


H3C PSR450 Power Module Series User Manual-APW104

H3C PSR450系列电源手册-APW104

Overview 功能简介

 H3C PSR450 power module series include PSR450-12A, PSR450-12A1, PSR450-12AHD, and PSR450-12D. The PSR450-12A, PSR450-12A1, and PSR450-12AHD power modules support AC and high-voltage DC inputs, and the PSR450-12AHD supports 240V/336V high-voltage DC input. The PSR450-12D supports DC input. They can provide a maximum output of 450 W. The PSR450-12A provides power module-side intake and port-side exhaust airflows. The PSR450-12A1, PSR450-12AHD, and PSR450-12D provides port-side intake and power module-side exhaust airflows. PSR450系列电源包括PSR450-12A、PSR450-12A1、PSR450-12AHD和PSR450-12D这四款电源。其中PSR450-12A、PSR450-12A1、PSR450-12AHD均支持交流和高压直流输入、直流输出的交流电源模块，其中PSR450-12AHD支持240V/336V高压直流输入；PSR450-12D是直流输入、直流输出的直流电源模块。在这四款电源模块中，PSR450-12A是电源侧进风，端口侧出风的吹风电源模块；PSR450-12A1、PSR450-12AHD、PSR450-12D是端口侧进风，电源侧出风的抽风电源模块。

The power modules provide the following features:

PSR450系列电源模块特点：

- **Self-protection**—The power modules provide output overvoltage, output current limiting, output short circuit, overtemperature, and input undervoltage protections. See the following table for the protection and auto-recovery features of the power modules.支持保护功能—支持输入过流保护、输出限流保护、输入欠压保护、输出过压保护、输出短路保护、过温保护等功能
- **Redundancy**—Two power modules can be connected in parallel to achieve 1+1 redundancy and load sharing.支持冗余备份—支持双电源模块并联工作，以实现电源系统1+1备份，并且备份电源间具有负载均衡功能
- **Hot swapping**—You can remove one of the two power modules in 1+1 redundancy while the device is operating.支持热插拔—在设备正常工作的情况下，可对1+1冗余备份电源系统中的某个电源模块进行插拔操作

Protection function 保护功能	Protection state 保护状态特征	Support for auto-recovery 恢复特性
Output overvoltage protection 输出过压保护	The power module does not supply power, and the power module status LED is steady red. 无输出，指示灯红灯常亮	No. Power supply can restore only when you reconnect the power cord to the power source.故障排除后，重新插拔输入线缆电源可恢复，指示灯绿灯常亮
Output current limiting protection 输出限流保护	The power module does not supply power, and the power module status LED is steady red. 无输出，指示灯红灯常亮	Power supply restores after the output current decreases to an acceptable range. 故障排除后可自恢复，指示灯绿灯常亮
Output short circuit protection 输出短路保护	The power module does not supply power, and the power module status LED is steady red. 无输出，指示灯红灯常亮	Power supply restores after the short circuit problem is resolved. 故障排除后可自恢复，指示灯绿灯常亮

Protection function 保护功能	Protection state 保护状态特征	Support for auto-recovery 恢复特性
Overtemperature protection 过温保护	The power module does not supply power, and the power module status LED is steady red. 无输出，指示灯红灯常亮	Power supply restores after the temperature decreases to an acceptable range. 故障排除后可自恢复，指示灯绿灯常亮
Input undervoltage protection 输入欠压保护	The power module does not supply power, and the power module status LED is flashing red. 无输出，指示灯红灯闪烁	Power supply restores after the input voltage increases to an acceptable range. 故障排除后可自恢复，指示灯绿灯常亮

Technical specifications 电源模块规格

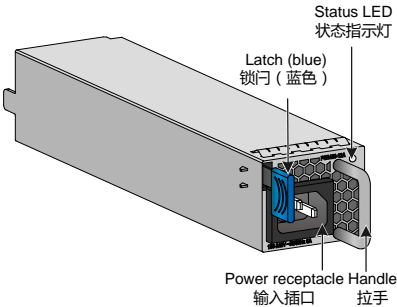
Item 项目		Specifications 规格	
		PSR450-12A/PSR450-12A1	PSR450-12AHD
AC input 交流输入	Rated input voltage 额定输入电压范围	100 to 240 VAC @ 50 or 60 Hz	100 to 240 VAC @ 50 or 60 Hz
	Rated input current 额定输入电流	6 A	6 A
	Max. input voltage 最大输入电压范围	90 to 290 VAC @ 47 to 63 Hz	90 to 290 VAC @ 47 to 63 Hz
	Max. input current 最大输入电流	7 A	7 A
High-voltage DC input 高压直流输入	Rated input voltage 额定输入电压范围	240 VDC	240 to 380 VDC
	Rated input current 额定输入电流	3 A	3 A
	Max. input voltage 最大输入电压范围	180 to 320 VDC	180 to 400 VDC
	Max. input current 最大输入电流	3.5 A	3.5 A
Output voltage 输出电压		12 V/3.3 V	12 V/3.3 V
Output current 输出电流		37.5 A (12 V)/2 A (3.3 V)	37.5 A (12 V)/2 A (3.3 V)
Max. output power 最大输出功率		450 W	450 W
Dimensions (H × W × D) 外形尺寸 (高 × 宽 × 深)		40.2 × 50.5 × 221 mm (1.58 × 1.99 × 8.70 in)	40.2 × 50.5 × 221 mm (1.58 × 1.99 × 8.70 in)
Operating temperature 工作环境温度		−10°C to +55°C (14°F to 131°F)	−10°C to +55°C (14°F to 131°F)
Relative humidity 相对湿度		5% to 95%	5% to 95%

Item 项目		Specifications 规格
		PSR450-12D
DC input 直流输入	Rated input voltage 额定输入电压范围	-48 to -60 VDC
	Rated input current 额定输入电流	12 A (48 VDC) 10 A (60 VDC)
	Max. input voltage 最大输入电压范围	-36 to -72 VDC
	Max. input current 最大输入电流	15 A
Output voltage 输出电压		12 V/3.3 V
Output current 输出电流		37.5 A (12 V)/2 A (3.3 V)
Max. output power 最大输出功率		450 W
Dimensions (H × W × D) 外形尺寸 (高×宽×深)		40.2 × 50.5 × 221 mm (1.58 × 1.99 × 8.70 in)
Operating temperature 工作环境温度		-10°C to +55°C (+14°F to +131°F)
Relative humidity 相对湿度		5% to 95%

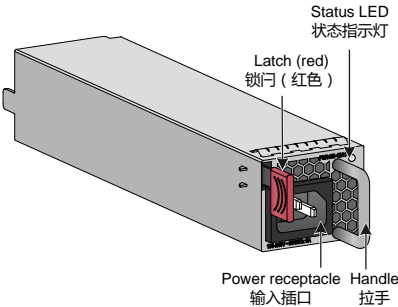
Views 电源模块示意图

☞ A blue latch indicates power module-side intake and port-side exhaust airflows. A red latch indicates port-side intake and power module-side exhaust airflows.
锁门为蓝色，表示电源侧进风、端口侧出风。锁门为红色，表示端口侧进风、电源侧出风。

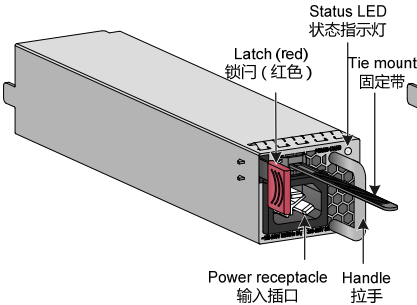
PSR450-12A



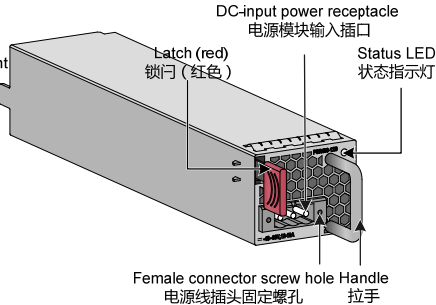
PSR450-12A1




PSR450-12AHD



PSR450-12D



LEDs 电源模块状态指示灯

 The power module has a status LED on its front panel. The following table provides the LED description. 电源模块面板上都有一个电源模块指示灯，用于指示电源的输入、输出状态。指示灯在不同情况下的状态及所表示的含义，如下表所示。

LED status 指示灯状态	Description 含义
Steady green 绿色常亮	The power module is operating correctly.电源模块工作正常
Flashing green 绿色闪烁	The power module has power input but is not installed in the device. 当前电源模块有电流输入（电源模块输入正常，但未安装到设备上，此时电源模块的指示灯会绿色闪烁）
Steady red 红色常亮	The power module has failed or entered protection state. 电源模块出现故障或进入保护状态
Flashing red/green alternatively 红色/绿色交替闪烁	The power module has generated an alarm for power problems (such as output overcurrent, output overload, and overtemperature), but has not entered protection state.电源模块告警（电源模块出现了如下情况，但还没有进入保护状态：输出过流、输出功率过载、过温等）
Flashing red 红色闪烁	<ul style="list-style-type: none">The power module does not have power input. If two power modules are installed and only one power module has power input, the status LED of the power module that does not have power input flashes red. 当前电源模块没有电流输入（设备安装有两块电源模块，如果其中一块电源有电流输入、另一块电源无电流输入，此时无电流输入的电源模块的指示灯会红色闪烁）The power module is in input undervoltage protection state. 输入欠压保护
Off 灭	The power module does not have power input.电源模块没有电流输入

Safety guidelines 安全注意事项

! To prevent device damage and bodily injury, follow these restrictions and guidelines when you install or remove the power module:

为避免对电源模块和设备造成损坏及对人身伤害，请遵从以下的注意事项：

- Before you install a power module, make sure its airflow direction is as required.
在安装电源模块以前，请确认电源模块气流方向和安装环境的通风要求一致。
- Do not install power modules that provide different airflow directions on the same device.
不同风向的电源模块不要混插在同一台设备上。
- Always wear an ESD wrist strap and make sure it makes good skin contact.
在安装和拆卸电源模块时，请佩戴防静电腕带，并确保防静电腕带与皮肤良好接触。
- Before installing a power module, make sure the voltage of the power source is as required by the power module, and the output voltage of the power module is as required by the device.
在安装电源模块以前，请确保外置供电系统的工作电压与电源模块所标电压、电源模块输出电压与设备所需电压一致。
- Do not touch any bare cables or terminals. 请不要接触电源模块中露出的任何导线、端子部分。
- Do not place the power module in a wet area, and prevent liquid from flowing into the power module.
请不要将电源模块放置在潮湿的地方，也不要让液体进入电源模块内部。
- To avoid power module damage, do not open the power module. When the internal circuits or components of the power module fail, contact H3C Support. 为了防止电源模块受损，请不要随意打开电源模块外壳，当电源模块内部线路或元器件出现故障时，请移交维修人员进行检修。

Tools 工具准备

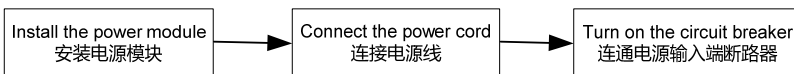
💬 No ESD wrist strap is provided with the power module. Prepare it yourself.
安装和拆卸电源模块和电源线过程中需要佩戴防静电腕带，请用户自行准备。

Installing and removing the power module 电源模块的安装与拆卸

- 💬**
- The installation and removal procedures for the PSR450 power modules are similar. The following procedures use a PSR450-12A power module as an example. PSR450系列电源模块的安装与拆卸的操作步骤基本相同，本手册以PSR450-12A交流电源模块为例进行介绍。
 - Make sure the power module is compatible with the device. For information about the compatibility matrix between power modules and the device, see the installation guide for the device.
安装前请检查电源模块型号与设备是否匹配，具体请参见各产品的安装指导。

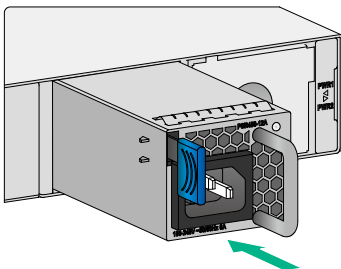
1 Installing the power module 安装电源模块

💬 To avoid bodily injury or device damage, follow the steps in the following figure to install the power module.
电源模块的安装过程应严格按照下图顺序进行，否则可能会对设备造成损坏或对人身造成伤害。



- ① Wear an ESD wrist strap, and make sure the strap makes good skin contact and is reliably grounded.
佩戴防静电腕带，请确保防静电腕带与皮肤良好接触，并确认防静电腕带已经良好接地。
- ② Remove the filler panel, if any, from the target power module slot. Keep the removed filler panel secure for future use. 若准备安装电源模块的电源槽位上有电源假面板，则在安装电源模块前请先拆卸电源假面板。请妥善保管电源模块插槽的假面板，以备将来需要时使用。

- ③ Unpack the power module and verify that the power module model is as required. Keep the power Module package secure for future use.从电源模块包装盒中取出电源模块，确认电源模块的型号与所需一致。请妥善保管电源模块的包装盒、包装袋等物品，以备将来需要时使用。
- ④ Correctly orient the power module. Holding the power module handle with one hand and supporting the power module bottom with the other, slide the power module along the guide rails into the slot until you hear a click.保证电源模块上下方向正确（电源模块及插槽为防反插结构设计，如果安装方向错误，电源模块将不能完全插入到插槽中），用一只手握住电源模块上的拉手，另一只手托住电源模块底部，将其后端对准电源插槽，将电源模块沿电源插槽水平插入插槽。当电源模块完全插入到插槽时，会听到电源模块上的锁门卡住插槽的声音。



- Make sure the power module makes good contact with the backplane of the device.插入电源模块的过程中，可以借助轻微的惯性将其插入插槽，从而保证电源后端与背板插口良好接触。
- The power module slot has a disorientation rejection structure. If you cannot insert the power module into the slot, re-orient the power module rather than use excessive force to push it in. 为了避免损坏或弯曲电源端子，在插入过程中，如果位置没有对正，请先将电源模块拉出，调整位置后再重新插入。

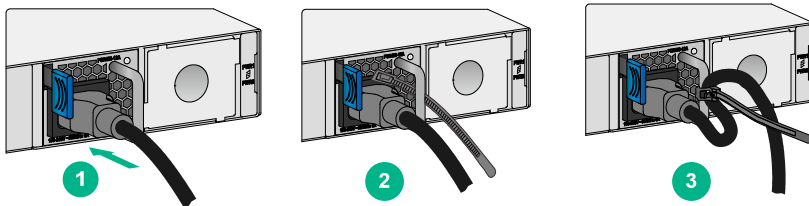
2 Connecting the power cord 连接电源线

- Make sure each power cord has a separate circuit breaker.请保证电源线有独立的输入断路器。
- Turn off the circuit breaker before connecting the power cord. 连接电源线前，请将需要连接电源线的输入端断路器置于断开状态。
- For a PSR450-12D power module, the power cord connector and the receptacle form a disorientation rejection structure. If you cannot insert the connector into the receptacle, the orientation might be wrong. Re-orient the connector rather than use excessive force to push it in.连接PSR450-12D电源模块的电源线时，注意电源线插头及插口为防反插结构设计，插入时请保证电源线插头上方向正确。

① Connect and secure the power cord to the power module 连接并固定电源线

PSR450-12A/PSR450-12A1 power module PSR450-12A/PSR450-12A1电源模块

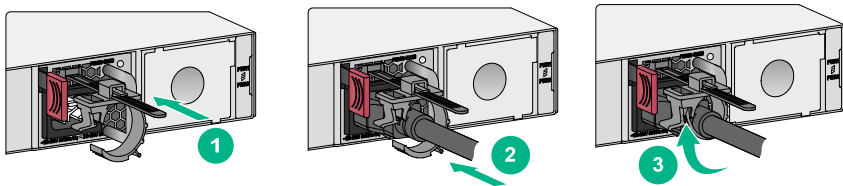
For a PSR450-12A or PSR450-12A1 power module, connect the female connector of the power cord to the power receptacle on the power module, and then use a cable tie to secure the power cord to the handle of the power module.连接PSR450-12A/PSR450-12A1电源模块的电源线时，将电源线带插孔的一端插到电源模块的输入插口上，再用可拆卸式扎带将电源线固定到电源模块的拉手处，以防电源线脱落。



PSR450-12AHD power module PSR450-12AHD电源模块

For a PSR450-12AHD power module, slide the cable clamp onto the tie mount, connect the female connector of the power cord to the power receptacle on the power module, and then close the cable clamp and slide it forward until it is flush against the edge of the female connector.

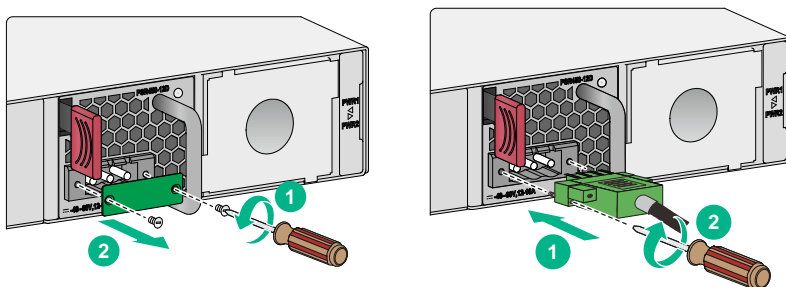
连接PSR450-12AHD电源模块的电源线时，先将防脱线扣扣到电源模块自带的固定带上；再将电源线带插孔的一端插到电源模块的输入插口上；最后使用防脱线扣扣紧电源插头，以防止电源线插头松动。



PSR450-12D power module PSR450-12D电源模块

For a PSR450-12D power module, use a flat-head screwdriver to loosen the screws on the protection cover over the power receptacle and then remove the cover. Connect the female connector of the power cord to the power receptacle on the power module, and then fasten the screws on the connector.

连接PSR450-12D电源模块的电源线时，先用一字螺丝刀逆时针旋松直流电源连接器保护盖两侧的固定螺钉，并取下连接器的保护盖，再将电源线插头插入到电源模块的直流输入插口上，用一字螺丝刀顺时针方向拧紧直流电源线插头两侧自带的螺钉，使电源线插头固定在电源模块直流输入插口上。

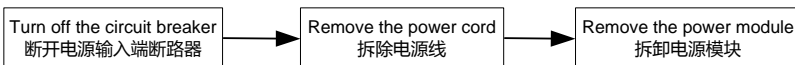


To prevent the power cord from falling off, use a removable cable tie to secure the power cord to the power module handle. For the securing method, see "PSR450-12A/PSR450-12A1 power module." 为防止电源线脱落，请使用可拆卸式扎带将电源线固定到电源模块的拉手处，固定方法同PSR450-12A/PSR450-12A1电源模块。

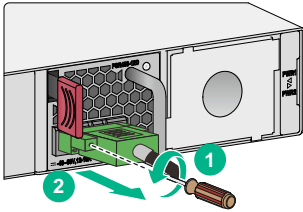
- ② Connect the other end of the power cord to an AC or DC power source, and then turn on the circuit breaker. 将电源线的另一端插到外置交流或直流供电系统的插座上，并连通电源输入端的断路器。
- ③ Examine the LED on the power module. If the LED is steady green, the power cord is connected correctly. If the LED is off or red, examine the installation and troubleshoot the problems until the LED becomes steady green. 查看电源模块的状态指示灯，如果指示灯的状态为绿色常亮，说明电源线连接成功。如果指示灯不亮或为红色，请仔细检查安装情况，排除各种故障后，再次尝试，直到电源模块状态指示灯正常为止。

3 Removing the power module 拆卸电源模块

To avoid bodily injury or device damage, follow the steps in the following figure to remove the power module. 电源模块的拆卸过程应严格按照下图顺序进行，否则可能会对设备造成损坏或对人体造成伤害。

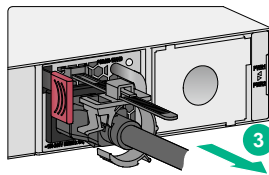
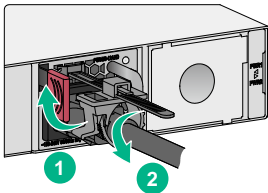


- ① Turn off the circuit breaker for the power feed to the power module. 断开电源输入端断路器。
- ② Wear an ESD wrist strap, and make sure the strap makes good skin contact and is reliably grounded. 佩戴防静电腕带，请确保防静电腕带与皮肤良好接触，并确认防静电腕带已经良好接地。
- ③ Loosen the removable cable tie, and remove the power cord connector from the power module. 松开固定电源线的可拆卸式扎带，取下电源线。



For a PSR450-12D power module, use a flat-head screwdriver to loosen the screws on the connector, and then remove the power cord connector from the power module. PSR450-12D电源模块需要先使用一字螺丝刀逆时针拧下直流电源线插头两侧自带的螺钉，然后将插头向外拔出。

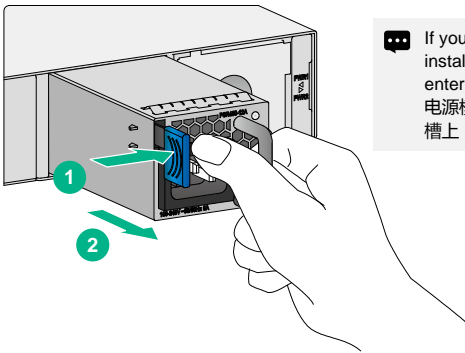
For a PSR450-12AHD power module, release the jaw of the cable clamp and open the cable clamp, and then remove the power cord connector from the power module. PSR450-12AHD电源模块需要先解开防脱线扣上的卡扣，然后松开电源线缆上的防脱线扣，最后向外拔出电源线插头。



④ Hold the handle of the power module with one hand, press the latch on the power module to the right with your thumb, and pull the power module part way out of the slot. Supporting the power module bottom with one hand, slowly pull the power module out of the slot along the guide rails with the other. 一只手握住电源模块上的拉手，用拇指向拉手侧掰动锁门，同时向外垂直拉动电源模块，将模块拉出来一部分后，用另一只手托住电源模块底部，将电源模块缓慢拉出。

⑤ Put the removed power module on an antistatic mat or in its initial package.

将拆卸下来的电源模块放置到防静电垫子上或电源模块的包装袋中。



💬 If you are not to install a power module in the slot, install a filler panel in the slot to prevent dust from entering the chassis. 如果该电源插槽中不再安装电源模块，请将电源模块插槽的假面板安装到该插槽上，以免灰尘进入机箱。