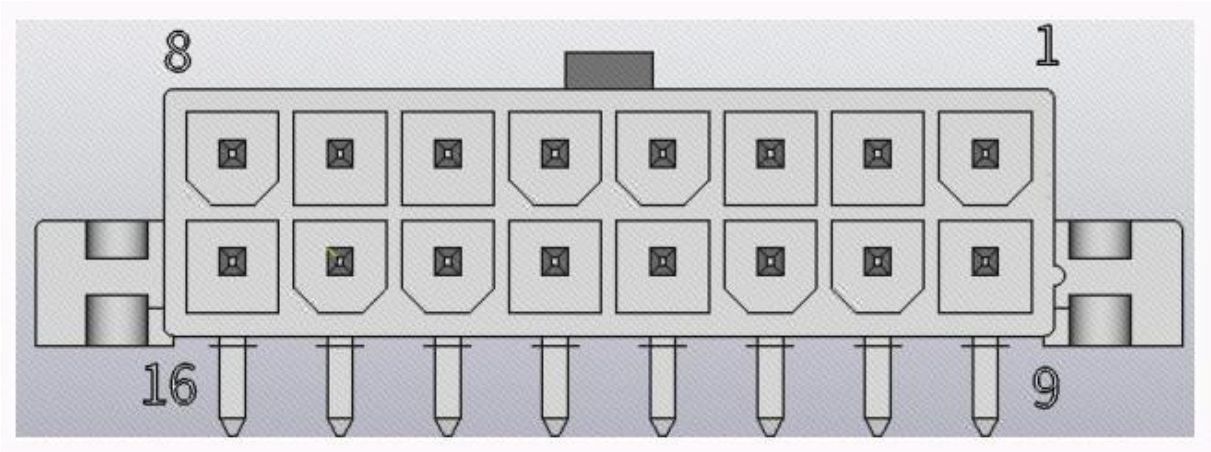


Figure 4-1-3-1 J1 Interface Definition（**Socket Model: HX42003-16WA - Red Star**）

Pin	Name	Description	Pin	Name	Description
1	shunt+	Positive shunt acquisition	9	Shunt-	Negative shunt acquisition
2	/	NC (Not Connected)	10	BAT-	Positive cell - side voltage acquisition
3	/	NC (Not Connected)	11	/	NC (Not Connected)
4	BAT+	Positive cell - side voltage acquisition	12	/	NC (Not Connected)
5	/	NC (Not Connected)	13	/	NC (Not Connected)
6	/	NC (Not Connected)	14	VH-	Negative pre-charge voltage acquisition
7	/ /	NC (Not Connected)	15	/	NC (Not Connected)
8	VH+	Positive pre-charge voltage acquisition	16	/	NC (Not Connected)

Remarks:

1. If a shunt is used, the shunt negative port (Shunt -) must be directly connected to BAT-.

2. Before wiring the high-voltage part, the corresponding pin positions must be confirmed.

Interface Definition J2

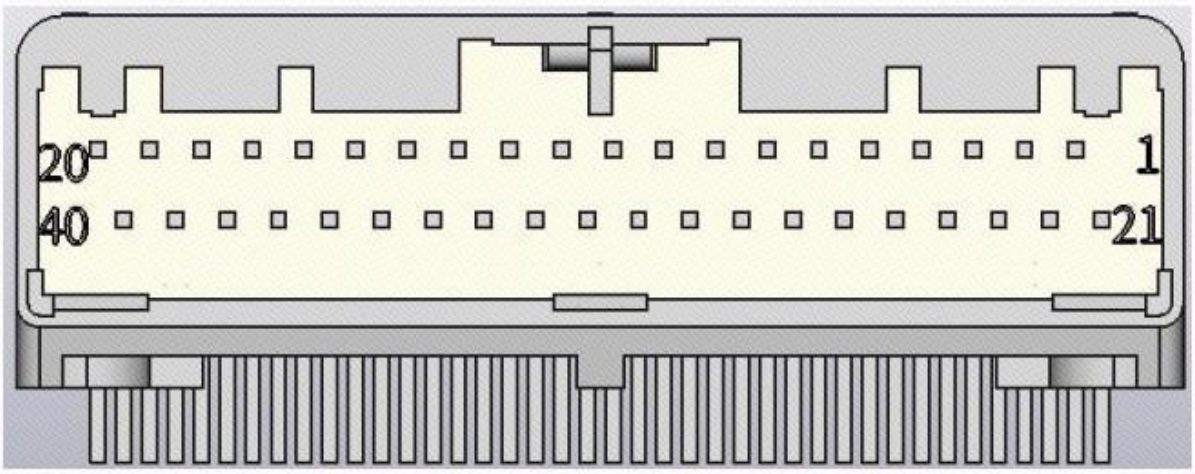


Figure 4-1-3-2 J2 Interface Definition（**Socket Model: MX84B040NF1 - JAE**）

Pin	Name	Description	Pin	Name	Description
1	/	NC (Not Connected)	21	EARTH	Earth insulation resistance wire
2	H.O7	7th high - side drive	22	/	NC (Not Connected)
3	H.O6	6th high - side drive	23	H.O8	8th high - side drive
4	H.O5	5th high - side drive	24	/	NC (Not Connected)
5	H.O4	4th high - side drive	25	/	NC (Not Connected)
6	H.O3	3rd high - side drive	26	/	NC (Not Connected)
7	H.O2	2nd high - side drive	27	IMB - 2	2nd BMU communication M
8	H.O1	1st high - side drive	28	IPB - 2	2nd BMU communication P
9	L_O2	2nd low - side drive	29	IMB - 1	1st BMU communication M
10	L_O1	1st low - side drive	30	IPB - 1	1st BMU communication P
11	/	NC (Not Connected)	31	/	NC (Not Connected)
12	O1-	1st dry contact negative	32	O1+	1st dry contact positive
13	ADDO-	Address signal output negative	33	ADD0+	Address signal output positive

Pin	Name	Description	Pin	Name	Description
14	ADDI-	Address signal input positive	34	ADDI+	Address signal input positive
15	CANH2	2nd CAN high	35	CANL2	2nd CAN low
16	/	NC (Not Connected)	36	/	NC (Not Connected)
17	485B2	2nd RS485 - B	37	485A2	2nd RS485 - A
18	/	NC (Not Connected)	38	/	NC (Not Connected)
19	CANH1	1st CAN high	39	CANL1	1st CAN low
20	485B1	1st RS485 - B	40	485A1	1st RS485 - A

Remarks:

1.CAN2 is for internal communication between BMS and BMU. CAN1 is for internal communication between BMS and BMU. CAN0 is for communications between BMS and CAN-Hall Sensor.

2.The 24V power supply for the 8 high-side drive is directly led out from pin 16 and pin 32 of the Interface J3.

Interface Definition J3

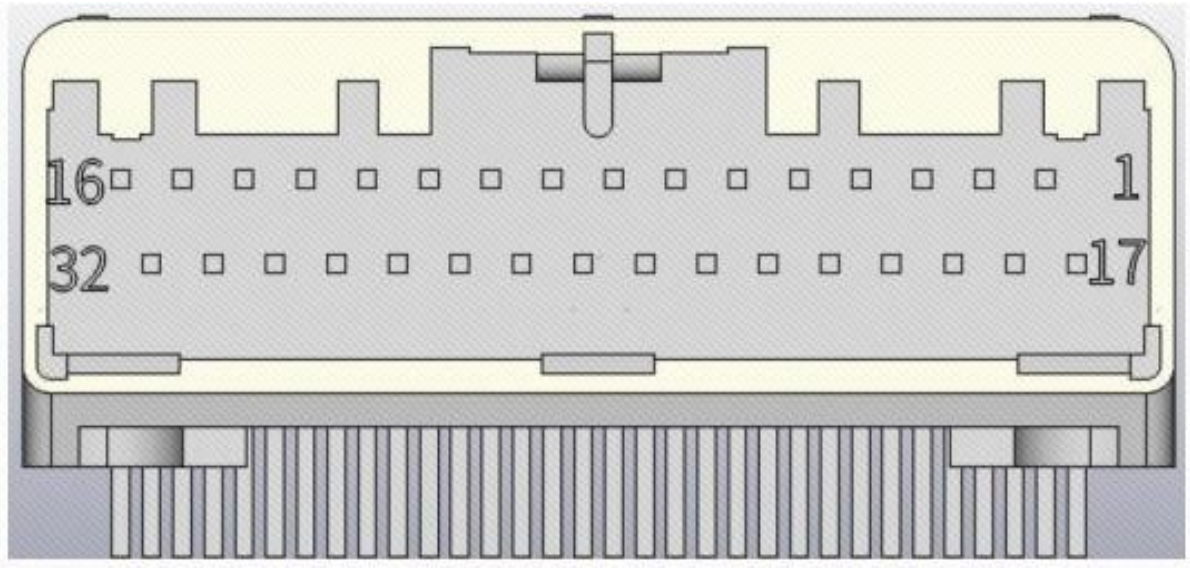


Figure 4-1-3-3 J3 Interface Definition（**Socket Model: MX84B032NF1 - JAE**）

Pin Number	Name	Description	Pin Number	Name	Description
1	DI_G	Input detection of the dry contact point to ground	17	DI11	Input detection of the 11th dry contact point
2	DI10	Input detection of the 10th dry contact point	18	DI9	Input detection of the 9th dry contact point

Pin Number	Name	Description	Pin Number	Name	Description
3	DI8	Input detection of the 8th dry contact point	19	DI7	Input detection of the 7th dry contact point
4	DI6	Input detection of the 6th dry contact point	20	DI5	Input detection of the 5th dry contact point
5	DI4	Input detection of the 4th dry contact point	21	DI3	Input detection of the 3rd dry contact point
6	DI2	Input detection of the 2nd dry contact point	22	DI1	Input detection of the 1st dry contact point
7	485B3	3rd port RS485-B	23	485A3	3rd port RS485-B
8	RT4	Positive 4th temperature sensor port	24	RT5	Positive 5th temperature sensor port
9	RT-	Negative temperature sensor port	25	RT3	Positive 3rd temperature sensor port
10	RT1	Positive 1st temperature sensor port	26	RT2	Positive 2nd temperature sensor port
11	GND	-12V power supply output	27	CAN-3L	CAN-low Hall signal
12	+12V	+12V power supply output	28	CAN-3H	CAN-high Hall signal
13	GND	-5V power supply output	29	HALL_2	Acquisition of 1st channel Hall sensor
14	+5V	+5V power supply output	30	HALL_1	Acquisition of 2nd channel Hall sensor
15	+24V	Positive power supply	31	-24V	Negative power supply
16	+24V	Positive power supply	32	-24V	Negative power supply

Remarks:

The +12V power supply is only for CAN-Hall sensor communication.

4.1.4 Functions

The battery management system (BMS) employs a **two-tier architecture** for system monitoring, structured as follows：

- Module-Level Battery Management Unit (BMU)
- System-Level Battery Control Unit (BCU)

The low-level component is the Battery Management Unit (BMU), which monitors voltage and temperature and performs cell balancing. The high-level Battery Control Unit (BCU) manages all BMUs, measures overall voltage and current, control DC contactors for system protection, and communicates with PCS and EMS.

The main functions of the battery management system are summarized in the table below：

Table 4-1-4-1 Battery Management System Functions

Function		BMU	BCU
Temperature Measurement	Cell Voltage	√	
	Cell Temperature	√	
	Module Voltage		
	Rack Voltage		√
	Rack Current		√
Calculation	SOC		√
	SOH		√
	Power Prediction		√
Control	Contactor Control		√
	Cell Balancing	√	√
Communication	CAN2.0	√	√
	RS485		√
	Ethernet		

4.2 Power Conversion System

4.2.1 PCS Overview

The PCS is a bidirectional controllable conversion device that connects the energy storage battery system to the grid. Its main function is to enable energy exchange between the battery and the grid, and to control and manage the charging and discharging of the battery. In grid-connected mode, the EMS can control the PCS to achieve peak shaving and valley filling, capacity expansion, as well as off-grid backup power. The PCS has a rated power of 125kW, supports off-grid operation, charging/discharging switch ≤20ms (with STS), and supports LVRT/HVRT, island mode operation, black start, reactive power compensation, harmonic suppression, and three-phase imbalance compensation.

Figure 4-2-1-1 Physical Diagram of the PCS

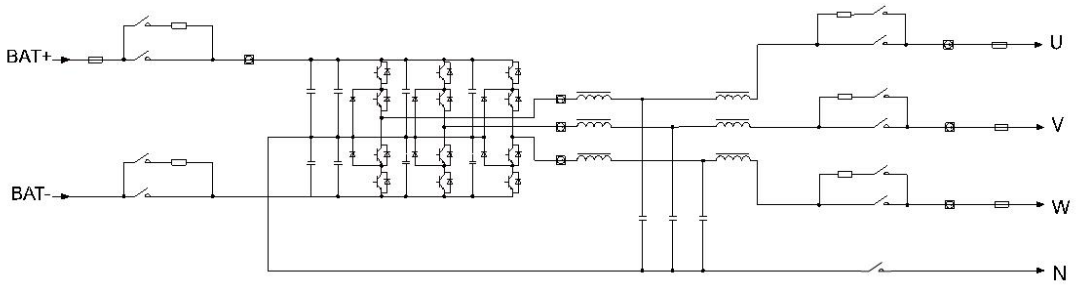


Figure 4-2-1-2 Schematic Diagram of the PCS

4.2.2 Technical Specification

Table 4-2-2-1 PCS Key Specifications

Product Model	EPCS125-AM-F
DC Side	
Operating Voltage Range (V)	615~950（3W+PE）/650~950（3W+N+PE）
Full-Load Voltage Range (V)	615~950（3W+PE）/650~950（3W+N+PE）
Number of Input Circuits	1
Maximum Current (A)	203
AC Side (Grid-connected)	
Rated Voltage (V)	230/400
Voltage Deviation	-15% ~ +15%
AC Output Type	(3W+PE) Three-Phase Three-Wire / (3W+N+PE) Three-Phase Four-Wire
Rated Output Power (kW)	125
Maximum Output Power (kW)	137.5
Maximum Current (A)	200
Rated Grid Frequency (Hz)	50/60
Power Factor	0.99
Power Factor Range	1 (leading) to 1 (lagging)
THD	<2% (at rated power)
DC Component	0.5%
Overload Capacity	110% long-term
Maximum Discharge Efficiency	98.5%
AC Side (Off-Grid)	
Rated Output Voltage (V)	230/400
AC Voltage Harmonic Distortion	<3% (linear load)
Rated Frequency (Hz)	50/60
Rated Output Power (kW)	125
Maximum Apparent Power (kVA)	137.5
Maximum Output Current (A)	200
Protection Features	
Functions	AC Overcurrent Protection, AC Overvoltage Protection, AC Surge Protection, AC Short-Circuit Protection, Anti-Islanding Protection, DC Reverse Polarity Protection, DC Surge Protection
System Parameters	
Dimensions (mm)	520*785*232
Weight (kg)	74.5
Max. Operation Altitude	4000 m (Derating≥2000 m)
Operating Temperature	-30℃ ~ 55℃ (Derating≥45℃)
Storage Temperature	-45℃~70℃
Humidity	0%RH ~ 95%RH, non-condensing
Cooling Method	Intelligent Forced Air Cooling
Protection Degree	IP20
Communication Interfaces	Ethernet/CAN/RS485
Certification	IEC62477-1

4.2.3 Main Functions

1) Active Power Control

When the PCS is operating in grid-connected mode, it receives active power dispatch command from EMS to control the charging and discharging operations, achieving output tracking.

2) Reactive Power Control

The PCS has the ability to control reactive power under rated grid voltage conditions.

3) Protection and Alarm

The PCS system is equipped with both hardware and software-based protection. These protection mechanisms are comprehensive and overlapping, with no blind spots, ensuring system safety in various fault conditions. Specific protection functions include:

- AC/DC overcurrent/short-circuit protection
- AC/DC overvoltage/undervoltage protection
- Output overload protection
- DC reverse polarity protection
- AC input phase sequence protection
- Module overtemperature protection
- Three-phase imbalance protection
- AC over/under-frequency protection
- Battery overcharge/over-discharge protection
- Communication failure protection

For Grid-Off-Grid Switching: Precautions

- **Grid-connected to off-grid: Open the main circuit breaker, then switch the EMS to off-grid mode (ensure this is done while disconnected. If the system is switched and the main circuit breaker remains closed, it will not affect the system in a non-operational state. However, if the system is running and power is suddenly restored, it may cause system damage).**
- **Off-grid to grid-connected:Switch the EMS to grid-connected mode, then close the main circuit breaker.**

4.3 Liquid Cooling System

4.3.1 Introduction

This chiller unit is specifically developed for the applications such as thermal management of energy storage batteries, suitable for applications where the internal battery generates a large amount of heat and the internal equipment is sensitive to environmental temperature, ensuring the service life of the components in the cabinet. This product features comprehensive functions, including upper-level computer communication and alarm functions. It is highly reliable and easy to install, without complex commissioning.

The product is an AC power supply chiller

- Power Supply：220V 50/60Hz
- Cooling Capacity：5000W
- Heating Capacity：2000W
- Installation：Horizontal mounting
- Operating Temperature：-30ºC ~+55 ºC
- Coolant：50% ethylene glycol aqueous solution

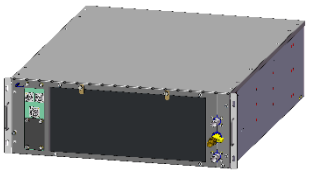
Key Advantages

- Integrated design saves on-site installation and commissioning costs；
- High-efficiency variable frequency compressor, efficient and energy-saving；
- DC variable frequency compressor with stepless speed regulation, intelligent adjustment of cooling capacity；
- DC brushless fan with intelligent speed regulation, real-time thermal load match, energy-saving and noise reduction；
- AC 220V 50/60Hz power supply with ±15% voltage tolerance；
- Condenser system adopts finned copper tube design ensures high corrosion resistance and reliability；
- BMS monitoring；
- Power-on self-start function, providing multiple alarms and protection functions；
- Meets RoHS；
- High reliability, 365 days/year continuous operation.

4.3.2 Specifications

Table 4-3-2-1: Liquid-Cooled Chiller Technical Specifications

	Parameter	Unit	Specification	Example
	Manufacturer	-	Inovance	
	Model	-	EMW50HFNC1A	
	Cooling Capacity (@W18/L45)	kW	5.0	
	Heating Capacity	kW	2.0	
	Power Supply		220±15%，50/60±3	
	Operating Temp. Range		-30~+55	
	Cooling Input Power	kW	2.4	
	Heating Input Power	kW	2.35	
	Max. Operating Current	A	19.2	
	Protection Degree	-	IPX5	
Water Circuit System	**Refrigerant**		R134a	
	Coolant		50% Ethylene Glycol Solution	
	Pipe Diameter	mm	20	
	Pipe Connection Type		Quick Connector	
	Water Flow Rate	L/min	50@90kPa	
Installation Parameters	**Dimensions (L×H×W)**	Mm	245x700x900	
	Weight	kg	85	
	Installation Environment		Outdoor	



（For reference only）

4.3.3 Interface Description

Table 4-3-3-1: Liquid-Cooled Chiller Interface Description

Interface Item	Description
INLET	Water Inlet
OUTLET	Water Outlet
CHARGE	Filling Port
POWER	Power Supply
PUMP	Water Pump
DEBUG	Debug
COM	Communication

4.4 Fire Suppression System

4.4.1 System Overview

The liquid-cooled battery storage cabinet system adopts aerosol fire suppression, which is installed on the door of each cabinet. along with a smoke detector and a heat detector. These two detectors communicate with the BMS. In the event of an alarm, a signal is sent back to the BMS, and then the entire system is shut down via the EMS controller.

4.4.2 Components

4.4.2.1 Smoke Detector

The smoke detector used in this system is a high-sensitivity photoelectric sensor, designed for integration with conventional fire alarm control systems. Combined with advanced algorithms enables early detection of smoke during the initial stages of a fire;

Figure 4-4-2-1-1 Smoke Detector Physical Picture

4.4.2.2 Heat Detector

This detector has a molded, self-extinguishing white polycarbonate housing. Inside the housing is a printed circuit board (PCB] that can accommodate signal processing electronics. In the A1R, BR, and CR variants, a pair of matched Negative Temperature Coefficient (NTC) thermistors are installed on the PCB. One thermistor is exposed to good thermal contact with the surrounding air, while the other is thermally insulated. Under stable conditions, both thermistors are in thermal equilibrium and have the same resistance value. If the air temperature rises rapidly, the resistance of the exposed thermistor will be less than that of the insulated thermistor. The ratio of the thermistor resistances is electronically monitored, and if

this ratio exceeds a pre-set threshold, an alarm will be triggered. This characteristic determines the detector's "rate-of-rise" response.

Figure 4-4-2-2-1 Thermal Detector Physical Picture

4.4.2.3 Aerosol Fire Extinguisher

The operation temperature range of the aerosol fire extinguishing device is -40°C to 54°C. When a fire is identified, it sends a start signal to the aerosol extinguishing system's initiator, which then starts the aerosol generator. After the generator is started, a large amount of extinguishing medium is produced, which is cooled and then discharged through system port into the protected area to suppress the fire.

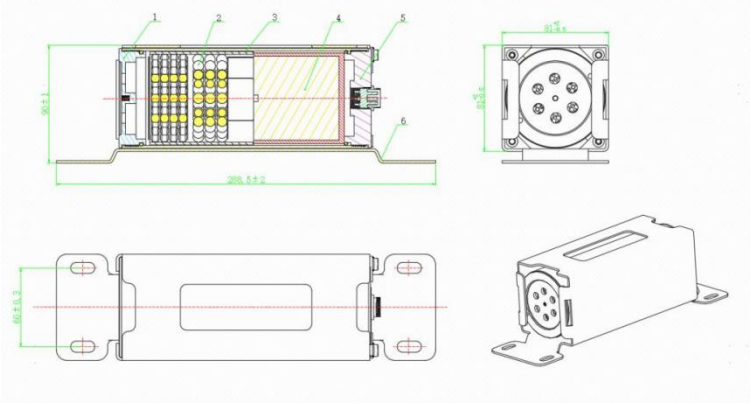


Figure 4-4-2-3-1 Aerosol Fire Extinguisher Exterior View

4.4.2.4 Gas Detector

This gas detector is either explosion-proof or intrinsically safe explosion-proof. It can detect toxic gases, oxygen, and combustible gases. Sensors for detecting toxic gases and oxygen are based on electrochemical or PID principles, and should be calibrated with standard sample gases according to customer requirements before leaving the factory. Sensors for detecting

combustible gases are based on catalytic combustion or infrared principles, with a detection range for combustible gases of 0-100% LEL.

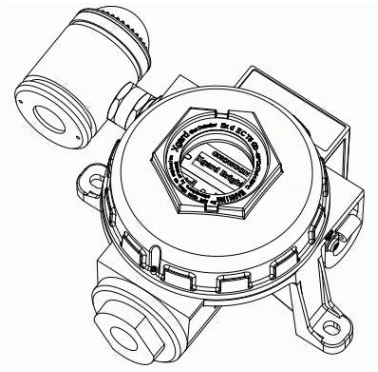


Figure 4-4-2-4-1 Gas Alarm Exterior View

4.4.2.5 Audible and Visual Alarm

The siren is equipped with a professional capsule-driven horn and offers 32 selectable tones, including low-frequency, high-frequency, European, American, and Australian standard frequency modes, as well as all industry-standard frequency patterns. It is made of flame-retardant polymer and is available in standard colors with up to 5 different lens colors, making it suitable for a range of fire and safety notification applications as well as DDA-compliant installations.

Figure 4-4-2-5-1 Audible and Visual Alarm Exterior View Diagram

4.4.2.6 Ventilation Fans

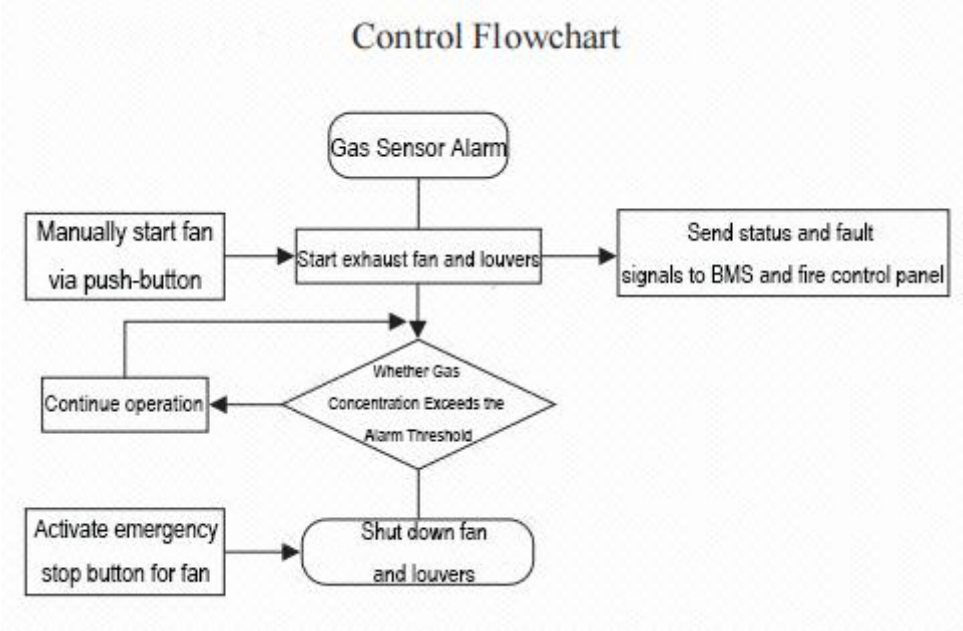


Figure 4-4-2-6-1 Blower Control Flow Diagram

4.4.2.7 Explosion Relief Valve

Working Principles:

- Pressure Balance Function**:**

  Balances the internal and external pressure differences of highly sealed products such as battery cabinet, ensuring that under normal operating conditions, external environmental changes (e.g., temperature or altitude) do not cause sealing failure due to pressure differences exceeding its tolerance.

- Explosion-proof Venting Function**:**

  When the internal pressure of sealed products such as battery cabinet rises rapidly, the explosion Relief valve opens to release internal gases quickly and in a controlled manner, preventing explosions caused by overpressure.

Product Overall Dimensions：

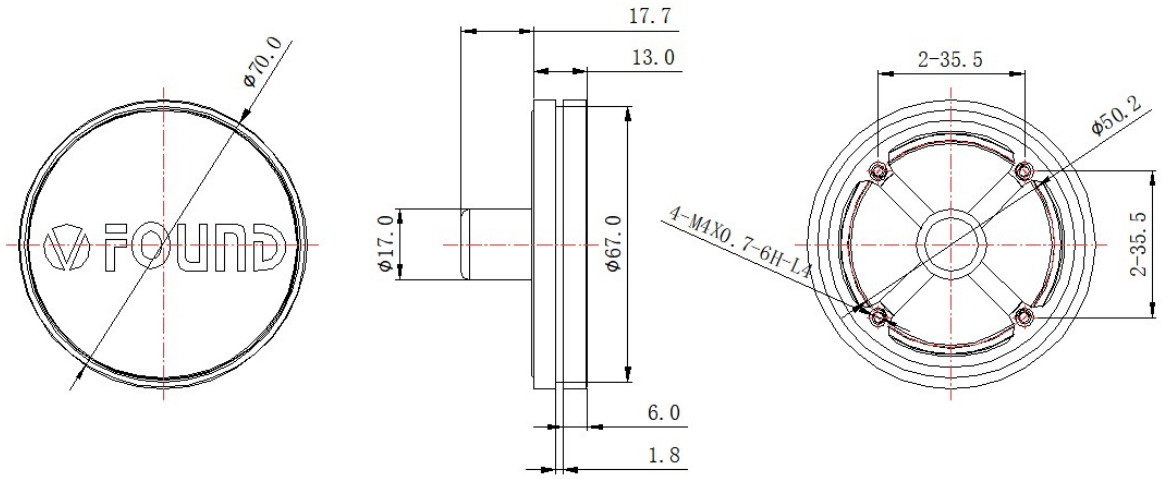


Figure 4-4-2-7-1 Explosion Relief Valve Schematic Diagram

Technical parameters：

Parameter	Requirement	Standard
Airflow	≥ 3100mL/min@1.5kPa	/
Response Pressure	4±1Kpa	/
Ambient Temperature Range	-40℃~+125℃	/
Flame Resistance	UL94-V0	/
Protection Degree	IP68	/
Corrosion protection	720h(Salt Spray)	GB/T 10125
Installation Torque	1.5N·m±0.3N·m	/
Environmental Compliance	ROHS 2.0 Compliance	/

4.5 Energy Management System

The EMS serves as the local monitoring and management unit for containerized energy storage systems or distributed energy storage cabinet systems. It integrates real-time data aggregation, display, and coordinated control of information from all components within the energy storage system. It features on-site monitoring, protection, and energy management capabilities, supports multiple communication protocols such as IEC 61850, Modbus TCP, and MQTT, and provides advanced diagnostic functions for the operational status, safety, and health of energy storage system equipment and battery systems. Additionally, it enables local intelligent operation and

maintenance, data aggregation, and collaborative diagnostics. The system supports 4G wireless IoT communication interfaces and large-capacity SSD storage, facilitates cloud-edge interaction with cloud platforms or station control layers, and allows end-users to directly access the operational status of field terminals, thereby delivering richer data services and an enhanced user experience. Furthermore, it performs numerical calculations, performance analysis, alarm handling, and data storage for real-time battery data uploaded by the ESBCM (Secondary Battery Management System) and ESBMM (Primary Battery Management System). As a result, the EMS represents a cost-effective, centralized, intelligent, and integrated local control and management solution for energy storage systems.

Figure 4-5-1 EMS Architecture

5. Product Dimensions

Unit：cm

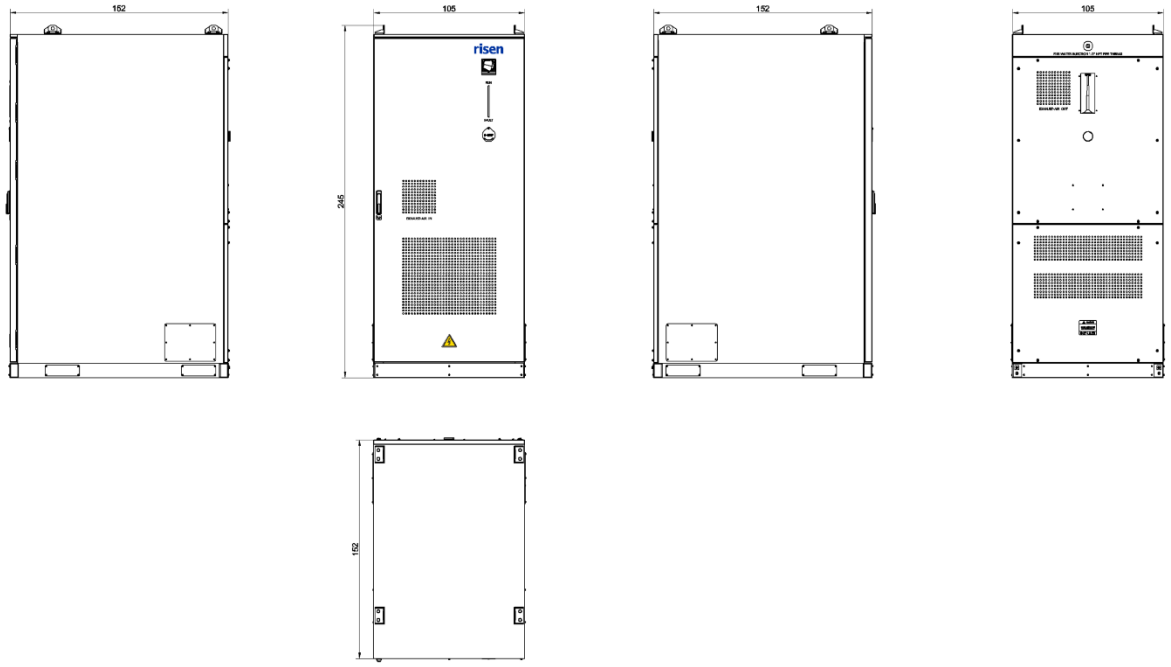


Figure 5-1 SI261A125LM Product Dimensions (Unit: cm)