

**FusionModule500 Smart Mini Data Center
V100R022C10**

**Product Description (02116611,
02116612, 02116613)**

Issue	01
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Huawei Digital Power Technologies Co., Ltd.

Address: Huawei Digital Power Antuoshan Headquarters

Futian, Shenzhen 518043

People's Republic of China

Website: <https://e.huawei.com>

About This Document

Overview

This document describes the FusionModule500 Smart Mini Data Center (smart module for short) in terms of the appearance, features, and specifications for you to understand the product information.

Intended Audience

This document is intended for:

- Sales engineers
- Technical support engineers
- System engineers
- Hardware installation engineers
- Commissioning engineers
- Data configuration engineers
- Maintenance engineers

Symbol Conventions

The symbols that may be found in this guide are defined as follows.

Symbol	Description
 DANGER	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

Symbol	Description
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or other unanticipated results. NOTICE is used to address practices not related to personal injury.
 NOTE	Supplements important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

Changes between document issues are cumulative. The latest document issue contains all the changes in earlier issues.

Issue 01 (2022-04-30)

This issue is the first official release.

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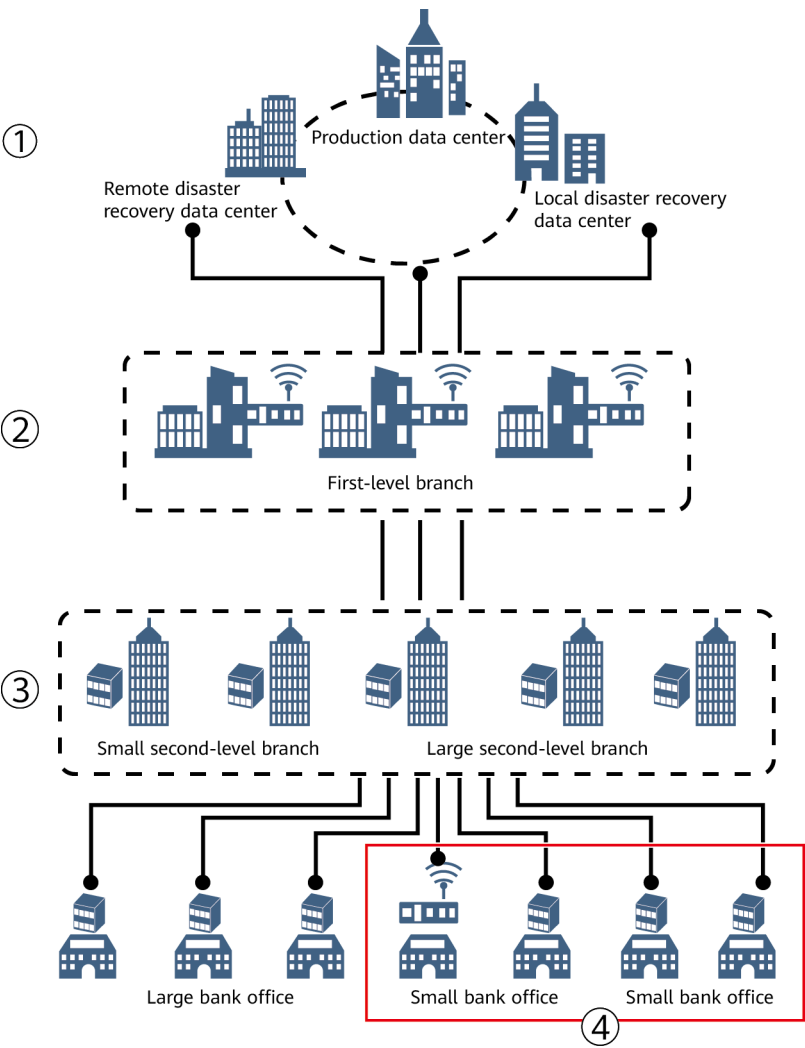
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1 Overview

1.1 Positioning

To meet the requirements for customers' growing services, Huawei launches the FusionModule500 that can be rapidly deployed and flexibly expanded. The FusionModule500 is positioned as a small edge data center solution and occupies about 10 m². It is mainly used in the equipment rooms of county-level governments, bank business outlets, and small- and medium-sized enterprises.

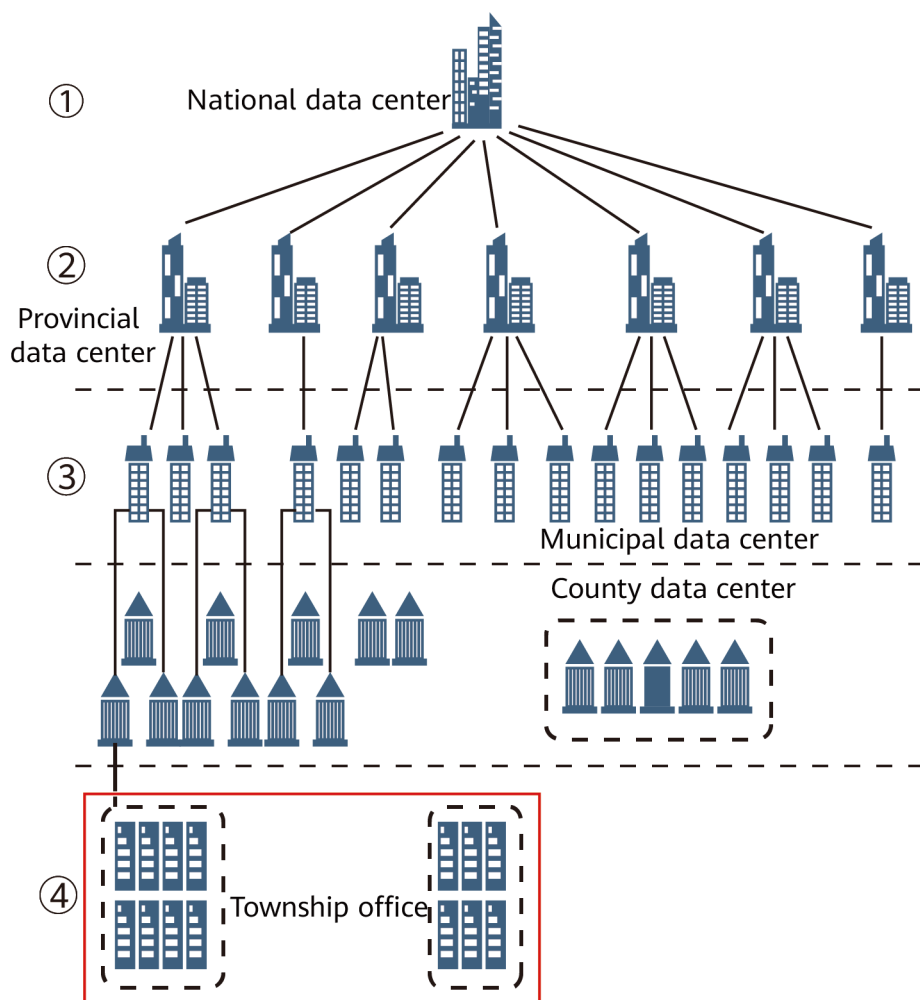
Figure 1-1 Position of the FusionModule500 in the financial industry



DM00N00002

- | | |
|----------------------|----------------------|
| (1) FusionModule5000 | (2) FusionModule2000 |
| (3) FusionModule800 | (4) FusionModule500 |

Figure 1-2 Position of the FusionModule500 for governments



DM00N00001

(1) FusionModule5000

(2) FusionModule2000

(3) FusionModule800

(4) FusionModule500

1.2 Features

High Integration

The smart module integrates the cabinet system, power supply and distribution system, cooling system, management system, surge protection and grounding system, and integrated cabling system to provide a comprehensive solution.

High Safety and Reliability

- The Converged Cabinet incorporates the UPS, monitoring, power distribution, and cooling devices that are designed in modular manner, delivering high safety and reliability.
- The powerful monitoring system allows you to master the infrastructure status anytime and improves the cabinet protection capability.

High Scalability

- The modular design allows the smart module to be flexibly configured so that fast capacity expansion can be achieved.
- The smart module provides redundant power ports and communications ports for future expansion.

Powerful Monitoring

- Provides various sensors to monitor the functional modules.
- Provides a display to easily manage the functional modules locally.

2 Typical Application Scenarios and Configurations

2.1 Typical Scenarios

The solution is mainly used in network access rooms of bank outlets, small- and medium-sized enterprises, and government departments and supports the 220 V/230 V/240 V, 1 Ph, 50 Hz/60 Hz power systems.

2.2 Typical Configurations

The smart module architecture is classified into two types: smart module with cooling (02116613) and smart module without cooling (02116611 and 02116612).

Figure 2-1 Basic configuration of the Converged Cabinet (02116611)

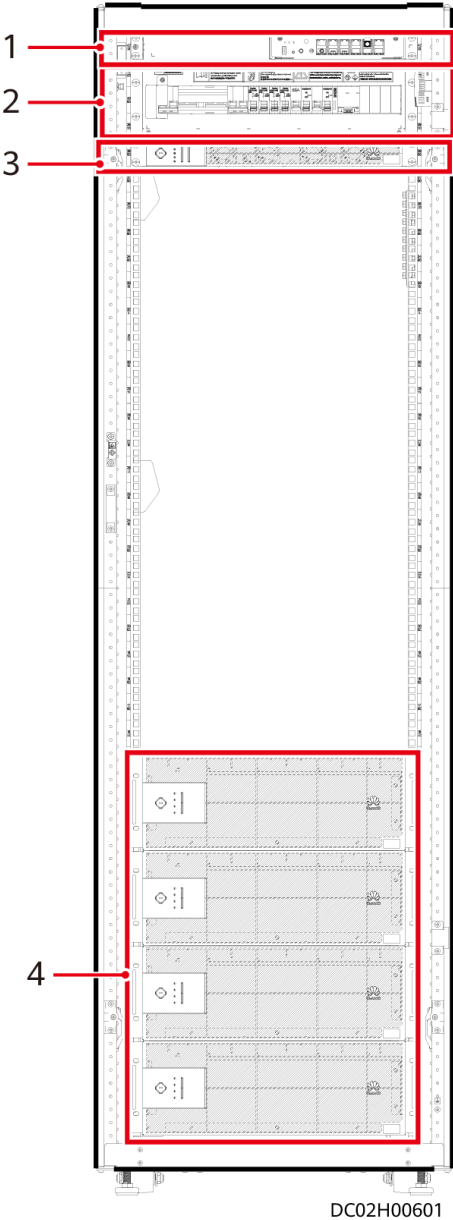


Figure 2-2 Basic configuration of the Converged Cabinet (02116612)

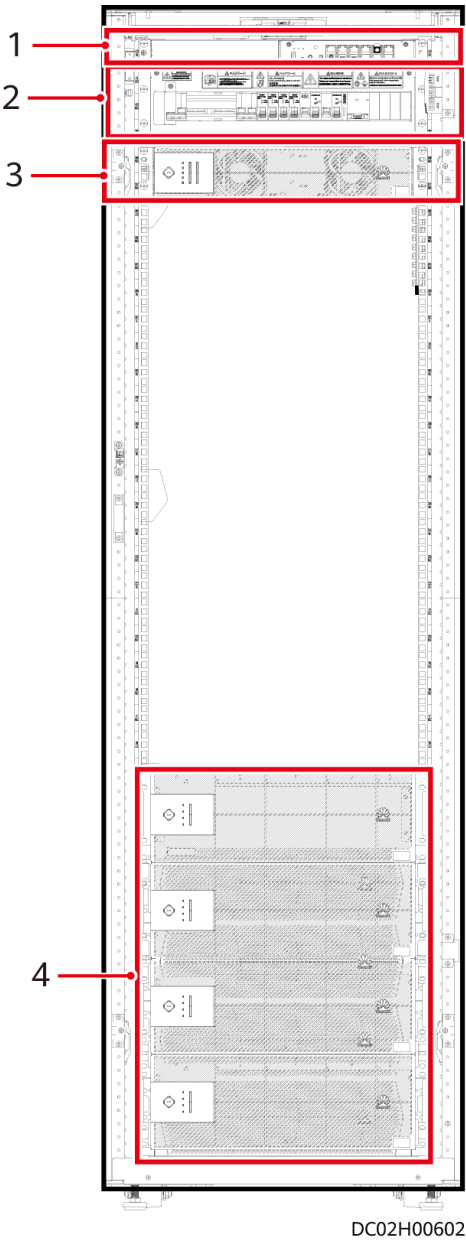
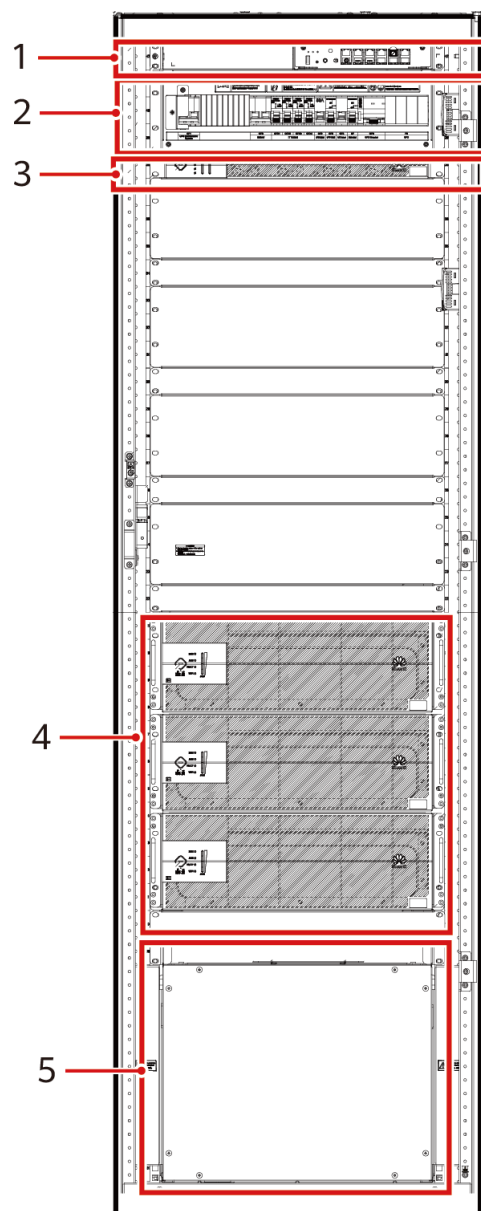


Figure 2-3 Basic configuration of the Converged Cabinet (02116613)



DC02H00603

(1) ECC800-Pro

(2) Power distribution module

(3) UPS

(4) Lithium battery (optional: lead-acid battery)

(5) 3.5 kW integrated air conditioner

Figure 2-4 Front view of Converged Cabinet components (02116611 and 02116612)

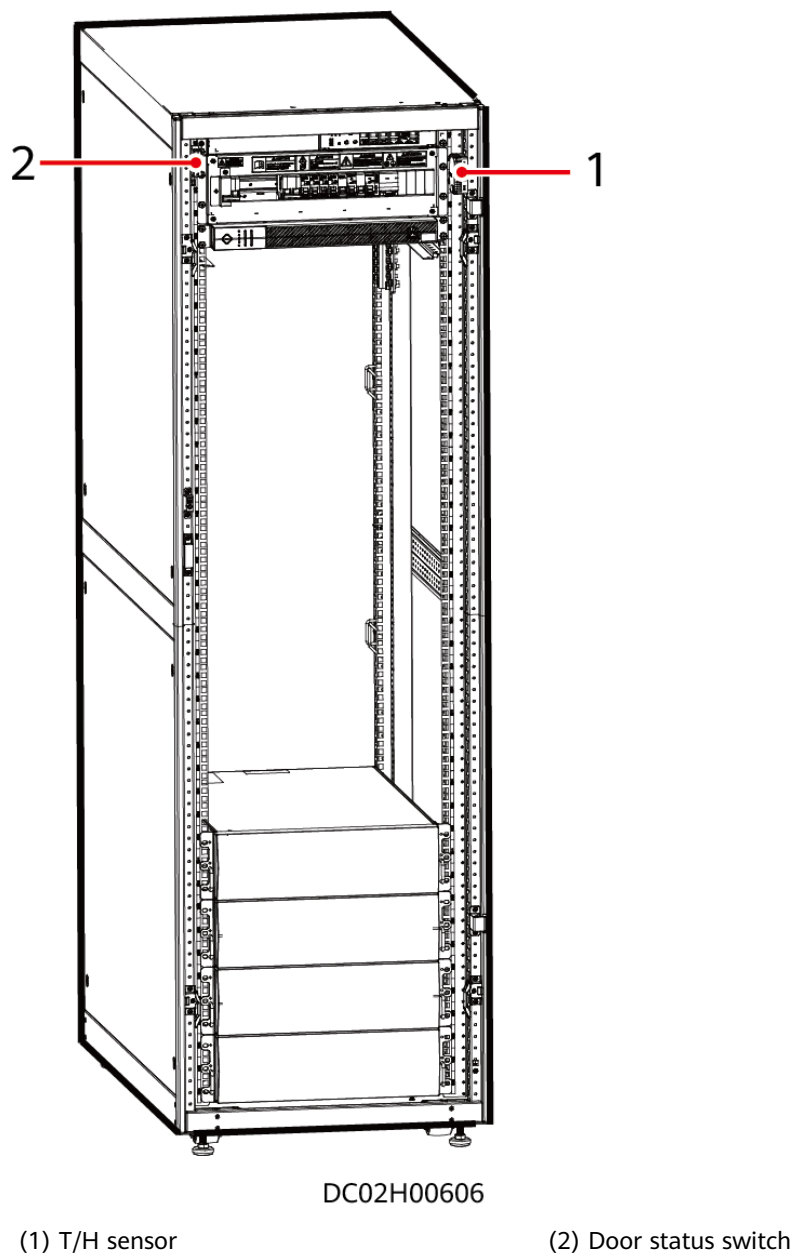
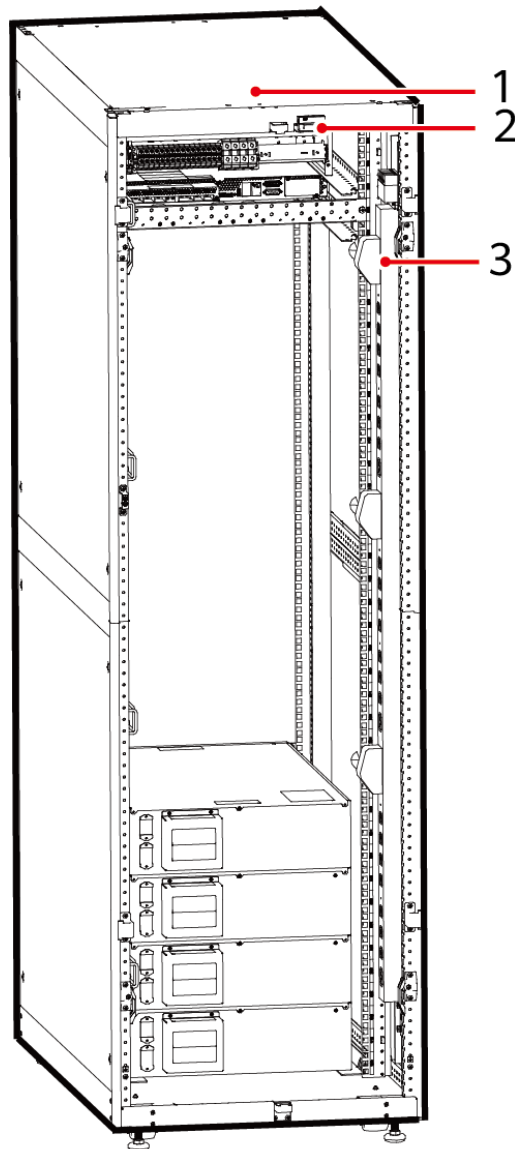


Figure 2-5 Rear view of Converged Cabinet components (02116611 and 02116612)



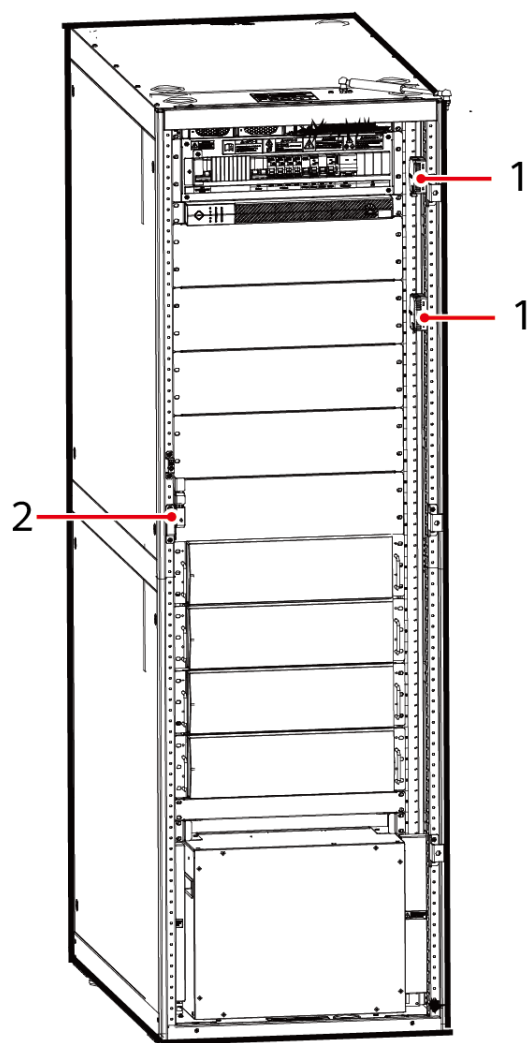
DC02H00607

- (1) Smoke detector (behind the top panel of the cabinet) (2) Door status switch
(3) PDU2000

NOTE

The electrode water sensor is located at the bottom of the cabinet.

Figure 2-6 Rear view of Converged Cabinet components (02116613)

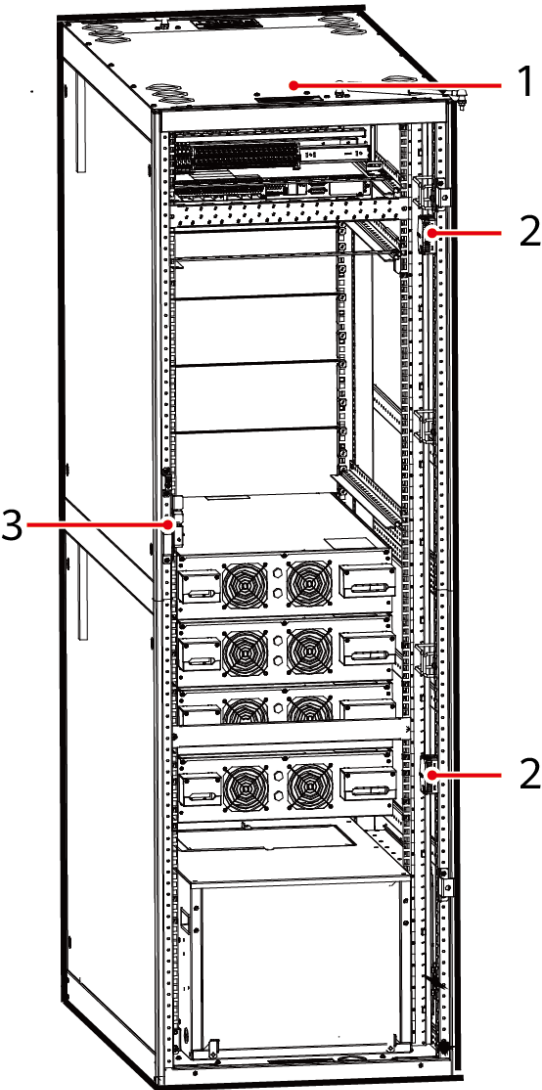


DC02H00609

(1) T/H sensor

(2) Cabinet electronic clasp lock

Figure 2-7 Rear view of Converged Cabinet components (02116613)



DC02H00610

- (1) Smoke detector (behind the top panel of the cabinet)
- (2) T/H sensor
- (3) Cabinet electronic clasp lock

NOTE

The electrode water sensor is located at the bottom of the cabinet.

Table 2-1 Typical configurations

Item	Converged Cabinet	Converged Cabinet	Converged Cabinet
Basic configuration	BC1L	BC2L	BC3L

Item	Converged Cabinet	Converged Cabinet	Converged Cabinet
Model	FusionModule500-U61FSLN	FusionModule500-U101FSLN	FusionModule500-U61A21SLN
BOM number	02116611	02116612	02116613
Cabinet dimensions (H x W x D)	2000 mm x 600 mm x 1100 mm		
Cooling	No	No	3.5 kW integrated air conditioner
Power distribution	UPS2000-H-6 kVA, lead-acid battery/lithium battery, PDU2000	UPS2000-H-10 kVA, lead-acid battery/lithium battery, PDU2000	UPS2000-H-6 kVA, lead-acid battery/lithium battery, PDU2000
Backup time	Lead-acid battery: 15 minutes, 30 minutes, and 60 minutes Lithium battery: 30 minutes, 60 minutes, 120 minutes, 180 minutes, and 240 minutes	Lead-acid battery: 15 minutes, 30 minutes, and 60 minutes Lithium battery: 30 minutes, 60 minutes, 120 minutes, 180 minutes, and 240 minutes	Lead-acid battery: 15 minutes, 30 minutes, and 60 minutes Lithium battery: 30 minutes, 60 minutes, 120 minutes, 180 minutes, and 240 minutes
Monitoring	ECC800, T/H sensor, smoke detector, water sensor, door status sensor, WiFi module (optional), and NetEco (optional)	ECC800, T/H sensor, smoke detector, water sensor, door status sensor, WiFi module, and NetEco (optional)	ECC800, T/H sensor, smoke detector, water sensor, PAD, cabinet electronic clasp lock, WiFi module, eLight (optional), and NetEco (optional)
Fire extinguishing device	Room-level fire control linkage	Room-level fire control linkage	Fire extinguishing module (optional) or room-level fire control linkage

Table 2-2 Major differences between smart modules with and without cooling

Item	Smart Module with Cooling (02116613)	Smart Module without Cooling (02116611 and 02116612)
Supported configuration	Single Converged Cabinet	Single Converged Cabinet, Converged Cabinet + Network cabinet
Maximum load power per cabinet	3 kW	02116611: 6 kW 02116612: 10 kW
Aisle	Cold and hot aisle containment. The cooling module ensures appropriate operating temperature for devices in the cabinet.	No aisle containment. External environment devices ensure appropriate operating temperature for devices in the cabinet.
Aisle door	Sealed glass door	Hexagonal mesh door
Cabinet door lock	Cabinet electronic clasp lock (fire control linkage supported)	Door status sensor (manual or active electric control)
eLight intelligent alarm	The eLight controls light colors to indicate cabinet alarms.	No eLight
Fire extinguishing system	The fire extinguishing module (optional) is supported.	Depending on room-level fire control linkage

3 System Architecture

3.1 Structural System

The cabinet possesses the following features:

- The cabinet houses standard 19-inch wide devices.
- The PDU2000 is installed at the rear of the cabinet.
- The position of each U is marked on the vertical mounting bars.
- The front and rear doors of the cabinet can be locked, and can be unlocked by using dedicated keys.
- The cabinet can be installed on a base (which needs to be prepared by customers).
- The cabinet can house ICT devices with a depth of no more than 750 mm.

Table 3-1 Cabinet technical specifications

Item	Specifications
Color	Black
Material	High-intensity class A carbon cold rolled steel plate and zinc-coated steel plate
Air channel	Cold and hot aisle containment
Installation mode	Installed on a concrete floor or electrostatic discharge (ESD) floor
Static load	1500 kg
Dynamic load	1000 kg
IP rating	IP20

3.2 Power Supply and Distribution System

3.2.1 Working Principles

The UPS supplies uninterruptible power to loads by means of batteries when the external power supply fails.

Figure 3-1 Power distribution diagram (02116611 and 02116612)

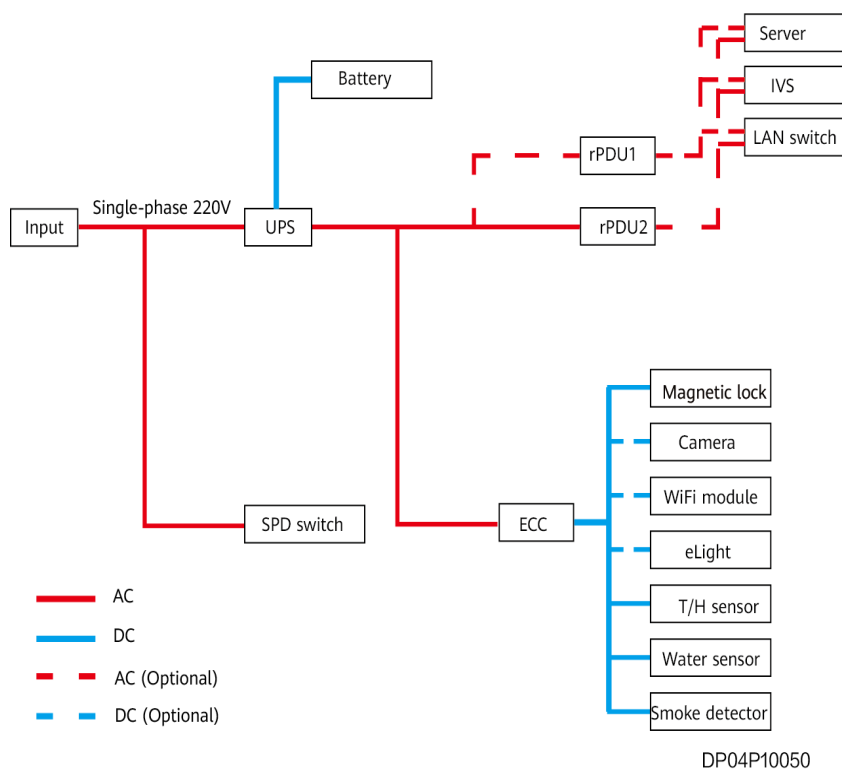
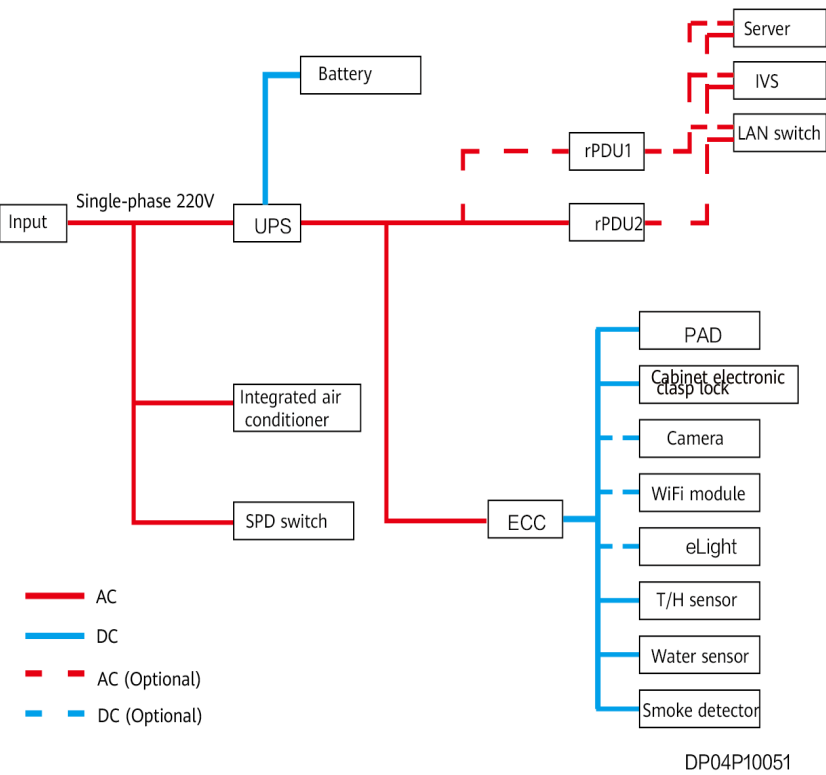


Figure 3-2 Power distribution diagram (02116613)



3.2.2 Key Hardware Devices

3.2.2.1 Power Distribution Module

Table 3-2 Technical specifications

Item	Without a Cooling Module (6 kVA UPS)	Without a Cooling Module (10 kVA UPS)	With a Cooling Module (6 kVA UPS)
Maximum input current	63 A	63 A	63 A
Number of phases	Single phase	Single phase	Single phase
Input frequency	50/60 Hz	50/60 Hz	50/60 Hz
Input voltage	220 V	220 V	220 V

Item	Without a Cooling Module (6 kVA UPS)	Without a Cooling Module (10 kVA UPS)	With a Cooling Module (6 kVA UPS)
Output frequency	50/60 Hz	50/60 Hz	50/60 Hz
General input	63 A/1P		
UPS input	63 A/1P	63 A/1P	63 A/1P
UPS output	63 A/1P	63 A/1P	63 A/1P
Maintenance bypass	63 A/2P	63 A/2P	63 A/2P
Output branch	4 x 40 A/1P + 1 x 16 A	4 x 40 A/1P + 1 x 16 A	2 x 40 A/1P, 3 x 16 A/1P
Battery output	63 A/2P	63 A/2P	63 A/2P
Smart cooling switch	-	-	16 A/1P
Dimensions (H x W x D)	130 mm x 442 mm x 450 mm	86 mm x 430 mm x 514 mm	130 mm x 442 mm x 450 mm

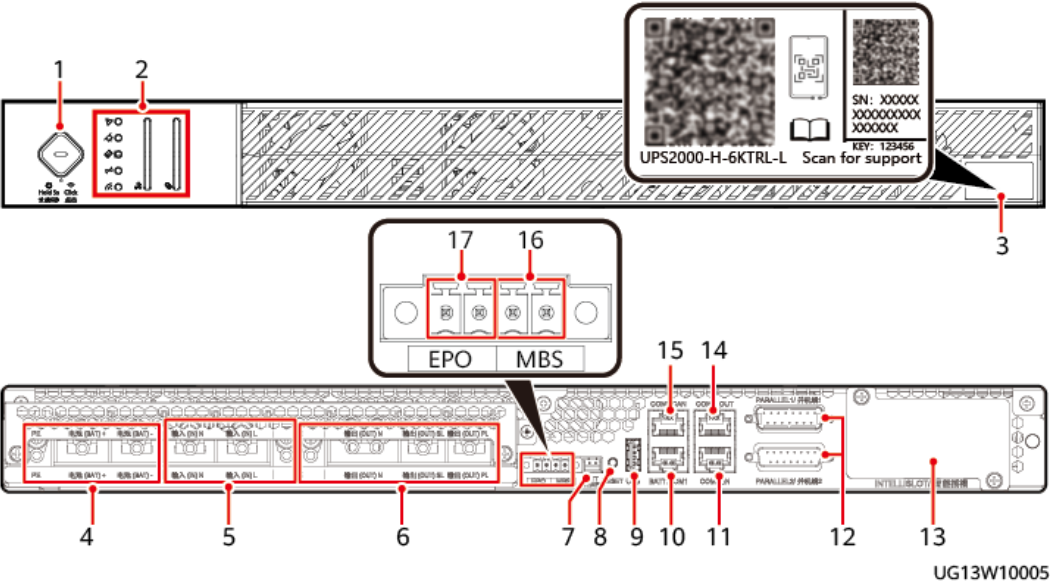
3.2.2.2 UPS2000-H-6kVA

The UPS2000-H-6 kVA can be used to deploy a minimum uninterruptible power supply system. The UPS contains main power circuits such as rectifier circuit, inverter circuit, and bypass circuit, as well as extra-low voltage (ELV) circuits such as the monitoring circuit and parallel control circuit. Its external ports include power input and output ports, parallel ports, communications ports, and communications slots.

Figure 3-3 6 kVA UPS front and rear



Figure 3-4 Front and rear views



- (1) Button
 (2) Indicators
 (3) Label^a
 (4) Battery ports
- (5) AC input ports
 (6) AC output ports
 (7) Battery temperature sensor port
 (8) RESET button
- (9) USB port
 (10) BATT.COM1 port
 (11) COM3_IN port
 (12) Parallel ports
- (13) Optional card slot
 (14) COM3_OUT port
 (15) COM2/CAN port
 (16) Maintenance bypass port (MBS)
- (17) EPO port

 NOTE

a: The label contains the SN, QR codes, and KEY (reserved). Scan the QR codes to download the app, connect to the WiFi network, and view documents such as user manual and quick guide. The information on the label is for reference only. The actual parameters may vary.

Table 3-3 Technical specifications

Item	Specifications
Rated capacity	6 kVA
Input power cable	1 Ph (L/N) + PE, single-phase input
Input power factor	> 0.99
Output power factor	1
Rated input voltage	220 V AC/230 V AC/240 V AC
Input voltage range	80–280 V AC (When the ambient temperature ranges from 0°C to 40°C, the load is linearly derated from 100% to 40% when the voltage ranges from 80 V AC to 176 V AC.)
Rated output voltage	220 V AC/230 V AC/240 V AC
Output voltage precision	±1%
System efficiency	96% (maximum)
Dimensions (H x W x D)	43 mm x 430 mm x 514 mm
Weight	14 kg
IP rating	IP20

3.2.2.3 UPS2000-H-10 kVA

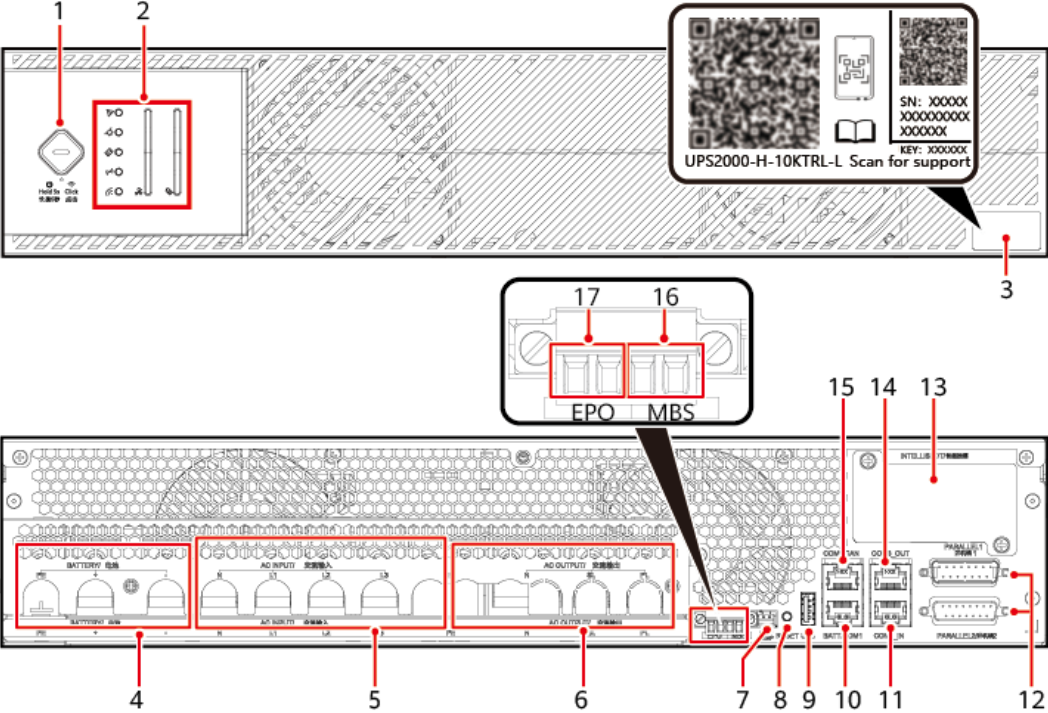
The UPS2000-H-10 kVA can be used to deploy a minimum uninterruptible power supply system. The UPS contains main power circuits such as rectifier circuit, inverter circuit, and bypass circuit, as well as extra-low voltage (ELV) circuits such as the monitoring circuit and parallel control circuit. Its external ports include power input and output ports, parallel ports, communications ports, and communications slots.

Figure 3-5 Appearance



UG13I00084

Figure 3-6 Front and rear views



UG13W10002

- (1) Button

(2) Indicators

(3) Label^a

(4) Battery ports
- (5) AC input ports

(6) AC output ports

(7) Battery temperature sensor port

(8) RESET button

- (9) USB port (10) BATT.COM1 port (11) COM3_IN port (12) Parallel ports
(13) Optional card slot (14) COM3_OUT port (15) COM2/CAN port (16) Maintenance
bypass port (MBS)
(17) Emergency
power-off (EPO) port

 NOTE

a: Scan the QR codes close to the SN to download the app, connect to the WiFi network, and view documents such as user manual and quick guide. The information on the label is for reference only. The actual parameters may vary.

Table 3-4 Technical specifications

Item	Specifications
Rated capacity	10 kVA
Input power cable	1 Ph (L/N) + PE, single-phase input 3 Ph (L1/L2/L3/N) + PE, three-phase input
Input power factor	> 0.99
Output power factor	1
Rated input voltage	208 V AC/220 V AC/230 V AC/240 V AC (single-phase input) 380 V AC/400 V AC/415 V AC (three-phase input)
Input voltage range	- Single-phase 80–280 V AC (When the ambient temperature ranges from 0°C to 40°C, the load is linearly derated from 100% to 40% when the voltage ranges from 80 V AC to 176 V AC.) - Three-phase 138–485 V AC (When the ambient temperature ranges from 0°C to 40°C, the load is linearly derated from 100% to 40% when the voltage ranges from 138 V AC to 305 V AC.)
Rated output voltage	220 V AC/230 V AC/240 V AC
Output voltage precision	±1%
System efficiency	96% (maximum)
Dimensions (H x W x D)	86 mm x 430 mm x 514 mm
Weight	17 kg
IP rating	IP20

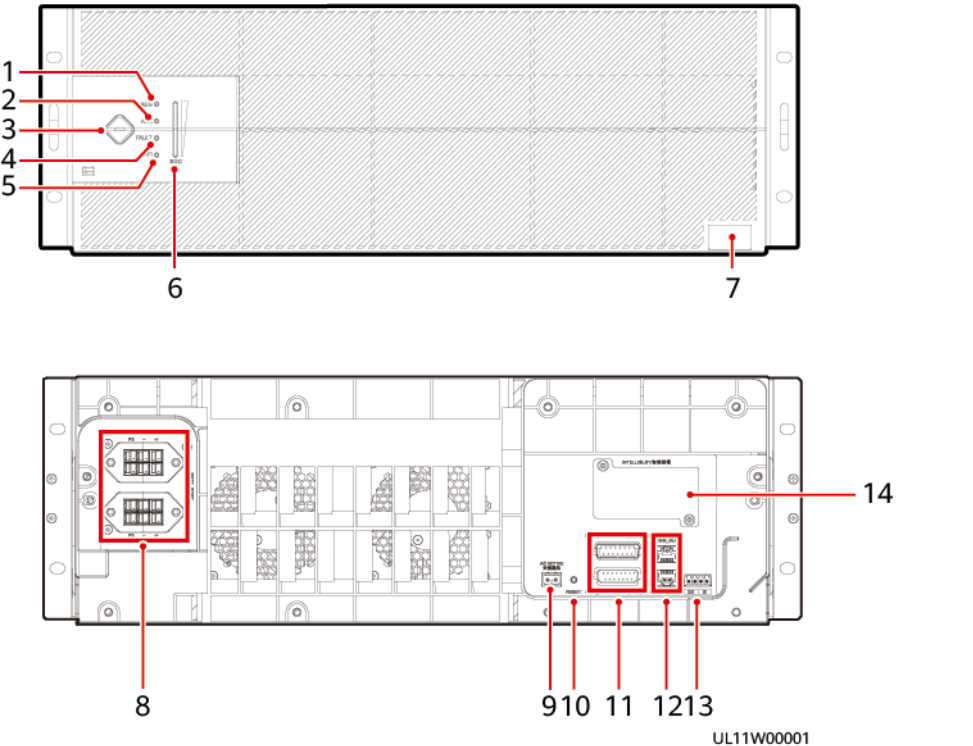
3.2.2.4 Lithium Battery SmartLi-ESM-24020P1

Figure 3-7 Lithium battery appearance



- The lithium battery uses lithium cells with superior charge and discharge characteristics and high cycle performance to provide comprehensive battery management. It provides comprehensive battery management functions to implement overcharge, overdischarge, and overtemperature protection.
- Management functions:
 - Detects the cell voltage, current, and temperature.
 - Detects the state of health (SOH) of the lithium battery module and reports the result to the network management system (NMS).
 - Detects the state of charge (SOC) of the lithium battery module.
 - Counts the number of charge and discharge cycles.
 - Detects faults in certain key circuits (such as charging, discharging, and protection circuits) and reports alarms.
 - Stores historical data.

Figure 3-8 SmartLi-ESM-24020P1 appearance



- (1) Running indicator (2) Alarm indicator (3) Activate button (4) Fault indicator
- (5) WiFi indicator (6) Battery SOC indicator (7) Label^a (8) Power output ports
- (9) AC activation port (10) WiFi restart button (11) Battery parallel ports (12) Network ports
- (13) Dry contacts (14) Intelligent slot

NOTE

a: This area shows the SN and QR code. Scan the QR code to download the app, connect to the WiFi network, and view documents such as user manual and quick guide.

Table 3-5 Technical specifications

Item	Specifications
Dimensions (H x W x D)	160 mm × 442 mm × 520 mm (excluding mounting ears)
Weight	53 kg
Nominal voltage	240 V DC
Operating voltage range	70–320 V DC
Rated capacity	20 Ah
Maximum charge/discharge current	20 A/40 A@35°C

Item	Specifications
Cycle life	2500 cycles@0.5C/1C, 85% DOD, 70% EOL, 35°C
Operating temperature	0–40°C: not derated; 40°C–50°C: linearly derated
Storage temperature	0–60°C
Transport temperature	–40°C to +60°C
Relative humidity	5%–95% RH (non-condensing)
Altitude	0–4000 m 0–1000 m: not derated; above 1000 m: derated as specified in IEC 62040-3
Maximum number of batteries connected in parallel	16
IP rating	IP20

3.2.2.5 Lead-Acid Battery

3.2.2.5.1 Battery Pack

- The battery pack is a lead-acid battery. It is built in the cabinet as required and occupies 3 U space.
- The battery pack provides 9 Ah power supply.

Appearance

Figure 3-9 Battery pack



Technical Specifications

Table 3-6 Battery pack specifications

Battery Pack Specifications	Dimensions (L x W x H)	Weight
9 Ah	685 mm x 430 mm x 130 mm	69 kg

3.2.2.5.2 Battery

- Lead-acid batteries are placed in the battery cabinet.
- A battery cabinet provides space for installing batteries and routing battery cables in a data center. The battery cabinet can be deployed inside or outside the smart module. A maximum of two battery cabinets can be deployed inside the smart module.
- Battery cabinets are classified into master cabinets and slave cabinets. Conversion copper bars are required for the input and output of circuit breakers in the master cabinet.
- The required battery backup time is 15 minutes or 30 minutes.

Figure 3-10 Battery cabinet



Table 3-7 Battery cabinet technical specifications

Item	Technical Specifications
Dimensions (H x W x D)	• Deployed inside the smart module: 2000 mm x 600 mm x 1350 mm • Deployed outside the smart module: 2000 mm x 600 mm x 1100 mm

Item	Technical Specifications
Color	Black
Material	High-intensity class A carbon cold rolled steel plate and zinc-coated steel plate
Air channel	Front and rear air channels
Installation space	42 U available space
Installation mode	Installed on a concrete floor or ESD floor
Weight (excluding batteries)	- Deployed inside the smart module: 160 kg - Deployed outside the smart module: 140 kg
Static load	1500 kg
Dynamic load	1000 kg
IP rating	IP20

Table 3-8 Battery tray specifications

Item	Technical Specifications
Dimensions (W x D)	421 mm x 930 mm

Table 3-9 Lead-acid battery specifications

Battery Specifications	Battery Vendor and Model	Battery Weight	Battery Dimensions (H x W x D)
26 Ah	Shoto 6-GFM-26	10.0 kg	172 mm x 125 mm x 165 mm
40 Ah	Shoto 6-GFM-40	14.0 kg	172 mm x 165 mm x 197 mm
65 Ah	Shoto 6-GFM-65	22.0 kg	214 mm x 168 mm x 258 mm
100 Ah	Shoto 6-GFM-100	30.0 kg	222 mm x 174 mm x 330 mm

Table 3-10 Maximum number of batteries inside a battery cabinet

Battery Specifications	Maximum Number of Batteries Inside a Battery Cabinet
26 Ah	40
40 Ah	

Battery Specifications	Maximum Number of Batteries Inside a Battery Cabinet
65 Ah	20
100 Ah	

3.2.2.6 PDU2000

- The vertical PDU is configured for the version without cooling. The horizontal PDU is configured for the version with cooling. The monitoring PDU2000 is a horizontal product.
- In the standard solution, the basic PDU2000 is provided.

Figure 3-11 Horizontal PDU2000

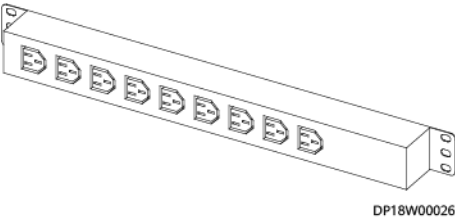
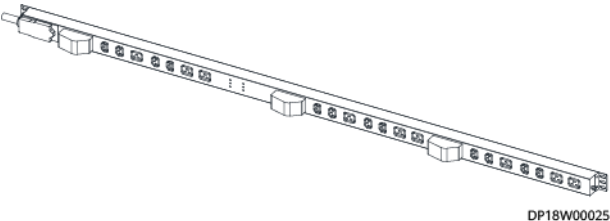


Figure 3-12 Vertical PDU2000



NOTE

The figures are for reference only. The actual products may vary.

Table 3-11 PDU2000 technical specifications

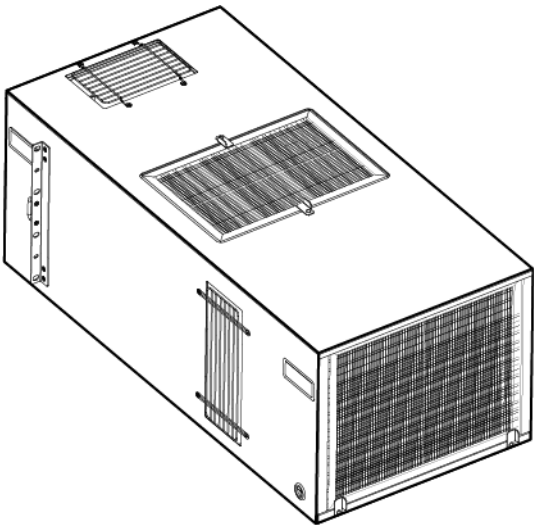
Type	Model	Output Port
IEC	PDU2000-32-1PH-20/2-B1	20 x C13 + 2 x C19
GB	PDU2000-32-1PH-20/2-B2	20 x GB 10 A + 2 x GB 16 A
IEC	PDU2000-32-1PH-9/3-B1	9 x C13 + 3 x C19
GB	PDU2000-32-1PH-9/3-B2	9 x GB 10 A + 3 x GB 16 A
GB	PDU2000-16-1PH-7/0-B1	7 x GB 10 A

Type	Model	Output Port
IEC	PDU2000-16-1PH-8/0-B1	8 x C13

3.3 Cooling System

The cabinet in the smart module with cooling (02116613) is equipped with an integrated air conditioner FusionCol5000-A003HX, which ensures the normal operating temperature and humidity of the cabinet and provides a stable operating environment.

Figure 3-13 Integrated air conditioner



3.3.1 Application Conditions

Operating Environment

Table 3-12 Operating environment

Item	Integrated Air Conditioner
Operating temperature	0–40°C
Operating humidity	5%–95% RH (non-condensing)
Storage temperature	–40°C to +70°C (without refrigerant) –40°C to +55°C (with refrigerant)
Storage humidity	5%–95% RH (non-condensing)
Altitude	0–4000 m; derated at 1000 m or above. For details about derating coefficients, see Table 3-13 .

Table 3-13 Derating coefficients

Altitude (m)	0	1000	1500	2000	2500	3000	3500	4000
Air volume coefficient	1	0.887	0.835	0.785	0.737	0.692	0.649	0.608
Cooling capacity coefficient	1	0.940	0.909	0.878	0.846	0.815	0.784	0.753

3.3.2 Technical Specifications

Table 3-14 Technical specifications

Item	Integrated Air Conditioner
Power system	208–240 V AC 50/60 Hz, 1 Ph
Power	3.5 kW
Refrigerant	R410A
Cooling capacity	3.5 kW ^a
Air volume (m ³ /h)	600
EER (nominal working condition)	3.0
AEER (100% load) - return air 37.8/20.8°C	4.0 (3.5 kW cooling capacity, return air temperature 37/20.8°C, annual average AEER)
Air supply mode	Front flow or front upflow
Dimensions (H x W x D)	355 mm x 442 mm x 930 mm
Net weight	≤ 60 kg
IP rating	IP20
Certification	(1) CCC, CE, CB (2) CQC energy saving certification
Environmental protection	RoHS, REACH, and WEEE

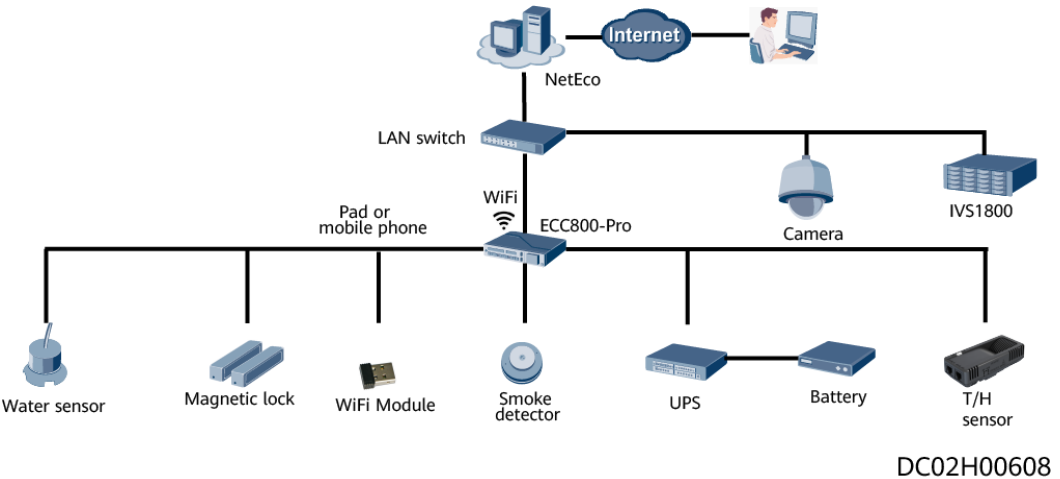
Item	Integrated Air Conditioner
a: The cooling capacity is obtained when the cabinet internal dry bulb temperature is 37°C, the cabinet internal wet bulb temperature is 24°C, and the cabinet external dry bulb temperature is 35°C. The actual cooling capacity varies depending on the ambient temperatures and relative humidity inside and outside the cabinet.	

3.4 Management System

3.4.1 Overview

- The smart module monitoring solution consists of the collector and monitoring components. The ECC800 functions as the collector.
- The smart module provides a module-level PAD for local intelligent management in terms of real-time monitoring, status browsing, alarm management, and system configuration.
- The NetEco can manage the infrastructures of a single data center or of data centers in various areas in a centralized manner.
- A third-party NMS can be used to manage data center infrastructure.
- The ECC800 manages the real-time status, alarms, and configuration information about the devices inside the smart module. It also provides a graphical user interface (GUI) for ease of operating and maintaining devices inside the smart module.

Figure 3-14 Logical networking diagram of the system (021116611 and 02116612)



The diagram illustrates the NetEco system architecture. At the top, the 'Internet' is connected to a 'NetEco' cloud. The 'NetEco' cloud is connected to a 'LAN switch'. The 'LAN switch' is connected to a 'WiFi' router. The 'WiFi' router is connected to a 'Pad or mobile phone'. The 'WiFi' router is also connected to a 'Camera' and an 'IVS1800' module. The 'WiFi' router is connected to a 'Smoke detector' and a 'UPS' (Uninterruptible Power Supply). The 'UPS' is connected to a 'Battery'. The 'WiFi' router is connected to a 'T/H sensor' (Temperature/Humidity sensor). The 'WiFi' router is connected to a 'Fire extinguishing module' and a 'Smart Cooling Product'. The 'WiFi' router is connected to a 'Water sensor' and a 'Cabinet electronic clasp lock'. The 'WiFi' router is connected to a 'WiFi Module'.

DC02H00609

- The configuration with a temperature control module supports facial recognition through the app installed on the PAD. After facial recognition information is added, click **Facial Enter** to start the facial recognition. If you do not have facial recognition permission or an error occurs during facial recognition, you can use the user name and password to log in.

3.4.2.3 Alarm

- The system monitors the status of smart cooling products, power distribution, and environment. If a fault or parameter error occurs, the system generates an alarm in real time. You can view the alarm cause and solution in the alarm details.
- Alarms can be classified into four severities: critical, major, minor, and warning. The alarm severities can be user-defined.
- Active alarms can be filtered by device and alarm severity.
- Alarm notifications can be sent by email and SMS.
- A maximum of 500 concurrent active alarms are supported.

3.4.2.4 Historical Data Query

- Historical alarm query: You can view the alarms that have been generated in the system. The historical alarm information includes the device name, alarm name, alarm severity, alarm generation time, and alarm clearance time.
- Performance data statistics: You can view historical data of devices to help analyze data or problems.
- Operation log query: You can view logs of key operations, such as user login, parameter modification, data export, device upgrade, and access control events.
- Data export: You can export historical data of the ECC800 and certain southbound devices.

3.4.2.5 Linkage Control

- Supports the linkage logic of aisle smoke alarms or high temperature alarms. By default, the cabinet doors are opened through linkage by default.

NOTE

Aisle smoke alarms cannot trigger the customer's fire extinguishing system. Only dry contact alarm signals are provided.

- Supports the aisle emergency ventilation linkage logic. The cabinet doors are opened by default under linkage.
- If the protected area of the fire extinguishing system is inside the smart module, when a smoke alarm is generated, the door of the linked cabinet does not open. If the door is opened, an alarm (door open alarm) is generated.
- If the protected area of the fire extinguishing system is outside the smart module, when a smoke alarm is generated, the rear door of the linked cabinet is opened.

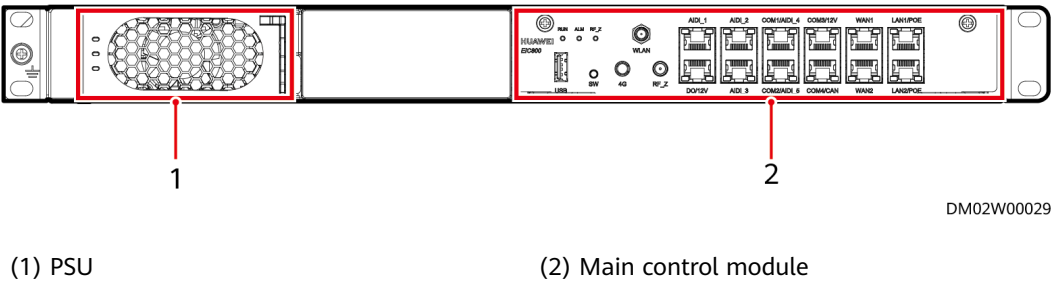
3.4.3 Key Hardware Devices

3.4.3.1 ECC800-Pro

3.4.3.1.1 Product Configuration

The ECC800-Pro data center controller is used to monitor the devices and environment in the smart module. It consists of the power supply unit (PSU) and main control module. You can insert and remove the PSU.

Figure 3-16 ECC800-Pro



(1) PSU (2) Main control module

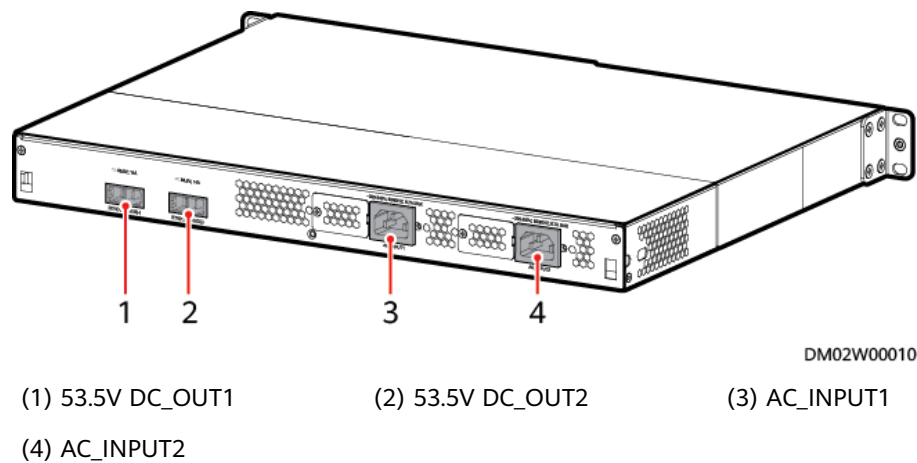
Table 3-15 ECC800-Pro environmental specifications

Item	Specifications
Operating temperature	-20°C to +50°C
Storage temperature	-40°C to +70°C
Relative humidity	5%–95% RH (non-condensing)
Altitude	0–4000 m (When the altitude is between 3000 m and 4000 m, the temperature decreases by 1°C for each additional 200 m.)

Table 3-16 ECC800-Pro structural specifications

Item	Specifications
Dimensions (L x W x H)	442 mm x 330 mm x 43.6 mm
Weight	7.5 kg (dual power supplies + main control module)
Color	Black
Installation requirements	Can be installed in a 1 U space in a standard 19-inch cabinet
Environmental protection	RoHS5, REACH, WEEE

Figure 3-17 ECC800-Pro (rear view)



Power Port

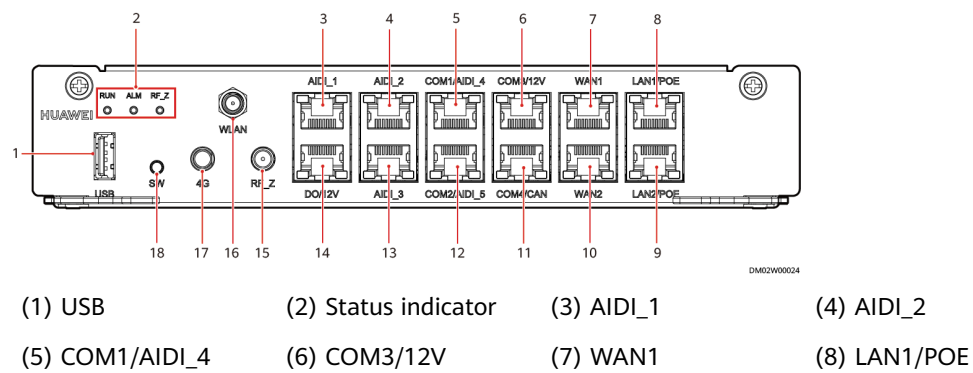
The ECC800-Pro provides four power ports, including two AC input ports (AC_INPUT1 and AC_INPUT2) and two DC output ports (DC_OUTPUT1 and DC_OUTPUT2). Table 3-17 provides the power port pin definitions.

Table 3-17 Power port pin definitions

Port Type	Pin sequence	Description
AC	Pin1	L
	Pin2	PE
	Pin3	N
DC	Pin1	48V+
	Pin2	48VGND

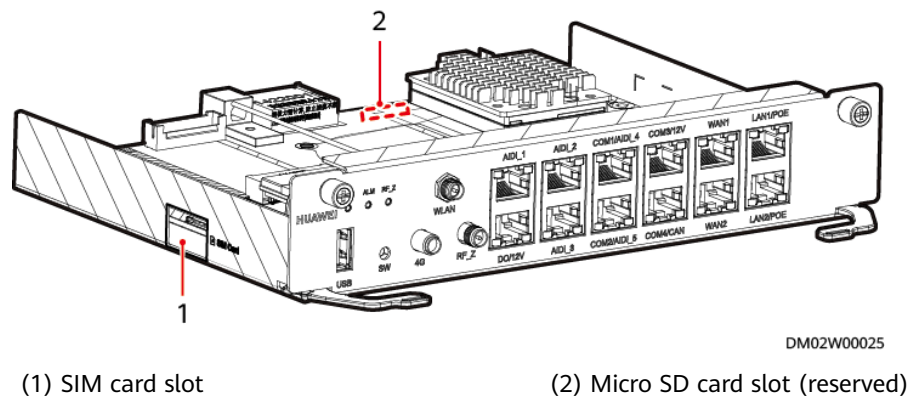
3.4.3.1.2 Main Control Module

Figure 3-18 ECC800-Pro collector main control module



- (9) LAN2/POE
- (10) WAN2
- (11) COM4/CAN
- (12) COM2/AIDI_5
- (13) AIDI_3
- (14) DO/12V
- (15) RF_Z
- (16) WLAN
- (17) 4G
- (18) SW button

Figure 3-19 ECC800-Pro main control module (side view)



Specifications

Table 3-18 Technical specifications of the ECC800-Pro main control module

Item	Specifications
Power input	- Supports one AC input or two AC inputs - Rated voltage: 200–240 V AC - Rated frequency: 50/60 Hz
Power output	- Output voltage: 42–58 V DC (rated voltage: 53.5 V DC) - Output power of two power module supplies: 2000 W (200–240 V AC); 940 W (linear derating at 85–175 V AC) - Output power of a single power module supply: 1000 W (200–240 V AC); 470 W (linear derating at 85–175 V AC)
WAN port	- Supports two WAN ports. WAN1 is used to connect to the management system, and WAN2 is used for maintenance. The ports support autonegotiation of 10/100/1000 Mbit/s communication rates. - Connect shielded network cables to the WAN ports.
LAN port	- Supports two LAN ports, which can be connected to the LAN. The ports support autonegotiation of 10/100/1000 Mbit/s communication rates. - Connect shielded network cables to the LAN ports.

Item	Specifications
RS485 serial port expansion	• Output voltage: 13–15 V DC (rated voltage: 14.5 V DC) • Four RS485 ports with the default communications rate of 9600 bit/s • COM1–COM3 ports provide 12 V DC power. • The power supply can be switched on or off and is on by default.
PoE expansion	Supports two PoE (GE) ports for expansion of the PoE bus, and supports network isolation and ring network.
AIDI expansion (RJ45)	• Output voltage: 13–15 V DC (rated voltage: 14.5 V DC) • Provides five universal AIDI ports for connecting to sensors such as smoke sensors, water sensors, and NTC sensors. AIDI_1 to AIDI_3 are full-function AIDI ports, and AIDI_4 to AIDI_5 are simplified AIDI ports without type identification. • The power supply can be switched on or off and is on by default.
DO expansion (RJ45)	• Output voltage: 13–15 V DC (rated voltage: 14.5 V DC) • Supports one active DO port. • The power supply can be switched on or off and is on by default.
Fault isolation	There are three groups of 12 V ports. A group has a maximum current of 660 mA, a route has a maximum current of 800 mA, and the maximum total current is 2 A. Group 1: AIDI_1 and DO/12V ports Group 2: AIDI_2, COM1/AIDI_4, and COM3/12V ports Group 3: AIDI_3 and COM2/AIDI_5 ports
Wireless communication	Supports wireless communication that complies with IEEE802.15.4.

Item	Specifications
4G	Supports the 4G module, SMS sending, and 3G communication, and provides a standard SIM card slot. - China: 2G and 4G networks support China Unicom or China Mobile SIM cards, and 3G networks support only China Unicom SIM cards. - Outside China: Select SIM cards according to the following wireless modes and frequency bands: 4G: wireless mode (FDD-LTE and TDD-LTE), coverage frequency band (B1, B3, B5, B7, B8, and B20) 3G: wireless mode (WCDMA), coverage frequency bands (B38, B40, and B41) 2G: wireless mode (GSM), coverage frequency band (900/1800 MHz) NOTE - The prerequisite for using a SIM card is that the site has signal coverage. - Due to the performance limitation of the wireless module, China Telecom SIM cards are not supported.
USB	- Supports USB 2.0 and 5 V, 1 A power supply. - After installing the WiFi module, connect the WiFi module to the ECC800-Pro using the app on the mobile phone or PAD to view the basic information about the smart module, such as layout, resources, energy efficiency, environment, and alarms. - You can insert a USB flash drive to export historical data and configuration files and import configuration files.
SW button	- Restores the default IP address, factory settings, and user information. - Supports RF_Z networking.

Table 3-19 ECC800-Pro RF_Z parameters

Item	Specifications
RF_Z Operation Frequency	2405–2480 MHz
RF_Z EIRP (max.)	8 dBm

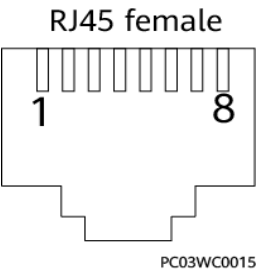
Table 3-20 ECC800-Pro 4G parameters

Item	Specifications
3G/4G operation frequency	LTE (FDD): BAND1, BAND2, BAND3, BAND4, BAND5, BAND7, BAND8, BAND20 DC-HSPA+/HSPA+/HSPA/UMTS: 850/900/1900/2100 MHz GSM/GPRS/EDGE: 850/900/1800/1900 MHz
3G/4G EIRP (max.)	23 dBm

Communications Port

The ECC800-Pro provides the following communications ports. [Figure 3-20](#) shows the pins of the RJ45 port.

Figure 3-20 RJ45 port pins



There are four GE ports, that is, two WAN ports (WAN1 and WAN2) and two LAN ports (LAN1/POE and LAN2/POE).

Table 3-21 GE port pin definitions

Item		Description
Pin sequence	Pin1	GE1+
	Pin2	GE1-
	Pin3	GE2+
	Pin4	GE3+
	Pin5	GE3-
	Pin6	GE2-
	Pin7	GE4+
	Pin8	GE4-
Indicator	Green indicator	Linked, steady on

Item		Description
	Yellow indicator	ACT data communication, blinking

Table 3-22 COM1/AIDI_4, COM2/AIDI_5 port pin definitions

Item		Description
Pin sequence	Pin1	RS485+
	Pin2	RS485-
	Pin3	12V DC_OUT
	Pin4	RS485+
	Pin5	RS485-
	Pin6	DI-
	Pin7	DI+
	Pin8	GND
Indicator	Green indicator	Power output indicator - Steady on: The 12 V DC output is normal. - Off: No 12 V DC output is provided.

Table 3-23 COM3/12V port pin definitions

Item		Description
Pin sequence	Pin1	RS485+
	Pin2	RS485-
	Pin3	12V DC_OUT
	Pin4	RS485+
	Pin5	RS485-
	Pin6	-
	Pin7	-
	Pin8	GND
Indicator	Green indicator	Power output indicator - Steady on: The 12 V DC output is normal. - Off: No 12 V DC output is provided.

Table 3-24 COM4/CAN port pin definitions

Item		Description
Pin sequence	Pin1	RS485+
	Pin2	RS485-
	Pin3	-
	Pin4	RS485+
	Pin5	RS485-
	Pin6	-
	Pin7	CAN_H
	Pin8	CAN_L

The following provides the AIDI_1, AIDI_2 and AIDI_3 ports pin definitions.

 NOTE

- Pins 1, 2, 4, and 5 identify sensor types.
- Pin 3 and Pin 8 are power output ports.
- Pin 6 and Pin 7 collect sensor data. Pin 7 can detect current type sensors (4–20 mA). Pin 6 and Pin 7 can detect the output status of passive dry contact type sensors. Pin 3 and Pin 7 can detect temperature sensors.

Table 3-25 AIDI_1, AIDI_2 and AIDI_3 ports pin definitions

Item		Description
Pin sequence	Pin1	Type_1
	Pin2	Type_2
	Pin3	12V DC
	Pin4	Type_3
	Pin5	Type_4
	Pin6	DI-
	Pin7	DI+
	Pin8	GND
Indicator	Green indicator	Power output indicator • Steady on: The 12 V DC output is normal. • Off: No 12 V DC output is provided.

Table 3-26 DO/12V port pin definitions

Item		Description
Pin sequence	Pin1	-
	Pin2	-
	Pin3	12V DC_OUT
	Pin4	-
	Pin5	-
	Pin6	DO_OUT+
	Pin7	DO_OUT-
	Pin8	GND
Indicator	Green indicator	Power output indicator - Steady on: The 12 V DC output is normal. - Off: No 12 V DC output is provided.

Table 3-27 USB port pin definitions

Item		Description
Pin sequence	Pin1	5V
	Pin2	DM
	Pin3	DP
	Pin4	GND

Indicators

Table 3-28 Indicators on the ECC800-Pro main control module

Indicator	Color	Name	Status	Status Description
RUN	Green	Running status indicator	Steady on	The power supply is normal, the program is being loaded.
			Off	The power supply is abnormal.

Indicator	Color	Name	Status	Status Description
			Blinking at long intervals	The software runs properly (the indicator blinks at 0.5 Hz, on for 1s and then off for 1s) or the ECC800-Pro registers with the NetEco successfully.
			Blinking at short intervals	The ECC800-Pro does not register with the NetEco (the indicator blinks at 5 Hz, on for 0.125s and then off for 0.125s).
ALM	Red	Alarm indicator	Steady on	A system failure alarm is generated.
			Off	The system is normal.
RF_Z	Green	Communication status indicator	Blinking at long intervals	A network is set up, and no node access is allowed (the indicator blinks at 0.5 Hz, on for 1s and then off for 1s).
			Blinking at super short intervals	A network is set up, and node access is allowed (the indicator blinks at 10 Hz, on for 0.05s and then off for 0.05s).

SW Button

Table 3-29 SW button description

Function Description	Operation Description	Indicator Status
Wireless network RF_Z (802.15.4) pairing	In non-wireless network (802.15.4) pairing mode, press and hold down the button for 3s to 5s to enter the wireless network pairing mode.	The RF_Z indicator is blinking at super short intervals.
	In wireless network (802.15.4) pairing mode, press and hold down the button for 3s to 5s to exit the pairing mode; or the system automatically exits the pairing mode after 30 minutes without pressing the button.	The RF_Z indicator is blinking at long intervals.

Function Description	Operation Description	Indicator Status
	Press and hold down the button for more than 8s to clear network parameters.	The RF_Z indicator is steady on.
WLAN enabling	Press and hold down the button for 1s to enable WLAN.	None
Restoring the default IP address, factory settings, and user information	Press and hold down the button for 1 minute.	None

3.4.3.1.3 PSU

Indicator

Table 3-30 PSU indicator description

Indicator	Color	Name	Status	Description
	Green	Power indicator	Steady on	The PSU has input power.
			Off	The PSU has no input power or is faulty.
			Blinking at long intervals	The PSU is being queried (the indicator blinks at 0.5 Hz, on for 1s and then off for 1s).
			Blinking at short intervals	The PSU application program is being loaded (blinking at 4 Hz, on for 0.125s and then off for 0.125s).
	Yellow	Alarm indicator	Steady on	Power limiting warning due to ambient overtemperature; protection shutdown alarm due to ambient overtemperature or undertemperature
				Power input overvoltage or undervoltage protection
				Reverse DC input connection
				Slight current imbalance
				Output overvoltage

Indicator	Color	Name	Status	Description
				Hibernation
			Off	The PSU generates no protection alarms.
			Blinking at long intervals	The communication between the PSU and the outside is interrupted (the indicator blinks at 0.5 Hz, on for 1s and then off for 1s).
	Red	Fault indicator	Steady on	The PSU locks out due to output overvoltage.
				The PSU has no output due to internal faults.
			Off	The PSU is normal.

3.4.3.2 Environment Monitoring System

3.4.3.2.1 Electrode Water Sensor

An electrode water sensor (BOM number: 33010444) consists of an electrode probe and a cable. The sensor is placed on the floor under the cabinet to detect water leakage and trigger an alarm.

Figure 3-21 Electrode water sensor

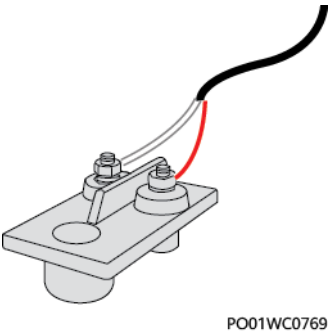


Table 3-31 Technical specifications of the electrode water sensor

Item	Specification
Operating temperature	-40°C to +80°C
Storage temperature	-40°C to +80°C

3.4.3.2.2 Ambient T/H Sensor

An ambient T/H sensor monitors the ambient temperature and humidity and generates an alarm when the temperature or humidity inside the cabinet is unbalanced.

Figure 3-22 T/H sensor



The T/H sensor uses an RJ45 connector.

NOTE

The appearance of the T/H sensor delivered onsite may vary.

Figure 3-23 Pins of an RJ45 connector

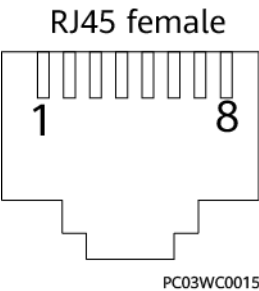


Table 3-32 RJ45 port pin definitions

Pin	Description
Pin 1 or Pin 4	A
Pin 2 or Pin 5	B
Pin 3	V+
Pin 6 or Pin 8	V-
Pin 7	Disconnected

Table 3-33 T/H sensor specifications

Item	Specifications
Temperature measuring range	-20°C to +70°C

Item	Specifications
Temperature precision	±1℃
Humidity measuring range	5%–95% RH
Humidity precision	±5% RH (25℃, 20%–80% RH)
Operating temperature	–20℃ to +70℃
Operating voltage	9–16 V DC
Storage temperature	–40℃ to +70℃
Output	RS485

3.4.3.2.3 Smoke Detector

A smoke detector detects smoke around cabinets.

Figure 3-24 Appearance of the smoke detector (JTY-GD-S839)

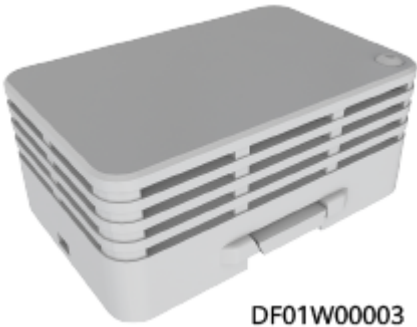
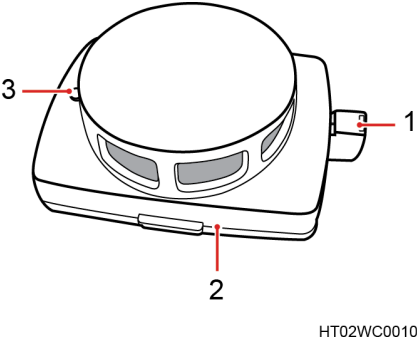


Figure 3-25 Appearance of the smoke detector (LH-09A)



- (1) Wiring terminal
- (2) Base
- (3) Indicator

Table 3-34 Smoke detector technical specifications

Item	Specifications (JTY-GD-S839)	Specifications (LH-09A)
Operating voltage	9–27 V	9–27 V
Alarm current	1–20 mA	3–8 mA
Indication	Monitoring: The red indicator blinks once every 3 to 8 seconds. Alarm reporting: The red indicator is steady on.	Monitoring: The indicator blinks once every 4 to 6 seconds. Alarm reporting: The indicator is steady on.
Operating temperature	–10°C to +55°C	–10°C to +55°C
Ambient humidity	≤ 95% RH (non-condensing at 40°C ±2°C)	≤ 95% RH (non-condensing at 40°C±2°C)
Dimensions (H x W x D)	31 mm x 75 mm x 51 mm (with the base)	74.8 mm x 58.8 mm x 30.4 mm
Weight	50 g	60 g

3.4.3.3 Video Management System

3.4.3.3.1 Camera

- The C3220 is a 2-megapixel infrared zoom dome camera.
- The C3220 camera can be installed on the top of the cabinet exterior to save space and is used to monitor the smart module.

Figure 3-26 C3220 camera



Table 3-35 C3220 camera technical specifications

Item	Specifications
Image sensor	1/2.7" two-megapixel progressive scan CMOS
Minimum illumination	- Color: 0.002 lux (F1.2, AGC ON, 1/30s shutter speed) - Black/White: 0.0005 lux (F1.2, AGC ON, 1/30s shutter speed); 0 lux (infrared illuminator enabled)
Wide dynamic range	120 dB
Focal length	2.8–12 mm
Video compression standard	H.265/H.264/MJPEG
Maximum resolution	1920x1080
Power supply	12 V DC, PoE
IP rating	IP67
Vandal resistant rating	IK10

3.4.3.3.2 (Optional) IVS1800

Figure 3-27 IVS1800



Table 3-36 Performance specifications

Category	Item	IVS1800-C08-04T (16CH)	IVS1800-C08-04T (64CH)
Device performance	Network video inputs	16-channel 1080p, up to 160 Mbit/s access bandwidth	64-channel 1080p, up to 320 Mbit/s access bandwidth Up to 160 Mbit/s access bandwidth with intelligent services enabled

Category	Item	IVS1800-C08-04T (16CH)	IVS1800-C08-04T (64CH)
	Video transfer	16-channel 1080p, up to 160 Mbit/s forwarding bandwidth	64-channel 1080p, up to 320 Mbit/s forwarding bandwidth Up to 160 Mbit/s forwarding bandwidth with intelligent services enabled
	Playback/Download	16-channel 1080p, up to 80 Mbit/s playback bandwidth	32-channel 1080p, up to 160 Mbit/s playback bandwidth
Platform performance	IP cameras connected	16 cameras to one IVS1800	64 cameras to one IVS1800

Table 3-37 Hardware specifications

Category	Item	Specifications
Storage capacity	Hard disk quantity	8
	Hard disk port	SATA3.0
	Hard disk type	Enterprise-level disks: 4 TB, 6 TB, 8 TB, or 10 TB Monitoring-level disks: 4 TB or 6 TB
Controller	Processor	Hi3559A
	Memory	8 GB DDR4
External ports	Network port	Two 10/100/1000 Mbit/s Ethernet ports
	USB ports	Three USB ports (two USB 2.0 ports on the front panel and one USB 3.0 port on the rear panel)
	Audio input	1 channel, RCA port
	Audio output	1 channel, RCA port
	Alarm port	4-channel alarm input, 2-channel alarm output
Other specifications	Power consumption (8 hard disks included)	124 W
	Power supply	110–220 V AC

Category	Item	Specifications
	Weight (hard disks excluded)	6.60 kg
	Dimensions (H x W x D)	86 mm x 442 mm x 467 mm

3.4.3.4 PAD

The PAD allows the wireless access from the data center management system. You can monitor the equipment in the data center and environmental parameters in real time over the app.

Figure 3-28 PAD

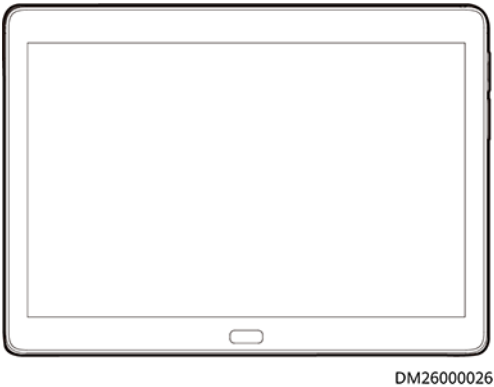


Table 3-38 PAD structural specifications

Item	Specifications
Dimensions (L x W x H)	243 mm x 164 mm x 7.8 mm
Weight	About 460 g

Table 3-39 PAD technical specifications

Item	Specifications
Touchscreen	10.1-inch, 1920 x 1200 resolution, IPS screen, and multi-touch
Storage	- Machine: 32 GB - Memory: 3 GB - Extension card: Micro SD, a maximum of 256 GB (non-standard configuration)

Item	Specifications
Button/Port	• Touch button + power switch and volume button • 3.5 mm stereo headphones port • Micro SD card port • MicroUSB port
Camera	• Rear camera: 8-megapixel, F2.4 aperture, automatic focus • Front camera: 2-megapixel, F2.4 aperture, fixed focus • Sensor type: BSI • Flash: not supported • Video recording: rear camera up to 1080 pixels at 30 FPS; front camera up to 720 pixels at 30 FPS • Zoom mode: digital zoom • Photo resolution: rear camera up to 8 M (3264 x 2448 pixels); front camera up to 1.9 M (1600x1200 pixels)
Battery	• Materials: Li-polymer • Capacity: 5100 mAh (typical value) or 4980 mAh (rated value) • WiFi connection/web page browse time: about 6.5 hours • Power adapter charge time: about 3.5 hours (5 V 2 A adapter)

3.4.3.5 Cabinet Electronic Clasp Lock

- The Converged Cabinet in the smart module with cooling (02116613) is equipped with an electronic clasp lock.
- The cabinet electronic clasp lock is used to manage access control. It can be electrically unlocked, or manually locked and unlocked.

Figure 3-29 Cabinet electronic clasp lock

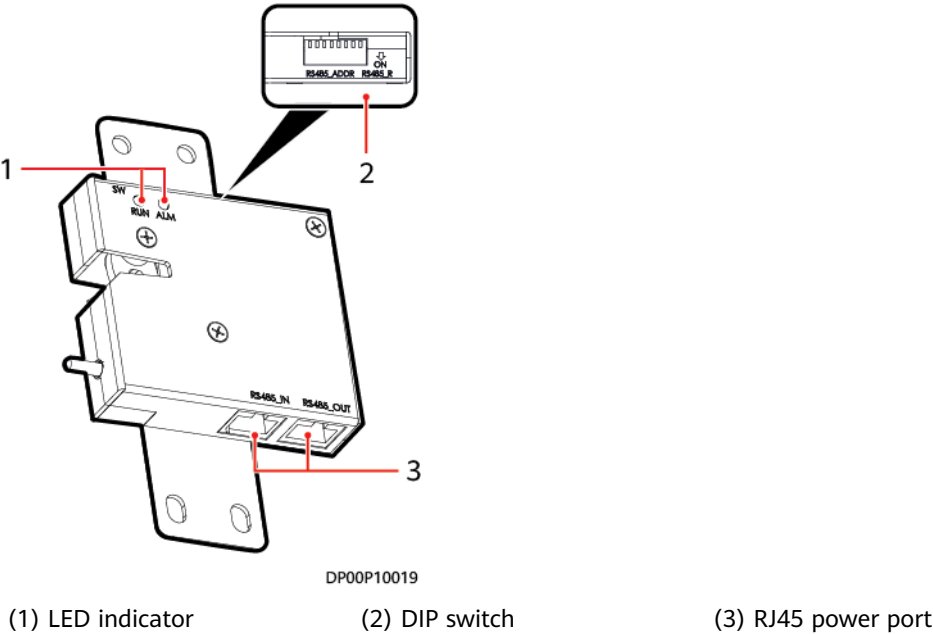


Table 3-40 RJ45 port definitions

No.	Pin Description	Description
1	RS485+	RS485+
2	RS485-	RS485-
3	+12 V power supply	+12VDC
4	RS485+	RS485+
5	RS485-	RS485-
6	-	-
7	-	-
8	Ground	GND

Table 3-41 LED indicator status

Indicator	Color	Name	Operation	Status	Status Description
RUN	Green	Module running indicator	/	Blinking	• The door lock is paired with the host, and the power supply is normal: The indicator blinks at 0.5 Hz (on for 1s and then off for 1s). • The door lock fails to pair with the host: The indicator blinks at 4 Hz (on for 0.125s and then off for 0.125s).
				Off	The power supply is abnormal.
			Press SW.	Blinking intermittently at super short intervals	• The indicator blinks at super short intervals for 0.5s, and then off for 0.5s. • The indicator blinks at super short intervals (blinking at 10 Hz, on for 0.05s and then off for 0.05s). The cycle lasts for 5s.
ALM	Red	Alarm indicator	/	Steady on	A system failure alarm is generated.
				Off	The system is normal.

3.4.3.6 Door Status Switch

- The Converged Cabinet in the smart module without cooling (02116611 or 02116612) is equipped with a door status switch.
- The door status switch has been installed on the cabinet door, which can be manually opened and closed.

Figure 3-30 Door status switch



DM82000012

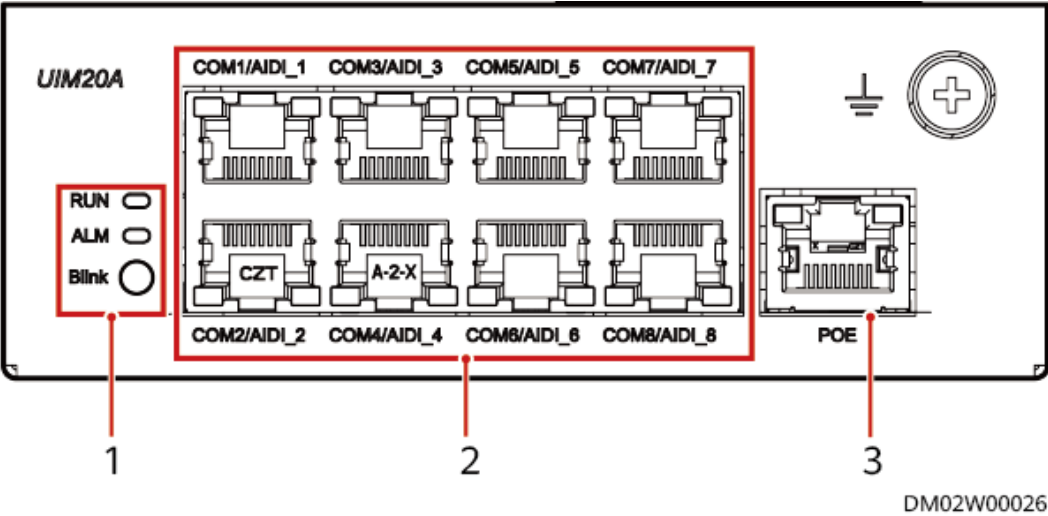
Table 3-42 Technical specifications of the door status switch

Item	Specifications
Connection method	Using wiring terminals
Rated current	500 mA
Opening distance	25 mm ≤ Opening distance ≤ 45 mm
Rated power	10 W
Securing mode	Using screws
Distance between mounting holes	40 mm ±0.8 mm
Open-circuit voltage	100 V DC (maximum)
Contact withstand voltage	150 V DC (maximum)
Impedance	0.3 ohm
Switch status	Normally open
Outer material	White acrylonitrile butadiene styrene (ABS) engineering plastic

3.4.3.7 UIM20A Expansion Module

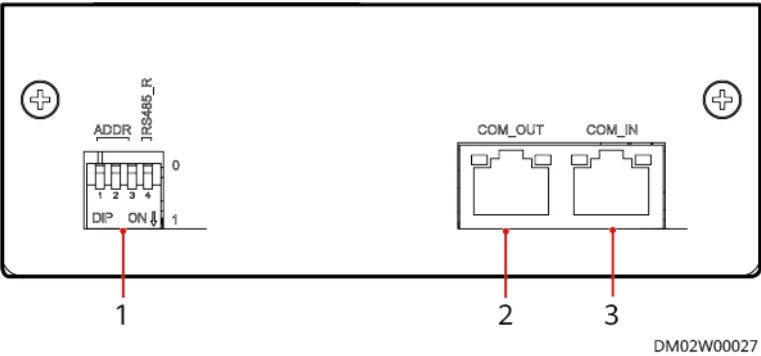
- If the monitoring PDU2000 is used, install the UIM20A expansion module.
- The UIM20A expansion module supports PoE input. It provides eight COM/AIDI ports and four 12 V outputs.

Figure 3-31 Front panel of the UIM20A expansion module



- (1) Indicators and button
- (2) COM1/AI/DI_1–COM8/AI/
DI_8
- (3) PoE

Figure 3-32 Rear panel of the UIM20A expansion module



- (1) DIP switch (reserved)
- (2) COM_OUT (reserved)
- (3) COM_IN (reserved)

Table 3-43 UIM20A expansion module specifications

Item	Specifications
Width	120 mm
Depth	200 mm
Height	43 mm
Operating temperature	–30°C to +65°C
Installation requirements	Installed in a 19-inch rack

Item	Specifications
Environmental protection	RoHS5

Specifications

Table 3-44 UIM20A technical specifications

Item	Specifications
Power input	Supports the RS485 or PoE power supply.
COM/AIDI (RJ45)	- Supports eight RS485 or AI/DI signal inputs. - Can connect to sensors such as the smoke detector, water sensor, door status sensor, and infrared sensor. - Each port can supply power. Two RJ45 ports share one 12 V DC power supply that is controlled independently. The maximum output current is 900 mA when the voltage is 12 V. (COM1/AIDI_1 and COM2/AIDI_2 form a group, COM3/AIDI_3 and COM4/AIDI_4 form a group, COM5/AIDI_5 and COM6/AIDI_6 form a group, and COM7/AIDI_7 and COM8/AIDI_8 form a group). - The 12 V DC power supply can be switched on or off and is on by default.
PoE	Connects to the ECC800 through the PoE port.
E-label 4.0	Supported

Communications Port

The following table describes the pin assignment for ports COM1/AIDI_1 to COM8/AIDI_8.

Table 3-45 Pin assignment for ports COM1/AIDI_1 to COM8/AIDI_8

Item	Description
Pin sequence	Pin 1 RS485+
	Pin 2 RS485-
	Pin 3 12 V
	Pin 4 RS485+
	Pin 5 RS485-

Item		Description
	Pin 6	D-
	Pin 7	D+
	Pin 8	GND

The following table describes the pin assignments for the COM_IN and COM_OUT ports.

Table 3-46 Pin assignment for the COM_IN and COM_OUT ports

Item		Description
Pin sequence	Pin 1	RS485+
	Pin 2	RS485-
	Pin 3	12 V (input power, supplying power to the module)
	Pin 4	RS485+
	Pin 5	RS485-
	Pin 6	-
	Pin 7	-
	Pin 8	GND

Indicators and Buttons

Table 3-47 UIM20A indicators

Indicator	Status	Status Description
RUN	Steady on	A board application is being loaded.
	Off	The board is not running.
	Blinking slowly	The module successfully registers with the ECC800 and the software runs properly (the indicator blinks at 0.5 Hz, on for 1s and then off for 1s).
	Blinking fast	The communication is interrupted or the ECC800 is unsuccessfully registered (blinking at 2.5 Hz, on for 0.2s and then off for 0.2s).

Indicator	Status	Status Description
	Blinking	Blinking at super short intervals for 0.5s and then off for 0.5s; last 10s (blinking at super short intervals for 10 Hz, on for 0.05s and then off for 0.05s)
ALM	Steady on	A system fault alarm is raised.
	Off	The system is normal.

Table 3-48 BLINK button description

Function Description	Operation Description	Indicator Status
Blinking	Press the button for less than 2s.	The RUN indicator blinks at super short intervals for 0.5s and then off for 0.5s; last 10s (blinking at super short intervals for 10 Hz, on for 0.05s and then off for 0.05s).

3.4.3.8 WiFi Module

The WiFi module provides WiFi signals for equipment such as PADs to interact with the ECC800-Pro.

Figure 3-33 WiFi module

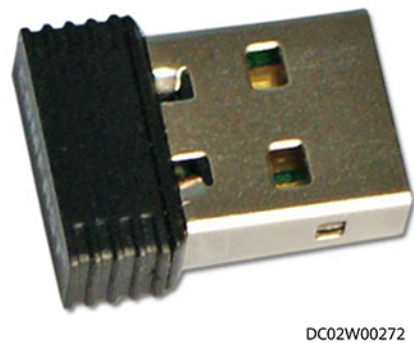


Table 3-49 Technical specifications of a WiFi module

Item	Specifications
Wireless standard	IEEE 802.11n, IEEE 802.11g, and IEEE 802.11b

Item	Specifications
Network bandwidth	• 11n: up to 150 Mbit/s • 11g: up to 54 Mbit/s • 11b: up to 11 Mbit/s
Frequency band	2.4–2.4835 GHz
Wireless transmission power	20 dBm (MAX EIRP)
Supported operating system	Windows 2000/XP/Vista/Linux/Win 7
Port	USB 2.0 Hi-Speed connector
Voltage range	5.0 V DC±5%
Operating temperature	–20°C to +70°C
Storage temperature	–40°C to +90°C
Relative humidity	10%–90% RH (non-condensing)
Power	< 0.8 W

3.4.3.9 eLight

- The Converged Cabinet in the smart module with cooling (02116613) is equipped with an eLight.
- The eLight system consists of the eLight power actuator, eLight light, and cables.
- The eLight can interact with the alarm system and control light colors to indicate alarms, making maintenance status clear and reducing O&M costs.

Figure 3-34 eLight light



Figure 3-35 eLight actuator



NOTE

The appearance of the eLight actuator depends on the actual delivery.

Table 3-50 Actuator indicator description

Indicator	Color	Function Definition	Status	Status Description
PWR	Green	Power status indicator	Steady on	The power supply works properly.
			Off	There is no power input, or the internal power supply fails.
RUN	Green	Running status indicator	0.5 Hz	The software runs properly: The indicator blinks at 0.5 Hz (on for 1s and then off for 1s).
			4 Hz	Communication is disconnected (no communication for 30s): The indicator blinks at 4 Hz (on for 0.125s and off for 0.125s).
			Off	There is no power input, or the internal power supply fails.

Table 3-51 Description of eLight light colors

Scenario	Light Color	Remarks
Not associated with an alarm severity	Blue NOTE On the ECC800-Pro WebUI, set Associated Alarm Severity to None .	-

Scenario	Light Color	Remarks
Associated with an alarm severity	- Mapping between smart module alarm severities and strip light colors: - Critical: red - Major: orange - Minor: yellow - Warning: grayish-white - No alarm: off	- Critical and major alarms are associated by default. Alarms of any severity can be manually associated. - When alarms of multiple severities are generated, the strip light displays only the color of the alarm with the highest severity.
Door alarm	White	
eLight fault	The eLight disconnects from the ECC800-Pro and blinks in red.	-

Table 3-52 eLight system technical specifications

Item	Specifications
eLight power actuator	- Rated input voltage: 220–240 V AC - Frequency: 50/60 Hz - Output: 24 V DC - There are two output channels. The output of channel I is connected to the RGBW light. The output voltage of different ports is controlled based on the command from the host to display different colors. The 24 V output can be connected and disconnected. Channel II is the same as channel I. - Modbus communications protocol, RS485 port, two RJ45 ports - Certification: CE
eLight light	- Rated input voltage: 24 V DC - Light type: RGBW LED light, in different colors depending on commands - Power: $P \approx 6$ W/m under maximum working conditions (RGB all on or W white light on) - Installation mode: attached to the cabinet top beam by magnet - Certification: CE

Item	Specifications
IP rating	≥ IP20
Operating environment	- Indoor normal temperature 30°C - Operating temperature range: 4°C to 40°C - Humidity range: 5%–95%, non-condensing

3.4.4 Data Center Management System

3.4.4.1 (Optional) NetEco Intelligent Data Center Management System

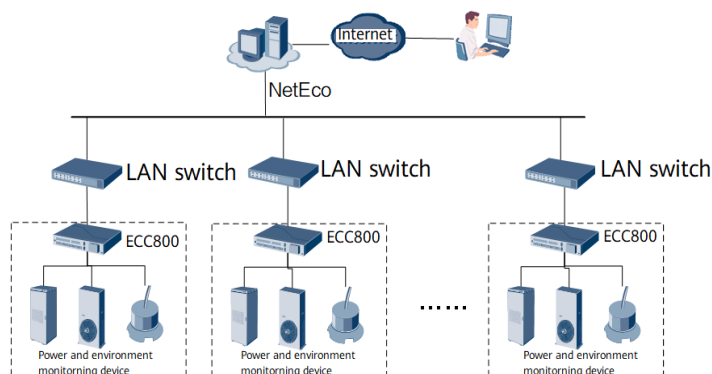
3.4.4.1.1 System Overview

With a flexible structure and modular design, the NetEco can manage facilities of one data center or centrally manage facilities of multiple data centers in different regions.

The management system provides a GUI to implement comprehensive management functions based on requirements. The system mainly monitors following devices:

- Power equipment: smart cooling product, Power distribution module, UPS, and so on
- Environment equipment: water sensor, temperature and humidity sensor, and so on
- Video equipment: camera, and so on
- Access control equipment: A standard access management system is integrated to manage and monitor key information such as door status, card swiping, and permission setting.
- Standard network management interface: The NetEco provides SNMP interfaces to communicate with third-party NMSs. The system can be customized to support other protocols for the access from different devices.

Figure 3-36 Networking diagram



3.4.4.1.2 Server

The NetEco can be deployed on one of the following servers according to the management capability requirement.

Table 3-53 Server

Model	Configuration
TaiShan 200 (Model 2280) standard configuration	2 x Kunpeng 920 48-core@2.6 GHz, 4 x 32 GB memory, 2 x 1.2 TB + 8 x 1.8 TB drives
TaiShan 200 (Model 2180) basic configuration	1 x Kunpeng 920 32-core@2.6 GHz, 2 x 32 GB memory, 2 x 1.2 TB drives
2288X V5-H22X-standard configuration	2 x 5218 16-core@2.3 GHz CPU, 4 x 32 GB memory, 2 x 1.2 TB + 8 x 1.8 TB SAS drives
2288X V5-H22X-basic configuration	2 x 4208 8-core@2.1 GHz CPU, 2 x 32 GB memory, 2 x 1.2 TB SAS drives

3.4.4.1.3 LAN Switch

Select LAN switches based on site requirements.

Table 3-54 LAN switch

Model	Maximum Number of Ports
S5331-H24P4XC	Twenty-four 10/100/1000BASE-T Ethernet ports, four 10GE SFP+ ports
S5731-H24P4XC	Twenty-four 10/100/1000BASE-T Ethernet ports, four 10GE SFP+ ports

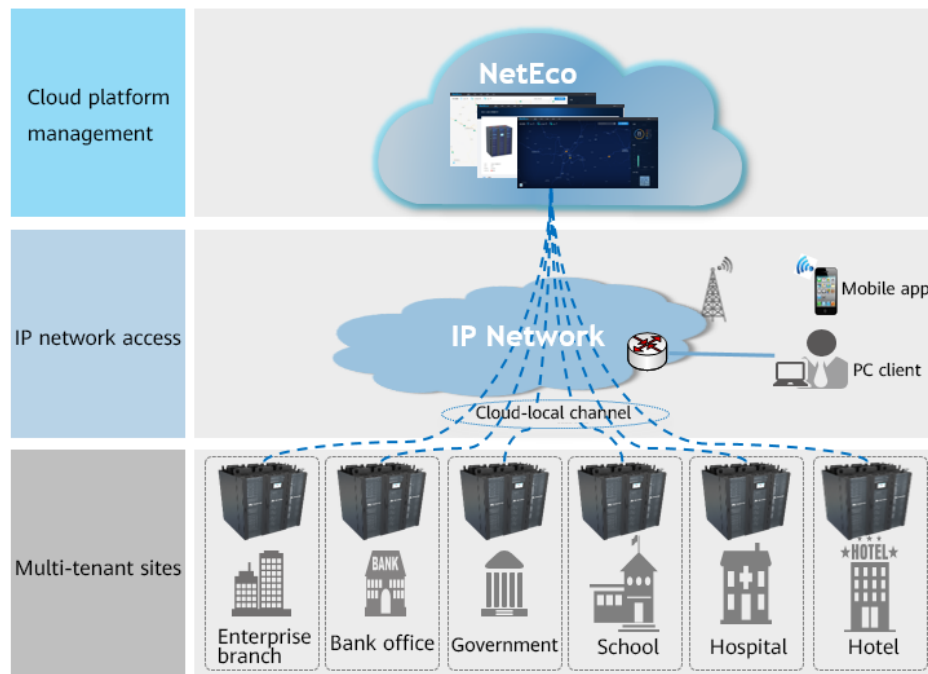
3.4.4.2 (Optional) Edge Data Center Management System

The edge data center management system monitors the running status of the entire network on the GIS home page. After an abnormal site is detected, you can double-click it to access the site monitoring page. Environment, energy consumption, key device, alarm, and security monitoring is provided on the site monitoring page.

- Environment monitoring: Monitors the temperature, humidity, water, and smoke.
- Energy consumption monitoring: Displays the PUE and load rate of sites in real time.
- Key device monitoring: Monitors the UPS, air conditioners, and related power distribution devices in real time, and displays the energy flow diagram and air conditioner link diagram.

- Alarm monitoring: Displays site alarm information in real time and quickly locates device faults.
- Security monitoring: Monitors the cabinet door status and cameras in sites.

Figure 3-37 Networking mode



3.5 Surge Protection and Grounding System

3.5.1 Surge Protection Solution

The Smart Module is mainly used for building equipment rooms. Its power distribution system is a subsystem of the building power distribution system. Class I surge protective devices (SPDs) of the power system are provided by the general low-voltage power distribution room or cabinet of the building.

3.5.2 Grounding Solution

Cabinet Potential Grounding

A general ground bar is installed in the cabinet. Ground terminals of the cabinet are connected to the ground bar using a ground cable with a minimum cross-sectional area of 16 mm².

NOTE

The AC input power is from the upstream power distribution system. The cross-sectional areas of ground cables are determined according to IEC 60364-5-54.

Cabinet Grounding

- Metal components and parts of cabinets are properly connected. A structural connection area is protected and applied with antioxidants. An area protected with painting should ensure proper metal surface contact for two connected components. The DC resistance is within 0.1 ohm between any two connected metal components. Use a ground cable to connect two metal components that cannot be directly connected, such as cabinets and cabinet doors. A cable for connecting these two metal components has a minimum cross-sectional area of 6 mm².
- A ground bar or general ground point is provided in the cabinet for equipment grounding. The ground bar does not need to be insulated.
- A ground terminal is greater than or equal to M8 in dimensions. A yellow ground label  is attached close to the general ground terminal for cabinets.
- Connect equipotential cables to metal components without carrying currents in the module, such as metal doors and windows. Each equipotential cable has a minimum cross-sectional area of 6 mm².

3.6 Fire Extinguishing System

The cabinet with a cooling module can be equipped with a built-in fire extinguishing module.

- If the fire extinguishing module is configured, it is used to put out the fire when a fire signal is detected.
- If the fire extinguishing module is not configured, the cabinet door is automatically opened when a smoke signal is detected in the cabinet. Then the fire extinguishing system of the building is used to put out the fire.

Figure 3-38 Fire extinguishing module



Table 3-55 Technical specifications

Item		Specifications
Storage pressure (at 20°C)		≤ 1.6 MPa
Operating environment	Operating temperature	0–50°C

Item		Specifications
	Storage temperature	–40°C to +70°C (excluding the glass bulb)
	Humidity	≤ 95% RH (non-condensing)
Startup mode		Glass ball: 68°C
		Pipe blasting: 90–110°C
Alarming mode		Dry contact signal feedback
Dimensions		≤ 1 U (height) x 700 mm (depth)

3.7 Cable Management

A cable tray is used inside a cabinet to route cables from the front to the rear.

Cable Tray

A cable tray is used for forward and backward cabling. It uses mounting ears to facilitate device installation.

Figure 3-39 Cable tray



Table 3-56 Cable tray technical specifications

Dimensions (H x W x D)	Weight	Space Occupied
43.6 mm x 482.6 mm x 250 mm	1.89 kg	1 U