

PowerEdge Data Center

Deckro PowerEdge Modular Data Center

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1. General View



2. Project Overview

It is aimed to supply and install the Modular Data Center Project planned to be installed in and other components within it.

In this context, the advantages and disadvantages of data center infrastructure design and construction, Direct relationship, whether the various equipment inside the data center can operate stably and reliably, Whether it can ensure that all kinds of information is not blocked, Through a rational and scientific design, To ensure that the data center's power supply, temperature / humidity, cleanliness, lighting, static, interference, vibration, lightning protection can fully meet the safety of data center equipment, Reliable all-weather operation goal, Extend the use time requirement of the data center system to ensure error-free operation; To provide the data center with a scientific, advanced, reasonable, cost-effective, complete and comprehensive structure, in line with the relevant national standards of the overall design scheme

3. Item Information

This project belongs toand is located in The main information is shown in the following table.

Project Name	
Industry Involved	
Design level of the data center room	Data Center Design Specification
IT cabinet quantity Requirements	2x 600mm Width Server Rack 2x 800mm Width IT/ Server Rack 1x 600mm Width IT Smart Device Rack Total : 6 Pcs IT/Smart/Server Rack
Cabinet power consumption density	3kW / IT/Server Rack
The UPS backup time requirement	Optional 50 minutes at full load
Date	11.09.2023

4. Construction Conditions

- 4.1. The data room is located between the axis number of **** building **** floor ** ~ ** and ** ~ ** , with an area of about ** square;
- 4.2. The total height of the data room is ** meters, the net height under the beam: ** meters;
- 4.3. Weight bearing of the data room area: ** KG;
- 4.4. Power supply: provide 1 circuit of power supply, total power: 35KW;
- 4.5. Front-end power supply introduction location: **** , about ** meters away from the mains power distribution cabinet in the data room;
- 4.6. Installation location of air conditioner outdoor unit: **** , the total length of air conditioner indoor unit to outdoor unit pipeline is about ** meters;
- 4.7. For other building conditions, see the original building plan, as shown in the figure below:

5. Design Basis

Refer to the following relevant international and domestic standards and specifications (but not limited to for this purpose)

- Design Specification for Data Center (GB50174-2017)
- The UPTIME INSTITUTE
- TIA/EIA-942
- Code for Construction and Acceptance of Data Center Infrastructure (GB50462-2015)
- Code for Design of Power Supply and Distribution System (GB50052-2009)
- Code for Design of LV Power Distribution (GB50054-2011)
- Uninterruptible Power Supply for Communication-UPS (YD / T 1095-2008)
- Code for Lightning Protection Design of Buildings (GB50057-2010)
- Code for Design of Heating, Ventilation and air conditioner for Civil Buildings (GB507362012)
- Design Standard for Intelligent Buildings (GB50314-2015)

6. Design Ideas

This project adopts the "PowerEdge" series micro module solution, the overall design of micro module is "green energy saving", with the integration of airflow management, intelligent management, power supply and distribution management, safe and reliable, low noise, save the room area and energy saving, installation time, labor saving, worry saving, architecture compatibility, fast and flexible deployment, multiple power system and perfect monitoring; "PowerEdge" series micro module enables the room to realize intelligent and efficient operation, so as to reduce the operating costs

7. Product Characteristic

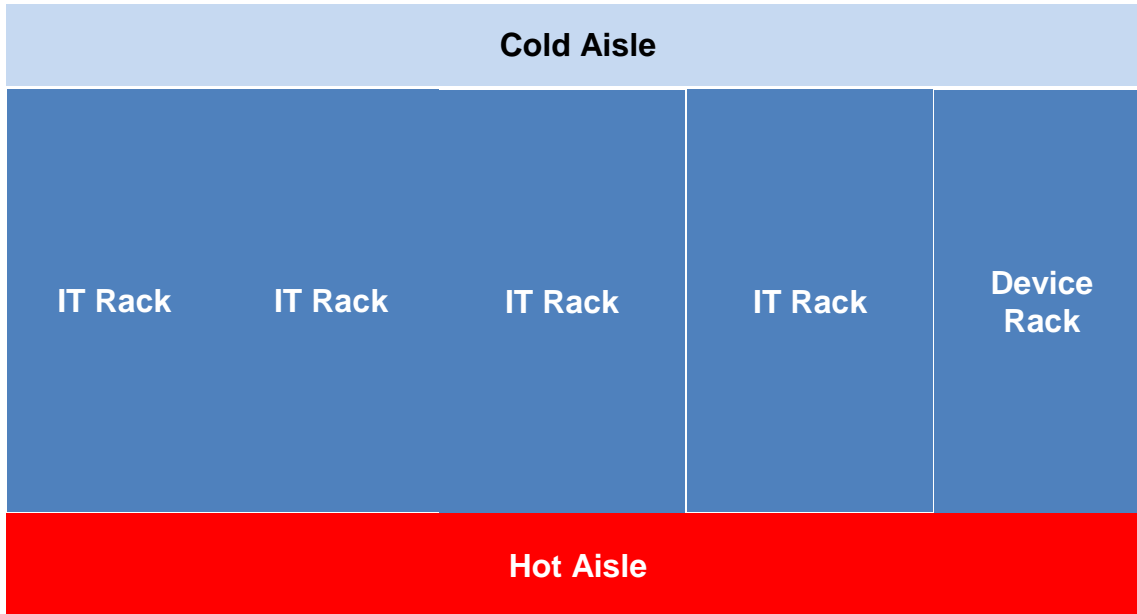
Overall integration: PowerEdge micro-module system integration, cabinet system, power supply and distribution system, refrigeration system, air flow organization and management, intelligent monitoring system, security system, fire protection system and etc., to provide a complete solution.

Safety:

- PowerEdge Micro-module meets the level requirements of Data Center Design standard to improve the reliability of micro-modules;
- Power current and communication walk the have separate tray to reduce electromagnetic interference;
- The UPS (Optional) is configured with a manual maintenance bypass, and the manual maintenance bypass MCB is in a locked state during normal operation to avoid electrical accidents caused by misoperation
- Support cabinet-level access control, avoid irrelevant personnel to open the micro-module and improve the security of the data center room.
- High efficiency and energy saving: the use of frame air conditioner with DC frequency conversion compressor, EC fan, cold and hot air flow management and other means to achieve high efficiency and energy saving, reduce the overall operation cost of micro-module and achieve green environmental protection
- Rapid and flexible deployment: modular design, factory prefabrication, pre-commissioning, on-site installation (only on-site power access, network access is easy to operate), shorten the construction cycle.
- Perfect monitoring: uninterrupted monitoring of the micro module through various sensors. The monitoring system supports web access for remote monitoring and management of the function module.



8. Product Typical Configuration Plan



9. Value

- Substantially faster and less expensive than traditional data center buildouts.
- 100% ROI within 12 months of deployment
- Flexible, efficient to operate and easy to manage.
- Can use the building's existing power infrastructure
- Enables the use of best-in-class cooling and UPS technologies
- Built-in fire suppression systems for compliance
- Safety glass and metal containment for fire hazard safety
- 100% IT usable space with zero infrastructure overhead.

10. Typical Configuration Of Products

Overall Dimension (WxDxH)mm	3700x1400x2350mm
Cabinet Dimensions (WxDxH)mm	3x 600mm Width Server Rack 600x1400x2000mm 2x 800mm Width IT/ Server Rack 800x1400x2000mm 1x 600mm Width IT Smart Device Rack 600x1400x2000mm
Power System	380Vac, 50Hz, 3Ph+N+PE

Rack-Type Precision Power Distribution Cabinet

To achieve the main circuit voltage, current, load rate, active power, reactive power, apparent power, dependent power, power factor, electric energy, empty open state and other power parameters monitoring

PDU Quantity	2 Pcs/ Rack
AC Cooling Capacity	8.1kW
Air Conditioner Quantity	2 Pcs.
AC Installation Mode	Rack Type
AC Air Supply Mode	Front left and upper air supply, after the return wind
AC Refrigerant	R410A
Intelligent Monitoring System	1 set (real-time monitoring of power distribution, refrigeration, environment, security in the micro module)
Sea Level	0m~4000m (more than 1000m required)
Way To Install	Support for cement floor and overhead floor installation
Incoming And Going Line Pipe Mode	Support up and down lines, up or down pipes
Working Temperature	Indoor: 0°C ~40°C Outdoor: -20°C ~ + 45°C
Working Humidity	5% RH to 95% RH without condensation
Storage Temperature	No refrigerant-40°C ~ + 70°C
Store Humidity	5% RH to 95% RH without condensation
Specific Configuration	See list for details

11. Cabinet System

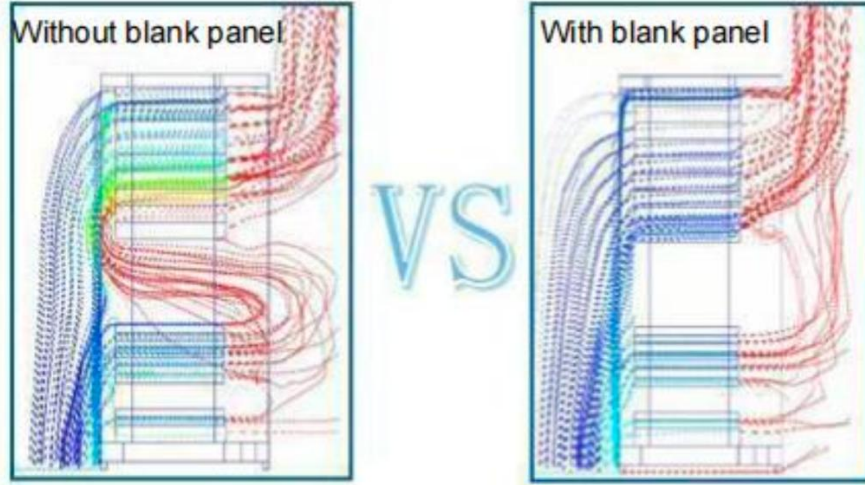
- Single-row fully enclosed micro module IT cabinet can be selected according to actual requirements, mainly used for placing IT equipment such as server and network equipment, IT cabinet specifications: 800 * 1200 * 2000mm (for installing IT equipment, UPS, rack type precision power distribution cabinet, monitoring box, rack air conditioner, fire fighting etc.), all cabinet modules meet the 19-inch installation specification.
- The single-row fully enclosed micro module cabinet complies with IEC (International Electrical technical Commission) 60297-1 standard, providing reliable and stable installation space for IT equipment and ensuring the safe operation of IT equipment.
- The cabinet door is controlled by integrated monitoring host + intelligent linkage unit device or integrated monitoring host + access control system + intelligent linkage unit device. When the temperature in the cabinet reaches a certain value (can be set) or emergency fault occurs, the linkage automatically opens the front and rear doors of the cabinet.
- Welded frame structure, cold and hot channels are fully closed, two fan reserved holes are configured at the top of the heat channel which made of cold-rolled steel plate, the load-bearing column parts of the cabinet are made of 2.0mm thick high-quality cold-rolled steel plate, and the rest of 1.2mm thick high-quality cold-rolled steel plate.
- A vertical multifunctional panel is standard on the left and right sides of the rear door of the cabinet for PDU installation and the use of network cables
- Four square inlet ports are provided at the top of the cabinet with brush protection to avoid scratching the cable; at the bottom, two circular inlet ports with 100mm diameter and rubber protection to avoid scratching the cable.
- Support the installation of cable slot on the top of the cabinet to realize the orderly management of cables.
- The wire channel is divided into weak current cable and power cable channel, which are used for weak current cable and power cable respectively. Specification of weak current U wire channel: 320mm (W) * 150mm (H), and specification of strong current channel: 220mm (W) * 150mm (H).
- The IT cabinet adopts single tempered glass door and single steel door, the integrated equipment cabinet shall open the polycarbonate door and open the front and back door are equipped with mechanical lock hidden in the front and rear frame, with local touch screen password opening, remote door, mechanical key opening and cabinet door status monitoring functions (optional access control system).
- The system supports the function of automatically opening the front and rear doors of the cabinet when the temperature in the cabinet reaches a certain value (set) or an emergency fault occurs.

12. Lighting System

The front and rear of the cabinet is installed with lighting, lighting LED light source, the color is white, through the cabinet door linkage control, the door open light, door close light out.

13. Air Flow In The Cabinet

The front panel of the equipment in the cabinet module shall be equipped with necessary sealed components so that the cold air can enter the air inlet of the front panel of the equipment without leakage. The sealing assembly mainly includes the sealing panel (also known as the false panel or blank panel) between the upper and lower equipment. Seal panel specifications should be 1U, 2U and other specifications, easy to disassemble and assemble, not easy to fall off, not easy to deformation.



14. Grounding

The cabinet module is equipped with one set of grounding device, specification: 490 (long) * 25 (width) * 3 (thick) mm, for the grounding of IT equipment inside the cabinet.

The cabinet provides two contact sites for all doors. There is soft wire connection between the door and the cabinet

15. Power Supply And Distribution System

- **PowerEdge** series micro module power supply and distribution system is designed according to class C standard, leading 1 external power supply to the frame type precision distribution unit in the micro module to supply power to UPS, air conditioner, lighting, intelligent equipment, etc.
- The main switch in the frame type precision distribution box with the excitation tripping device, when the fire fighting action, provide a dry contact signal, open automatic trip, automatically cut off the mains access power supply (including air conditioner units), in order to eliminate the disaster in time.

16. Technical Parameters Of Rack-Type Precision Power Distribution Cabinet

Rated Operational Voltage	380V/400V/415V AC
Nominal Insulation Voltage	440V
Rated Frequency	50Hz/60Hz
Working Current	≤ 63A
Lightning Protection Grade	Configure the Class C lightning protection device
IP Grade	IP40
Monitor The Content	It can realize the main road power collection current, voltage, active power, reactive power, frequency, power, the branch can collect current, switch state, active power, reactive power, frequency, power and other parameters monitoring
Outline Way	Up in and out, down in and out
Specification and dimension	440mm(W)*4U(H)*600mm(D)
Way to install	19-inch rack-type mount

17. Cooling System

- Calculated according to the actual power consumption, micro module configuration 28.1KW rack type dc frequency conversion air conditioner + micro module cold and cold channel isolation + blankness for micro module provide cold source in the equipment, effectively shorten the air path, and refrigerant on more accurate, air predictability is good, all rated cooling capacity of air conditioner can be efficient use.
- When the air conditioner fails, the front and rear cabinet doors of the micro module are automatically opened through the intelligent linkage unit linkage, and the air in the room is used to provide temporary refrigeration for the IT equipment in the cabinet.
- Rack type air conditioner includes air conditioner indoor unit, air conditioner outdoor unit, connecting copper pipe, etc.
- The air conditioner indoor unit is installed at the bottom of the Tianhe series of "PowerEdge" micro module integrated equipment cabinet, and the upper air return mode is used to provide cold source for the equipment in the micro module. The air conditioner indoor unit and the outdoor unit are connected through the copper pipe.
- There are two ways of outdoor unit installation, one is directly fixed with the horizontal ground, one is fixed with the installation bracket.

18. FM200 System

- **PowerEdge** series micro module is integrated 1*3Kg FM200 fire system, when the module fire trigger mild smoke detector, start the internal fire extinguishing system
- Automatic, Electrical Manual, Mechanical Emergency Manual
- Rack mounted type
- 3Kg, control by temp, when the temp arrived or pass 60°C, It will opened automatically
- Designed to fit in cabinet depths of between 600mm and 1100mm.
- Point type optical smoke detection
- Pressure gauge indication of bottle fill condition
- Low gas pressure output warning

19. Intelligent Monitoring System

- From the perspective of system engineering, the four basic elements of environmental structure, service demand, equipment content and management mode of "PowerEdge" series micro modules and their

internal connection are optimized, so as to provide a stable, reliable, reasonable investment, efficient, convenient, comfortable and safe intelligent management system.

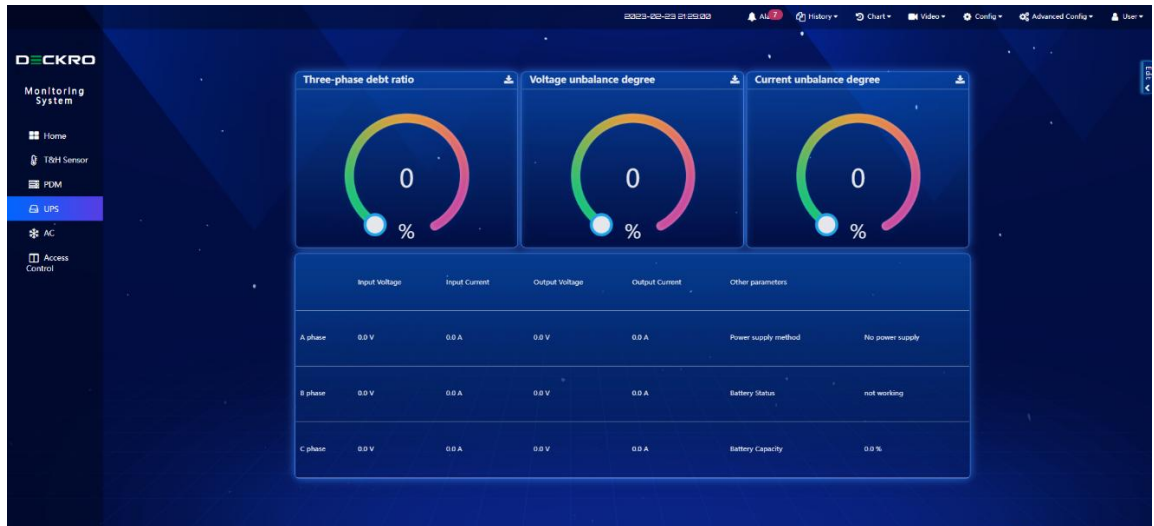
- **PowerEdge** series micro module intelligent management control module system is mainly composed of the following three parts: field collection layer, management host, monitoring and management terminal.
- The main functions of each part are as follows:
Field equipment acquisition layer: composed of various I / O acquisition modules and sensors, directly connected to various monitored equipment, collecting field signals such as UPS, air conditioner, temperature and humidity, water leakage, smoke sensor, etc. The collected field signals are uploaded to the management host through RS485 / 232.
- Management host: can be off the network work and have independent data processing and data storage capacity, used to be the field equipment acquisition layer to the transmission of all kinds of information storage, real-time processing, analysis and output, processing all alarm information, record alarm events, and is responsible for the control command forward equipment, to achieve remote control of the field equipment.
- Monitoring and management terminal: used for on-site management and remote browsing, convenient for the management personnel to understand the working conditions of the data center room anytime and anywhere, can directly watch the monitoring screen consistent with the management host, with the corresponding authority can also achieve remote control of the equipment, such as air conditioner switch, etc.

20. Monitoring Content



- **PowerEdge** series micro module configuration 1 set of integrated monitoring host (10 inches full color LCD touch screen) or monitoring host + 32 inches LCD touch screen, can realize the micro module power distribution, temperature and humidity, smoke, leakage alarm, UPS, battery, air conditioner information real-time monitoring (optional), through SMS, sound and light alarm measures alarm, support IE remote access, mobile phone APP client access function;
- The intelligent management host can be used as local monitoring, and can be connected to the centralized monitoring and management platform of the previous layer to realize centralized monitoring and management.
- Real-time monitoring of the voltage, current, frequency, active power, reactive power, apparent power, power factor, total harmonic content, empty and open state of the total input circuit and UPS output circuit of the power distribution cabinet;
- Show the operation data intuitively through the charts;
- Once there is an alarm, the state will turn red, at the same time to produce alarm events for recording and storage, and the first time to send out mobile phone SMS, sound and light, voice and other external alarm;
- Historical curve record, you can query the historical curve of the corresponding parameters within a year and the parameter value of the specific time, and you can export the historical curve into EXCEL format, to facilitate the administrator to fully understand the operation status of the distribution cabinet.
- Real-time monitoring of the operating status and parameters of UPS rectifier, inverter, battery (battery health detection, including voltage and current values), bypass, load and other parts (such as customer supply or old UPS, the specific content of monitoring will be different according to different brands and protocols);
- Show the overall operation data of UPS intuitively through charts;
- Once the UPS has an alarm, the state will turn red, and produce the alarm event to record and store, and the first time to send mobile phone SMS, phone, sound and light, voice, email, wechat and other external alarm;
- Historical curve record, you can query the historical curve of the corresponding parameters and the specific time (including the maximum value, the minimum value), and can export the historical curve into EXCEL format, to facilitate administrators to fully understand the health of UPS.
- Monitor the temperature and humidity in the micromodule;
- When the temperature or humidity exceeds the alarm, record and store it, and immediately issue the alarm according to the alarm mode corresponding to the event;

- Through the dynamic electronic map, real-time monitoring of the real temperature and humidity in different spatial positions;
- Real-time curve: estimate the trend of the temperature and humidity in the equipment room through the dynamic curve, and the dynamic curve can be printed;
- Historical curve: to record the temperature and humidity of the data center room, you can query the historical curve and historical data.
- Real-time monitoring of return air temperature of the air conditioner, return air humidity, return air temperature and humidity limit, set value of temperature, set value of humidity, operating status of heater, operating state of refrigerator, operating status of dehumidifier, compressor high and low pressure alarm, main fan overload alarm, filter blockage alarm, etc.(Such as customer supply or old air conditioner, the specific content of monitoring will be different according to different brands and agreements).
- Display the overall operation data of the air conditioner intuitively through the chart;
- Once the air conditioner has an alarm, the alarm event is recorded and stored, and the alarm is issued to the outside according to the alarm mode corresponding to the event.
- Historical curve record, can query the historical curve of the corresponding parameters within the storage period and the parameter value of the specific time (including the maximum value, the minimum value), and can export the historical curve into EXCEL format, convenient for administrators to fully understand the running status of air conditioner.
- Real-time monitoring of the water leakage situation in the data center room;
- When the water leakage sensor has an alarm, the alarm event is recorded and stored, and the first time sends out an alarm according to the alarm mode corresponding to the event;
- Monitor leaky areas in real time through a dynamic electronic map.
- Real-time online monitoring of the battery pack single voltage, battery temperature, charge and discharge current, total voltage of the battery pack, internal resistance of the battery;
- Display the overall operation data of the battery intuitively through the chart; Once the battery is alerted, the relevant state will display different colors according
- to the different level of the event, and the alarm event will be generated for record and storage, and the first time is to issue the alarm according to the alarm mode corresponding to the event;
- Historical curve record, you can query the historical curve of the corresponding parameters within the storage period and the parameter value of the specific time (including the maximum value, the minimum value), and can export the historical curve into EXCEL format, convenient for administrators to fully understand the status of the battery.
- Monitor the smoke concentration value of the internal environment of the micro module; Once the smoke sensor alarm situation, the state will turn red, at the same time, the alarm event to record the storage, and the first time to send out mobile phone SMS, telephone, voice, sound and light and other external alarm.
- The system supports setting the alarm linkage light function, supports the alarm linkage of no less than 4 color lights, and can be set according to different alarm levels (emergency, serious, secondary, prompt, etc.).
- Once the alarm in the micro module, linkage with the monitoring fault level, the alarm lighting lights turned on (according to the alarm event severity from low to high into four levels of warning, general, important, emergency, and use blue, yellow, orange and red lights for alarm), record the alarm event storage, and the first alarm according to the alarm corresponding to the event.



21. Specifications

Function	Item	Configuration	Specifications
Enclosure	Dimensions	Standard 42 inches	600/800*2000/2200*1200/1400mm(W*H*D)
	Cabinet door	Polycarbonate or steel	Polycarbonate door : front and rear door thickness≥1.2mm, side door thickness ≥1.5mm
	Ground connection	Reserved for more than two ground points.	BVR6mm ²
	Shelves(Optional)	Two pieces per cabinet	50Kg
	Cable management	Near the rear door	Vertical cable panel
Cooling system	Air conditioner	Rack-mounted or In row	Determine the air conditioning cooling capacity according to the equipment power
	Emergency exhaust	Draught fan	Air volume239~288CFM
	Drainage	A water supply pipe and a drain pipe, bottom installation	PPR hot melt pipe , Flooding:DN25, Discharge:DN40
Power system	UPS	10KVA to 30KVA	Rack-mounted, single-in single-out or three-in single-out, on-line UPS, power selection according to project situation
	Power backup	Lead-acid batteries or lithium battery	7AH, 9AH
	PDM	32A or 63A input	Specification : 410mm(W)*3U(H)*600mm(D) Configuration: electricity circuit, UPS circuit, Max 19P breaker Function: intelligent or non-intelligent Installation: rail installation in rack
	PDU	IEC/GB	Vertical or horizontal(less than 8 port) installation
	Light	LED	Front and rear door install work lighting, controlled by the door or screen touch DC12V power supply, power ≤ 6W
Fire suppression	FM200	Rack mount	Optional
	Alarm system	Local and remote	Local lights sound warning, sent to the monitoring room or the control center
Monitoring system	Display screen	10 inch touch screen	Optional
		Home A/C restart function	Optional
		SMS	Optional
		Remote mobile App	Optional
		Liquid sensor	Optional
		Temp&Hum sensor	Standard configuration
		Door magnetic switch	Standard configuration
		Smoke sensor	Standard configuration
		Web monitoring	Standard configuration
	Camera	Optional	
Door access	Fingerprint,swipe or password	Optional	

Package	Dimensions	Crate	734/934*2200/2400*1368/1568mm(W*H*D)
	Weight	Per cabinet	150Kg(no battery pack)