# Product Specification

# 130kW/261kWh Liquid Cooling Energy Storage Cabinet

Product Model: VE-LCC-261-1


Version: 1.2

Date: 2025.06.26



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# Contents

## Abbreviation

**Table 1-1 Abbreviation**

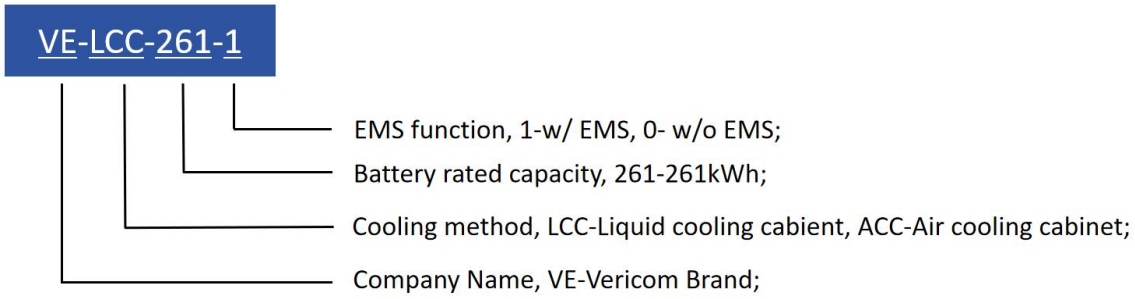
| Abbreviation Name | Full Title |
|---|---|
| EMS | Energy Management System |
| PCS | Power Conversion System |
| PDU | Power Distribution Unit |
| BMS | Battery Management System |
| BMU | Battery Management Unit |
| BCU | Battery Control Unit |
| BOL | Beginning of Life |
| EOL | End of Life |
| SOC | State of Charge |
| SOE | State of Energy |
| SOH | State of Health |
| RTE | Round-trip Efficiency |
| MCCB | Molded Case Circuit Breaker |

## Module description

This manual is applicable to the following models of integrated energy storage systems

Model description:

**Fiugre 1-1 Model description**




The following model:

**VE-LCC-261-1**

A liquid cooling cabinet by VERICOM brand, with a rated capacity of 261kWh and equipped with EMS.

## System environment requirements

**Table 1-2 Environment Requirements**

| SN | Specifications | Parameters | Remarks |
|---|---|---|---|
| 1 | Storage environment temperature | -30～60℃ | |
| 2 | Working environment temperature | -30～50℃ | |
| 3 | Working environment humidity | RH≤95% | Non-condensing |
| 4 | Working altitude requirements | ≤3000m | ＞2000m derating usage |

# 1. System performance parameters

## 1.1 Product Introduction

The electrical cabinet contains 5 battery packs, PDU, PCS, BMS system, EMS system, thermal management system, and fire suppression system. Among them, the battery cell is the most basic battery unit. PCS mainly includes a 130kW energy storage converter, responsible for AC/DC conversion. BMS mainly includes BCU and BMU, responsible for collecting information on battery cells, battery packs, and cabinets, as well as communicating with other devices. EMS mainly includes switches and IPC, responsible for energy control of the entire electrical cabinet system. The thermal management system is responsible for the cooling and heating of the entire electrical cabinet system. The fire suppression system is responsible for the fire status detection and fire prevention of the entire electrical cabinet system.

**Table 1-3 Main Components**

| SN | Modules | Quantity | Description |
|---|---|---|---|
| 1 | PCS | 1 | 130kW |
| 2 | BMS system | 1 | BMU + BCU |
| 3 | EMS system | 1 | Switch + IPC + Router |
| 4 | Battery Pack | 5 | 1P52S |
| 5 | PDU | 1 | The PDU mainly includes detection devices and protection devices |
| 6 | Thermal management system | 1 | Battery compartment liquid cooling method + electrical compartment air cooling method |
| 7 | Fire suppression system | 1 | Pack-level aerosol & Rack-level aerosol & 3-in-1 Composite Detector |

Figure 1-2 Components(with cabinet door opened)


## 1.2 Product Parameters

Table 1-4 Basic Parameters Table

| SN | Specifications | | Parameters | Remarks |
|---|---|---|---|---|
| 1 | Electrical performance parameters | Rated power | 130kW | |
| 2 | | Rated current | 187A | |
| 3 | | Grid | 400V±15%, 50Hz | 3L+N+PE |
| 4 | | Nominal energy capacity | 261kWh | |
| 5 | | DC voltage range | 650~949V | 2.5V~3.65V |
| 6 | | Nominal DC voltage | 832V | 3.2V |
| 7 | | Number of cycles | ≥ 8000 times | @70% SOH EOL, 95%DOD, 0.5P, 25±2℃ |
| 8 | | RTE | ＞87% | Including auxiliary power consumption |
| 9 | Communication parameters | Communication interface | Ethernet, RS485, CAN | |
| 10 | Battery parameters | Battery cell | 3.2V/314Ah | |
| 11 | | Battery configuration | 1P260S | |
| 12 | | Number of battery packs | 5 | |
| 13 | | Segment mode | Quick disconnect connector | |

| | | | | |
|---|---|---|---|---|
| 14 | | Cooling method | Liquid cooling | |
| 15 | Basic parameters | Dimensions (W*D*H) | 1375*1350*2150mm | |
| 16 | | Appearance color | RAL9016 | Optional |
| 17 | | Weight | About 2600kg | |
| 18 | | Corrosion resistance level | C4 | |
| 19 | | IP Degree | IP54 | |
| 20 | | Isc | 300A | PCS current limiting value |
| 21 | | Icc | 50KA | |
| 22 | | Icp, mr | 2.5KA | |
| 23 | MCCB | In | 250A | |
| 24 | | Uimp | 8000V | |
| 25 | | Icu | 70kA | |
| 26 | | Ics | 50kA | |
| 27 | Certificate | Certificate | CB, CE-LVD, CE-EMC, UN38.3 | Cabinet Solution |

# 2. System architecture

## 2.1 Battery Pack

The battery pack contains 52 battery cells and a BMU. Each battery contains 16 NTC temperature sampling points, and the BMU is responsible for collecting and balancing the voltage and temperature of the battery cells inside the battery pack (passive balancing). The appearance of the battery pack is shown in the following figure:

**Figure 2-1 Appearance of battery pack**

**Table 2-1 Technical parameters**

| SN | Specifications | | Parameters | Remarks |
|---|---|---|---|---|
| 1 | Basic | Nominal capacity | 52.249kWh | |
| 2 | | Number of battery cells | 52 | |

| | | | | |
|---|---|---|---|---|
| 3 | parameters | DC Voltage range | 130~189.8V | 2.5V~3.65V |
| 4 | | Rated DC voltage | 166.4V | |
| 5 | | Charge/discharge rate | 0.5P | |
| 7 | | Maximum continuous current | 157A | |
| 8 | | Communication method | CAN | |
| 9 | General parameters | Dimensions (W*D*H) | 790*1180*253mm | |
| 10 | | Weight(kg) | 312±5 | |
| 11 | | Cooling method | Liquid cooling | |
| 12 | | Protection level | IP66 | |

## 2.2 Power Distribution Unit (PDU)

The power distribution unit mainly includes disconneting switch, main circuit components BCU, FAN, copper bar, cables, etc. The layout of DC/DC power supply, cooling fan, and related wiring harnesses is shown in the following figure:

**Figure 2-2 Appearance of PDU**

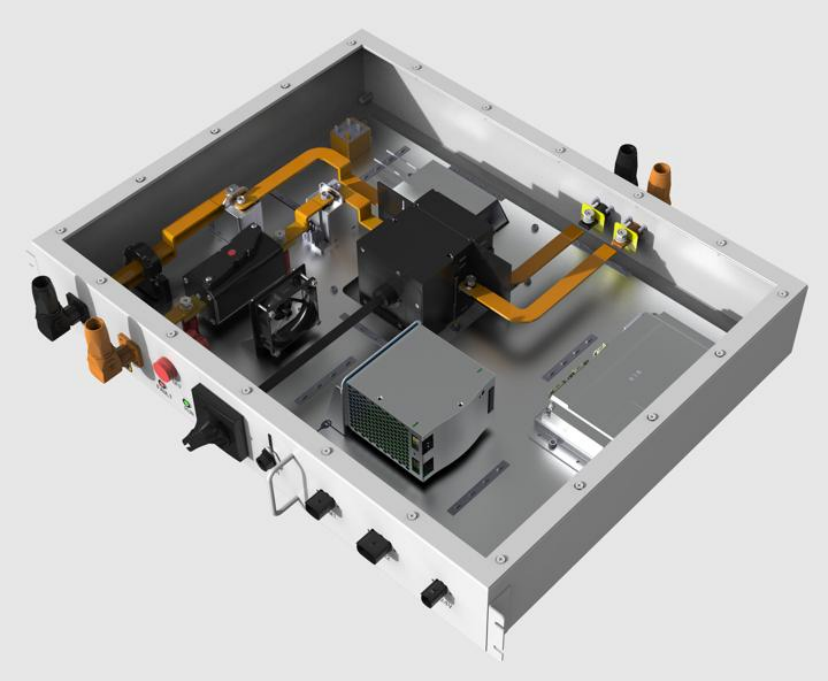


**Table 2-2 Definition of external interfaces**

| SN | Interface | Function | Description | Remarks |
|---|---|---|---|---|
| 1 | ETH | Ethernet communication | Socket SPRJS-5EPFFJ-TC7002 | |

| | | | | |
|---|---|---|---|---|
| 2 | DC24V | PDU power source | Socket FE25A04WB-16W Pin F3-C10156-04 | |
| 3 | COM1 | BMU Communication | Socket FLP6008W-01W Pin F3-C30214-04 | |
| 4 | COM2 | External communication | Socket FLP6014W-01W Pin F3-C30214-04 | |
| 5 | P+ | Positive electrode connection of PCS | Socket FSE20180P-M8AW | |
| 6 | P- | Negative electrode connection of PCS | Socket FSE80180Q-70B4W | |
| 7 | B+ | Positive pole connection of battery pack | Socket FSE20180P-M8AW | |
| 8 | B- | Negative pole connection of battery pack | Socket FSE80180Q-70B4W | |
| 9 | PE | Grounding of the enclosure | M4 * 10 Cross Recessed Pan Head Screw | |

## 2.3 Liquid Cooling Chiller

The system product is equipped with a liquid cooling chiller, which is a device used as an energy storage battery antifreeze for temperature control and reducing environmental humidity. It has frequency conversion control capability and includes cooling function, heating function, control module, high and low voltage power supply module, support and protection structure module and other functional modules.

The liquid cooling unit can effectively control the temperature of the battery cells within the optimal operating temperature range, ensuring that the battery operates at the optimal temperature for a long time, guaranteeing the normal operation of the battery cells, and extending the cycle life of the battery.

**Figure 2-3 Appearance of liquid cooling chiller**

**Table 2-3 Technical parameters**

| SN | Specification | Parameters |
|---|---|---|
| 1 | Work ambient temperature | -30℃~+55℃ |
| 2 | Cooling capacity @ L35/W18 | 5.0kW |

| | | |
|---|---|---|
| 3 | Heating capacity @ Tu=10 ℃ | 2.0kW |
| 4 | Unit power requirements | 220V±15%, 50/60±3Hz |
| 5 | Communication interface | RS485 |
| 6 | Weight | 85kg |
| 7 | Space dimensions (H*W*D) | 245×700×900mm |
| 8 | Appearance and colour | RAL7035 |

## 2.4 Fire Suppression System

The fire suppression system in energy storage cabinets plays a crucial role in ensuring the safety of energy storage equipment. Here is an overview of the main functions of this system:

- Real-Time Monitoring and Early Warning:

By utilizing temperature sensors, smoke detectors, and other devices, the system monitors the internal environmental conditions of the battery pack in real time. It promptly detects abnormal temperature rises or excessive smoke concentrations, issuing early warning signals to facilitate timely intervention.

- Precise Fire Extinguishing:

Once the early warning system is triggered, it can quickly locate the fire source and activate local extinguishing devices, such as aerosol systems. This allows for precise extinguishment of the fire source, preventing its spread and protecting the equipment and surrounding environment.

- Integrated Protection:

The system integrates a Battery Management System (BMS) to monitor critical parameters such as voltage, current, and temperature of individual battery cells. It provides early warnings of potential thermal runaway risks, allowing for proactive measures to be taken to reduce the likelihood of fire incidents.

- Rapid Response:

Each rack of energy storage cabinets is equipped with independent fire protection devices and monitoring systems, ensuring quick activation of extinguishing procedures in the event of a fire. This effectively controls the spread of the fire and safeguards both other equipment and personnel.

- Intelligent Management:

By combining IoT technology and big data analytics, the system achieves real-time monitoring and intelligent management of energy storage facilities. This enables the timely detection and resolution of safety hazards, preventing potential fire incidents.

- Coordinated Action:

In the event of a fire, the rack-level fire extinguishing system can coordinate with other firefighting and emergency equipment. This creates a cooperative response scenario, enhancing extinguishing efficiency and ensuring safe evacuation for personnel.

- Comprehensive Coverage:

These functions together form a comprehensive fire protection system for energy storage cabinets, aimed at enhancing fire prevention and extinguishing capabilities, thus ensuring the safe and stable operation of energy storage systems. Through these measures, the risk of fire can be effectively reduced, protecting both personnel and property.

**Table 2-4 Technical parameters**

| SN | Component Parts | Qty | Description |
|---|---|---|---|
| 1 | Prefabricated aerosol automatic fire extinguishing device | 1 | Cooling fire extinguishing, suffocation fire extinguishing, chemical suppression fire extinguishing |
| 2 | Smoke detector | 1 | Detect the rise of smoke produced in the early stages of a fire |
| 3 | Temp/Heat detector | 1 | Detect the rise of temperature in the early stages of a fire |

**Figure 2-4 Appearance of fire suppression system**

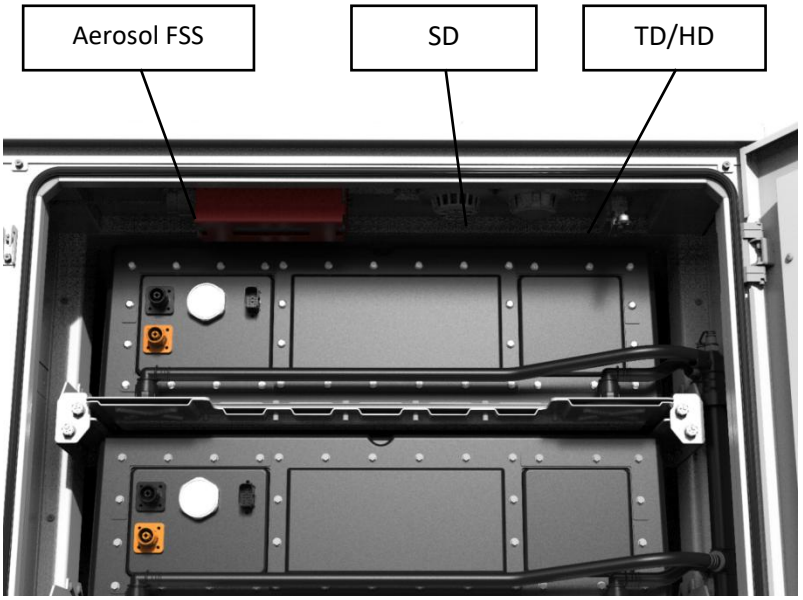
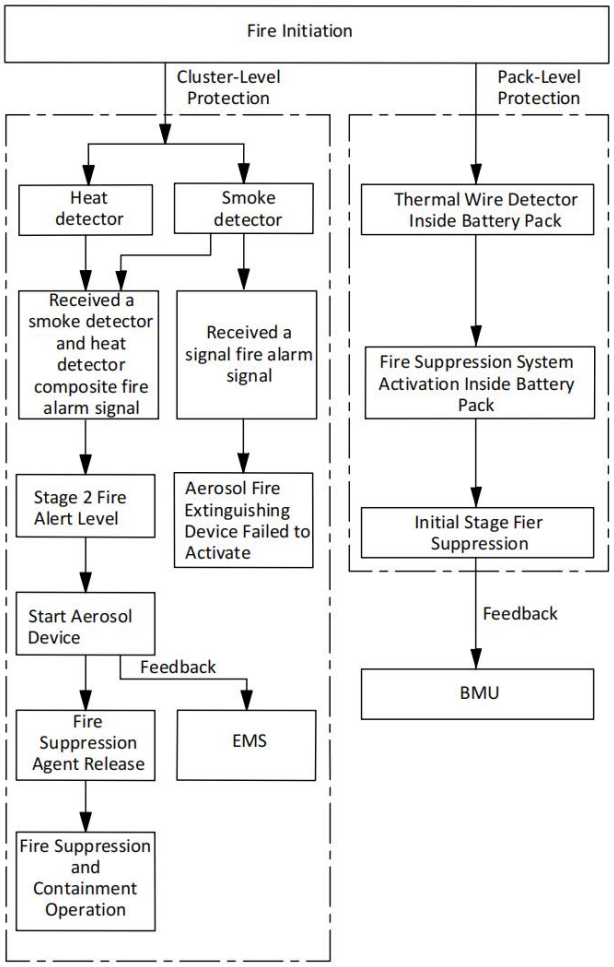



**Table 2-5 Alarm logic control**

Figure 2-5 Fire logic diagram




- **Fire Detection Phase**

When both the smoke detector and temp/heat detector are triggered simultaneously, the system identifies this as a composite fire alarm signal. A dual detection mechanism at the rack level and battery pack-level ensures comprehensive coverage of thermal runaway risks across the entire system.

- **Fire Alarm and Severity Classification**

Stage 2 Fire Alert Level: Upon detection of a composite signal, the system escalates to a Level 2 fire alarm (critical fire incident).

- **Fire Suppression Execution Phase**

The system automatically issues the "Start Aerosol Device" command to activate the aerosol fire suppression system inside the battery cabinet, achieving rapid chemical fire suppression. When a fire occurs, the aerosol fire extinguishing device inside the battery pack will be activated either by open flames igniting the thermal fuse wire or when the internal temperature reaches predetermined thresholds. Upon activation, the aerosol-forming agent inside the device undergoes an oxidation-reduction reaction, where the released heat causes decomposition of the chemical coolant. This dual-action mechanism combines the aerosol-forming agent's

chemical suppression with the coolant's temperature reduction effect, working in tandem to effectively extinguish the fire while simultaneously containing localized thermal spread, with all operational feedback signals being transmitted to the monitoring platform for comprehensive logging and analysis.

This integrated process ensures complete fire suppression through coordinated chemical and cooling actions while maintaining real-time system monitoring throughout the entire incident response cycle.

- **Fire Containment and Feedback**

Feedback signals (Feedback) are transmitted to the monitoring platform for logging and analysis.

## 2.5 Battery Management System (BMS)

The Battery Management System (BMS), as the core component of the battery system, serves as a bridge between the battery pack and external devices, determining the utilization rate of the battery. Its performance is crucial to the cost and safety performance of the energy storage system. BMS real-time collects, processes, and stores important information during the operation of the battery system, and exchanges information with external devices to provide real-time alarms and protection during the operation of the battery pack. BMS generally adopts a multi-level distributed architecture design. Depending on the different energy storage systems, two-level architecture schemes are adopted, and the system consists of a battery control unit(BCU) and a battery management unit(BMU).

**Function description:**

- Support battery status data processing, summarize ESBMM battery real-time data information through CAN, and manage and control battery pack/rack charging and discharging after processing;
- Support group terminal voltage detection, achieve real-time detection of group terminal voltage by isolating, collecting and processing group terminal voltage;
- Support group end current detection and real-time isolation, acquisition, and processing of current using Hall sensors;
- Support battery system insulation detection function, which can be turned on and off according to system configuration requirements;
- Support SOC/SOH/SOE/SOP estimation, which can realize the estimation of SOC and SOH of individual cells and battery packs;
- Support thermal management control function, which can actively manage the temperature of the battery pack according to its temperature status, achieve temperature control function of cooling or heating, and extend the service lifespan of the battery pack;
- Support fault detection function, which can alarm based on threshold values such as voltage, current, temperature, SOC, SOH, as well as circuit cut-off protection function for extreme alarm thresholds;
- Support data storage function, support local storage of system operation data;
- Support system expansion functions, including multiple active/passive node outputs, relay control

management, and effective isolation of strong and weak electricity, among other diverse safety control requirements.

- Supports CAN, RS-485, and Ethernet communication functions to achieve information exchange.

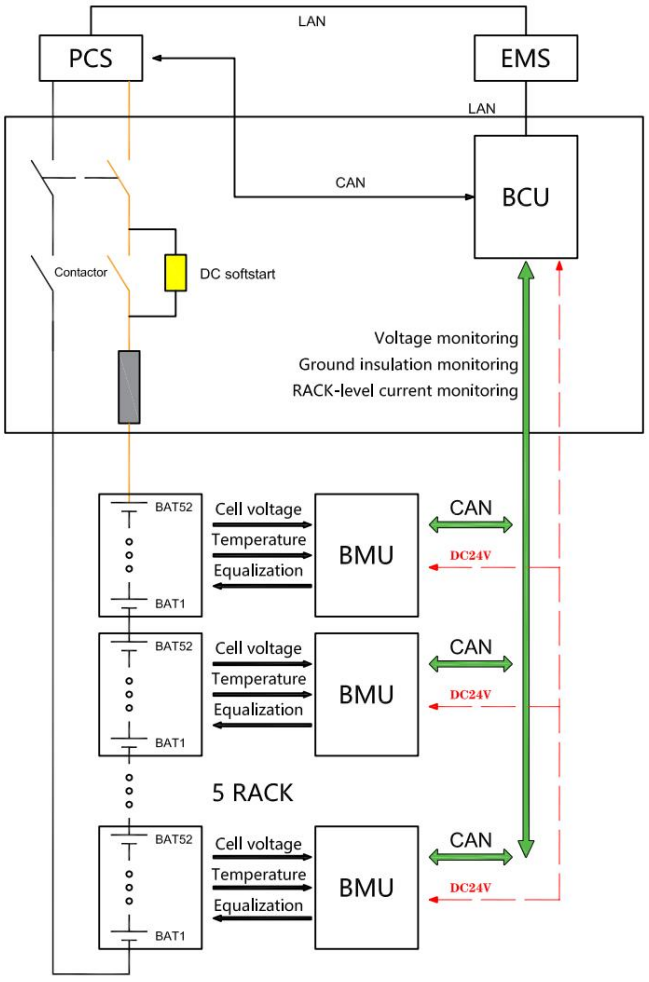
**Table 2-5 BCU Main function**

| Category | Funtion | Description |
|---|---|---|
| DO Control | Main Positive Contactor Control | |
| | Circulating Current Contactor Control | |
| | Main Negative Contactor Control | |
| | Fan Contactor Control | |
| | PCS Fault Dry Contact | |
| DI Monitoring | Main Positive Contactor Feedback | |
| | Main Negative Contactor Feedback | |
| | PDU Circuit Breaker Feedback | |
| BCU NTC | Temperature Acquisition | |
| Current Acquisition | Current Measurement via Hall Sensor | |
| Overtemp Alarm | Alarm Trigger Threshold | |
| Insulation | Insulation Resistance Detection | |
| Communication | Communication with PCS | CAN |
| | Communication with Liquid Cooling Chiller | RS485 |
| | Communication with EMS | RS485&LAN |
| | Internal Network Communication | |

**Table 2-6 BMU Main function**

| Catagory | Funtion | Description |
|---|---|---|
| DO Control | Fan Control | |
| DI Monitoring | Battery Pack FSS Feedback | |
| Automatic station address | IO1、IO2 | |
| Voltage Acquisition | One BMM, 52 voltage sampling points | |
| NTC | One BMM, 16 temperature sampling points | |

**Figure 2-6 BMS block diagram**



## 2.6 Power Conversion System (PCS)

**Introduction:**

The energy storage converter (PCS) shall be equipped with charge/discharge functions, active power control, reactive power regulation, and off-grid inverter capabilities. This bidirectional AC/DC PCS module is suitable for battery charging and discharging processes, performing AC/DC conversion, and can directly supply power to AC loads in the absence of a grid.

The PCS receives control commands from the EMS via RS485/CAN interfaces and regulates the converter's charging or discharging operations based on the polarity and magnitude of the power command, enabling active and reactive power adjustment for the grid. Its primary operating modes include: AC constant power mode/DC constant voltage mode/DC constant current mode/Independent inverter mode.

The PCS communicates with the BMS through a CAN interface to obtain battery pack status information, ensuring protective charging/discharging to maintain safe battery operation.

Typical Application Scenarios:

- Grid-connected energy storage system
- Grid-connected/off-grid switching microgrid energy storage system
- Inter-phase power balancing and distribution network regulation system

**Figure 2-6 Appearance of PCS**

**Table 2-6 Dimensions**

| Size | Includes front panel and terminals | Tolerance |
|---|---|---|
| Length | 715mm | ±0.5mm |
| Width | 500mm | ±0.5mm |
| Height | 190mm | ±0.5mm |
| Weight | ≤66kg | ±0.5kg |

Figure 2-7 Circuit schematic diagram of PCS

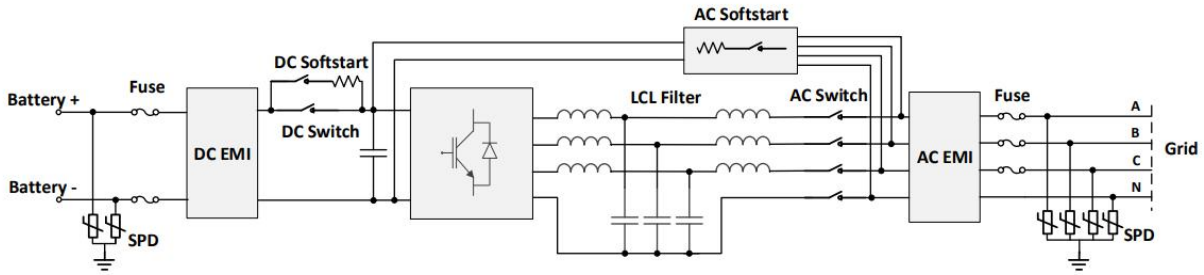



Table 2-7 Technical parameter

| SN | Specification | Parameters | Remarks |
|---|---|---|---|
| 1 | Wiring Configuration | 3P5W | |
| 2 | Rated power | 130kW | Max. output 156kW |
| 3 | Grid voltage | 400V | |
| 4 | Voltage range | 340~460V | ±15% |
| 5 | Rated AC current | 188A | |
| 6 | Overload capacity | 110%: long-term<br>120%: ≥1min | 143kW |
| 7 | Rated grid frequency | 50Hz | ±5Hz |
| 8 | Power factor | ≥0.99 | ＞50%PN |
| 9 | Power factor adjustable range | 1(leading)~1(lagging) | |
| 10 | THDi | ＜1.5%（100%PN）<br>＜5%（≥20%PN） | |
| 11 | Charge/discharge switching time | ≤20ms | |
| 12 | Power control deviation | ＜2% | ≥20%PN |
| 13 | DC component | 0.5% | Rated current |
| 14 | DC votlage range | 650~1000V | |
| 15 | DC voltage range@Full load | 650~950V | |
| 16 | Max. DC current | 220A | |
| 17 | Working temperature range | -30℃~70℃ | >50℃ derating, 70℃ overtemp protection |
| 18 | Storage temperature range | -40℃~75℃ | |
| 19 | Efficiency | ＞99% | Peak power |
| 20 | Auxiliary power supply | Self-powered | |
| 21 | Cooling method | Intelligence air cooling | |
| 22 | Altitude | 5000m（>3000m derating） | |
| 23 | Humidity | 0~95%(non-condensing) | |

| | | | |
|---|---|---|---|
| 24 | Communication method | Ethernet/RS-485/CAN | |
| 25 | Communication protocol | MODBUS TCP/IP / RTU / CAN2.0B | |
| 26 | Certificate | LVD(EU) 2014/35, IEC 61000-6-2/-4, IEC 62477-1, EN 50549-1 | |

## 2.7 Energy Management System (EMS)

**Application scenarios**

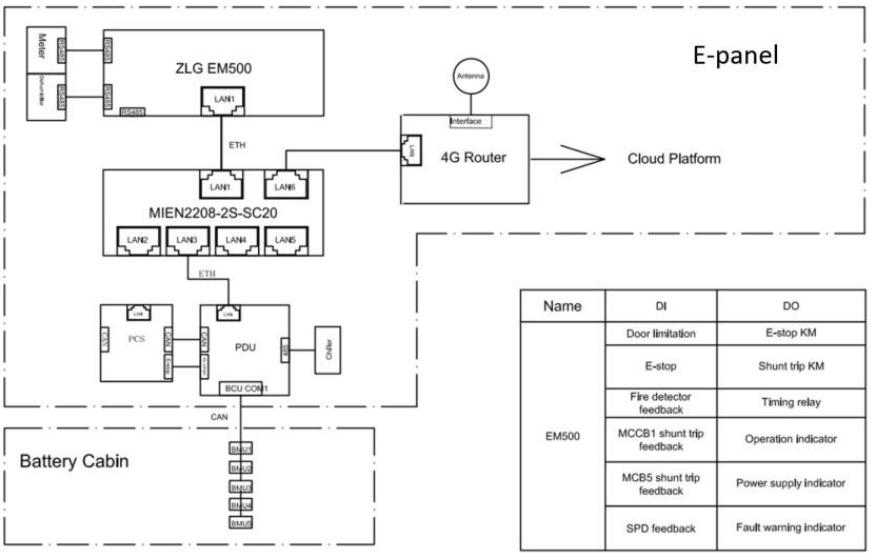
The VERICOM Standard Energy Storage System can be applied to the following scenarios:

- Capable of independently implementing "timed charging and discharging";
- Execute power scheduling instructions for the energy management system of the station;
- Cooperate with the energy storage scheduling system to achieve applications such as "load tracking", "demand tracking", and customized funtions such as "PV self-consumption", "PV-storage-charging", etc.

**Main functions of the monitoring system**

- Collect and manage various devices within the energy storage system, adapt to various communication interfaces and protocols.
- Control the start stop and power response of PCS.
- Monitor the working status of the battery and control the system operation mode based on its status.
- Monitor other auxiliary electrical equipment of the monitoring system to ensure electrical safety during operation.
- Open external communication interfaces to achieve data exchange with external parties.
- Optional local LCD display for local data viewing.
- The communication protocols used for internal communication between the energy storage controller and the energy storage system are Modbus TCP and Modbus RTU protocols.
- The communication protocols used for external communication are Modbus TCP and TCP/IP protocols.

**Figure 2-10 Communication topology diagram**




| Name | DI | DO |
|---|---|---|
| EM500 | Door limitation | E-stop KM |
| | E-stop | Shunt trip KM |
| | Fire detector feedback | Timing relay |
| | MCCB1 shunt trip feedback | Operation indicator |
| | MCB5 shunt trip feedback | Power supply indicator |
| | SPD feedback | Fault warning indicator |

**Communication physical interface**

- The external communication of the energy storage controller adopts Ethernet interface, and the interface used by Modbus TCP is Ethernet RJ45 connector.

**Mattersattention**

- During the configuration process, each device needs to provide detailed information such as IP address, port or device number, baud rate, etc.
- The Ethernet cables used for RJ45 interfaces should preferably use connectors with shielding covers.

**Functions implemented by the main controller**

- The energy storage controller collects data from BMS, PCS, liquid cooling chiller, fire protection, lightning protection, switch values, etc., and uploads it to the higher-level platform;
- The energy storage controller receives instructions from the higher-level platform, controls the PCS to start, stop, shut down, standby, and adjusts the charging and discharging power;
- During operation, collect the real-time power of the BMS and PCS maximum charging and discharging power regulation system;
- When the communication between the energy storage controller and BMS is interrupted, control the PCS to stop power; When communication with PCS is interrupted, the emergency stop signal is used to control the shutdown of PCS.
- When faults such as liquid cooling chiller, fire protection, water immersion, lightning protection, and switch values are detected, the control system will shut down;
- Optional LCD display screen, with functions such as summary data, detailed data, energy flow analysis, historical data query, fault and alarm prompt, parameter setting, equipment control, data analysis

and curve, revenue analysis and settlement for each sub device; The input and output changes of switch values need to be recorded.

- When a fire alarm or malfunction occurs, it is necessary to control the PCS to shut down, and at the same time, control the BMS to disconnect the contactor and disconnect the secondary power supply for energy storage.
- When the emergency stop button is pressed on site, PCS stops and BMS disconnects the contactor;
- When the system malfunctions, the control fault light will turn on. After the fault disappears, control the fault light to turn off;
- When the system generates an alarm, the control alarm light will turn on. After the alarm disappears, control the alarm light to turn off;
- When there is a communication failure between the energy storage controller and PCS, a shutdown dry node signal is sent to control PCS shutdown, and the control fault light is on.

**Data upload**

- The energy storage data is uploaded to the higher-level platform and communicated using Modbus TCP protocol, mainly including the following data:
- PCS detailed data: PCS temperature, voltage, frequency, effective operating time, DC charging and discharging capacity, AC charging and discharging capacity.
- Summary data of fuel cell stack: highest and lowest temperature values and position IDs, highest and lowest voltage values and position IDs, average voltage, average temperature, rechargeable and dischargeable power of the fuel cell stack.
- Energy storage controller operating condition data: total rechargeable power, number of operable battery systems (PCS+BMS as a whole), rechargeable power of individual battery systems, etc.
- Container energy statistics data: daily and total charging and discharging energy of the battery system, daily charging and discharging efficiency of the battery system, temperature and humidity of the operating environment, etc.
- The fault status of communication devices (such as greenhouse probes) for TCP and RS485, lightning protection signals, and meter communication.

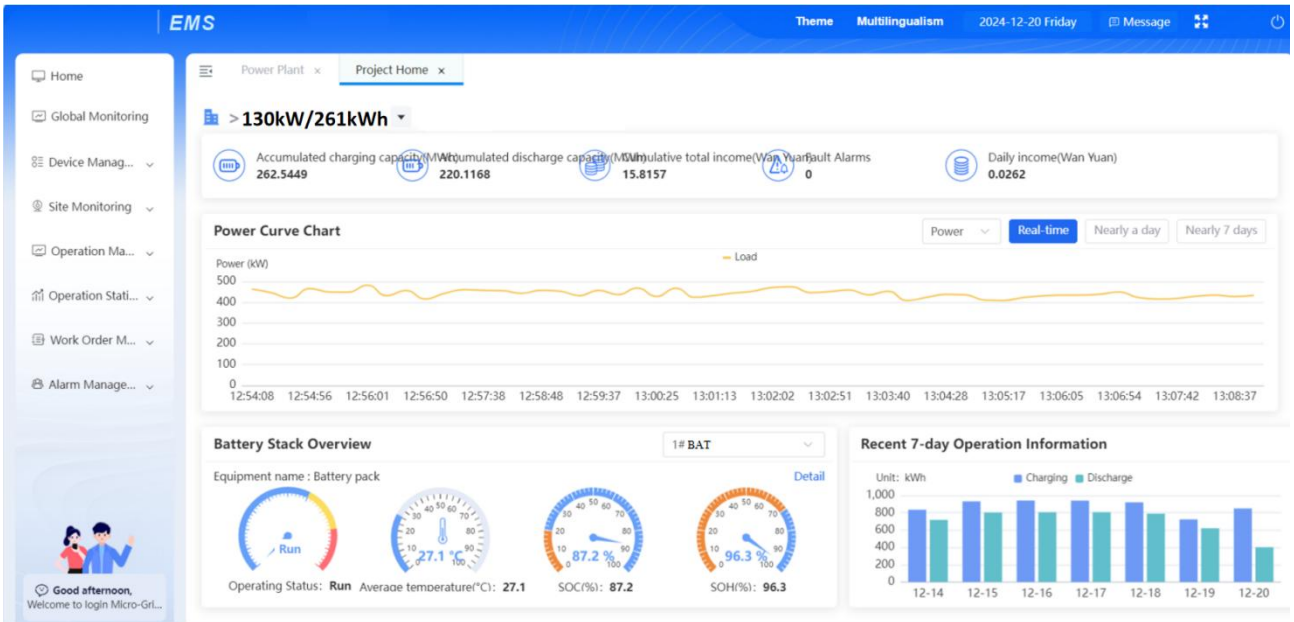
**Cloud Platform Technical Specifications**

- Visually display the composition and energy flow of the power station system (specific display determined by corresponding configuration data). Each component is an animated control that can respond to hovering or clicking with the mouse. By clicking on a component, you can enter a detailed device page. The device needs to have image display and be switchable between similar devices.

Figure 2-11 Power station topology diagram

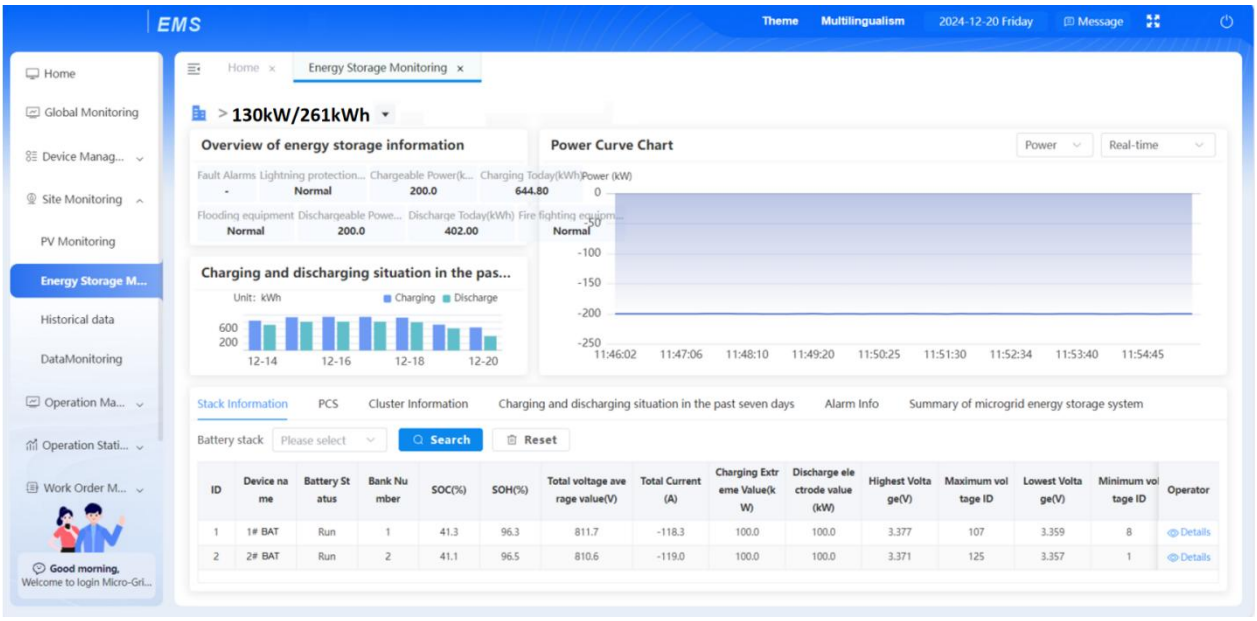

- On the homepage, display the data of the power station, such as operation strategy, real-time power of each component, battery SOC, battery status, daily revenue, total revenue, etc.

Figure 2-12 EMS homepage



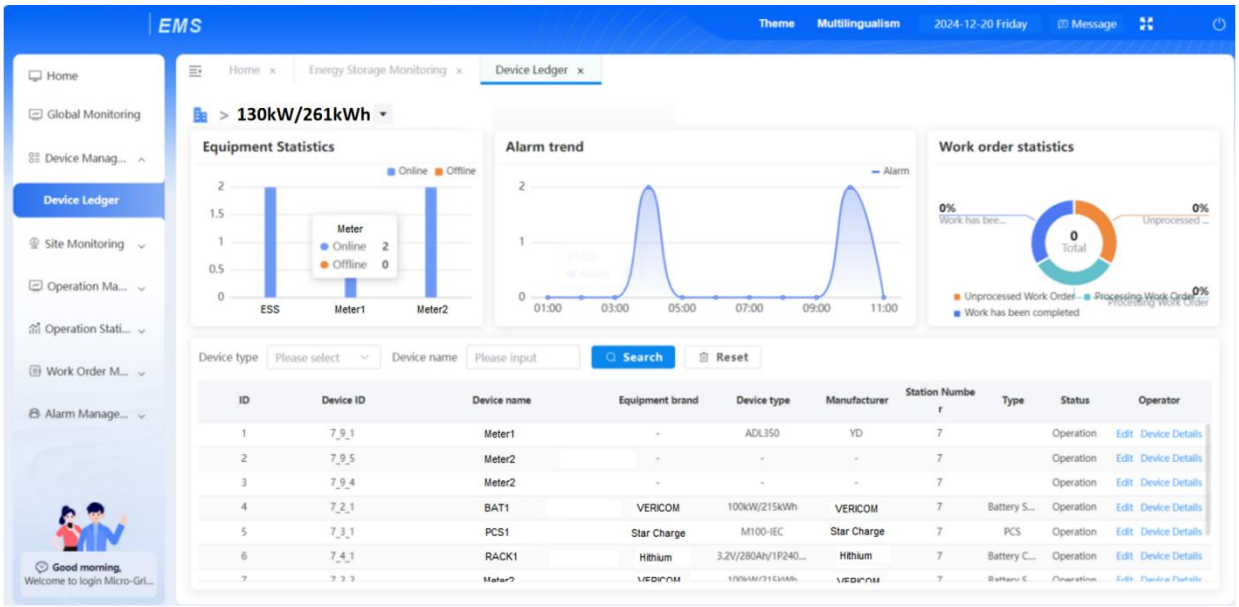

- Energy storage monitoring: including main data parts such as PCS, battery stack, battery rack, and detailed information of individual cells. Each component of energy storage needs to be displayed separately. You can enter by clicking to view details.

**Figure 2-13 EMS monitoring inteface**




- Information list: View device SN, product, device type, and manufacturer information such as brand, model, and manufacturer name.
- Equipment information: List of network equipment, loads, switches, and smart meters related to the power station.
- Switching device operating status: Control the switching of controllable device operating status.
- Alarm and warning information: View the warning time, warning type, warning description and other warning information of the device.
- Device parameters setting: Edit the numerical values of device parameters.

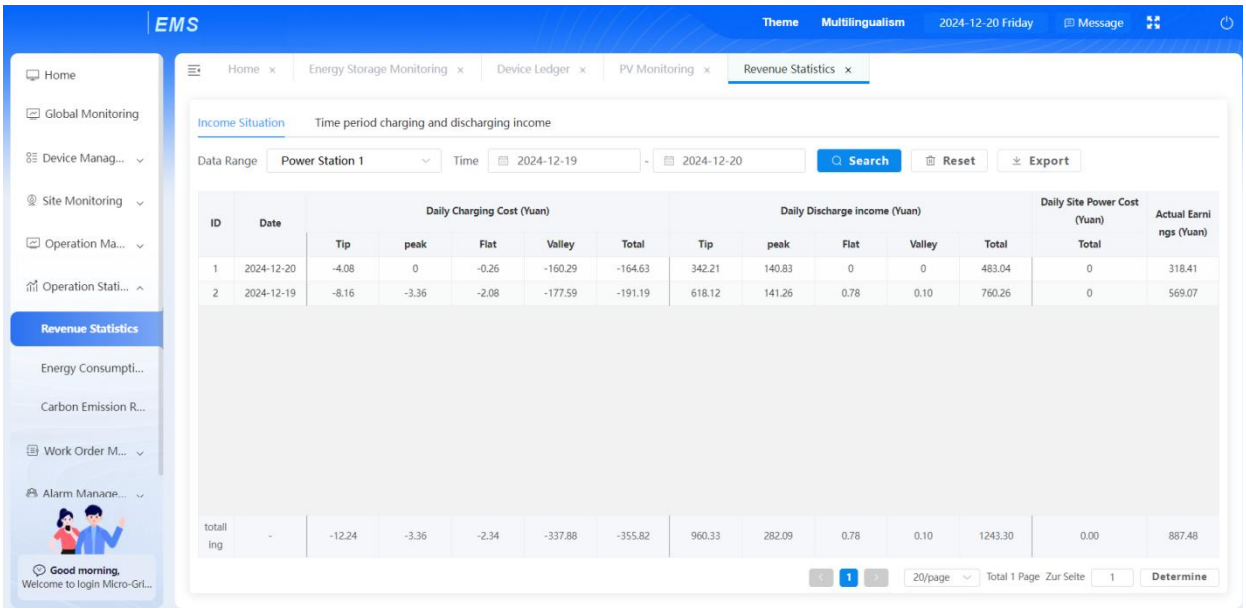
**Figure 2-14 Equipment ledger interface**




- Data statistics, calculated on a daily, monthly, and yearly basis, respectively, for the overall and

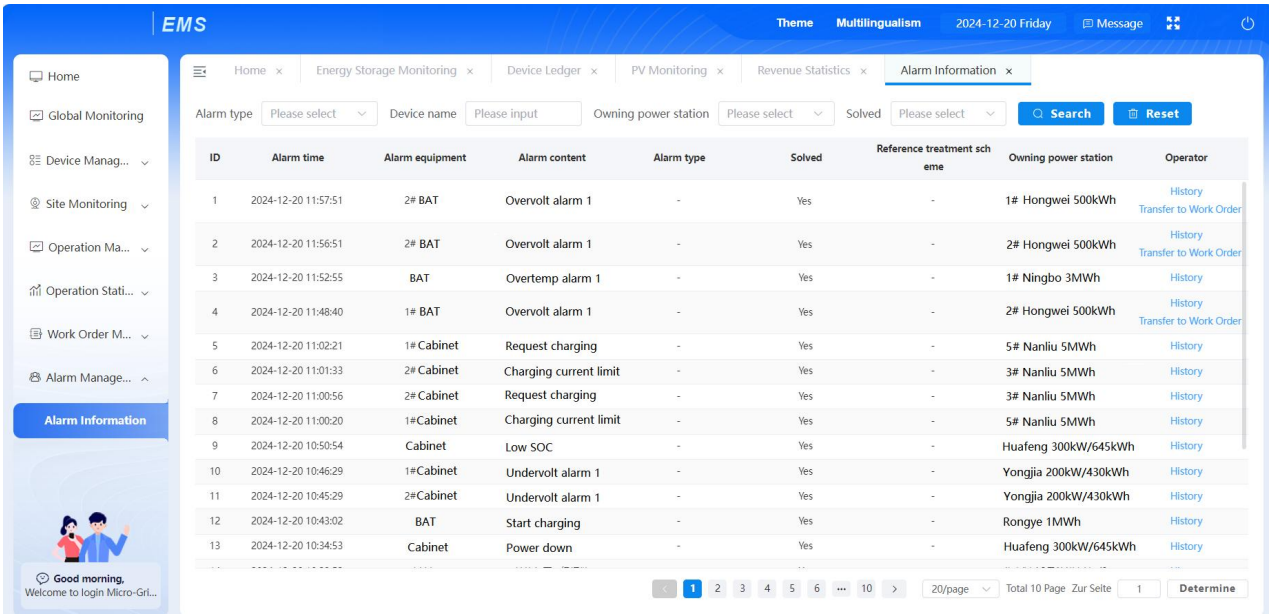
individual components of the microgrid, including revenue statistics, energy consumption statistics, and carbon emission reduction statistics. In the revenue statistics, the charging and discharging amount and cost of each peak and valley period can be displayed separately according to the configuration time period. Simultaneously supporting the generation and export of reports, with data generated in units of days or electricity price periods.

**Figure 2-15 Revenue statistics interface**




- Alarm and fault information column: including source, time, reference scheme, whether it has been resolved, etc., and can be converted into a work order; Unprocessed items will be displayed in a loop on the HMI.

**Figure 2-16 Real-time warning interface**



# 3. Electrical connection

## 3.1 Electrical schematic diagram

**Figure 3-1 System schematic diagram**

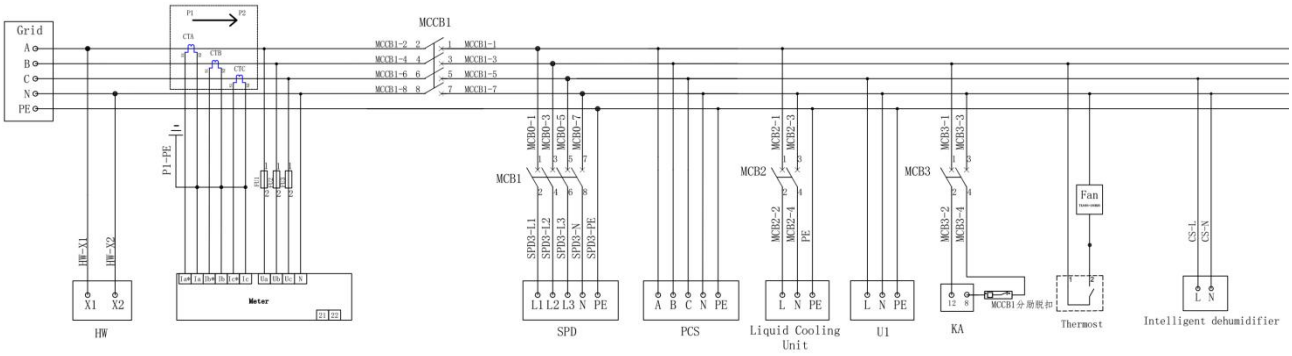



**Table 3-1 Electrical components**

| SN | Device number | Description | Remarks |
|---|---|---|---|
| 1 | MCCB1 | Molded Case Circuit Breaker | Main AC Circuit Breaker |
| 2 | MCB1 | Miniature Circuit Breaker | SPD Front-end Circuit Breaker |
| 3 | MCB2 | Miniature Circuit Breaker | Liquid Cooling Chiller Front-end Circuit Breaker |
| 4 | MCB3 | Miniature Circuit Breaker | Trip Unit Front-end Circuit Breaker |
| 5 | MCB4 | Miniature Circuit Breaker | Main DC Circuit Breaker |
| 6 | HG/HR | Warning/alarm indicator light, Green/Red | The light illuminates during system operation/alarm |
| 7 | HW | Power indicator light, White | The light illuminates when the system is powered on |
| 8 | HY | Fault indicator light, Yellow | The light illuminates when an alarm is triggered. |

# 4. Installation guidance

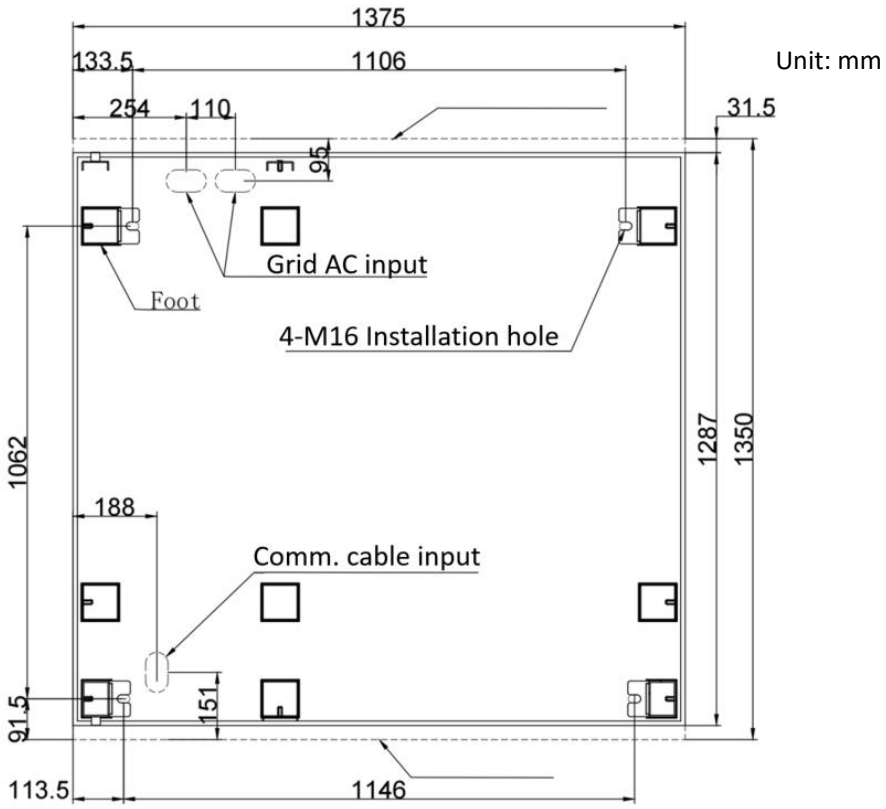
## 4.1 Environmental location requirements

The requirements for site flatness are as follows:

1. Ground level deviation ≤± 10mm
2. Ground flatness deviation ≤ ± 4mm/2m

## 4.2 Foundation

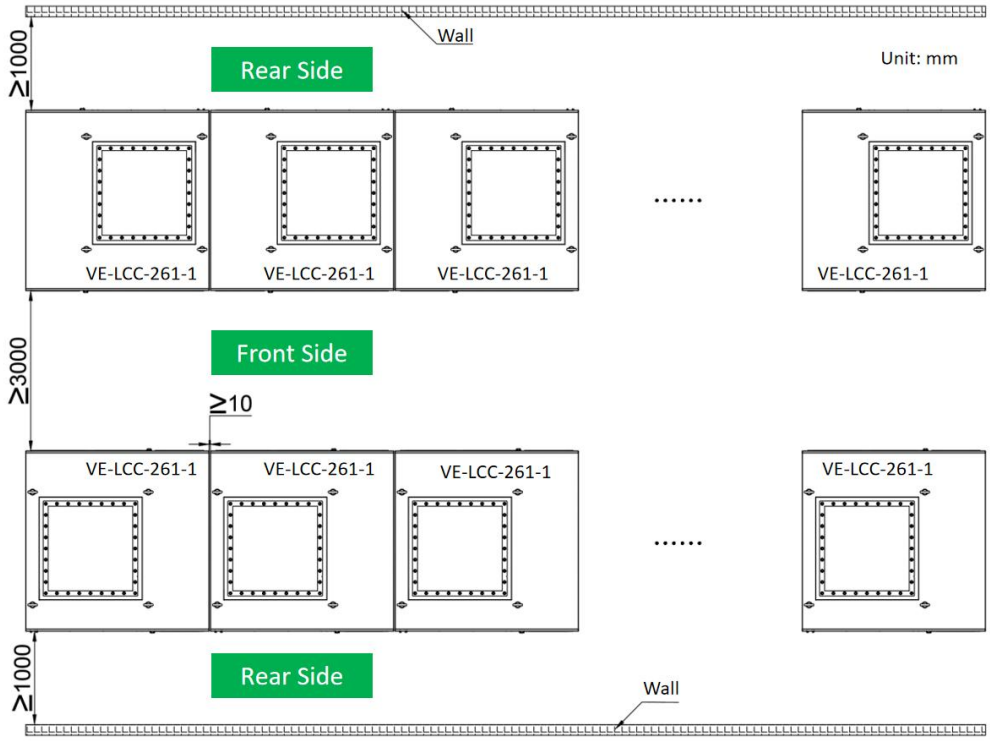
**Figure 4-1 Foundation**



### 4.3 Installation Layout

The distribution of different electrical cabinets is shown in the following figure:

**Figure 4-2 Distance between cabinets (Top view)**




The minimum gap between parallel arrangements of electrical cabinets is 10mm, and the recommended distance between two rows of electrical cabinets is ≥ 3000mm.

The minimum gap between the back of the cabinet and the wall is 1000mm.

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