

3 Installation Preparation

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3.1 Reading Carefully the Safety Precautions

Before you start the installation procedure, read all safety precautions described in this document and observe all warning labels affixed to the device. Doing so ensures your safety and protects the device from damage.

Safety precautions provided in this document may not cover every eventuality, so remain mindful of safety at all times.

Huawei is not liable for any consequence that results from violation of regulations pertaining to safe operations or safety codes pertaining to design, production, and equipment use.

Only trained and qualified personnel are allowed to install, operate, and maintain the device. Familiarize yourself with all safety precautions before performing any operation on the device.

General Safety

CAUTION

- Always take precautions against electrostatic discharge (ESD) whenever you handle a device. For example, wear ESD gloves or an ESD wrist strap. To avoid electric shock or burn, remove conductive objects like jewelry and watch.
 - Connect the ground cable first after installing the device into a cabinet or rack. Do not remove the ground cable unless all the other cables and modules have been removed from the device.
-

NOTICE

- During device transport and installation, prevent the device from colliding with objects like doors, walls, or shelves.
 - Move an unpacked device upright gently to avoid damages to the device. Do not lay down the unpacked device and drag it.
 - Do not touch uncoated metal surfaces of the device with wet or contaminated gloves.
 - Do not open the ESD bags of cards and modules until they are delivered to the equipment room. When taking a card out of the ESD bag, do not use the connector to support the card's weight because this operation will distort the connector and make the pins on the backplane connector bend.
-

Environmental Safety

DANGER

Do not place or operate the device in an environment with flammable or explosive gases or smoke.

NOTICE

- Keep the device away from sources of water or damp to prevent damages to circuits.
 - The installation site must be well ventilated to prevent the device from overheating.
-

Electrical Safety

 DANGER

- Direct contact with a high-voltage power source or indirect contact through damp objects can be fatal. Misoperations on high-voltage facilities may result in fire, electric shock, or other accidents.
 - Never install or remove the device or power cables while the power is on. The electric arc or spark generated between a power cable and conductor may cause fire or eye damage.
 - To protect personal and equipment safety, ground the device before powering it on.
-

Laser Safety

 CAUTION

- Laser beams will cause eye damage. Do not look into bores of optical modules or optical fibers without eye protection.
 - Cover fiber connectors with dust caps when they are not connected.
-

Mechanical Safety

 CAUTION

- Wear protective gloves when you are moving the device.
 - Use safe lifting practices when moving the equipment. Never attempt to lift objects that are too heavy for one person to handle. Instead, seek help or use appropriate tools.
 - Before installing the chassis into or removing it from a cabinet, ensure there are no objects that could fall from the cabinet and cause injury.
 - If MPUs, LPUs, SFUs, and power modules have been installed on the chassis, you are advised to remove them before moving the chassis to prevent them from falling off and causing injury.
 - Do not drill unapproved holes into a cabinet, as doing so may impair its electromagnetic shielding and damage cables inside. In addition, drilling holes produces metal shavings that may enter the cabinet and cause short circuits on printed circuit boards (PCBs).
-

Condensation Prevention

- Before installing the equipment, ensure that no condensation is on the equipment. Otherwise, the equipment may fail to be powered on.
- If the indoor and outdoor temperature difference is 15°C or more, wait eight hours after moving devices to the equipment and then install them.

- Generally, when the outdoor humidity is greater than 80% and the indoor and outdoor temperature difference is greater than 5°C, condensation forms. In highly humid weather, before installing a device or board, you are advised to remove the package inside an equipment room and check whether condensation forms as follows: Touch the surface of the device or board with dry fingers or ESD gloves to check whether water marks exist. If they do, condensation forms, and the device or board must be kept in the equipment room for 8 hours before being powered on.

 **NOTE**

If the temperature difference is undetermined, wait one night before installing the equipment.

3.2 Checking the Installation Site

The CloudEngine 16800 must be used indoors. To ensure normal operations and long service life of the device, the installation site must meet the following requirements described in [Table 3-1](#).

Table 3-1 Requirements for the installation site

Item	Requirement
Cleanliness	The device must be installed in a clean, dry, and well ventilated standard equipment room with controllable temperature. The equipment room must be free from leaking or dripping water, heavy dew, and damp.
Dust proofing	Dustproof measures must be taken in the site. Dust will cause electrostatic discharges on the chassis and affect connections of metal connectors and joints. This shortens service life of the device and may cause failures of the device.
Temperature and humidity	The temperature and humidity in the installation site must be within specifications. For the operating temperature and relative humidity ranges required by the device, see Hardware Description . If the relative humidity exceeds 70%, using dehumidifiers or dehumidifying air conditioners is recommended.
Corrosive gases avoidance	The installation site must be free from acidic, alkaline, or corrosive gases.
Heat dissipation space	There must be sufficient space around the device for heat dissipation: <ul style="list-style-type: none">• Leave at least 1000 mm of clearance for heat dissipation at the front and rear of the device.• Leave at least 1U (1U = 44.45 mm) of clearance above the device.

Item	Requirement
Maintenance space	Leave at least 1200 mm of clearance at the front and rear of the device.
Load bearing capacity of the equipment room	<p>Evaluate whether the load bearing capacity of the floor in the equipment room meets the deployment requirements based on the model and number of devices to be housed in each cabinet. If it is uncertain whether the load bearing capacity of the floor in the equipment room meets the device installation requirements, you are advised to contact a local professional architecture design institute for further evaluation and hardening solution formulation.</p> <ul style="list-style-type: none"> When one device is installed in each cabinet, the minimum load bearing capacity of the equipment room is 200 kg/m² (CloudEngine 16804), 450 kg/m² (CloudEngine 16816), and 300 kg/m² (CloudEngine 16808). When multiple devices are installed in each cabinet, the minimum load bearing capacity of the equipment room is 450 kg/m² (CloudEngine 16804) and 450 kg/m² (CloudEngine 16808).

3.3 Checking the Cabinet or Rack

A standard 19-inch four-post cabinet or rack is recommended for the CloudEngine 16800. To support the device in the cabinet or rack, you can use Huawei expandable guide rails (expandable between 500 mm and 850 mm) or separately purchased guide rails or tray with sufficient load bearing capacity. [Table 3-2](#) describes the requirements for the cabinet or rack.

Table 3-2 Requirements for the cabinet or rack

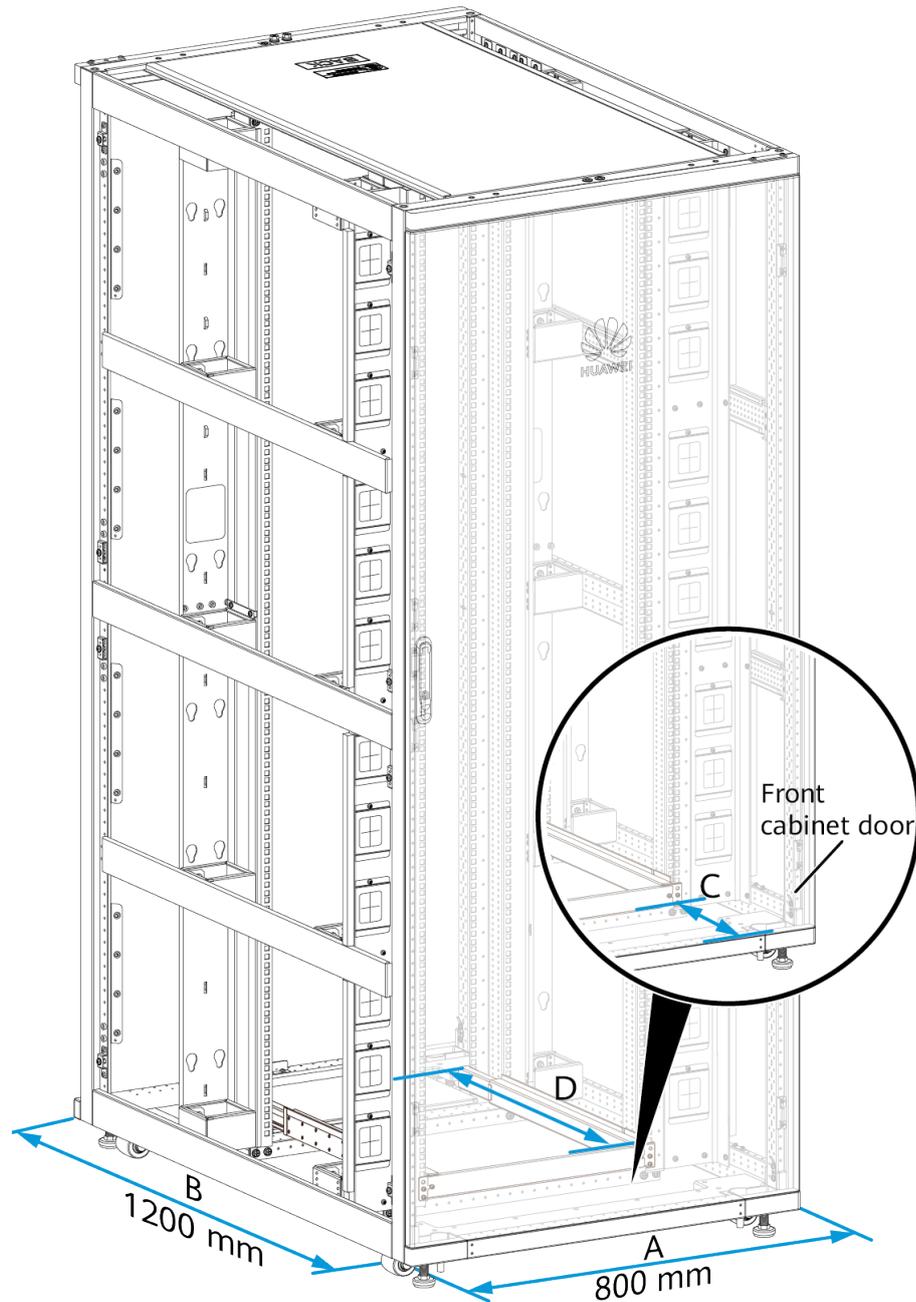
Item	Requirement
Width	For the CloudEngine 16800, a cabinet or rack with a width of 800 mm (distance A in Figure 3-1) is recommended.
Depth	<ul style="list-style-type: none"> When the CloudEngine 16804 and CloudEngine 16808 are installed, the depth of the cabinet or rack must be at least 1000 mm (distance B in Figure 3-1), and a cabinet or rack with a depth of at least 1200 mm is recommended. When a 1000 mm deep cabinet or rack is used, the front and rear doors must be single-swing doors. When the CloudEngine 16816 is installed, the depth of the cabinet or rack must be at least 1200 mm (distance B in Figure 3-1), and a cabinet or rack with a depth of 1200 mm is recommended.

Item	Requirement
Vertical space	<p>To facilitate power cable routing, the cabinet or rack must have sufficient vertical space for device installation. The vertical space requirements specific to different chassis are as follows:</p> <ul style="list-style-type: none"> • CloudEngine 16804 DC chassis: ≥ 13U • CloudEngine 16804 AC & high-voltage DC chassis: ≥ 12U • CloudEngine 16808 DC chassis: ≥ 20U • CloudEngine 16808 AC & high-voltage DC chassis: ≥ 18U • CloudEngine 16816 DC chassis: ≥ 37U • CloudEngine 16816 AC & high-voltage DC chassis: ≥ 35U <p>NOTE The height of the cabinet or rack is the sum of the chassis height, guide rails, and cabling space.</p>
Load bearing capacity	<p>Select a cabinet based on the number of devices to be installed and the load bearing capacity of the cabinet. When each cabinet accommodates only one device, the minimum load bearing capacity required for each cabinet is 246 kg for CloudEngine 16804, 859 kg for CloudEngine 16816, and 383 kg for CloudEngine 16808. To facilitate device movement and installation, each CloudEngine 16800 can be delivered with an optional flat cart and each CloudEngine 16816 is delivered with a flat cart.</p> <p>NOTICE If the cabinet or rack has a post inside, the guide rails delivered with the CloudEngine 16800 cannot be installed in the cabinet or rack. In this situation, use a tray that has sufficient load bearing capacity instead.</p>
Grounding	<p>The cabinet or rack must have reliable ground points for grounding the device.</p>
Air filter	<ul style="list-style-type: none"> • If a rack or a cabinet without doors is used, you need to configure chassis doors. • If a cabinet with a front door is used, the front door must be equipped with air filters. If the front door is not equipped with air filters, you need to configure Huawei air filter suites. For details, refer to <i>Air Filter Installation Instructions</i>. <p>CAUTION The front door of the cabinet must be equipped with an air filter, but the rear door of the cabinet cannot be equipped with any air filter. (If an air filter is installed on the rear door, uninstall it.)</p>

Item	Requirement
Distance between front and rear mounting rails	CloudEngine 16804 and CloudEngine 16808: If such a device is installed in a 1000 mm deep cabinet or rack, the distance (distance C in Figure 3-1) between the front mounting rail and the outer side of the front door is 150 mm, and the distance between the rear mounting rail and the outer side of the rear door is between 200 mm and 250 mm. If such a device is installed in a 1200 mm deep cabinet or rack, the distance (distance C in Figure 3-1) between the front mounting rail and the outer side of the front door is between 165 mm and 175 mm, and the distance between the rear mounting rail and the outer side of the rear door is between 200 mm and 300 mm.
Heat dissipation	The cabinet must meet the requirements for front-to-back airflow, and the front and rear doors must have a porosity rate of more than 55%.
Filler panel	For the CloudEngine 16804 and CloudEngine 16808, 1U and 2U filler panels are required. Part numbers of 1U and 2U filler panels are 21141166 and 21141167, respectively. Filler panels must be installed in vacant slots of a cabinet to isolate airflows; otherwise, heat dissipation of devices will be less effective. Huawei cabinets must be equipped with filler panels. If another vendor's cabinet with no filler panels is used, filler panels must also be prepared. Filler panels of Huawei cabinets are recommended.

Item	Requirement
Other requirements	<ul style="list-style-type: none">● If a vertical PDU is installed in a cabinet, the sockets need to be staggered with the chassis to prevent cables and sockets from affecting the installation and removal of fan modules and SFUs.● The PDUs in the cabinet must provide enough 16 A standard or C19 straight female power sockets. Specifically, power cables dedicated to Huawei PDUs will be delivered together with the PDUs. Huawei delivers power cables with matching connectors according to the type of the power sockets.● If AC power cables provided by Huawei are used, the cabling distance between the PDU and the device must be within 3000 mm and the cabling distance between each AC socket and the device must be within 2500 mm.● If necessary, use an earthquake-proof cabinet complying with GR63 Zone4 or Zone3 standard.● The cabinet must be installed (placed or fixed using expansion bolts) on a concrete or ESD floor.● If a third-party cabinet is used, you are advised to use the guide rails delivered with the device. If you want to use the tray delivered with the third-party cabinet, make sure the following requirements are met:<ol style="list-style-type: none">1. The front edge of the cabinet tray does not protrude from the front surface of the chassis or exceed the front mounting rail.2. The rear edge of the cabinet tray is at least 100 mm shorter than that of the chassis. 1U space (including the cabinet tray height) is reserved below the device to install a tool box for storing SFU wrenches.3. For details about the load-bearing capacity of the cabinet tray, see "Load bearing capacity".

Figure 3-1 Perspective view of a cabinet or rack



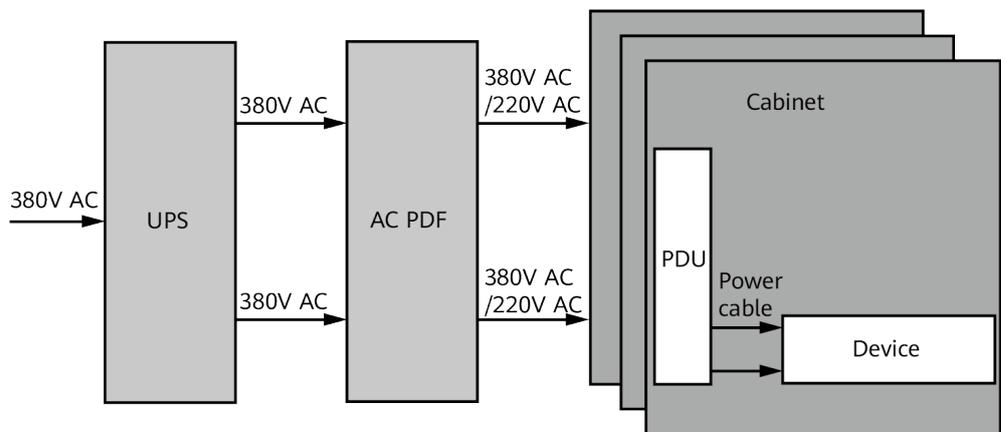
3.4 Checking the Power Distribution System

3.4.1 Introduction to the Power Distribution System

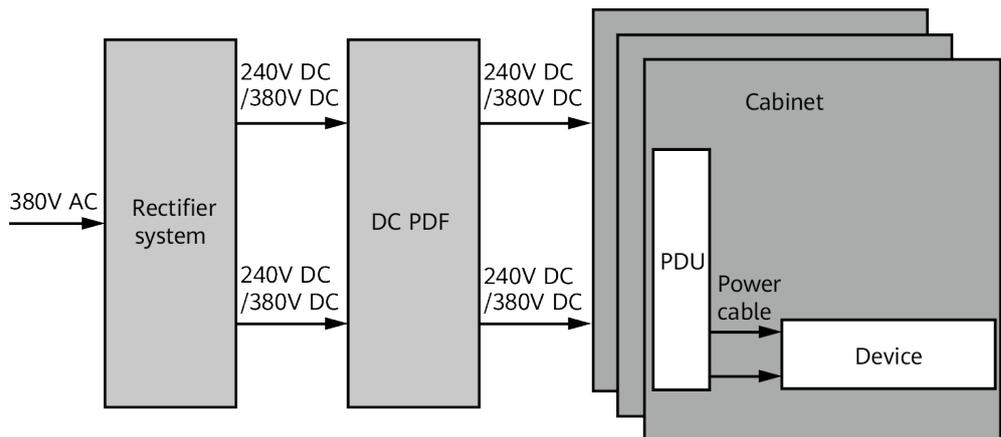
The CloudEngine 16800 supports AC, high-voltage DC (240 V DC/380 V DC), and DC power supply modes.

- AC power supply mode: Generally, an uninterruptible power supply (UPS) obtains three-phase 380 V AC power input from a mains power outlet and

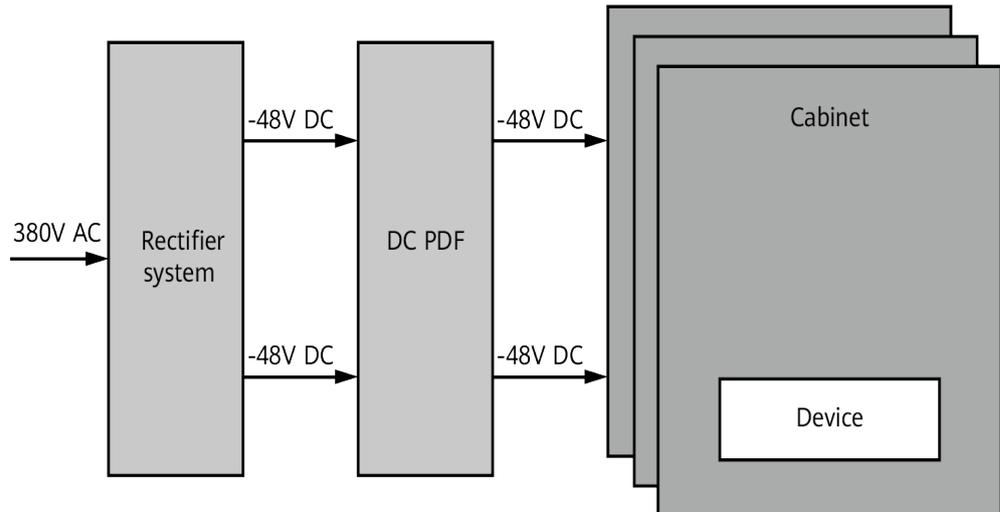
transmits 380 V AC power to an AC power distribution frame. A CloudEngine 16800 chassis receives power from the AC power distribution frame through the power distribution unit (PDU) installed in the cabinet.



- High-voltage DC (240 V DC/380 V DC) power supply mode: Generally, a rectifier system obtains three-phase 380 V AC power input from a mains power outlet and transmits 240 V DC/380 V DC power to a DC power distribution frame. A CloudEngine 16800 chassis receives power from the DC power distribution frame through the PDU installed in the cabinet.



- DC power supply mode: Generally, a rectifier system obtains three-phase 380 V AC power input from a mains power outlet and transmits -48 V DC power to a DC power distribution frame. The CloudEngine 16800 obtains power from the DC power distribution frame.



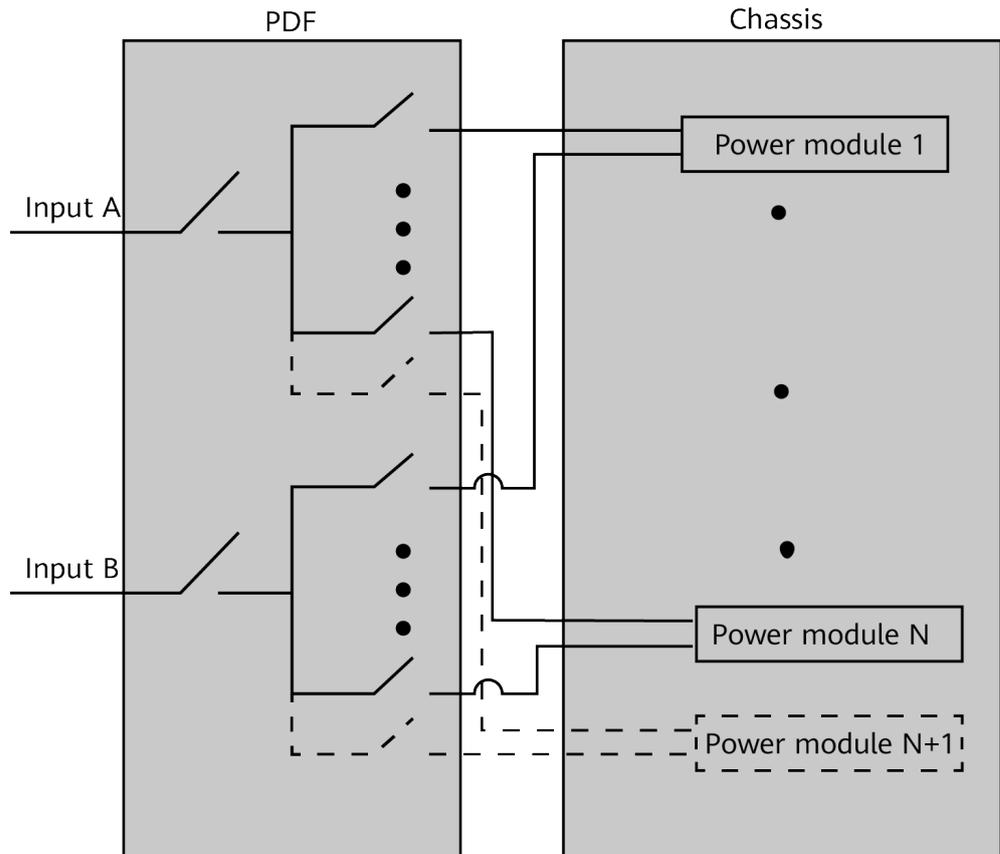
Power modules of the CloudEngine 16800 support N+1 redundancy configuration and N+0 configuration. Different configuration modes provide different reliability levels.

As data center core switches, CloudEngine 16800 series devices carry important services. Therefore, the N+1 mode is recommended to ensure high power reliability. This document provides power distribution instructions based on dual-system N+1 configuration of power modules.

The following compares the power reliability of different power module redundancy modes used on the CloudEngine 16800:

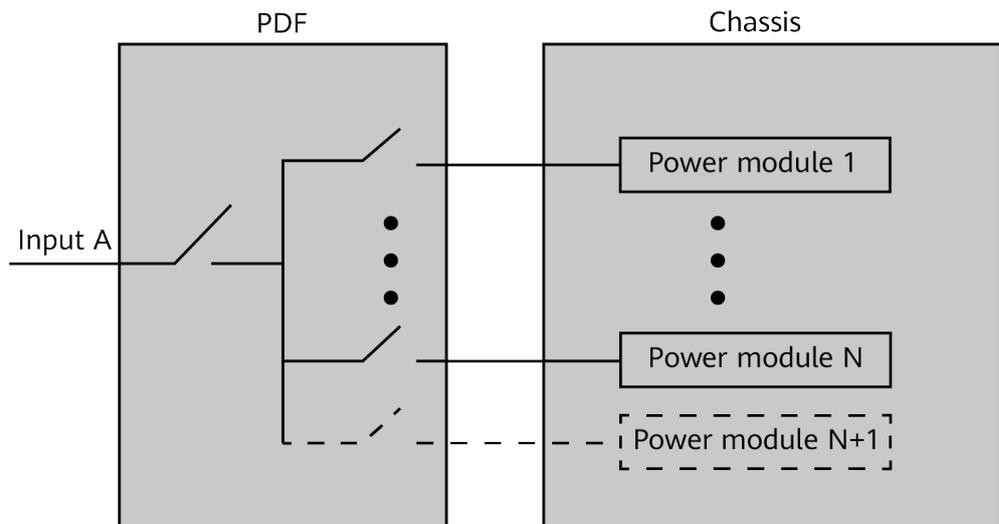
- Input redundancy and N+1 power module redundancy (shown in [Figure 3-2](#))
 - N power modules provide power for the device, and one power module works as a backup to provide power redundancy.
 - The two power inputs of the device are isolated and back up each other.
 - If any power module of the device fails, the device can still work normally.
 - The fault of any power supply system of input A or B does not affect the normal operation of the device.

Figure 3-2 Input redundancy and N+1 power module redundancy



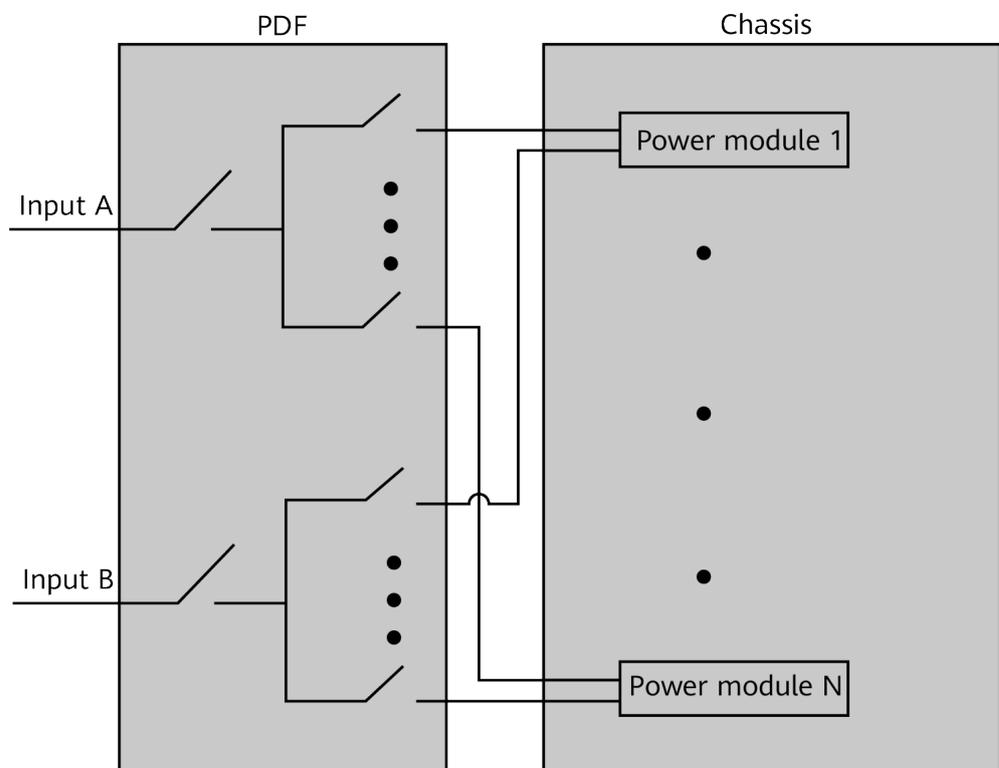
- N+1 redundancy (shown in [Figure 3-3](#))
 - N power modules provide power for the device, and one power module works as a backup to provide power redundancy.
 - The device is powered by one power input (no input redundancy).
 - If any power module of the device fails, the device can still work normally.
 - Any single-point failure in the power supply system (including a power supply failure caused by a faulty power module) will cause the device unable to work normally.

Figure 3-3 N+1 power module redundancy



- N+0 no redundancy (shown in [Figure 3-4](#))
 - All the N power modules provide power for the device.
 - The two power inputs of the device are isolated and back up each other.
 - If any power module of the device fails, the device cannot work normally.
 - The fault of any power supply system of input A or B does not affect the normal operation of the device.

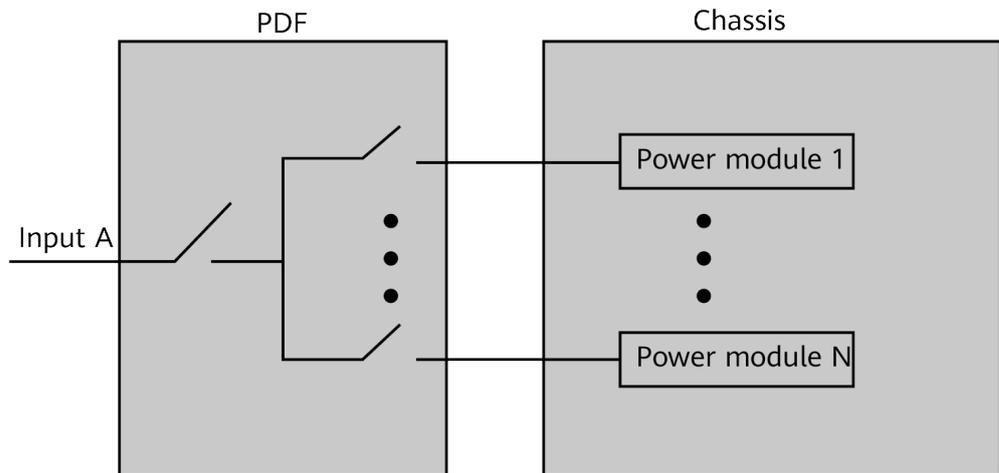
Figure 3-4 N+0 no redundancy



- N+0 no redundancy (shown in [Figure 3-5](#))
 - All the N power modules provide power for the device.

- The device is powered by one power input (no input redundancy).
- If any power module of the device fails, the device cannot work normally.
- Any single-point failure in the power supply system (including a power supply failure caused by a faulty power module) will cause the device unable to work normally.

Figure 3-5 N+0 no redundancy



3.4.2 CloudEngine 16804 Power Distribution Guide

3.4.2.1 Connecting the CloudEngine 16804 to a PDF Directly (AC)

Power Distribution Requirements

NOTE

- The power distribution frame (PDF) uses the 1+1 redundancy mode.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.

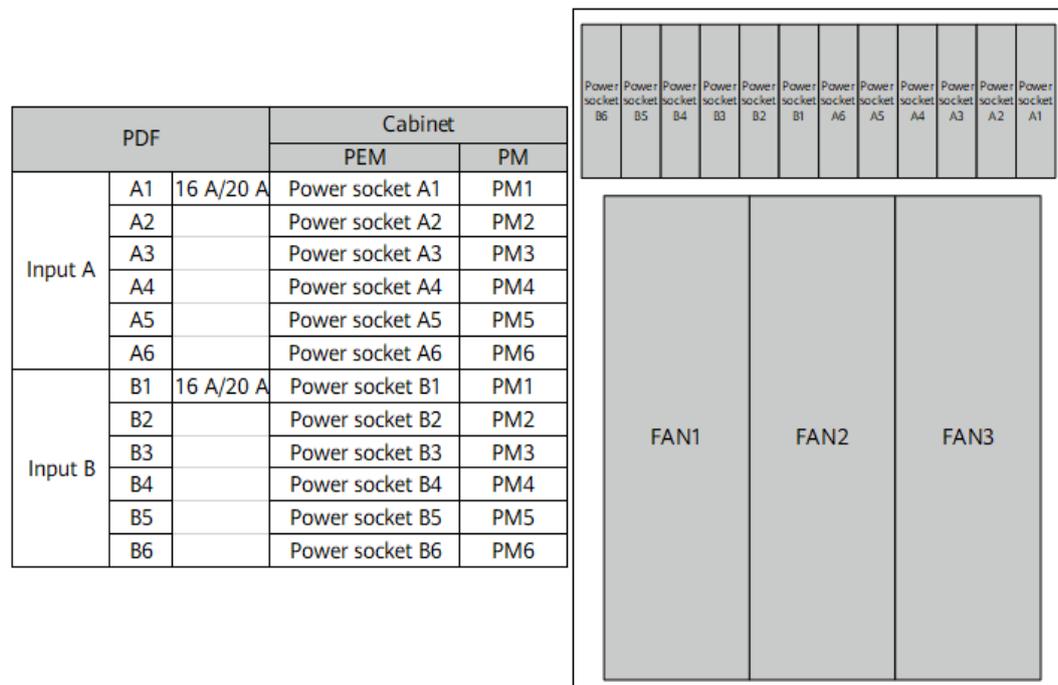
Table 3-3 Power distribution requirements (CloudEngine 16804 chassis)

Cabling Distance from the PDF to the Device's PEM	≤ 2.5 m (Determine this distance according to site survey results.)
Number of Power Inputs	6+6 input redundancy (outputs from the PDF)

Rated Current of Connected Circuit Breakers	<ul style="list-style-type: none"> • ≥ 16 A: The phase voltage is greater than or equal to 200 V AC, for example, the circuit breaker is connected to the uninterruptible power supply (UPS). • ≥ 20 A: The phase voltage is greater than or equal to 170 V AC, for example, the circuit breaker is connected to a public mains power outlet. <p>NOTE Circuit breakers with rated current of 16 A or 20 A are recommended for the PEM's power sockets A1 to A6 and B1 to B6.</p>
Output Terminal Type in the PDF	Power sockets complying with local standards

Power Distribution Schemes

Figure 3-6 CloudEngine 16804 chassis directly connected to the PDF



3.4.2.2 Connecting the CloudEngine 16804 to a PDF Directly (DC)

Power Distribution Requirements

NOTE

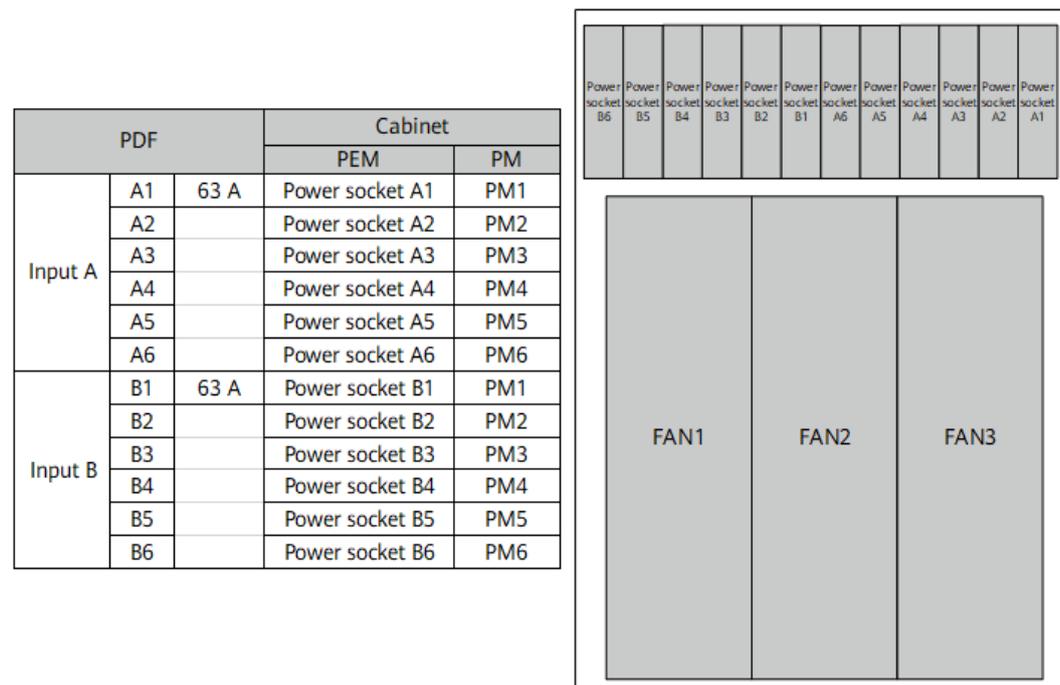
- The PDF uses power modules in 1+1 redundancy mode.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.

Table 3-4 Power distribution requirements (CloudEngine 16804 chassis)

Cabling Distance from the PDF to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	6+6 input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	≥ 63 A NOTE Circuit breakers with rated current of 63 A are recommended for the PEM's terminal blocks A1 to A6 and B1 to B6.
Output Terminal Type in the PDF	Naked Crimping Connector, JG2, 25mm ² /35mm ² , M6, 80A, Tin Plating, Right angle (cables are made onsite)

Power Distribution Schemes

Figure 3-7 CloudEngine 16804 chassis directly connected to the PDF



3.4.2.3 Connecting the CloudEngine 16804 to a PDF Directly (High-Voltage DC)

Power Distribution Requirements

 NOTE

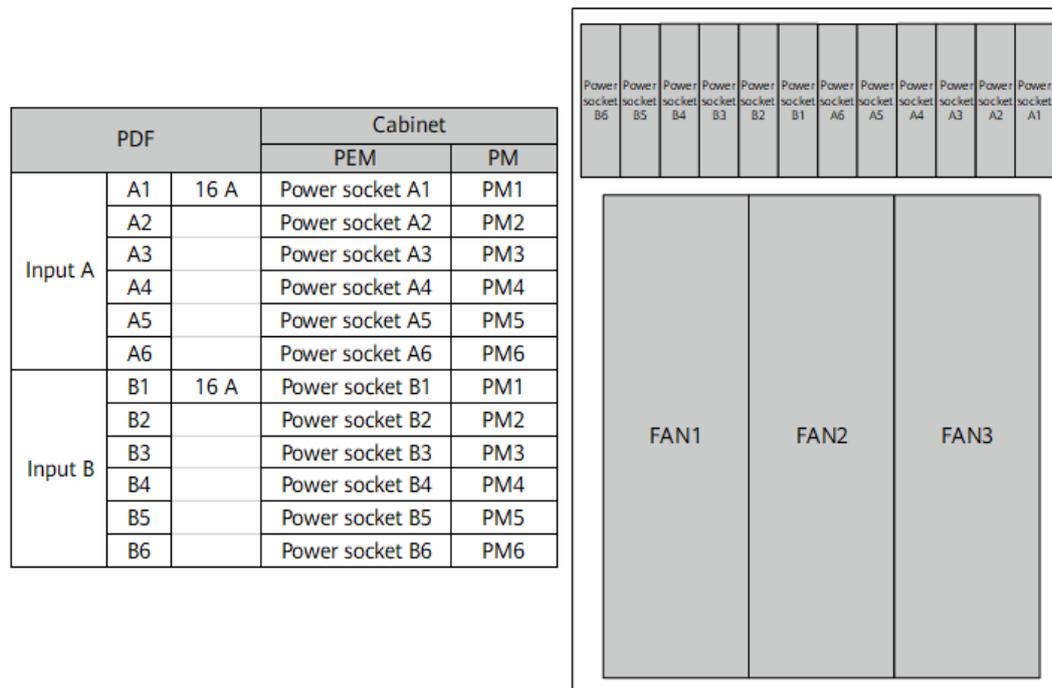
- The PDF uses power modules in 1+1 redundancy mode.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.

Table 3-5 Power distribution requirements (CloudEngine 16804 chassis)

Cabling Distance from the PDF to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	6+6 input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	≥ 16 A NOTE A circuit breaker with rated current 16 A is recommended for each channel of output A1 to A6 and B1 to B6.
Output Terminal Type in the PDF	Power sockets complying with local standards

Power Distribution Schemes

Figure 3-8 CloudEngine 16804 chassis directly connected to the PDF

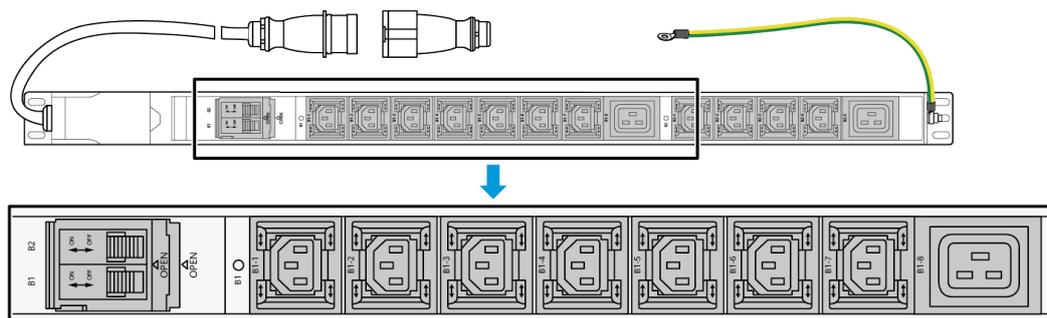


3.4.2.4 Connecting the CloudEngine 16804 to a PDF Through a Single-Phase PDU

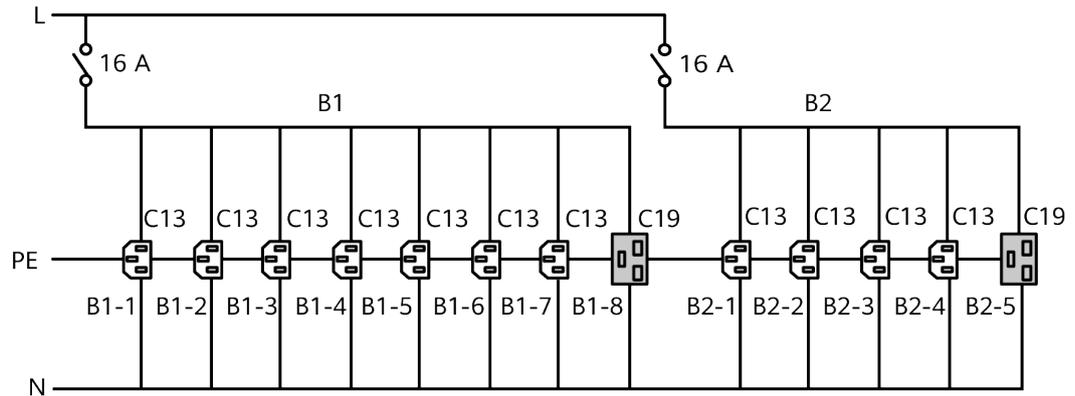
PDU Overview

Figure 3-9 shows the appearance of a 220 V single-phase PDU.

Figure 3-9 220 V single-phase PDU



A 220 V single-phase PDU supports single-phase 220 V to 240 V AC power input and provides two groups of power outputs B1 and B2. Group B1 includes seven C13 sockets and one C19 socket. Group B2 includes four C13 sockets and one C19 socket. Each group is controlled by a 16 A circuit breaker. When the groups are connected to a chassis, the total current of all sockets in each group cannot exceed 16 A.



Power Distribution Requirements

NOTE

- The PDF uses the 1+1 redundancy mode and three-phase 32 A or 40 A.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.
- A maximum of eight PDUs can be installed in a Huawei A812-20 cabinet. When the 220 V single-phase PDUs are used, a maximum of eight power modules can be configured in a single cabinet or rack.

Table 3-6 Power distribution requirements (CloudEngine 16804 chassis)

Cabling Distance from the PDU to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	3+3 single-phase 32 A/40 A input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	<ul style="list-style-type: none"> • ≥ 32 A: The phase voltage is greater than or equal to 200 V AC, for example, the circuit breaker is connected to the UPS. • ≥ 40 A: The phase voltage is greater than or equal to 170 V AC, for example, the circuit breaker is connected to a mains power outlet. <p>NOTE The rated current of 32 A or 40 A is the recommended specification for circuit breakers A1 to A3 and B1 to B3.</p>
Output Terminal Type in the PDU	IEC 309 industrial connectors

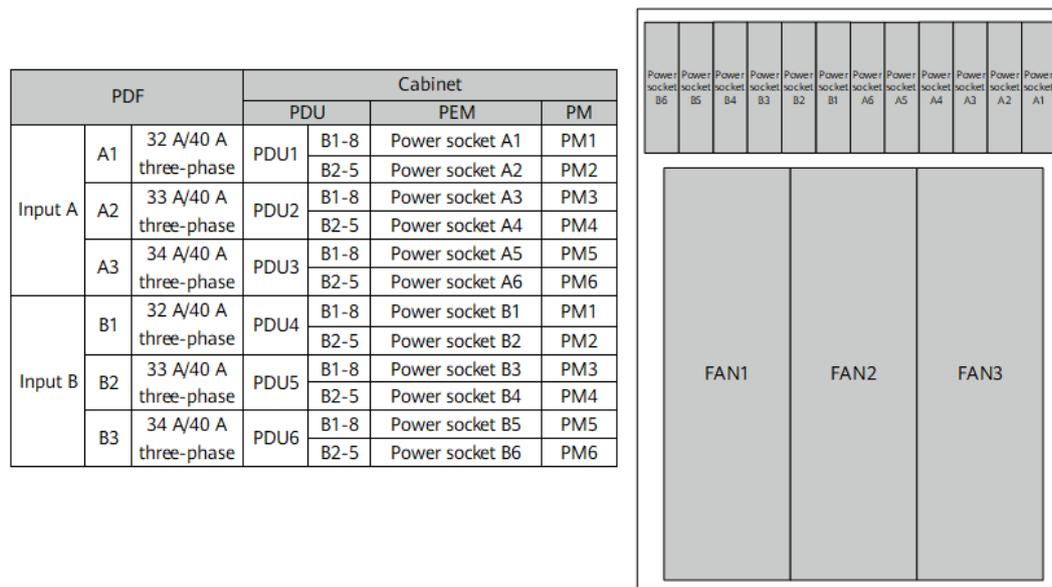
Power Distribution Schemes

When one CloudEngine 16804 is installed in the cabinet/rack, six power modules (full configuration) are configured for the device. In this case, six single-phase PDUs are required.

NOTE

When the CloudEngine 16804 is configured with more than eight power modules, a 220 V single-phase PDU cannot be used.

Figure 3-10 CloudEngine 16804 chassis connected to a PDF through a single-phase PDU

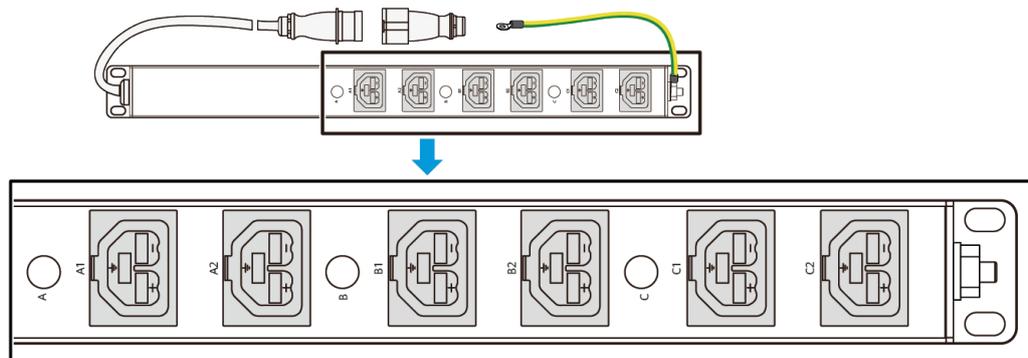


3.4.2.5 Connecting the CloudEngine 16804 to a PDF Through a Three-Phase AC PDU (PDU2000-32-3PH-6-B1)

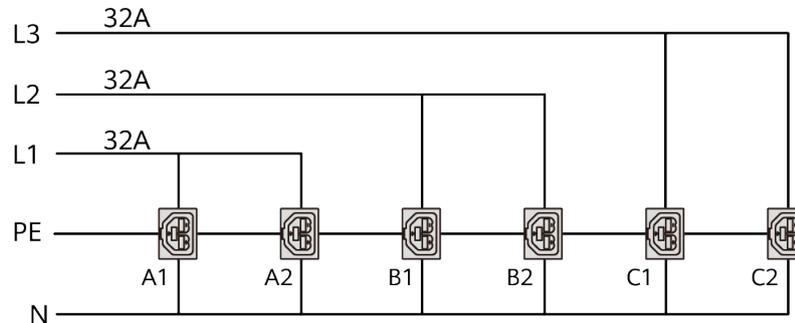
PDU Overview

Figure 3-11 shows the appearance of a 380 V three-phase PDU.

Figure 3-11 380 V three-phase PDU



A 380 V three-phase PDU supports three-phase (L1, L2, and L3) 346 V to 415 V AC power input, and provides three groups of outputs on each phase line, namely, A, B, and C. Groups A, B, and C each control two HVDC-3Z-03 sockets. When the groups are connected to a chassis, the total current of all sockets in each group cannot exceed 32 A.



Power Distribution Requirements

NOTE

- The PDF uses the 1+1 redundancy mode and three-phase 32 A or 40 A.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.
- A maximum of eight PDUs can be installed in a Huawei A812-20 cabinet. When 380 V three-phase PDUs are used, a maximum of 24 power modules can be configured in a single cabinet or rack.

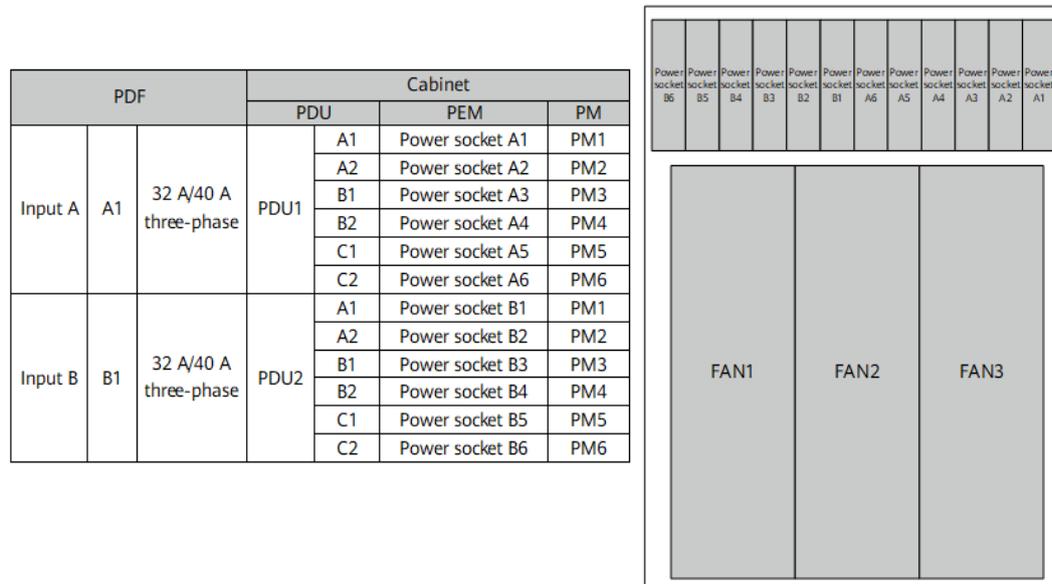
Table 3-7 Power distribution requirements (CloudEngine 16804 chassis)

Cabling Distance from the PDU to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	1+1 three-phase 32 A/40 A input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	<ul style="list-style-type: none"> • ≥ 32 A: The phase voltage is greater than or equal to 200 V AC, for example, the circuit breaker is connected to the UPS. • ≥ 40 A: The phase voltage is greater than or equal to 170 V AC, for example, the circuit breaker is connected to a mains power outlet. <p>NOTE The rated current of 32 A or 40 A is the recommended specifications for circuit breakers of the three-phase outputs A1 and B1.</p>
Output Terminal Type in the PDU	HVDC-3Z-03 socket

Power Distribution Schemes

The CloudEngine 16804 is installed in the cabinet/rack. The device can house up to six power modules. Under full configuration of the six power modules, two three-phase PDUs are required.

Figure 3-12 CloudEngine 16804 chassis connected to a PDF through a three-phase PDU

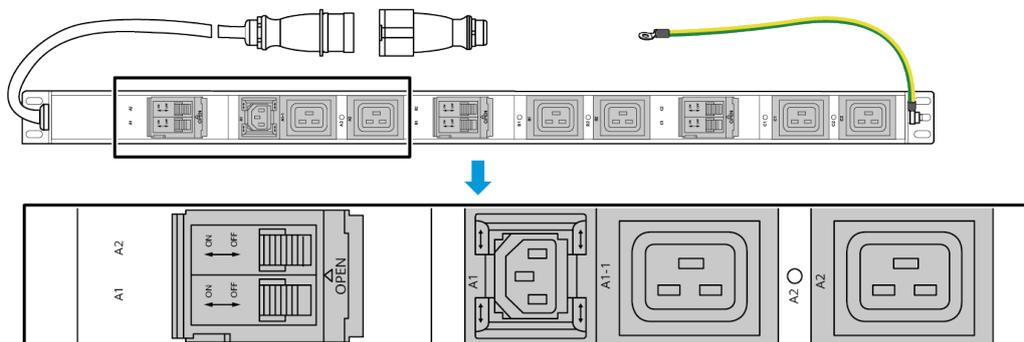


3.4.2.6 Connecting a CloudEngine 16804 to a PDF Through a Three-Phase PDU (PDU2000-32-3PH-1)

PDU Overview

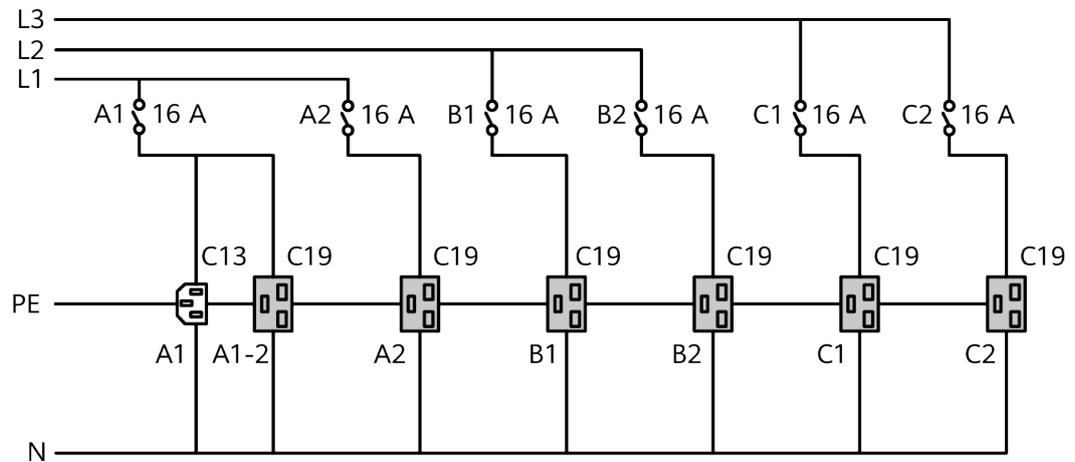
Figure 3-13 shows the appearance of a 380 V three-phase PDU.

Figure 3-13 380 V three-phase PDU



A 380 V three-phase PDU supports three-phase (L1, L2, and L3) 380 V to 415 V AC input, and provides two groups of outputs on each phase line. L1 provides outputs A1 and A2; L2 provides outputs B1 and B2; L3 provides outputs C1 and C2. A1 controls two C13 sockets and one C19 socket. A2, B1, B2, C1, and C2 control one C19 socket. Each group is controlled by a 16 A circuit breaker. When the groups

are connected to a chassis, the total current of all sockets in each group cannot exceed 16 A.



Power Distribution Requirements

NOTE

- The PDF uses the 1+1 redundancy mode and three-phase 32 A or 40 A.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.
- A maximum of eight PDUs can be installed in a Huawei A812-20 cabinet. When 380 V three-phase PDUs are used, a maximum of 24 power modules can be configured in a single cabinet or rack.

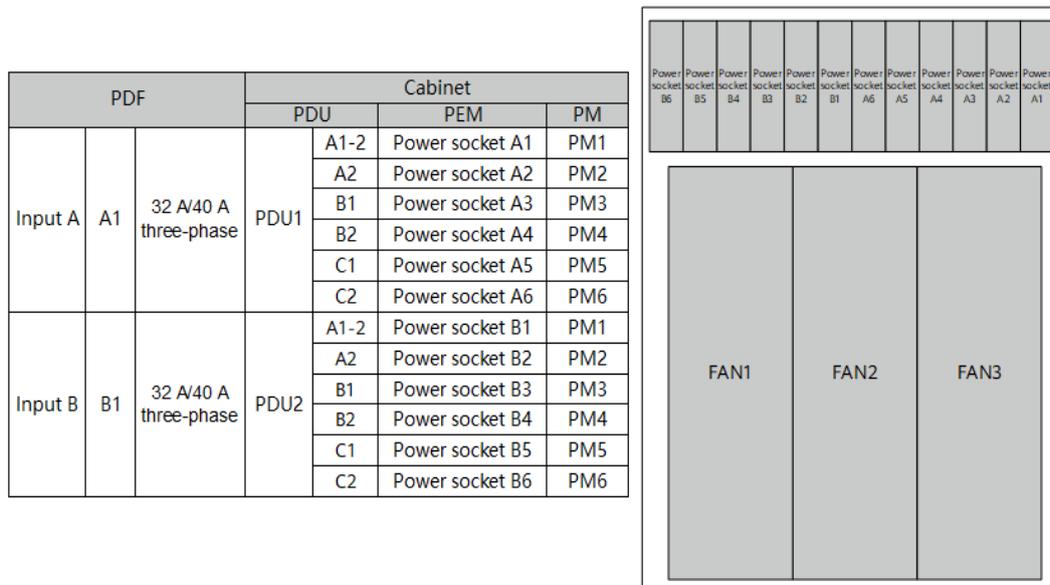
Table 3-8 Power distribution requirements (CloudEngine 16804 chassis)

Cabling Distance from the PDU to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	1+1 three-phase 32 A/40 A input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	<ul style="list-style-type: none"> • ≥ 32 A: The phase voltage is greater than or equal to 200 V AC, for example, the circuit breaker is connected to the UPS. • ≥ 40 A: The phase voltage is greater than or equal to 170 V AC, for example, the circuit breaker is connected to a mains power outlet. <p>NOTE The rated current of 32 A or 40 A is the recommended specification for circuit breakers A1 and B1.</p>
Output Terminal Type in the PDU	IEC 309 industrial connectors

Power Distribution Schemes

A CloudEngine 16804 is installed in the cabinet/rack. The device can house up to six power modules. Under full configuration of the six power modules, two three-phase PDUs are required.

Figure 3-14 CloudEngine 16804 chassis connected to a PDF through a three-phase PDU

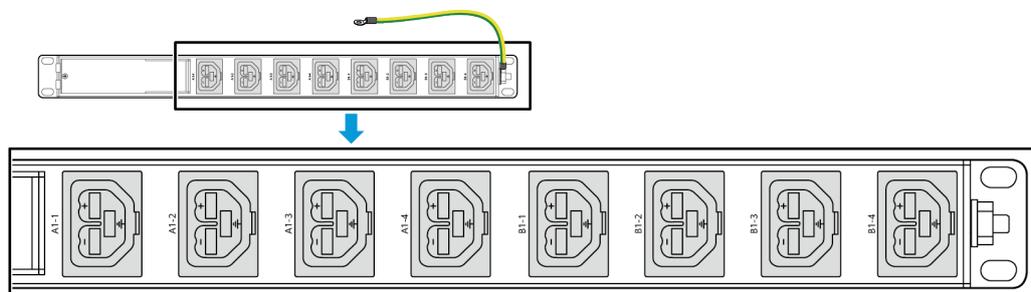


3.4.2.7 Connecting the CloudEngine 16804 to a PDF Through a High-Voltage DC PDU (PDU2000-63-380VDC-8-B1)

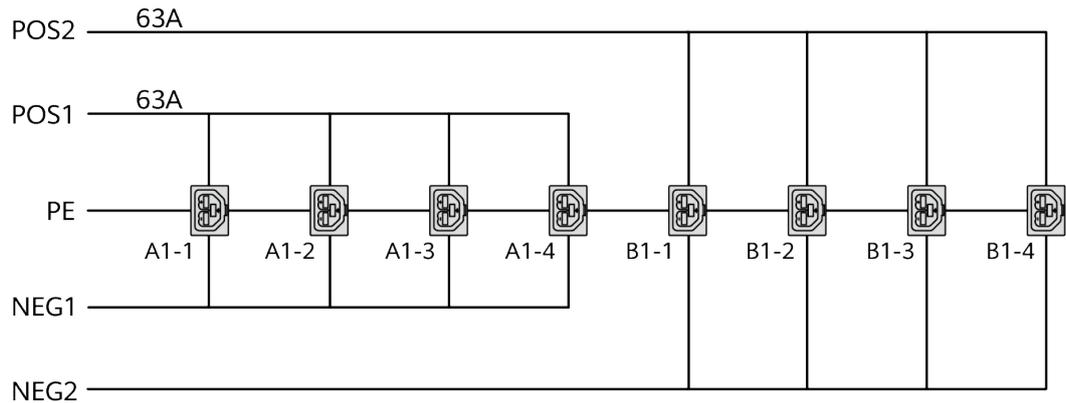
PDU Overview

A 380 V high-voltage DC PDU is used to supply power to a device through a 240 V or 380 V high-voltage DC power distribution system. [Figure 3-15](#) shows the appearance of a 380 V high-voltage DC PDU.

Figure 3-15 380 V high-voltage DC PDU



A 380 V high-voltage DC PDU supports 240 V/380V DC power input and provides two output groups A1 and B1. Each group controls four HVDC-3Z-03 sockets. When the groups are connected to a chassis, the total current of all sockets in each group cannot exceed 63 A.



Power Distribution Requirements

NOTE

- The PDF uses power modules in 1+1 redundancy mode.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.
- A maximum of eight PDUs can be installed in a Huawei A812-20 cabinet. When the 380 V high-voltage DC PDUs are used, a maximum of 24 power modules can be configured in a single cabinet or rack.

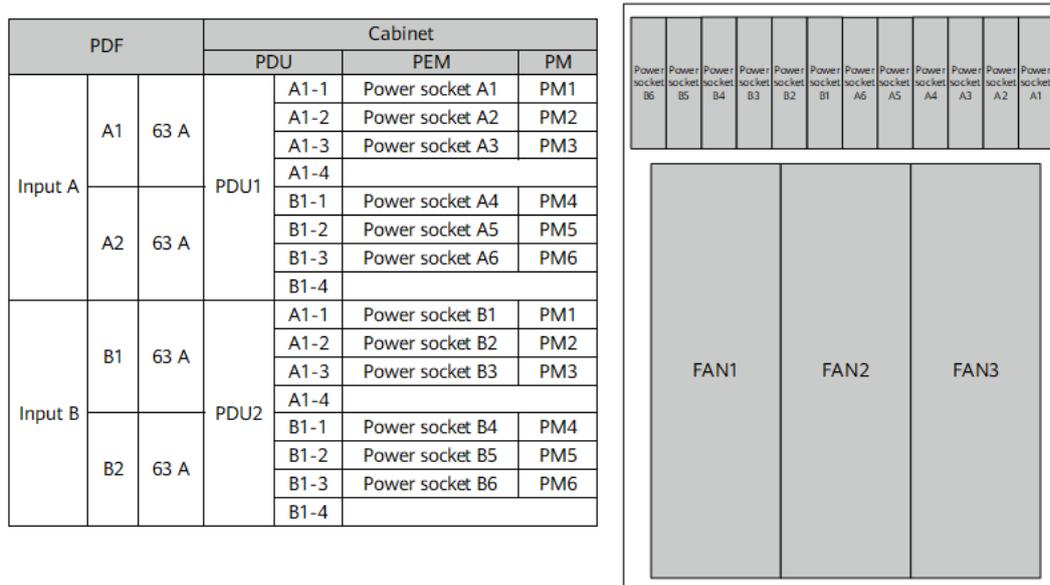
Table 3-9 Power distribution requirements (CloudEngine 16804 chassis)

Cabling Distance from the PDU to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	2+2 input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	$\geq 63 \text{ A}$ NOTE The rated current of 63 A is the recommended specification for circuit breakers A1 and B1.
Output Terminal Type in the PDU	HVDC-3Z-03 socket

Power Distribution Schemes

A CloudEngine 16804 is installed in the cabinet/rack. The device can house up to six power modules. Under full configuration of the six power modules, two 380 V high-voltage DC PDUs are required, and the output terminals of the PDUs are partially used.

Figure 3-16 CloudEngine 16804 chassis connected to the PDF through a 380 V high-voltage DC PDU

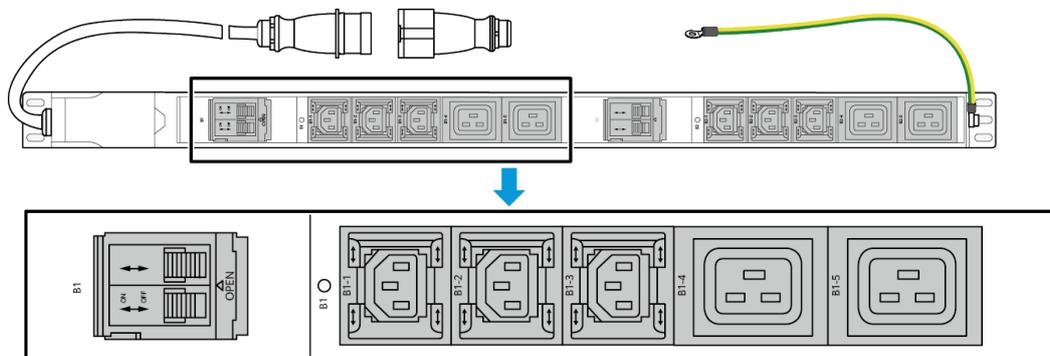


3.4.2.8 Connecting the CloudEngine 16804 to a PDF Through a 240 V DC PDU

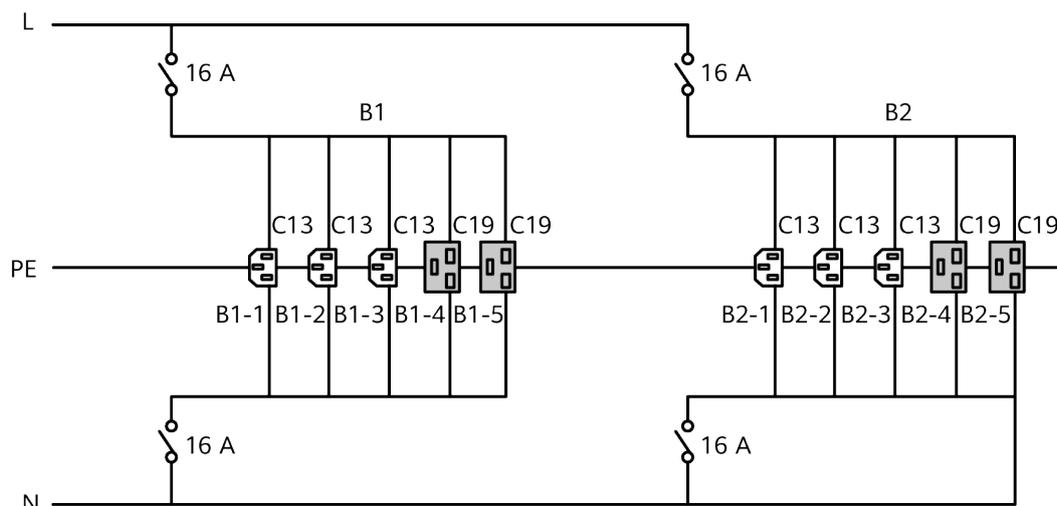
PDU Overview

A 240 V DC PDU is used to supply power to a device through a high-voltage DC power distribution system. [Figure 3-17](#) shows the appearance of a 240 V DC PDU.

Figure 3-17 240 V high-voltage DC PDU



A 240 V DC PDU provides two output groups B1 and B2. Each group includes three C13 sockets and two C19 sockets. Each group is controlled by a 16 A circuit breaker on the L line and a 16 A circuit breaker on the N line. The circuit breakers for the same group are closed or open at the same time. When the groups are connected to a chassis, the total current of all sockets in each group cannot exceed 16 A.



Power Distribution Requirements

NOTE

- The PDF uses power modules in 1+1 redundancy mode.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.
- A maximum of eight PDUs can be installed in a Huawei A812-20 cabinet. When the 240 V DC PDUs are used, a maximum of eight power modules can be configured in a single cabinet or rack.

Table 3-10 Power distribution requirements (CloudEngine 16804 chassis)

Cabling Distance from the PDU to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	3+3 input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	≥ 32 A NOTE The rated current of 32 A is the recommended specification for circuit breakers A1 to A3 and B1 to B3.
Output Terminal Type in the PDU	IEC 309 industrial connectors

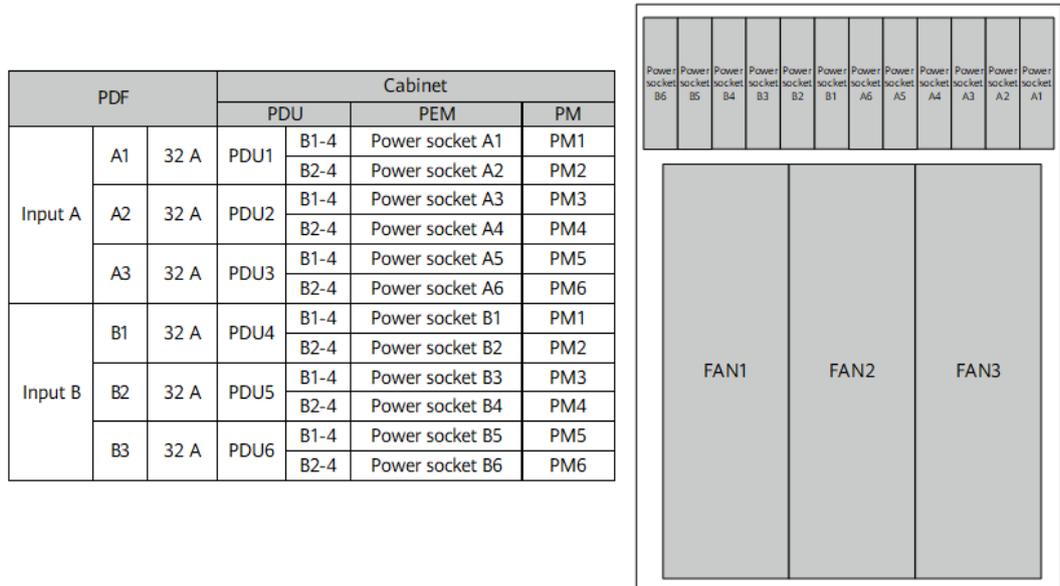
Power Distribution Schemes

When one CloudEngine 16804 is installed in the cabinet/rack, six power modules (full configuration) are configured for the device. In this case, six 240 V DC PDUs are required.

NOTE

When the CloudEngine 16804 is configured with more than eight power modules, the 240 V DC PDU cannot be used.

Figure 3-18 CloudEngine 16804 chassis connected to the PDF through a 240 V DC PDU



3.4.3 CloudEngine 16808 Power Distribution Guide

3.4.3.1 Connecting the CloudEngine 16808 to a PDF Directly (AC)

Power Distribution Requirements

NOTE

- The power distribution frame (PDF) uses the 1+1 redundancy mode.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.

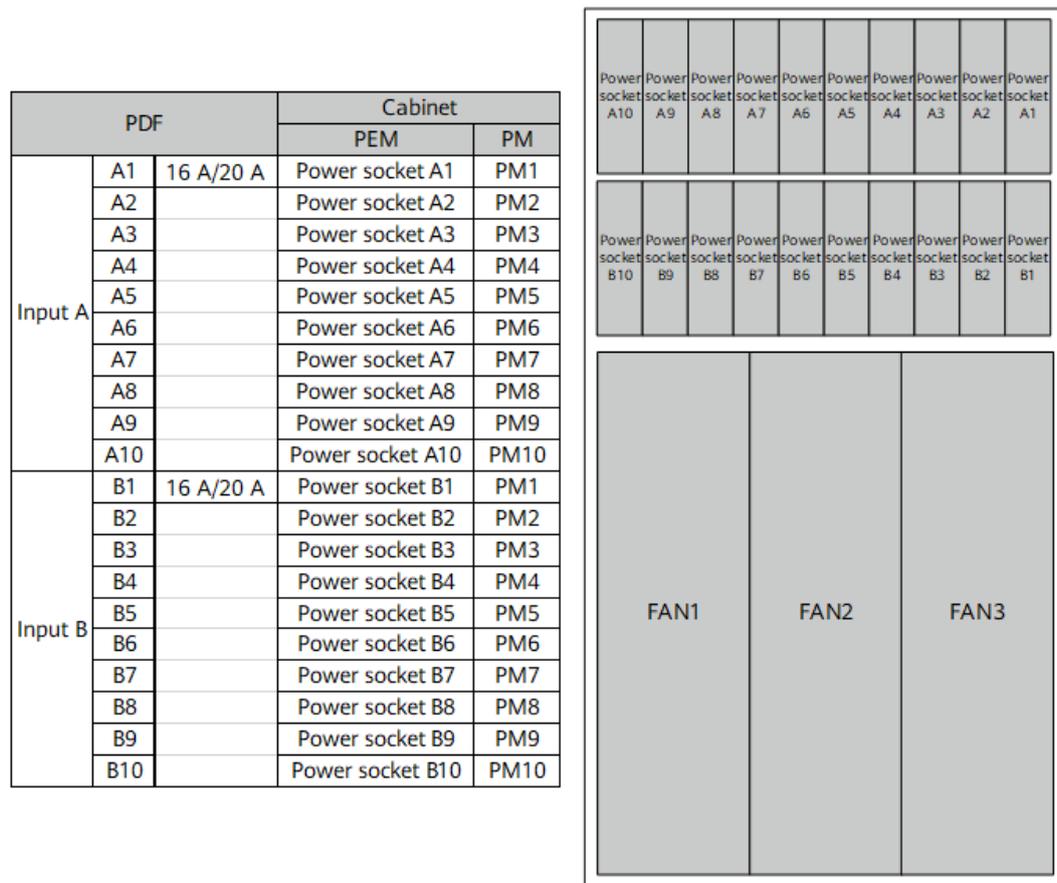
Table 3-11 Power distribution requirements (CloudEngine 16808 chassis)

Cabling Distance from the PDF to the Device's PEM	≤ 2.5 m (Determine this distance according to site survey results.)
Number of Power Inputs	10+10 input redundancy (outputs from the PDF)

Rated Current of Connected Circuit Breakers	<ul style="list-style-type: none"> • ≥ 16 A: The phase voltage is greater than or equal to 200 V AC, for example, the circuit breaker is connected to the uninterruptible power supply (UPS). • ≥ 20 A: The phase voltage is greater than or equal to 170 V AC, for example, the circuit breaker is connected to a public mains power outlet. <p>NOTE Circuit breakers with rated current of 16 A or 20 A are recommended for the PEM's power sockets A1 to A10 and B1 to B10.</p>
Output Terminal Type in the PDU	Power sockets complying with local standards

Power Distribution Schemes

Figure 3-19 CloudEngine 16808 chassis directly connected to the PDU



3.4.3.2 Connecting the CloudEngine 16808 to a PDF Directly (DC)

Power Distribution Requirements

 NOTE

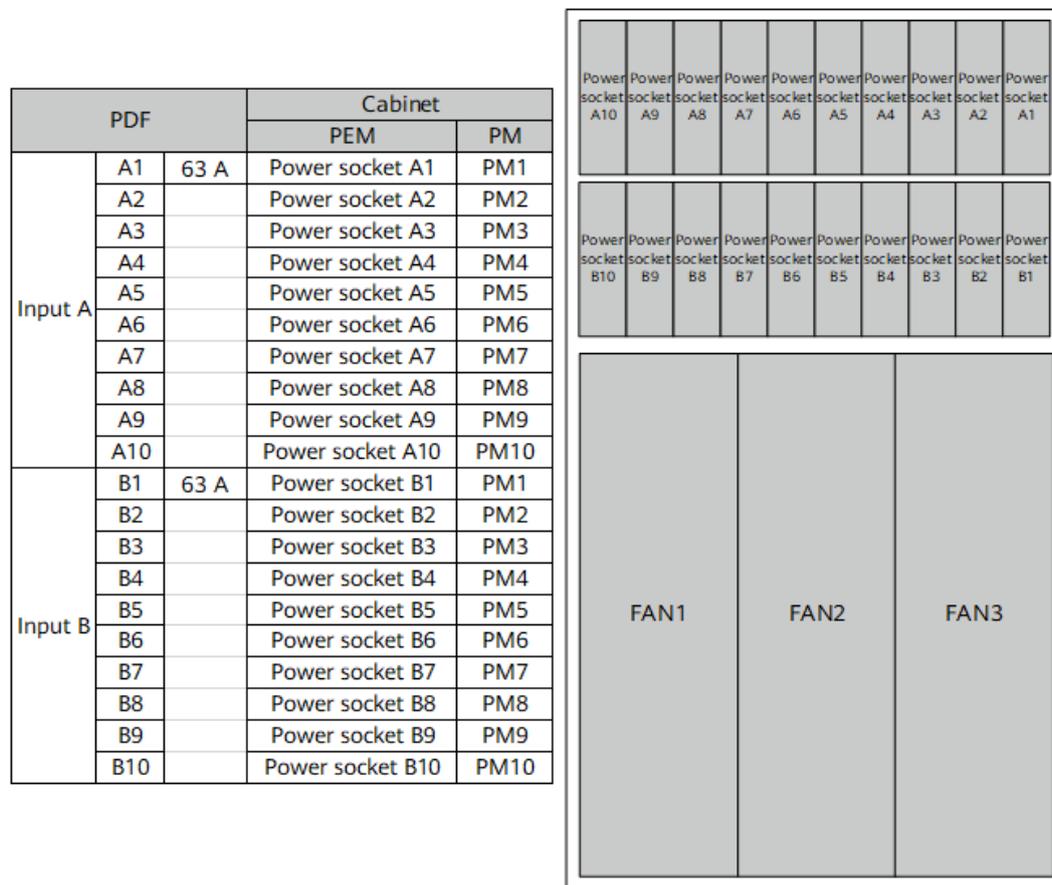
- The PDF uses power modules in 1+1 redundancy mode.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.

Table 3-12 Power distribution requirements (CloudEngine 16808 chassis)

Cabling Distance from the PDF to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	10+10 input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	≥ 63 A NOTE Circuit breakers with rated current of 63 A are recommended for the PEM's terminal blocks A1 to A10 and B1 to B10.
Output Terminal Type in the PDF	Naked Crimping Connector, JG2, 25mm ² /35mm ² , M6, 80A, Tin Plating, Right angle (cables are made onsite)

Power Distribution Schemes

Figure 3-20 CloudEngine 16808 chassis directly connected to the PDF



3.4.3.3 Connecting the CloudEngine 16808 to a PDF Directly (High-Voltage DC)

Power Distribution Requirements

NOTE

- The PDF uses power modules in 1+1 redundancy mode.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.

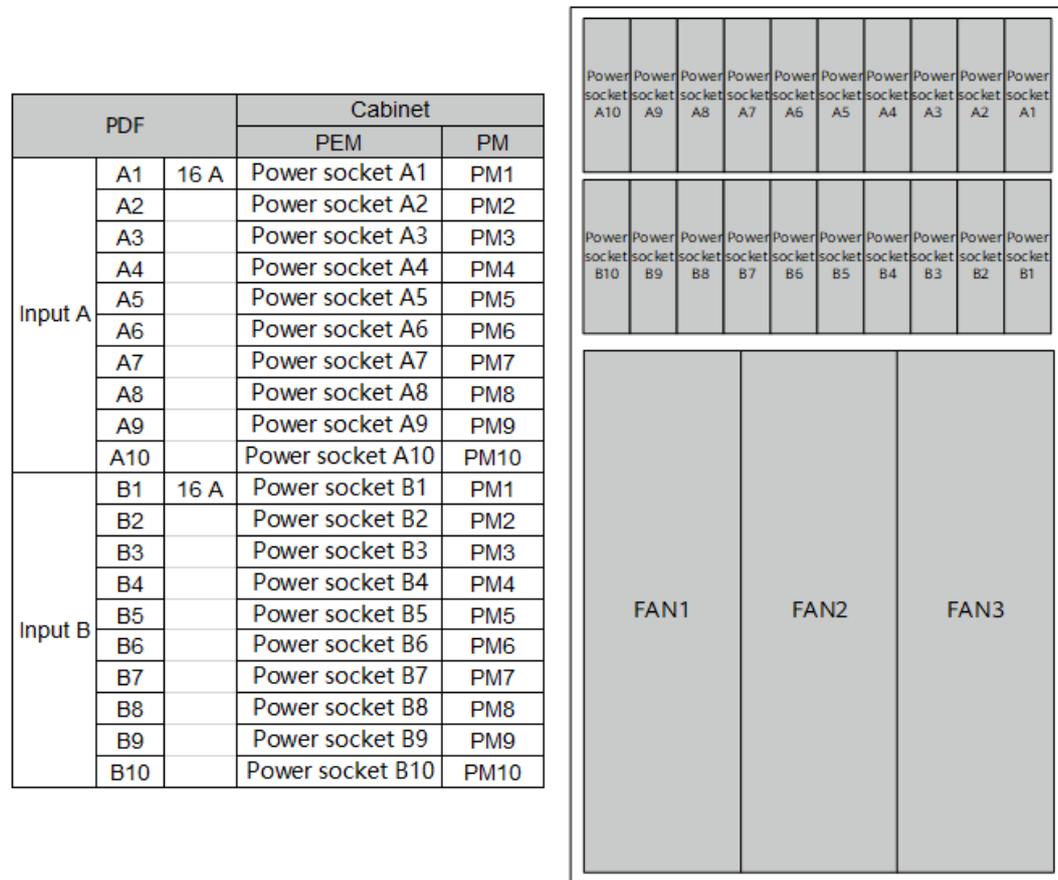
Table 3-13 Power distribution requirements (CloudEngine 16808 chassis)

Cabling Distance from the PDF to the Device's PEM	Determine this distance according to site survey results.
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Number of Power Inputs	10+10 input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	≥ 16 A NOTE Circuit breakers with rated current of 16 A are recommended for the PEM's power sockets A1 to A10 and B1 to B10.
Output Terminal Type in the PDF	Power sockets complying with local standards

Power Distribution Schemes

Figure 3-21 CloudEngine 16808 chassis directly connected to the PDF

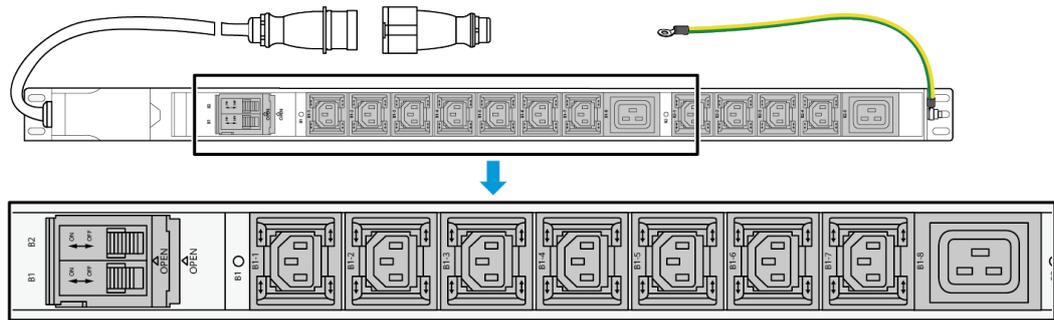


3.4.3.4 Connecting the CloudEngine 16808 to a PDF Through a Single-Phase PDU

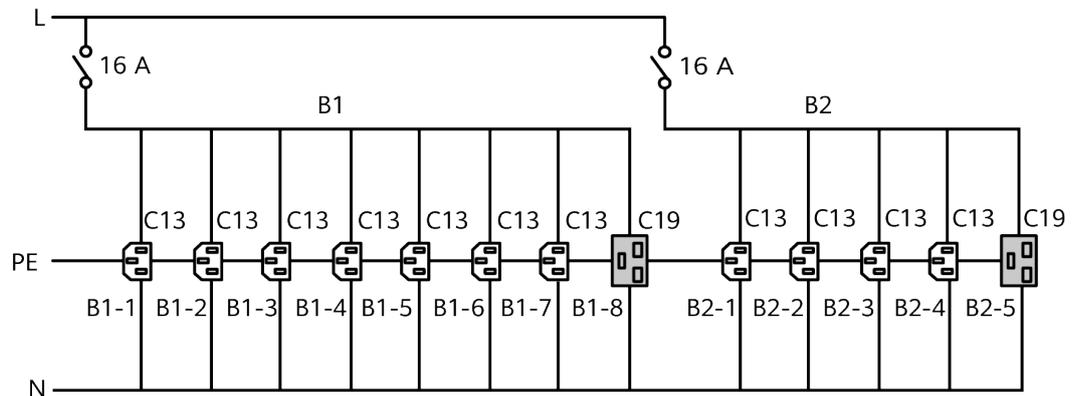
PDU Overview

Figure 3-22 shows the appearance of a 220 V single-phase PDU.

Figure 3-22 220 V single-phase PDU



A 220 V single-phase PDU supports single-phase 220 V to 240 V AC power input and provides two groups of power outputs B1 and B2. Group B1 includes seven C13 sockets and one C19 socket. Group B2 includes four C13 sockets and one C19 socket. Each group is controlled by a 16 A circuit breaker. When the groups are connected to a chassis, the total current of all sockets in each group cannot exceed 16 A.



Power Distribution Requirements

NOTE

- The PDF uses the 1+1 redundancy mode and three-phase 32 A or 40 A.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.
- A maximum of eight PDUs can be installed in a Huawei A812-20 cabinet. When the 220 V single-phase PDUs are used, a maximum of eight power modules can be configured in a single cabinet or rack.

Table 3-14 Power distribution requirements (CloudEngine 16808 chassis)

Cabling Distance from the PDU to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	<ul style="list-style-type: none">• The single-phase PDU input is not recommended. If the single-phase PDU input is used, ensure that a maximum of eight power modules are configured in a cabinet or rack.• 4+4 single-phase 32 A/40 A input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	<ul style="list-style-type: none">• ≥ 32 A: The phase voltage is greater than or equal to 200 V AC, for example, the circuit breaker is connected to the UPS.• ≥ 40 A: The phase voltage is greater than or equal to 170 V AC, for example, the circuit breaker is connected to a mains power outlet. <p>NOTE The rated current of 32 A or 40 A is the recommended specification for circuit breakers A1, A2, B1, and B2.</p>
Output Terminal Type in the PDU	IEC 309 industrial connectors

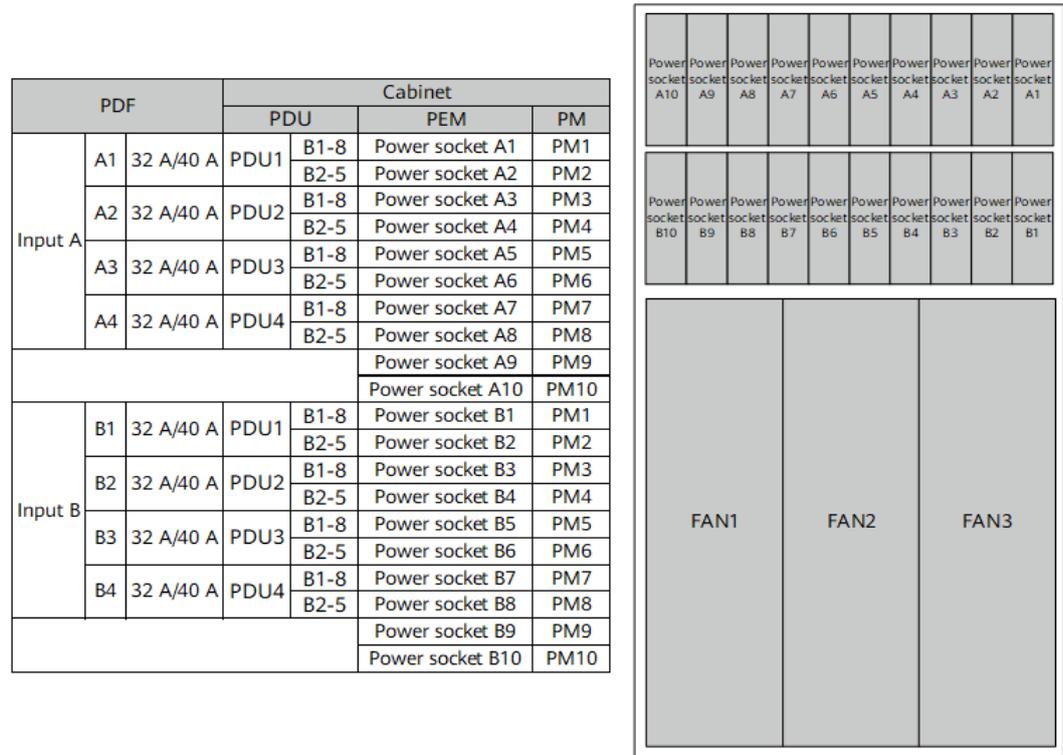
Power Distribution Schemes

When the single-phase PDUs are used and one CloudEngine 16808 is installed in the cabinet or rack, only eight power modules can be used and eight 220 V single-phase PDUs are required.

 **NOTE**

When the CloudEngine 16808 is configured with more than eight power modules, a 220 V single-phase PDU cannot be used.

Figure 3-23 CloudEngine 16808 chassis connected to a PDF through a single-phase PDU

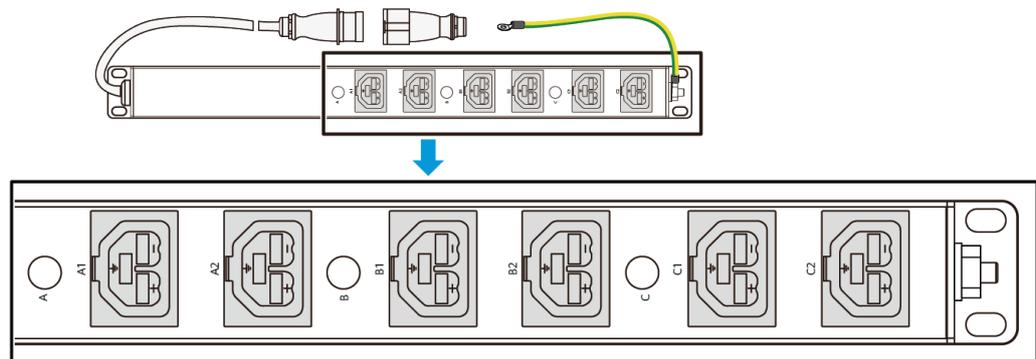


3.4.3.5 Connecting the CloudEngine 16808 to a PDF Through a Three-Phase PDU (PDU2000-32-3PH-6-B1)

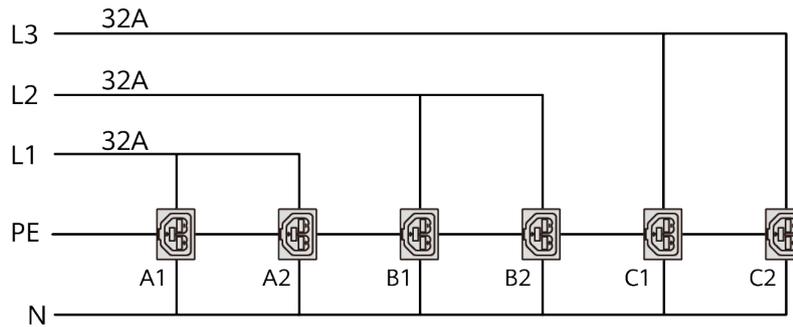
PDU Overview

Figure 3-24 shows the appearance of a 380 V three-phase PDU.

Figure 3-24 380 V three-phase PDU



A 380 V three-phase PDU supports three-phase (L1, L2, and L3) 346 V to 415 V AC power input, and provides three groups of outputs on each phase line, namely, A, B, and C. Groups A, B, and C each control two HVDC-3Z-03 sockets. When the groups are connected to a chassis, the total current of all sockets in each group cannot exceed 32 A.



Power Distribution Requirements

NOTE

- The PDF uses the 1+1 redundancy mode and three-phase 32 A or 40 A.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.
- A maximum of eight PDUs can be installed in a Huawei A812-20 cabinet. When 380 V three-phase PDUs are used, a maximum of 24 power modules can be configured in a single cabinet or rack.

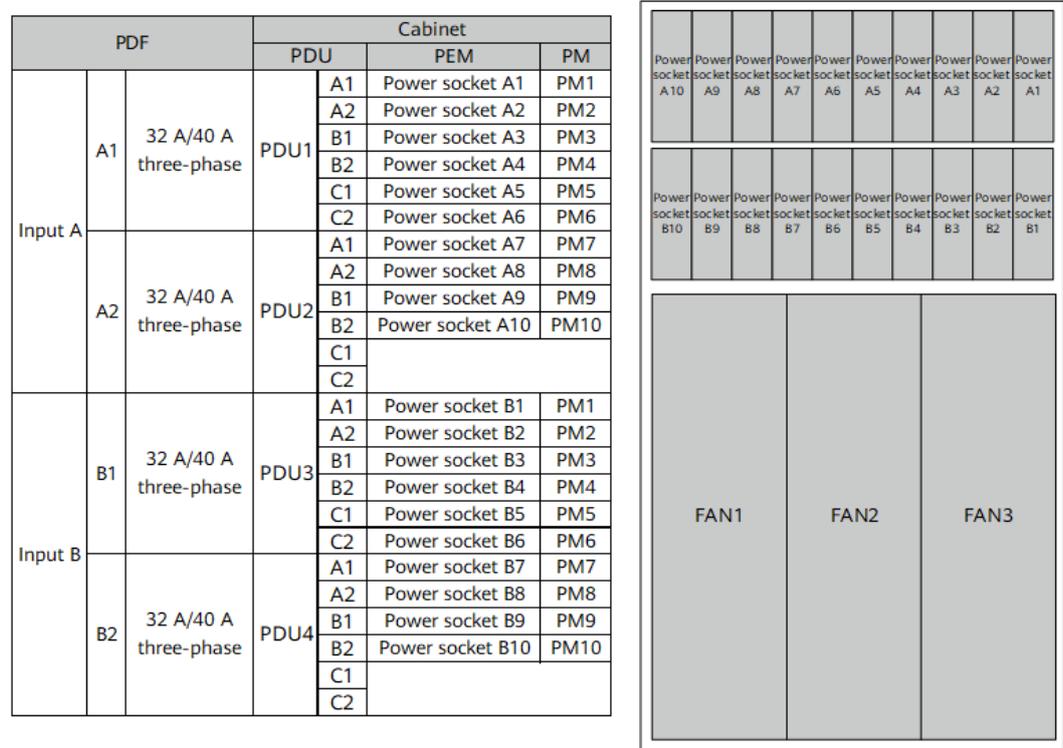
Table 3-15 Power distribution requirements (CloudEngine 16808 chassis)

Cabling Distance from the PDU to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	2+2 three-phase 32 A/40 A input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	<ul style="list-style-type: none"> • ≥ 32 A: The phase voltage is greater than or equal to 200 V AC, for example, the circuit breaker is connected to the UPS. • ≥ 40 A: The phase voltage is greater than or equal to 170 V AC, for example, the circuit breaker is connected to a mains power outlet. <p>NOTE The rated current of 32 A or 40 A is the recommended specifications for circuit breakers of the three-phase outputs A1, A2, B1, and B2.</p>
Output Terminal Type in the PDU	HVDC-3Z-03 socket

Power Distribution Schemes

A CloudEngine 16808 is installed in the cabinet/rack. The device can house up to 10 power modules. Under full configuration of the 10 power modules, four three-phase PDUs are required, and the output terminals of two PDUs are partially used.

Figure 3-25 CloudEngine 16808 chassis connected to a PDF through a three-phase PDU

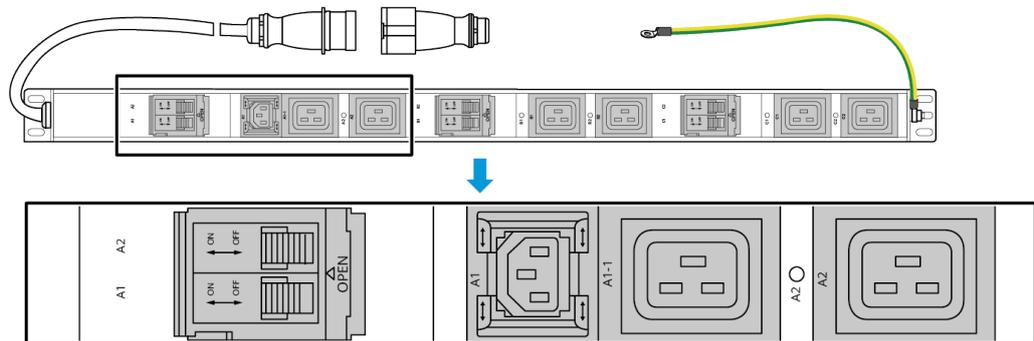


3.4.3.6 Connecting a CloudEngine 16808 to a PDF Through a Three-Phase PDU (PDU2000-32-3PH-1)

PDU Overview

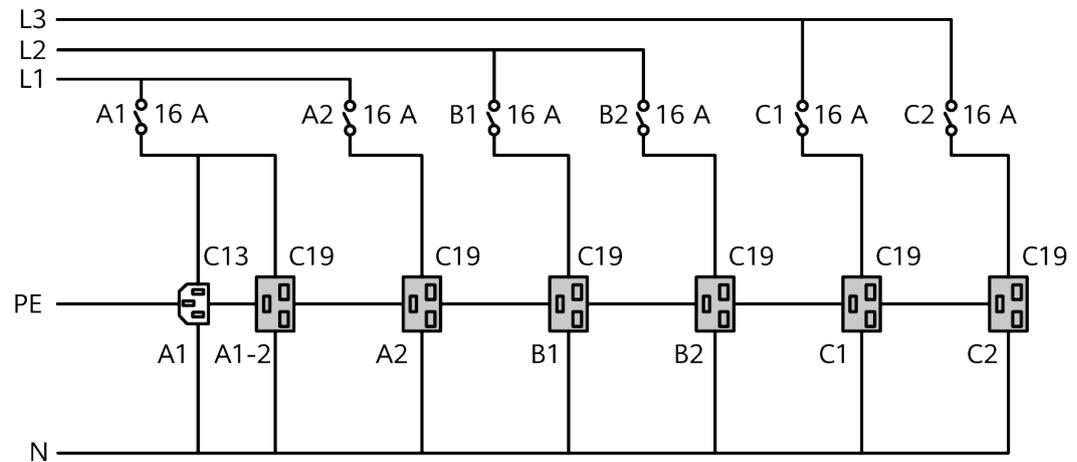
Figure 3-26 shows the appearance of a 380 V three-phase PDU.

Figure 3-26 380 V three-phase PDU



A 380 V three-phase PDU supports three-phase (L1, L2, and L3) 380 V to 415 V AC input, and provides two groups of outputs on each phase line. L1 provides outputs A1 and A2; L2 provides outputs B1 and B2; L3 provides outputs C1 and C2. A1 controls two C13 sockets and one C19 socket. A2, B1, B2, C1, and C2 control one C19 socket. Each group is controlled by a 16 A circuit breaker. When the groups

are connected to a chassis, the total current of all sockets in each group cannot exceed 16 A.



Power Distribution Requirements

NOTE

- The PDF uses the 1+1 redundancy mode and three-phase 32 A or 40 A.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.
- A maximum of eight PDUs can be installed in a Huawei A812-20 cabinet. When 380 V three-phase PDUs are used, a maximum of 24 power modules can be configured in a single cabinet or rack.

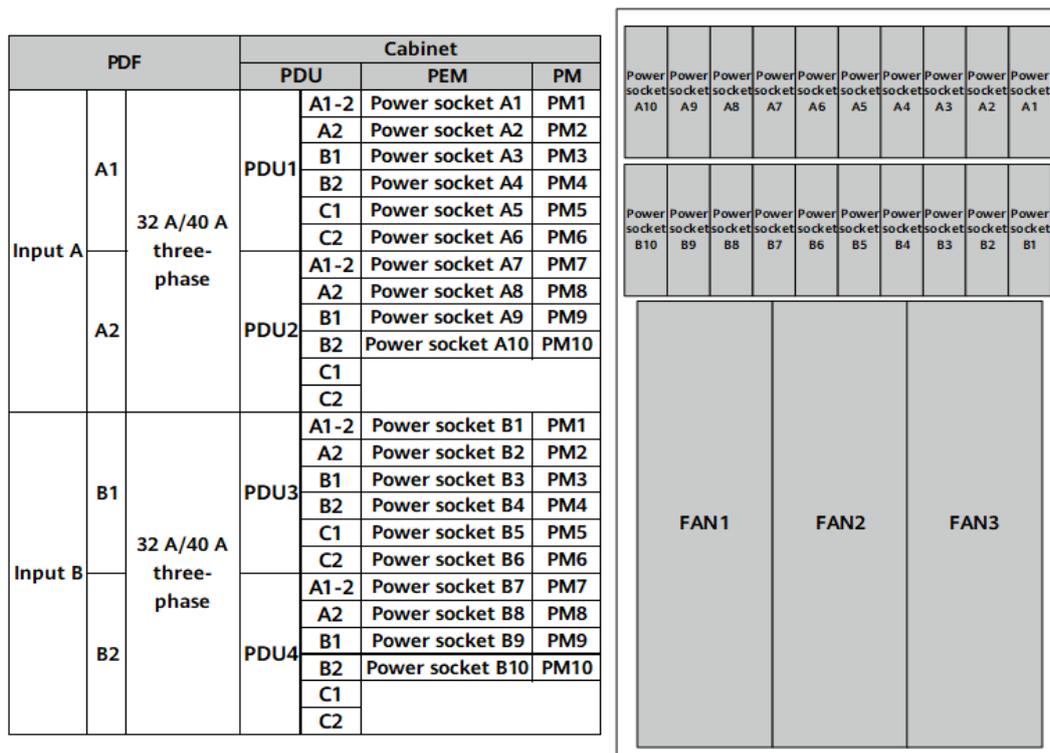
Table 3-16 Power distribution requirements (CloudEngine 16808 chassis)

Cabling Distance from the PDU to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	2+2 three-phase 32 A/40 A input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	<ul style="list-style-type: none"> • ≥ 32 A: The phase voltage is greater than or equal to 200 V AC, for example, the circuit breaker is connected to the UPS. • ≥ 40 A: The phase voltage is greater than or equal to 170 V AC, for example, the circuit breaker is connected to a mains power outlet. <p>NOTE The rated current of 32 A or 40 A is the recommended specification for circuit breakers A1, A2, B1, and B2.</p>
Output Terminal Type in the PDU	IEC 309 industrial connectors

Power Distribution Schemes

A CloudEngine 16808 is installed in the cabinet/rack. The device can house up to 10 power modules. Under full configuration of the 10 power modules, four three-phase PDUs are required, and the output terminals of two PDUs are partially used.

Figure 3-27 CloudEngine 16808 chassis connected to a PDF through a three-phase PDU

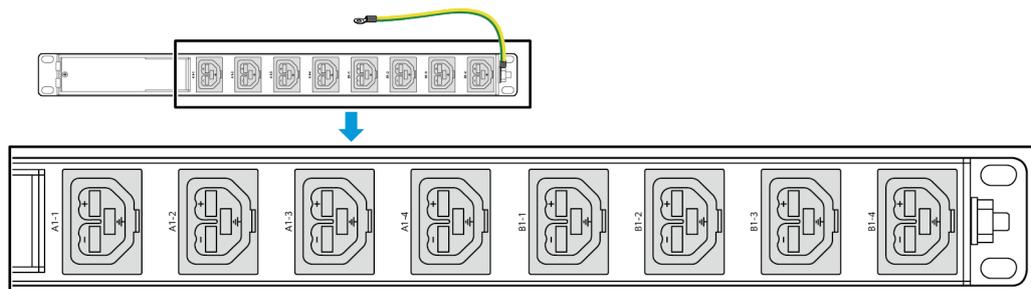


3.4.3.7 Connecting the CloudEngine 16808 to a PDF Through a High-Voltage DC PDU

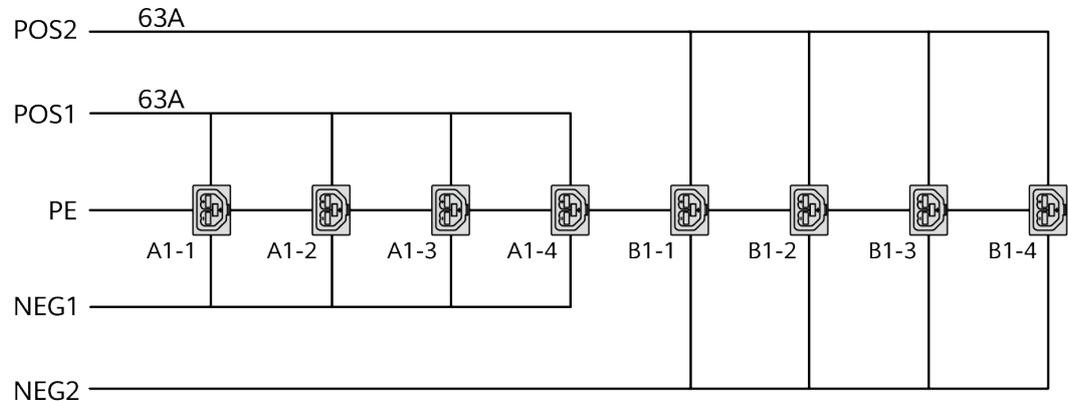
PDU Overview

A 380 V high-voltage DC PDU is used to supply power to a device through a 240 V or 380 V high-voltage DC power distribution system. [Figure 3-28](#) shows the appearance of a 380 V high-voltage DC PDU.

Figure 3-28 380 V high-voltage DC PDU



A 380 V high-voltage DC PDU supports 240 V/380V DC power input and provides two output groups A1 and B1. Each group controls four HVDC-3Z-03 sockets. When the groups are connected to a chassis, the total current of all sockets in each group cannot exceed 63 A.



Power Distribution Requirements

NOTE

- The PDF uses power modules in 1+1 redundancy mode.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.
- A maximum of eight PDUs can be installed in a Huawei A812-20 cabinet. When the 380 V high-voltage DC PDUs are used, a maximum of 24 power modules can be configured in a single cabinet or rack.

Table 3-17 Power distribution requirements (CloudEngine 16808 chassis)

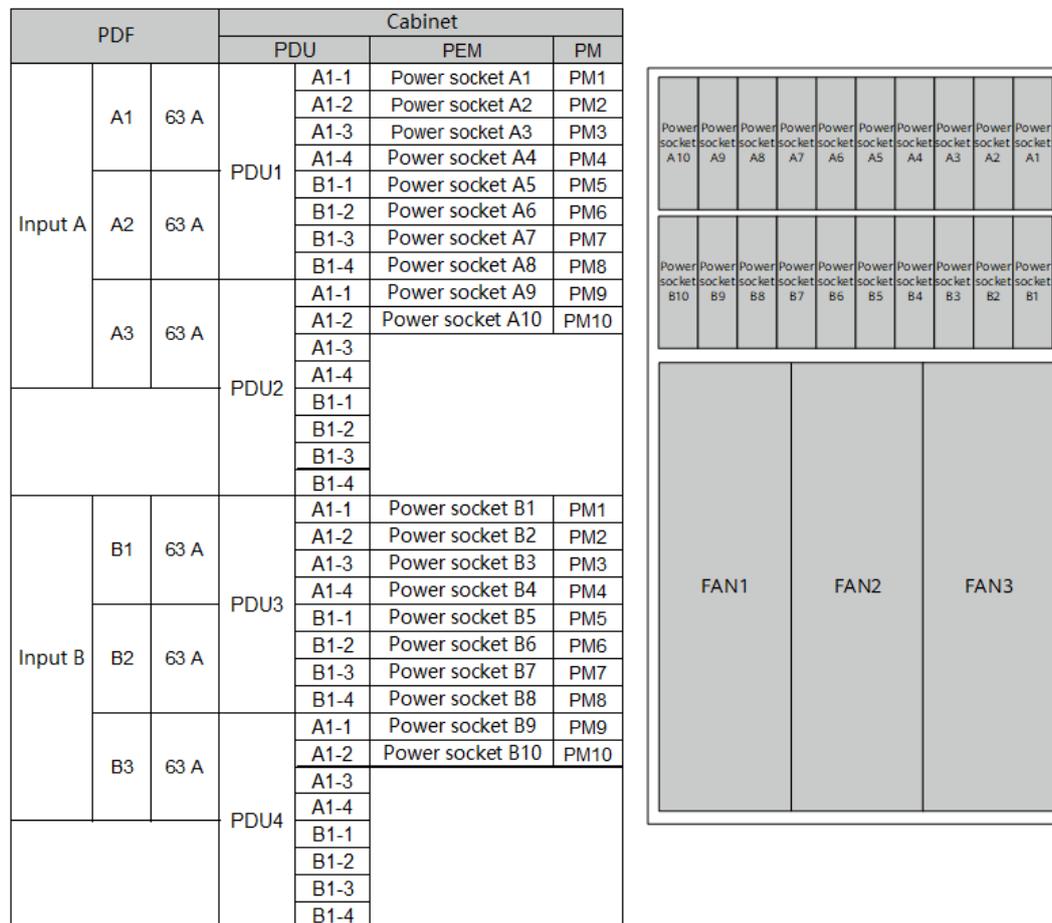
Cabling Distance from the PDU to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	3+3 input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	$\geq 63 \text{ A}$ NOTE The rated current of 63 A is the recommended specifications for circuit breakers A1, A2, B1, and B2.
Output Terminal Type in the PDU	HVDC-3Z-03 socket

Power Distribution Schemes

A CloudEngine 16808 is installed in the cabinet/rack. The device can house up to 10 power modules. Under full configuration of the 10 power modules, three 380 V

high-voltage DC PDUs are required. For reliability purposes, you are advised to use four PDUs. In this case, the output terminals of two PDUs are partially used.

Figure 3-29 CloudEngine 16808 chassis connected to the PDF through a 380 V high-voltage DC PDU

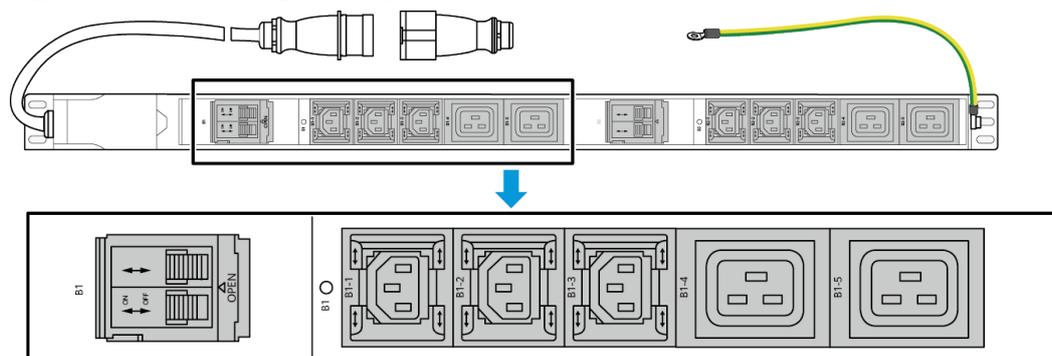


3.4.3.8 Connecting the CloudEngine 16808 to a PDF Through a 240 V DC PDU

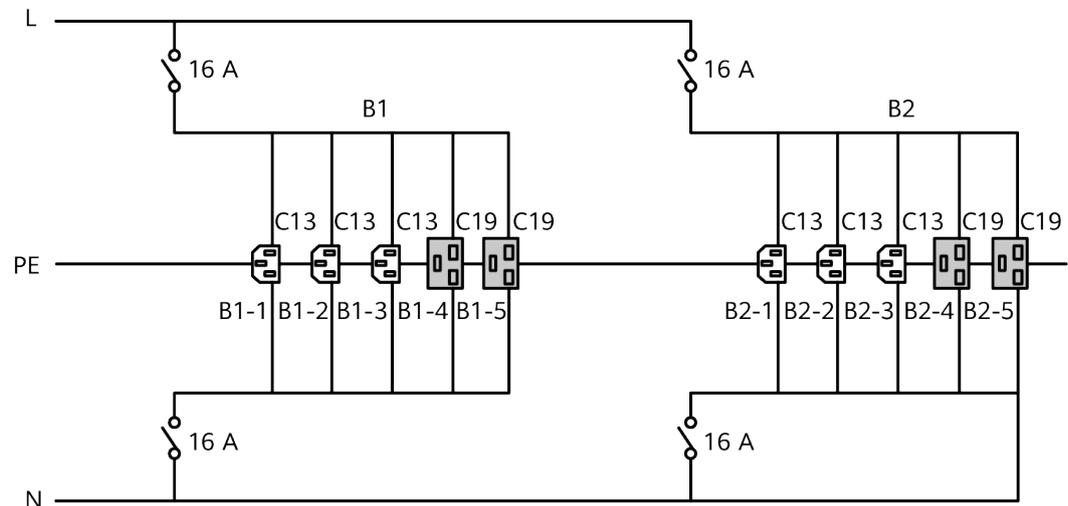
PDU Overview

A 240 V DC PDU is used to supply power to a device through a high-voltage DC power distribution system. **Figure 3-30** shows the appearance of a 240 V DC PDU.

Figure 3-30 240 V high-voltage DC PDU



A 240 V DC PDU provides two output groups B1 and B2. Each group includes three C13 sockets and two C19 sockets. Each group is controlled by a 16 A circuit breaker on the L line and a 16 A circuit breaker on the N line. The circuit breakers for the same group are closed or open at the same time. When the groups are connected to a chassis, the total current of all sockets in each group cannot exceed 16 A.



Power Distribution Requirements

NOTE

- The PDF uses power modules in 1+1 redundancy mode.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.
- A maximum of eight PDUs can be installed in a Huawei A812-20 cabinet. When the 240 V DC PDUs are used, a maximum of eight power modules can be configured in a single cabinet or rack.

Table 3-18 Power distribution requirements (CloudEngine 16808 chassis)

Cabling Distance from the PDU to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	The 4+4 redundancy input (PDC output) is supported. Ensure that a maximum of eight power modules are configured in a cabinet or rack.
Rated Current of Connected Circuit Breakers	<p>≥ 32 A</p> <p>NOTE The rated current of 32 A is the recommended specification for circuit breakers A1 to A4 and B1 to B4.</p>
Output Terminal Type in the PDU	IEC 309 industrial connectors

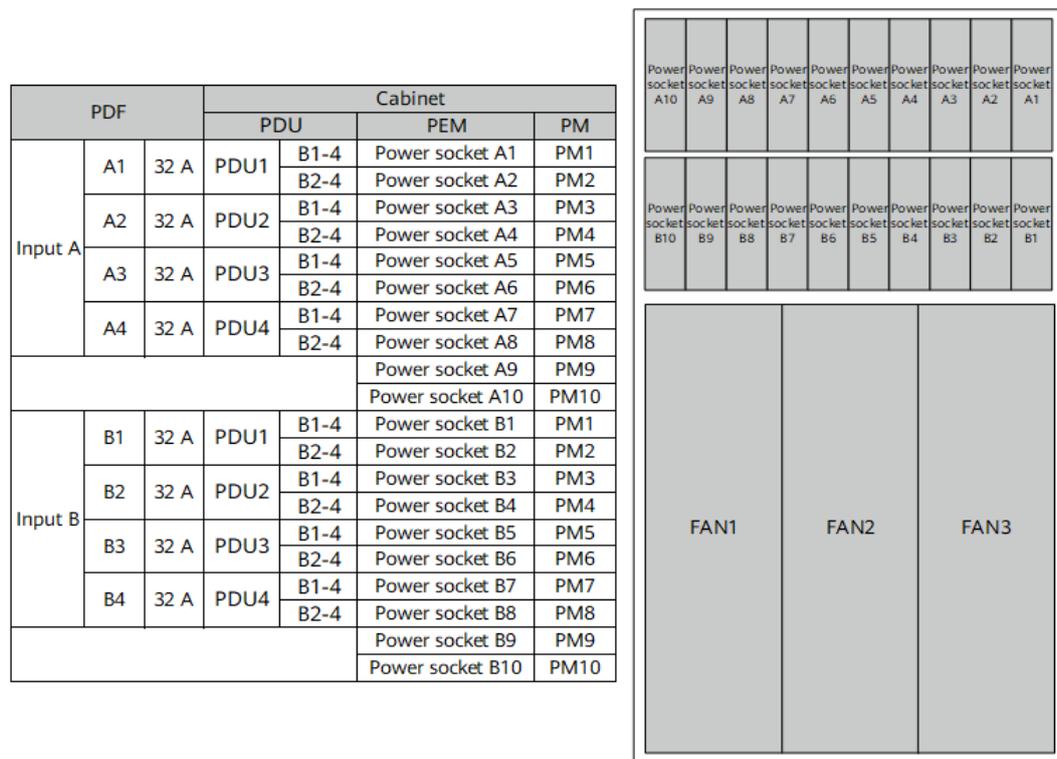
Power Distribution Schemes

When the 240 V DC PDUs are used and one CloudEngine 16808 is installed in the cabinet or rack, only eight power modules can be used and eight 240 V DC PDUs are required.

 **NOTE**

When the CloudEngine 16808 is configured with more than eight power modules, the 240 V DC PDU cannot be used.

Figure 3-31 CloudEngine 16808 chassis connected to the PDF through a 240 V DC PDU



3.4.4 CloudEngine 16816 Power Distribution Guide

3.4.4.1 Connecting the CloudEngine 16816 to a PDF Directly (AC)

Power Distribution Requirements

 NOTE

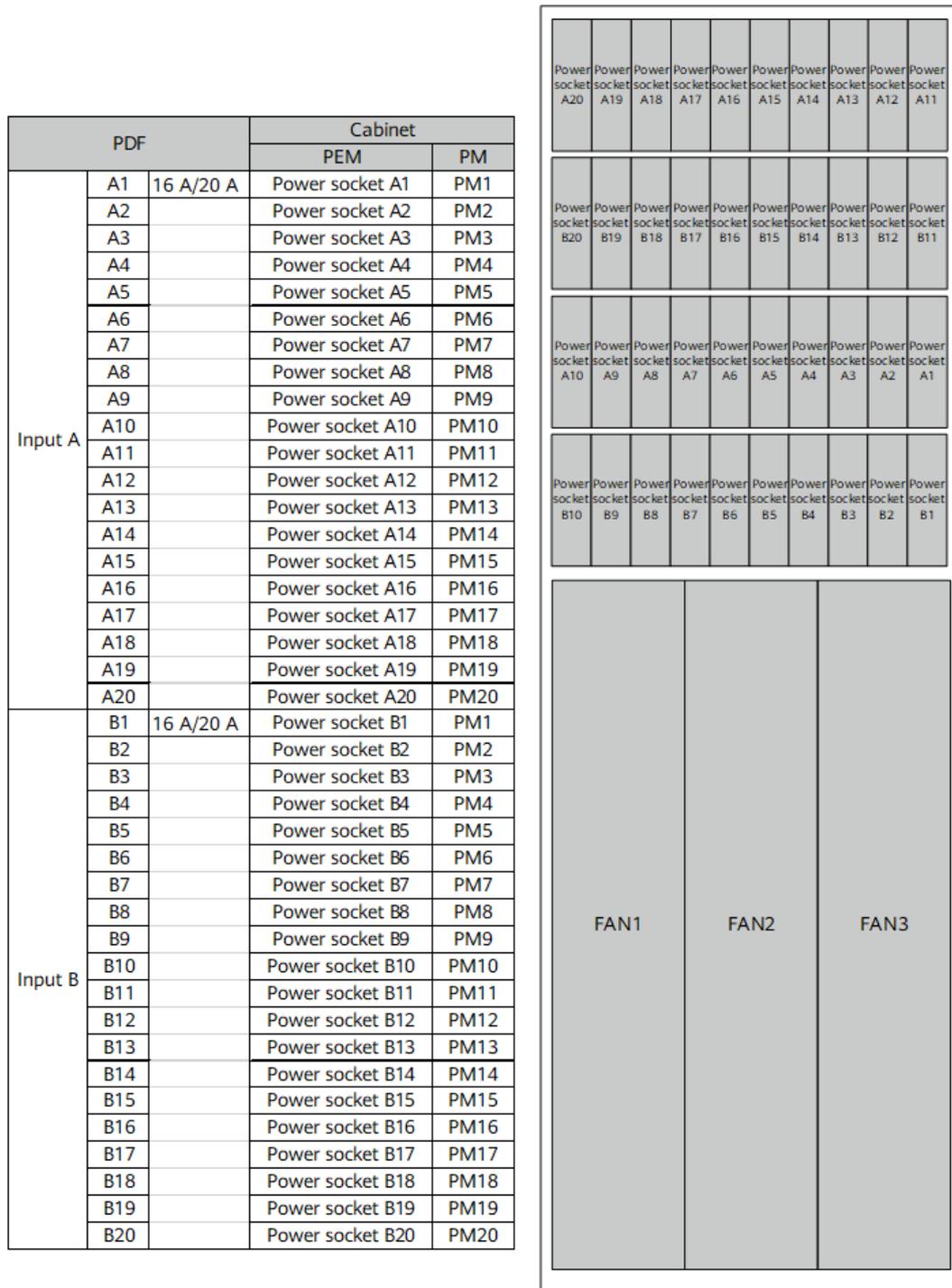
- The power distribution frame (PDF) uses the 1+1 redundancy mode.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.

Table 3-19 Power distribution requirements (CloudEngine 16816 chassis)

Cabling Distance from the PDF to the Device's PEM	≤ 2.5 m (Determine this distance according to site survey results.)
Number of Power Inputs	20+20 input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	<ul style="list-style-type: none">• ≥ 16 A: The phase voltage is greater than or equal to 200 V AC, for example, the circuit breaker is connected to the uninterruptible power supply (UPS).• ≥ 20 A: The phase voltage is greater than or equal to 170 V AC, for example, the circuit breaker is connected to a public mains power outlet. <p>NOTE The rated current of 16 A or 20 A is the recommended specification for circuit breakers A1 to A20 and B1 to B20.</p>
Output Terminal Type in the PDU	Power sockets complying with local standards

Power Distribution Schemes

Figure 3-32 CloudEngine 16816 chassis directly connected to the PDF



3.4.4.2 Connecting a CloudEngine 16816 to a PDF Directly (DC)

Power Distribution Requirements

 NOTE

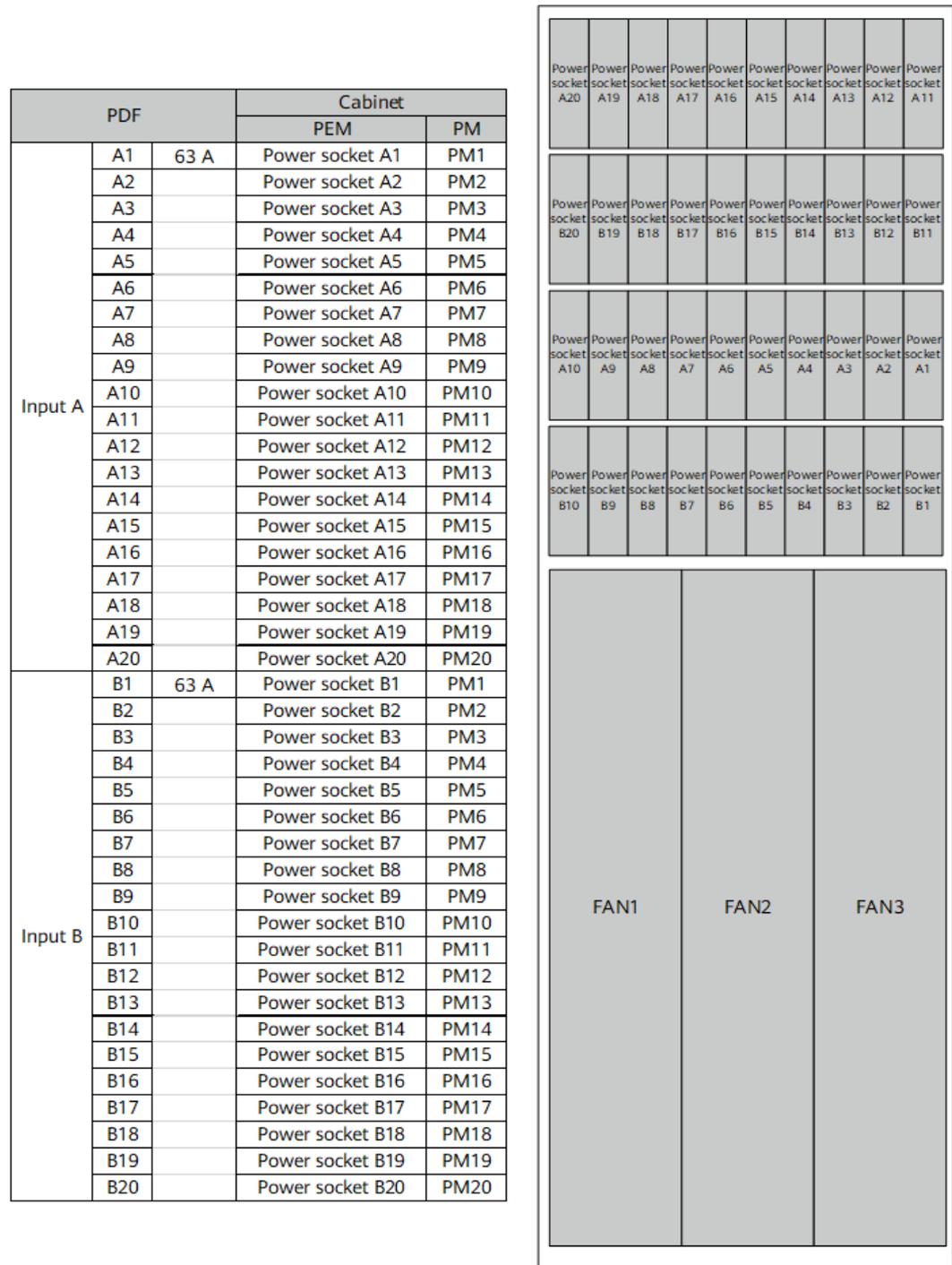
- The PDF uses power modules in 1+1 redundancy mode.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.

Table 3-20 Power distribution requirements (CloudEngine 16816 chassis)

Cabling Distance from the PDF to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	20+20 input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	≥ 63 A NOTE The rated current of 63 A is the recommended specification for circuit breakers A1 to A20 and B1 to B20.
Output Terminal Type in the PDF	Naked Crimping Connector, JG2, 25mm ² /35mm ² , M6, 80A, Tin Plating, Right angle (cables are made onsite)

Power Distribution Schemes

Figure 3-33 CloudEngine 16816 chassis directly connected to the PDF



3.4.4.3 Connecting a CloudEngine 16816 to a PDF Directly (HVDC)

Power Distribution Requirements

 NOTE

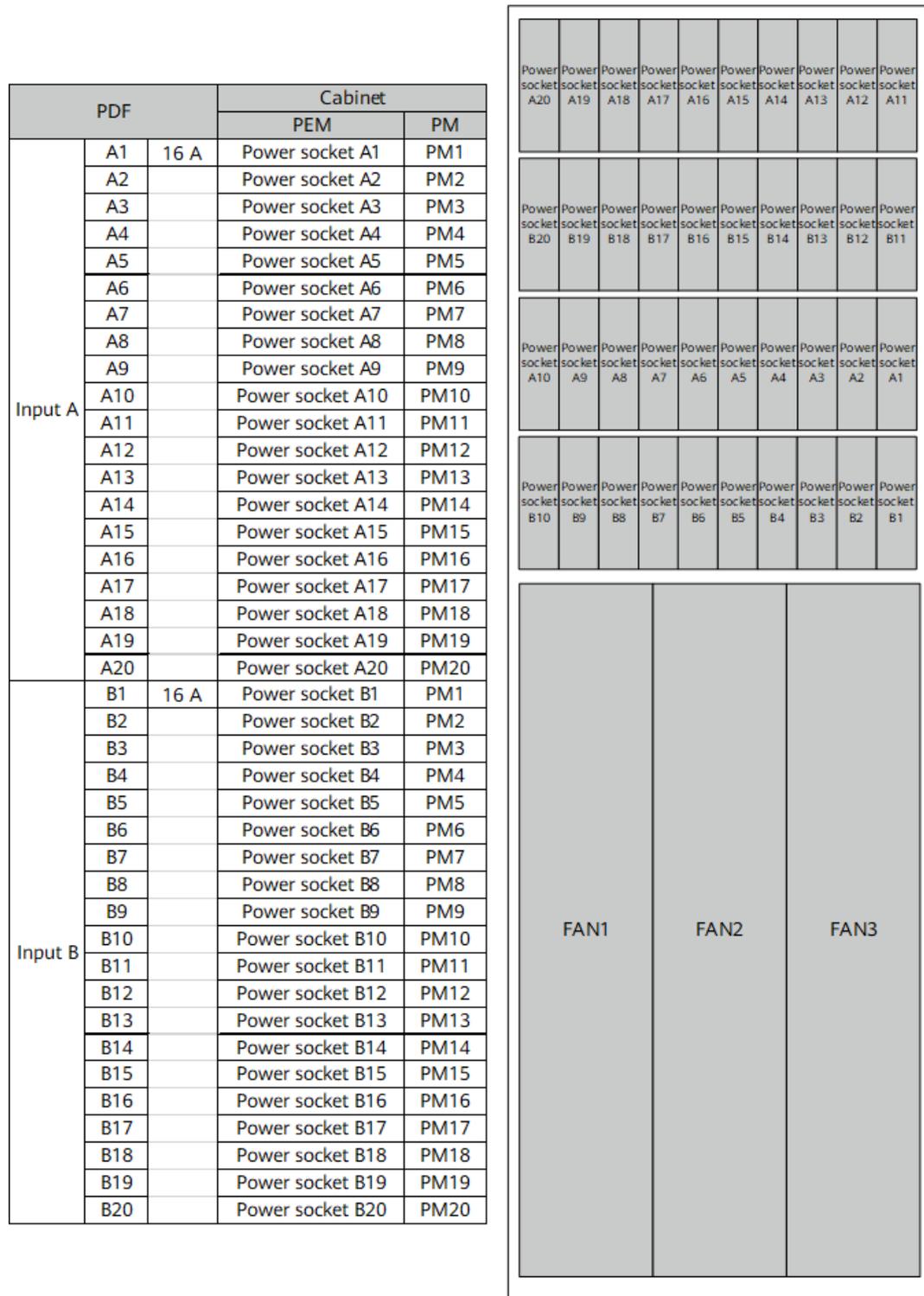
- The PDF uses power modules in 1+1 redundancy mode.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.

Table 3-21 Power distribution requirements (CloudEngine 16816 chassis)

Cabling Distance from the PDF to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	20+20 input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	≥ 16 A NOTE The rated current of 16 A is the recommended specification for circuit breakers A1 to A20 and B1 to B20.
Output Terminal Type in the PDF	Power sockets complying with local standards

Power Distribution Schemes

Figure 3-34 CloudEngine 16816 chassis directly connected to the PDF

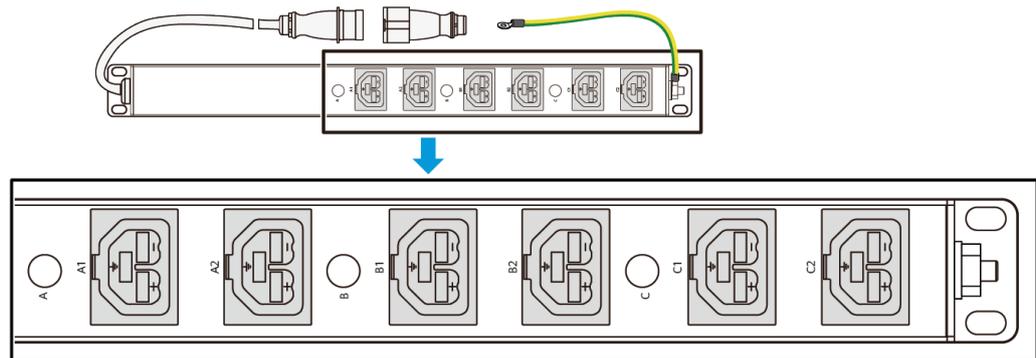


3.4.4.4 Connecting a CloudEngine 16816 to a PDF Through a Three-Phase PDU (PDU2000-32-3PH-6-B1)

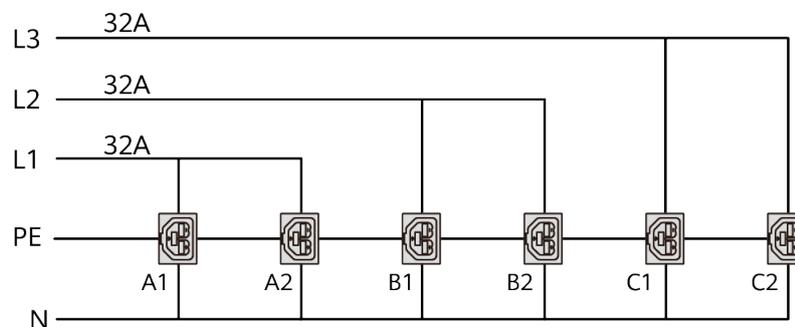
PDU Overview

Figure 3-35 shows the appearance of a 380 V three-phase PDU.

Figure 3-35 380 V three-phase PDU



A 380 V three-phase PDU supports three-phase (L1, L2, and L3) 346 V to 415 V AC power input, and provides three groups of outputs on each phase line, namely, A, B, and C. Groups A, B, and C each control two HVDC-3Z-03 sockets. When the groups are connected to a chassis, the total current of all sockets in each group cannot exceed 32 A.



Power Distribution Requirements

NOTE

- The PDF uses the 1+1 redundancy mode and three-phase 32 A or 40 A.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.
- A maximum of eight PDUs can be installed in a Huawei A812-20 cabinet. When 380 V three-phase PDUs are used, a maximum of 24 power modules can be configured in a single cabinet or rack.

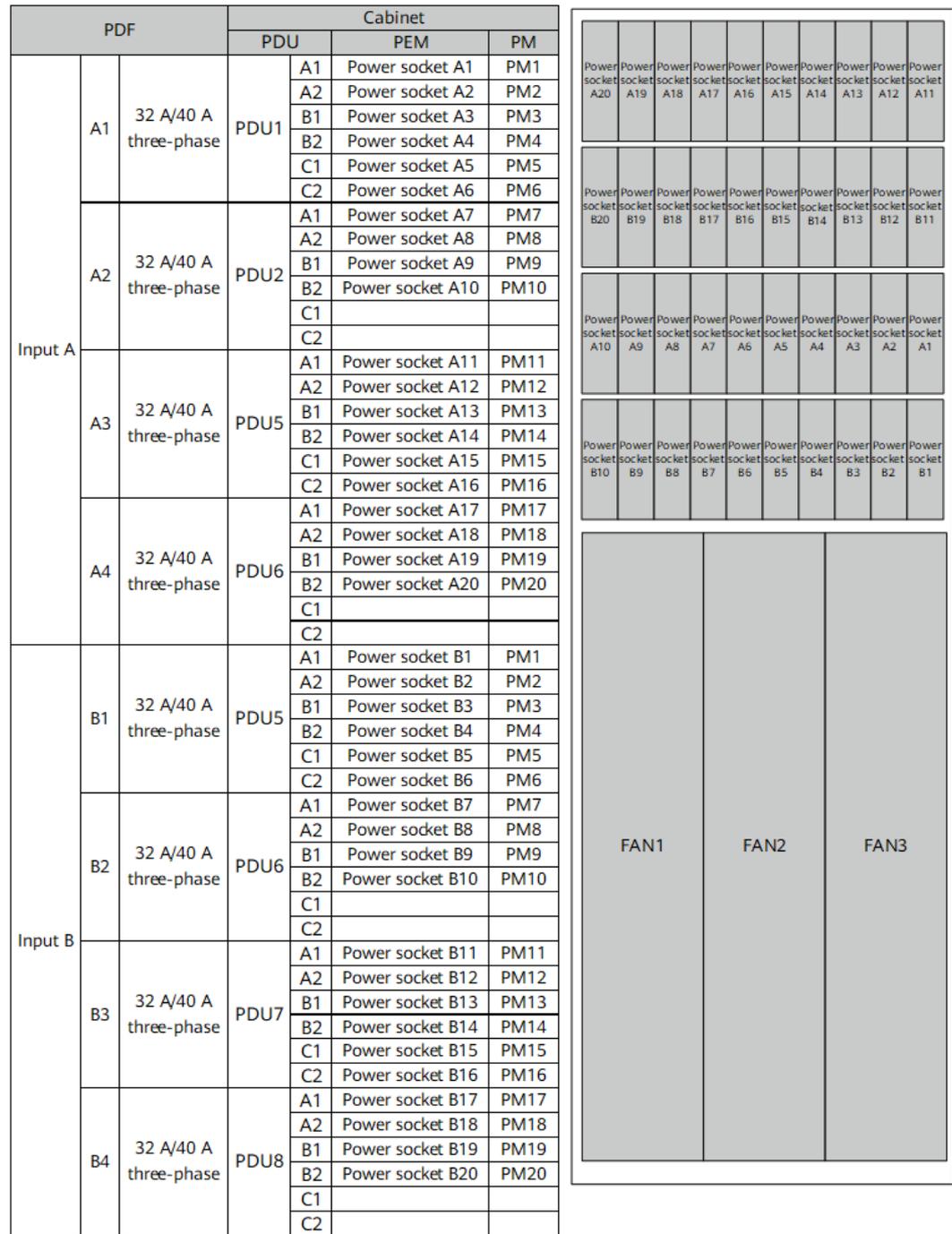
Table 3-22 Power distribution requirements (CloudEngine 16816 chassis)

Cabling Distance from the PDU to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	4+4 three-phase 32 A/40 A input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	<ul style="list-style-type: none">• ≥ 32 A: The phase voltage is greater than or equal to 200 V AC, for example, the circuit breaker is connected to the UPS.• ≥ 40 A: The phase voltage is greater than or equal to 170 V AC, for example, the circuit breaker is connected to a mains power outlet. <p>NOTE The rated current of 32 A or 40 A is the recommended specification for circuit breakers A1 to A4 and B1 to B4.</p>
Output Terminal Type in the PDU	HVDC-3Z-03 socket

Power Distribution Schemes

A CloudEngine 16816 is installed in the cabinet/rack. The device can house up to 20 power modules. Under full configuration of the 20 power modules, seven three-phase PDUs are required. For reliability purposes, you are advised to use eight PDUs. In this case, the output terminals of four PDUs are partially used.

Figure 3-36 CloudEngine 16816 chassis connected to a PDF through a three-phase PDU

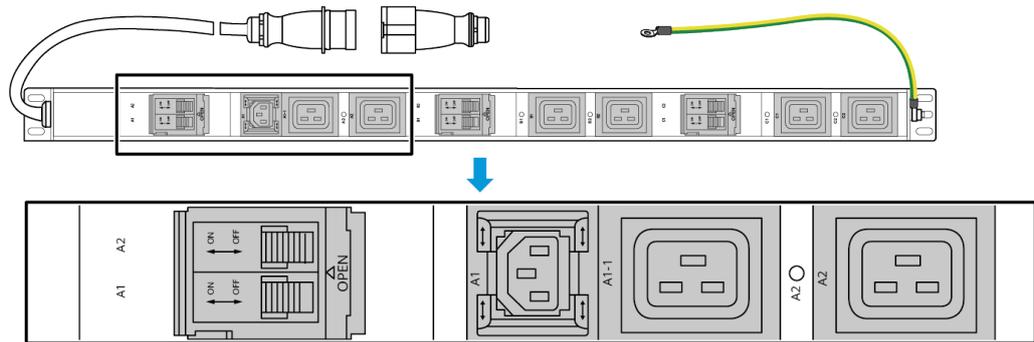


3.4.4.5 Connecting a CloudEngine 16816 to a PDF Through a Three-Phase PDU (PDU2000-32-3PH-1)

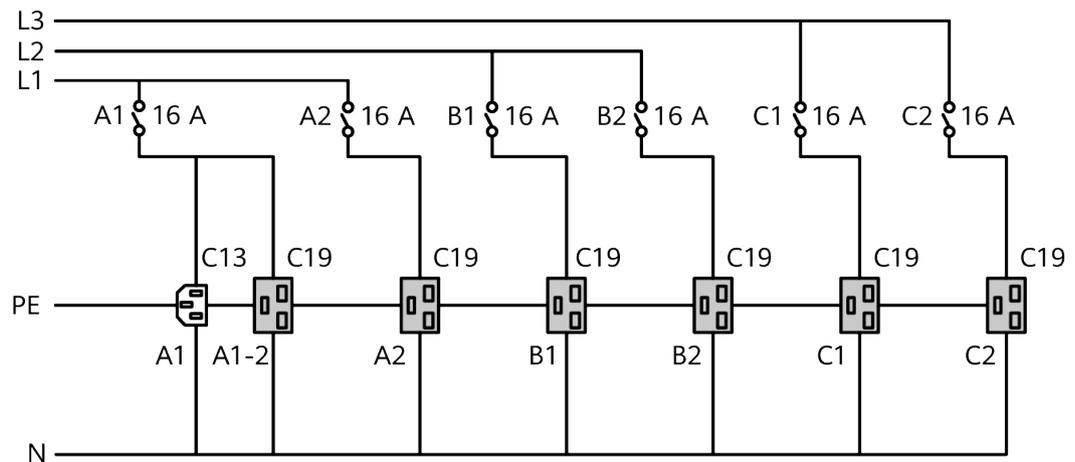
PDU Overview

Figure 3-37 shows the appearance of a 380 V three-phase PDU.

Figure 3-37 380 V three-phase PDU



A 380 V three-phase PDU supports three-phase (L1, L2, and L3) 380 V to 415 V AC input, and provides two groups of outputs on each phase line. L1 provides outputs A1 and A2; L2 provides outputs B1 and B2; L3 provides outputs C1 and C2. A1 controls two C13 sockets and one C19 socket. A2, B1, B2, C1, and C2 control one C19 socket. Each group is controlled by a 16 A circuit breaker. When the groups are connected to a chassis, the total current of all sockets in each group cannot exceed 16 A.



Power Distribution Requirements

NOTE

- The PDF uses the 1+1 redundancy mode and three-phase 32 A or 40 A.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.
- A maximum of eight PDUs can be installed in a Huawei A812-20 cabinet. When 380 V three-phase PDUs are used, a maximum of 24 power modules can be configured in a single cabinet or rack.

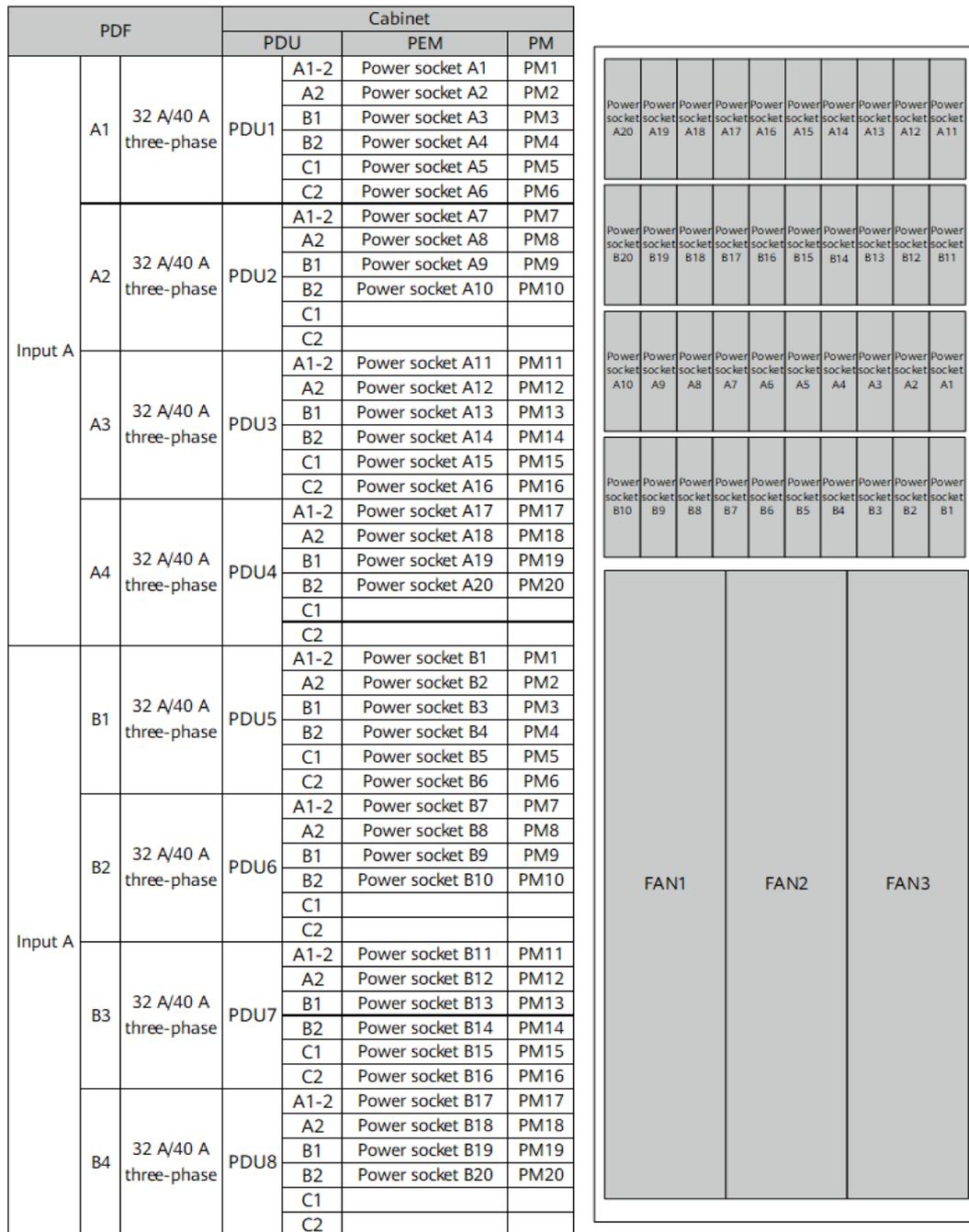
Table 3-23 Power distribution requirements (CloudEngine 16816 chassis)

Cabling Distance from the PDU to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	4+4 three-phase 32 A/40 A input redundancy (outputs from the PDF)
Rated Current of Connected Circuit Breakers	<ul style="list-style-type: none">• ≥ 32 A: The phase voltage is greater than or equal to 200 V AC, for example, the circuit breaker is connected to the UPS.• ≥ 40 A: The phase voltage is greater than or equal to 170 V AC, for example, the circuit breaker is connected to a mains power outlet. <p>NOTE The rated current of 32 A or 40 A is the recommended specification for circuit breakers A1 to A4 and B1 to B4.</p>
Output Terminal Type in the PDU	IEC 309 industrial connectors

Power Distribution Schemes

A CloudEngine 16816 is installed in the cabinet/rack. The device can house up to 20 power modules. Under full configuration of the 20 power modules, seven three-phase PDUs are required. For reliability purposes, you are advised to use eight PDUs. In this case, the output terminals of four PDUs are partially used.

Figure 3-38 CloudEngine 16816 chassis connected to a PDF through a three-phase PDU

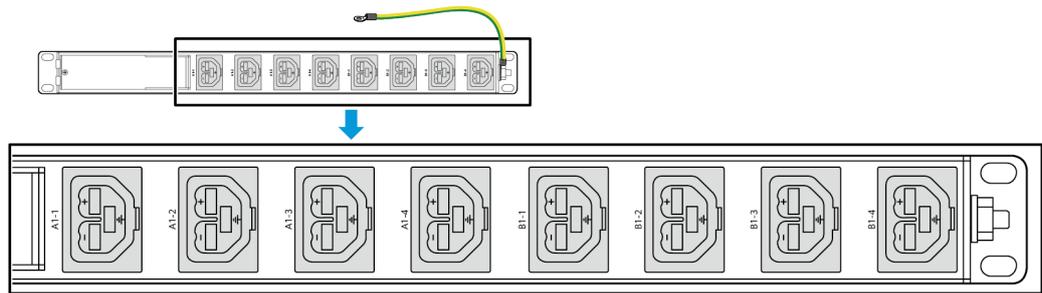


3.4.4.6 Connecting the CloudEngine 16816 to a PDF Through a High-Voltage DC PDU

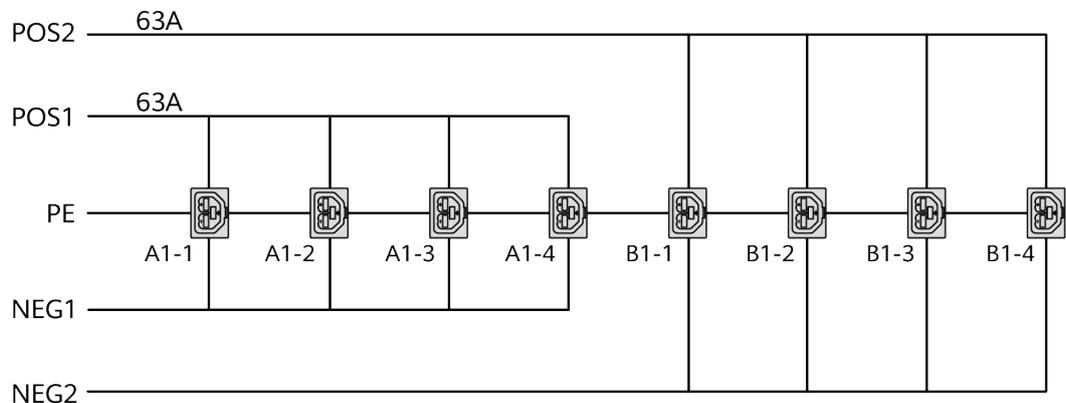
PDU Overview

A 380 V high-voltage DC PDU is used to supply power to a device through a 240 V or 380 V high-voltage DC power distribution system. [Figure 3-39](#) shows the appearance of a 380 V high-voltage DC PDU.

Figure 3-39 380 V high-voltage DC PDU



A 380 V high-voltage DC PDU supports 240 V/380V DC power input and provides two output groups A1 and B1. Each group controls four HVDC-3Z-03 sockets. When the groups are connected to a chassis, the total current of all sockets in each group cannot exceed 63 A.



Power Distribution Requirements

NOTE

- The PDF uses power modules in 1+1 redundancy mode.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.
- A maximum of eight PDUs can be installed in a Huawei A812-20 cabinet. When the 380 V high-voltage DC PDUs are used, a maximum of 24 power modules can be configured in a single cabinet or rack.

Table 3-24 Power distribution requirements (CloudEngine 16816 chassis)

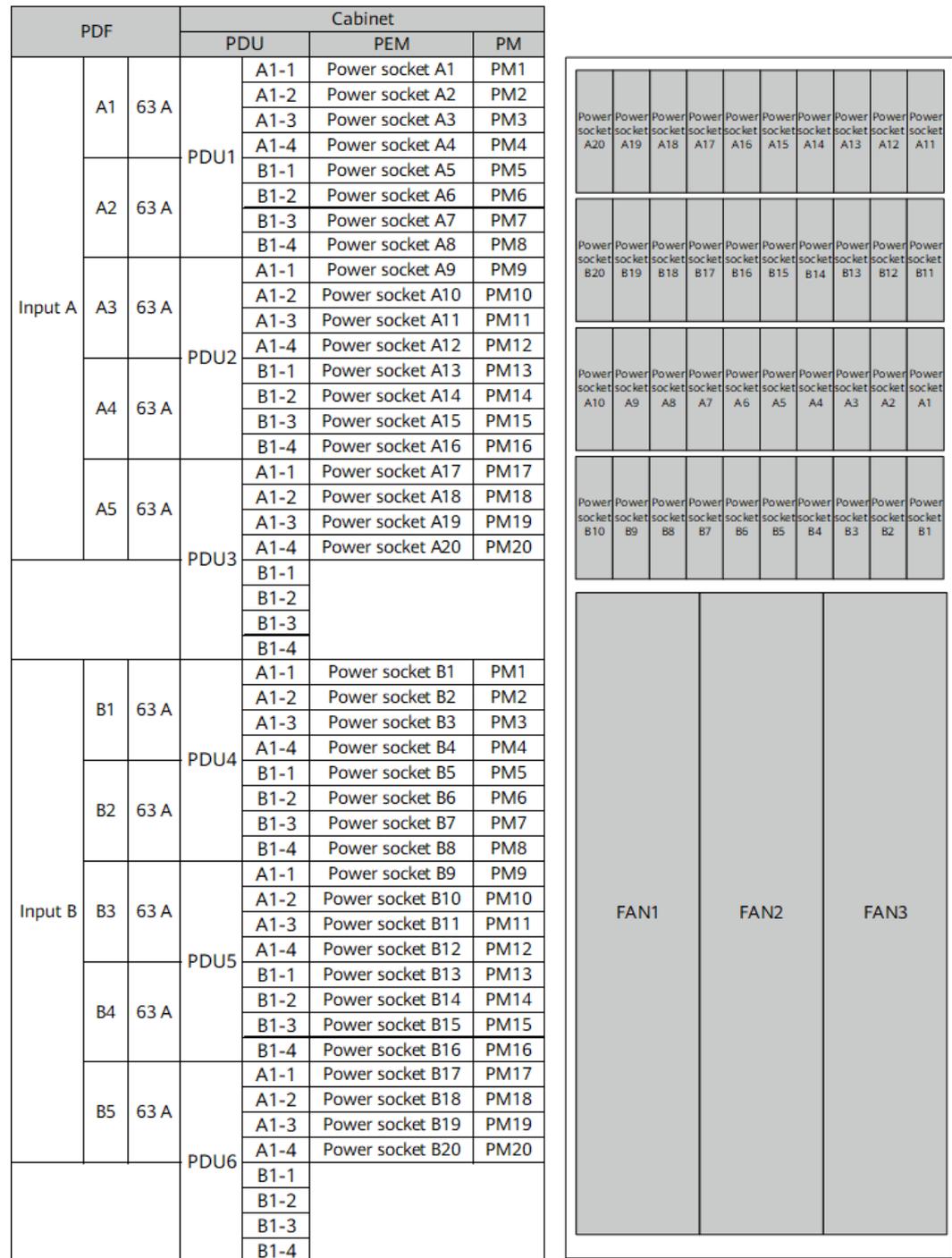
Cabling Distance from the PDU to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	5+5 input redundancy (outputs from the PDF)

Rated Current of Connected Circuit Breakers	≥ 63 A NOTE The rated current of 63 A is the recommended specification for circuit breakers A1 to A4 and B1 to B4.
Output Terminal Type in the PDU	HVDC-3Z-03 socket

Power Distribution Schemes

When one CloudEngine 16816 is installed in the cabinet/rack, 20 power modules (full configuration) are configured for the device. In this case, five 380 V high-voltage DC PDUs are required. For reliability purposes, you are advised to use six PDUs. Here, the output terminals of two PDUs are partially used.

Figure 3-40 CloudEngine 16816 chassis connected to the PDF through a 380 V high-voltage DC PDU

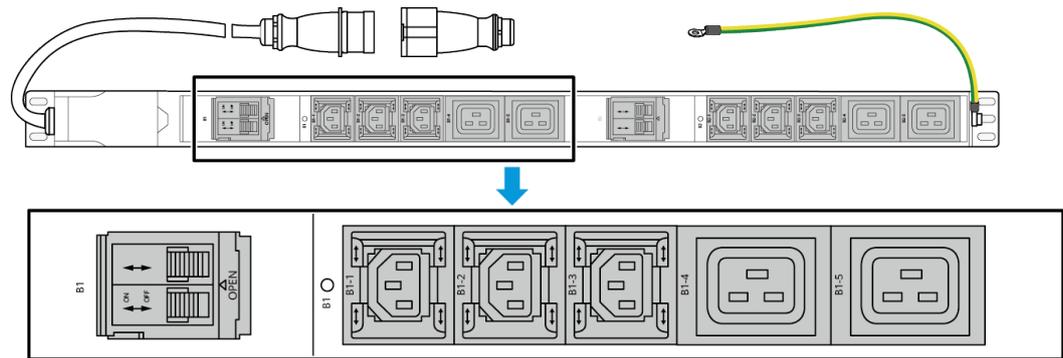


3.4.4.7 Connecting the CloudEngine 16816 to a PDF Through a 240 V DC PDU

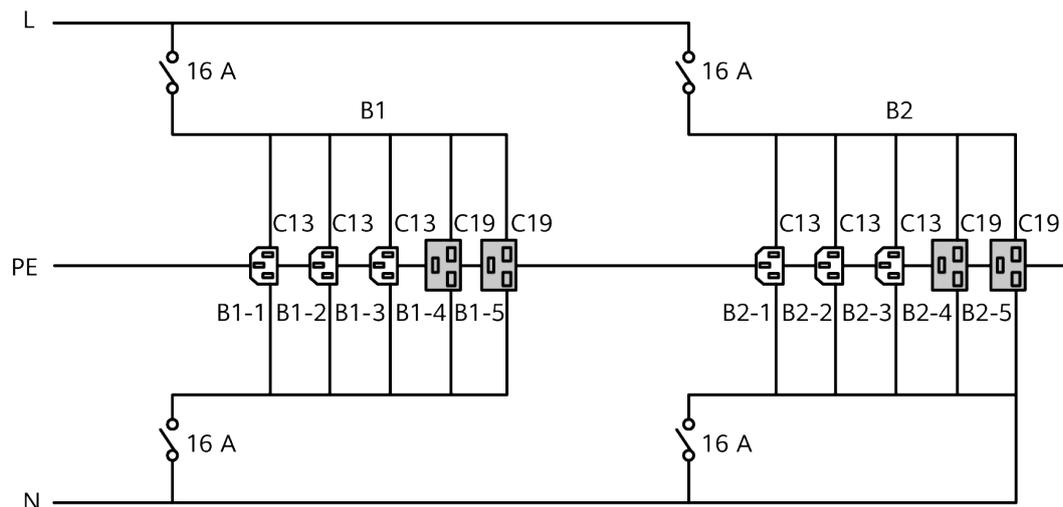
PDU Overview

A 240 V DC PDU is used to supply power to a device through a high-voltage DC power distribution system. [Figure 3-41](#) shows the appearance of a 240 V DC PDU.

Figure 3-41 240 V high-voltage DC PDU



A 240 V DC PDU provides two output groups B1 and B2. Each group includes three C13 sockets and two C19 sockets. Each group is controlled by a 16 A circuit breaker on the L line and a 16 A circuit breaker on the N line. The circuit breakers for the same group are closed or open at the same time. When the groups are connected to a chassis, the total current of all sockets in each group cannot exceed 16 A.



Power Distribution Requirements

NOTE

- The PDF uses power modules in 1+1 redundancy mode.
- If the chassis has a low power consumption, a small number of power modules in N+1 redundancy mode need to be configured. The vacant power module slots do not need to connect to the PDF.
- The CloudEngine 16800 must be reliably grounded. Circuit breakers with the current leakage protection function are not recommended for the devices.
- A maximum of eight PDUs can be installed in a Huawei A812-20 cabinet. When the 240 V DC PDUs are used, a maximum of eight power modules can be configured in a single cabinet or rack.

Table 3-25 Power distribution requirements (CloudEngine 16816 chassis)

Cabling Distance from the PDU to the Device's PEM	Determine this distance according to site survey results.
Number of Power Inputs	The 4+4 redundancy input (PDC output) is supported. Ensure that a maximum of eight power modules are configured in a cabinet or rack.
Rated Current of Connected Circuit Breakers	≥ 32 A NOTE The rated current of 32 A is the recommended specification for circuit breakers A1 to A4 and B1 to B4.
Output Terminal Type in the PDU	IEC 309 industrial connectors

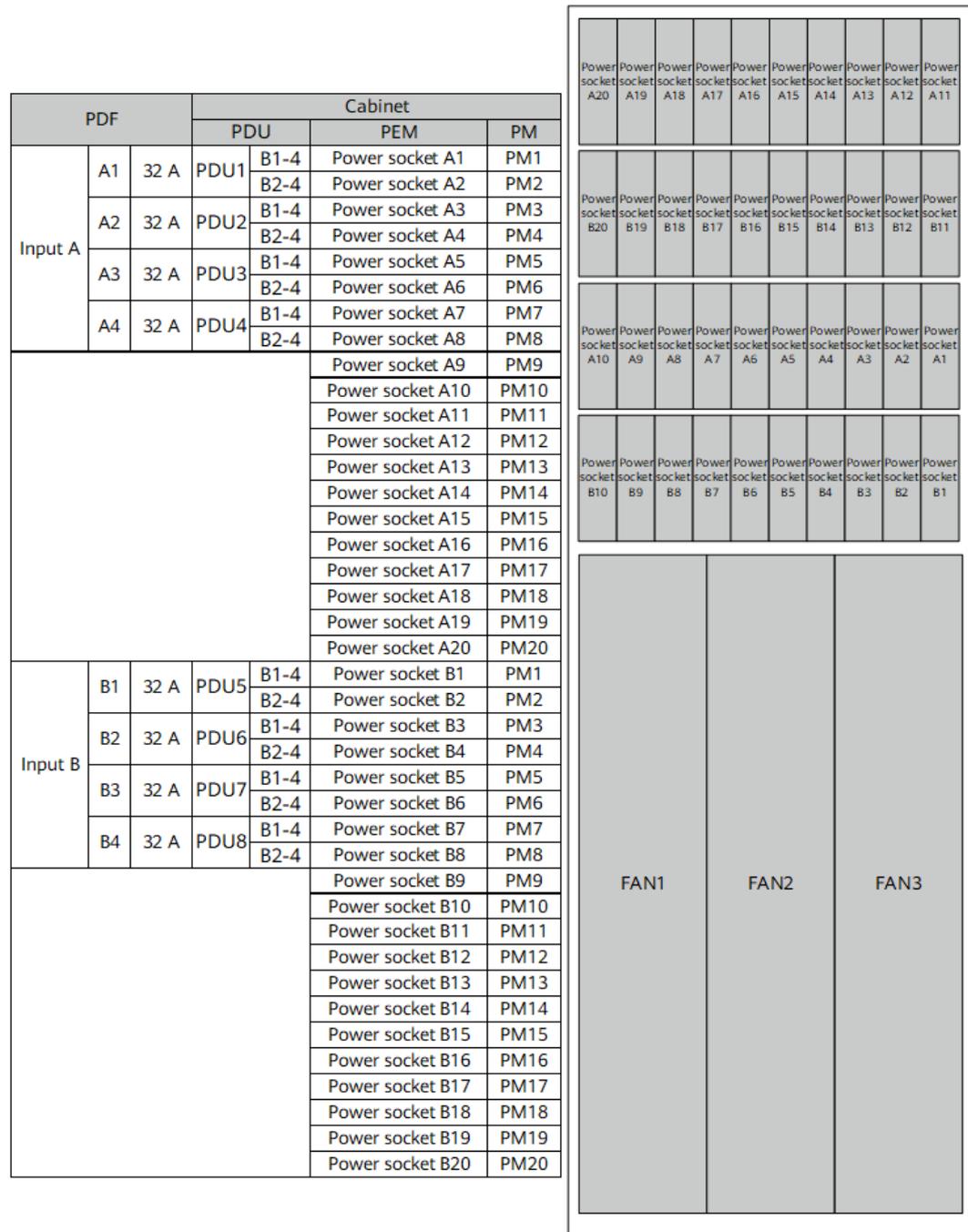
Power Distribution Schemes

When the 240 V DC PDUs are used and one CloudEngine 16816 is installed in the cabinet or rack, only eight power modules can be used and eight 240 V DC PDUs are required.

 **NOTE**

When the CloudEngine 16816 is configured with more than eight power modules, the 240 V DC PDU cannot be used.

Figure 3-42 CloudEngine 16816 chassis connected to the PDF through a 240 V DC PDU



3.5 Preparing Installation Tools and Accessories

Table 3-26 lists the tools required for installing a device.

Table 3-26 Installation tools

Tool	Description	Picture
Electrostatic discharge (ESD) gloves	Used to prevent ESD damage. They are included in the mandatory accessory package of the chassis.	
Protective gloves	Used to protect hands during operation.	
ESD wrist strap	Used to prevent ESD damage. Wear the strap on your wrist and insert the other end into the ESD jack on the cabinet. It is included in the mandatory accessory package of the chassis.	
Utility knife	Used to cut cartons or paper.	
Scissors	Used to cut the <i>Quick Installation Guide</i> .	

Tool	Description	Picture
Tweezers	Used to unplug Ethernet cables and optical fibers.	
Measuring tape	Used to measure distances.	
Marker	Used to mark component installation positions.	
Flat-head screwdriver	Used to turn slotted-head screws and bolts.	
Phillips screwdriver	Used to turn cross-head screws and bolts.	
Torque screwdriver	Used to turn slotted-head or cross-head screws and bolts. It allows for torque adjustment to avoid over-torque.	

Tool	Description	Picture
Combination pliers	Used to clamp or bend metal sheets, cut metal wires, strip off coating of cables, and unplug nails.	
Diagonal pliers	Used to cut insulation tubes and cable ties.	
Wire stripper	Used to strip off the insulation coating and shields of communication cables with small cross-sectional areas.	
RJ45 crimping tool	Used to crimp Ethernet cables.	
COAX crimping tool	Used to crimp the metal shield at the end of a coaxial cable.	

Tool	Description	Picture
Ethernet cable tester	Used to test Ethernet cable connectivity.	
Multimeter	Used to test cabinet insulation, cable connectivity, and device electrical performance indicators, including voltage, current, and resistance.	
Adjustable wrench	Used to tighten or loosen hex or square bolts and nuts. The span can be adjusted to suit bolts or nuts in different sizes.	

Table 3-27 lists the accessories required for installing a device.

Table 3-27 Installation accessories

Tool	Description	Picture
Insulation tape	Used to insulate electrical wires and other conductors.	
Corrugated pipe	Used to protect optical fibers.	

Table 3-28 lists the installation accessories delivered with the device.

Table 3-28 Installation accessories (applicable to the CloudEngine 16800)

Accessory	Quantity	Description	Part Number
Expandable guide rail	1 pair	Expandable in the range of 600 mm to 850 mm.	21242246
Quick Installation Guide	1	Used to guide device installation.	<ul style="list-style-type: none"> CloudEngine 16804 and CloudEngine 16808: 31500BEW CloudEngine 16816: 31500BEX

Accessory	Quantity	Description	Part Number
Serial cable	1 pair	Used to connect the console port of the device to a serial port of a maintenance terminal for local commissioning or maintenance of the device.	04040838
Ground cable	1	Used to ground the device.	04152748
Panel screw (M6x12)	10	Used to fix expandable guide rails and the device.	26020141
Floating nut (M6)	10	Installed on mounting rails of a cabinet or rack and used with M6 screws to secure the expandable guide rails and the device in the cabinet or rack.	26020075
Floating nut mounting bar	1	Used to install floating nuts.	63120191

Accessory	Quantity	Description	Part Number
ESD wrist strap	1	Used to prevent ESD damage when you touch or operate the device or components.	28050001
ESD gloves	2 pairs	Used to prevent ESD damage when you touch or operate the device or components.	02210177
Die-casting tweezers	1	Used to install or remove optical fibers on optical ports.	21123221
Fiber binding tape	2 m	Used to bundle optical fibers.	21101258
Cable tie (100 x 2.5 mm)	100	Used to bundle cables.	21100041
Cable tie (300 x 3.6 mm)	200	Used to bundle cables.	21100144

Accessory	Quantity	Description	Part Number
Label cable tie	100	Used to bundle cables and attach the power cable label (29041061) to the cables.	21200708
Signal cable label	30	Used to identify locations of signal cables.	29041060
Power cable label	2	Used to identify locations of power cables.	29041061
Bare crimp terminal (M8)	1	Used to replace an M6 bare crimp terminal when M8 screws are used to connect the ground cable to the ground point on the cabinet.	14170024
Heat shrink tubing	5 cm	Used to provide insulation protection for power cables.	28040011
Switch Fabric Unit (SFU) wrench	1 pair	Used to install SFUs in the chassis or remove SFUs from the chassis.	<ul style="list-style-type: none"> ● CloudEngine 16804: 21125663 ● CloudEngine 16808 and CloudEngine 16816: 21125452

Accessory	Quantity	Description	Part Number
Tool box for storing SFU wrenches	1	Used to store SFU wrenches.	<ul style="list-style-type: none">• CloudEngine 16804: 21244421• CloudEngine 16808 and CloudEngine 16816: 21244354
Cable management frame	1 pair	Used to route cables connected to Line Processing Units (LPUs).	<ul style="list-style-type: none">• CloudEngine 16804: 21125468• CloudEngine 16808: 21125470• CloudEngine 16816: 21125472