MR483000HG2B-GS Rectifier Module

User Manual

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Shenzhen Megmeet Electrical Co., Ltd. provides customers a full range of technical support. Users can contact the nearest Megmeet office or customer service center, or directly contact the company headquarters.

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Content

1. Product Introduction

MR483000HG2B-GS is a power supply device that converts standard AC voltage into stable 48Vdc for communication power supply system.
For a larger load capacity, the rectifier modules can be connected in parallel, or an additional independent monitoring module can be used for intelligent control.
The rectifier module is a plug-in modular unit designed to be compatible with racks and cabinets.

1.1 Appearance

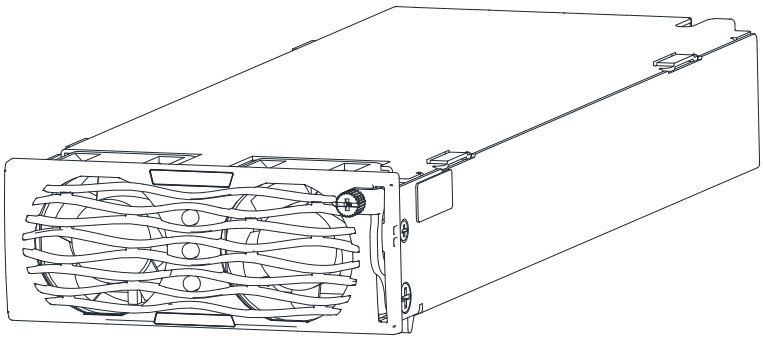


Figure 1-1 Appearance

1.2 Operating environment

Item	Configuration
Operating temperature	–10℃~+75℃ Note: When the ambient temperature is -10℃ ~ 55℃, it works normally; At 55℃ ~ 65 ℃, the output power is linearly derated to 80%； At 65℃ ~ 75℃, the output power is linearly derated to 40%,。 And when the power system is at -40℃, it can start normally after the input is powere on. Output voltage waveform is not required.
Storage temperature	–40℃~+75℃
Relative humidity	5%~95% （no condensation）
Altitude	≤4000m （When the altitude ranges from 3000 m to 4000 m, the operating temperature decreases by 1ºC for each additional 200 m）

1.3 Electrical Characteristics

Item	Input parameters
Operating Voltage	85Vac to 290Vac
Frequency	45Hz~66Hz； Rated value is 50Hz/60Hz
Input current	≤18A
Power factor	≥0.99 （220Vac@20%~100% load）

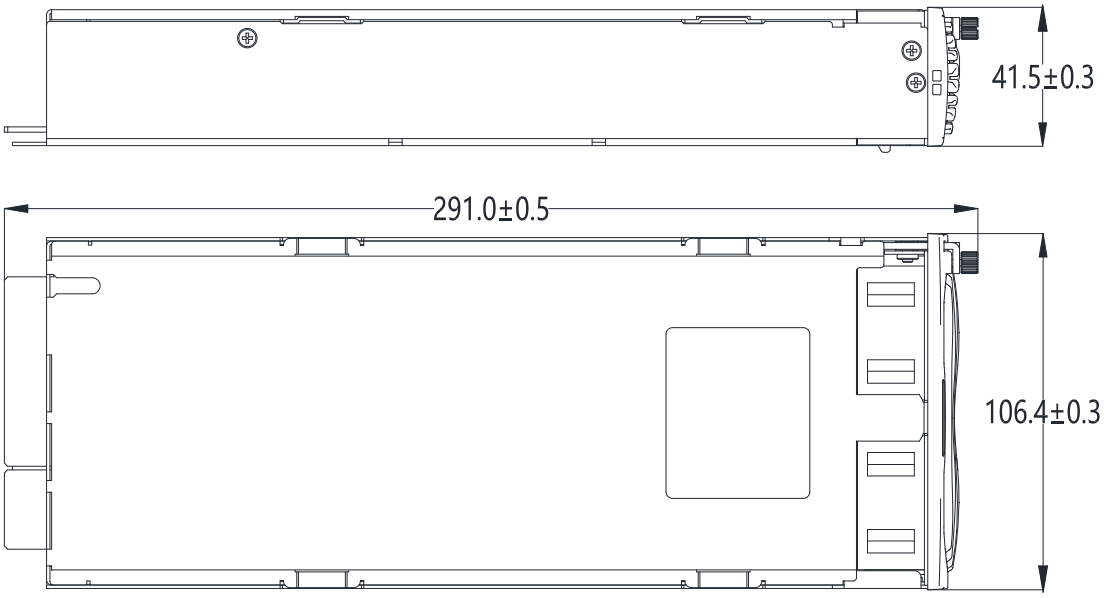
THD	≤5%（50%~100% load）

Item	Output parameters
Output voltage	42V DC~58V DC Rated value is 53.5V DC
Linear power derating	3000W（176V AC~290V AC） 3000W~1250W（175V AC~85V AC）
Regulated voltage precision	≤±0.6%V_o
Ripple and noise	≤200mV_{p-p}（bandwidth≤20MHz）
Standby power	≤4W
Startup duration	3s~8s（Instant start mode）
Output hold-up time	>10ms
Phone noise weighting voltage	≤2mV
Wide-band noise voltage	≤50mV（3.4kHz~150kHz） ≤20mV（0.15MHz~30MHz）

1.4 Mechanical characteristics

Item	Specification
Dimensions	41.5mm（H）×106.4mm（W）×291mm（D） *Note: For slot design, please contact sales for 3D model of the module*
Weight（Without packaging）	<2Kg
Cooling mode	Forced air cooling, built-in fan (with linear speed regulation function)

Figure 1-2 Product drawing



1.5 Output characteristics

176Vac≤Input voltage≤290Vac&-10°C≤Ambient temperature≤45°C

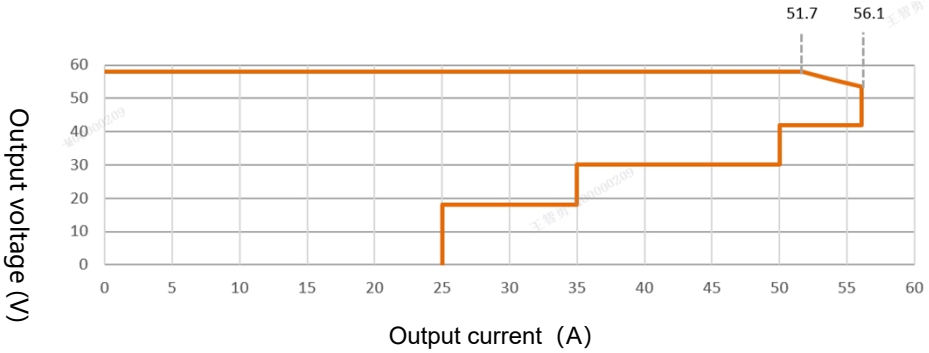


Figure 1-3 Output characteristic curve

-10°C≤Ambient temperature≤45°C

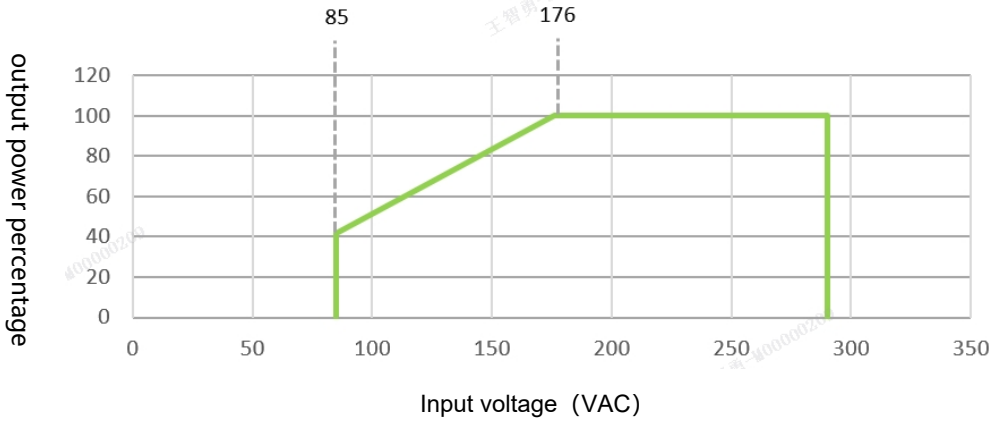


Figure 1-4　Input Voltage Derating Curve

176Vac≤Input voltage≤290Vac

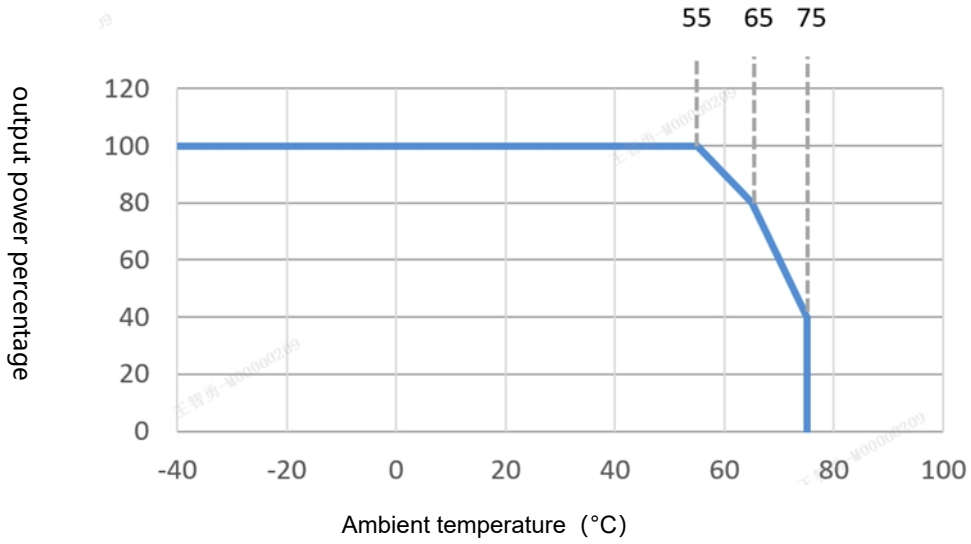


Figure 1-5　Temperature Derating Curve

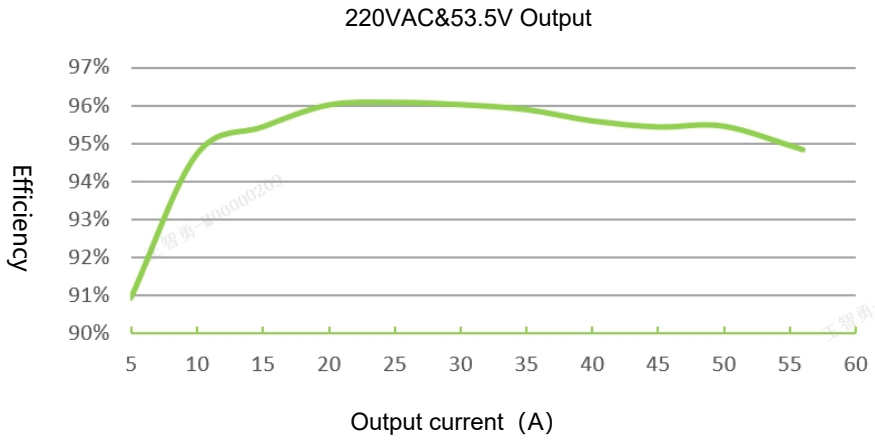


Figure 1-6 Efficiency curve

1.6 Other features

Item	Index
Protection Features	
Input over voltage protection	➢290Vac<Input voltage<300Vac：The warning light is on, the output is normal ➢300Vac<Input voltage：output off
Input over-voltage recovery	Input voltage<290Vac，automatic recovery
Input under-voltage protection	Input voltage<80±5Vac output off
Input under-voltage recovery	Input voltage>80~90VAC, automatic recovery
Output over-voltage protection	➢ Internal over-voltage: 58.5VDC~60.5 VDC, Can be set via monitor ➢ When the internal over-voltage protection occurs, the module locks out
	➢ External over-voltage：>63VDC, And last for more than 500ms ➢ When external over-voltage protection occurs, the module locks out
	➢ The above two output over-voltages can be recovered by re-powering on
Output current limiting protection	See module output characteristic curve
Output short-circuit protection	It can be short-circuited for a long time, and it can be automatically restored after the short-circuit disappears.
Overtemperature protection	With over temperature protection
Safety/EMC/Surge Protection	
Certification & Safety	➢ Passed the CE、UL、UL-CB certifications and obtained the CB、UL、CE certificate ➢ UL 62368-1 ➢ EN 62368-1 ➢ IEC 62368-1
EMC	➢ EN 55032 Class B ➢ EN 55035 ➢ IEC 61000-3-2 ➢ IEC 61000-3-3
Lightning protection	5KA 8/20μs

Reliability	
MTBF	>500,000 hours (25℃)
Audible Noise	
Specification	≤55dB(A) (40℃)

1.7 Interface description

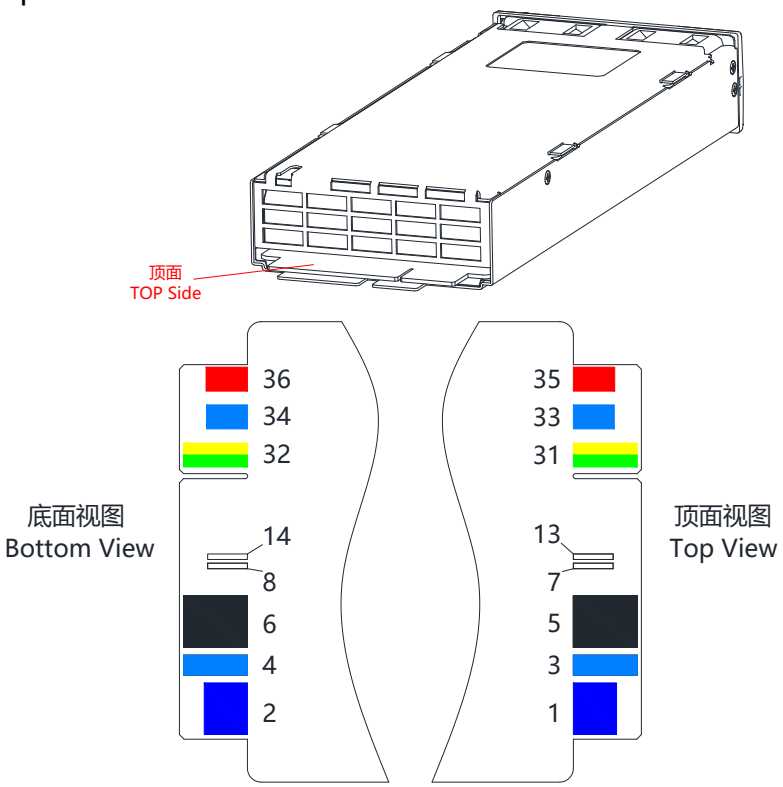


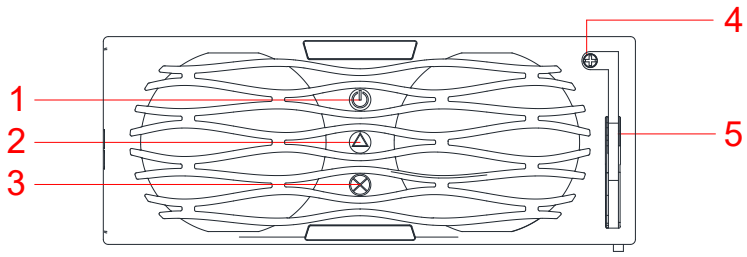
Figure 1-7 Projection diagram of module gold finger

Table 1 Definition of module gold finger

Pin number	Pin function description
1、2	Output 48V-
3、4	Pre-charge
5、6	Output 48V+
7	Group address wire of rectifier
8	Group inner address wire of rectifier
13	CANL
14	CANH
31、32	module protection ground
33、34	AC input neutral（N）

35、36	AC input phase line（L）

1.8 Module panel introduction



（1）Power Indicator　　（2）Alarm indicator　　（3）Fault indicator

（4）Fastening screws　　（5）handle

There are three indicator lights on the module panel. The indicator lights are used to reflect the running status of the module. The specific description of the indicator lights is as follows:

Table 2 Description of the indicator lights of the rectifier module

Indicator	Indicator color	Status	Status description	Suggested solution
Power indicator	Green	On	Module AC input is normal	Normal state, no action required
		Off	The AC input of the module is abnormal (no input power supply, input power supply over-voltage and under-voltage, etc.)	Check whether the input is normal; if the input is normal, replace the rectifier module
		4Hz flashing (4times/sec)	Manual query status	Normal state, no action required
Alarm indicator	Yellow	Off	No abnormal alarm	Normal state, no action required
		On	Temperature pre-alarm (ambient temperature exceeds 65℃ ~ over-temperature shutdown)	Check whether the ventilation of module are blocked and whether the ambient temperature is normal
			Dormancy shutdown (when the module is in dormancy shutdown, only the protection indicator is on, and the module does not report an alarm)	Normal state, no action required
			290Vac<Input voltage<300Vac	Check if the input voltage is normal
			Module current limiting	Normal state, no action required
		4Hz flashing (4times/sec)	Module hardware address error	Check if module is inserted in place and locked
		0.5Hz flashing (1times/2s)	The communication between the module and the outside is interrupted	Replace the rectifier module or monitoring module; check the CAN bus wiring of the power system for errors
Fault indicator	Red	Off	No abnormal alarm	Normal state, no action required
		On	The output is locked due to over-voltage or the module is not inserted in place	Unplug the rectifier module, wait for more than 1 minute, and then insert it
			No output caused by internal fault of rectifier module	Replace the rectifier module

2. Module user guide

This chapter mainly introduces the correct use methods in some applications of the rectifier module, and some precautions during application.

2.1 Module installation

Danger!

- Do not put your hand into the module slot to prevent electric shock
- Non-professional personnel cannot plug or replace the rectifier module with power on.

- Step 1, take out the module from the box.
- Step 2, hold the handle on the front panel of the module, support the module with your hand, and slowly push the module into the slot.
- Step 3, slowly push the module until the front panel of the module is flush with the panel of the power distribution sub-rack.
- Step 4. Tighten the fixing screws on the front panel of the module clockwise to lock the module on the power distribution frame.

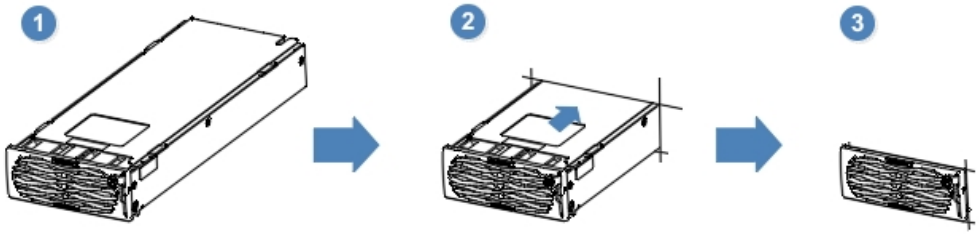


Figure 2-1 Rectifier module installation steps

Notice!

- After unpacking the rectifier module in the indoor scene, it is recommended to power on it within 7 days. If it cannot be powered on in time, the rectifier module needs to be placed in an indoor, dry and non-corrosive gas environment.
- After unpacking the rectifier module in outdoor scenarios, it is recommended to power on it within 24 hours. If it cannot be powered on in time, the rectifier module needs to be placed in an indoor, dry, and non-corrosive environment.
- After the module is installed, be sure to fix the module and the slot firmly through the fixing screws on the panel. Otherwise, vibration during the operation of the product, etc., will cause the module to come out of the slot, resulting in damage to the module.

2.2 Module fixation

If the design or processing tolerance of the slot of the finishing module is not well controlled, the module will not work properly, be damaged, etc. It is recommended to design according to the slot 3D model provided by Megmeet or purchase the demanded module slot from Megmeet.

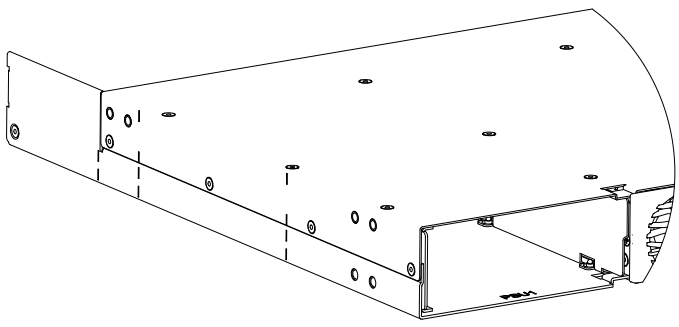


Figure 2-2 Schematic diagram of the rectifier module slot

2.3 CAN Bus Termination Resistor

- In order to ensure the communication quality of the module, the CAN bus needs to use T-type wiring, and star-type wiring is not recommended.
- It is necessary to install a 120-Ω matching resistor on the head and tail of the CAN bus. After adding the resistance, the resistance of the CAN bus is 60 Ω.
- If there is a monitoring module or a host computer on the CAN bus, you need to confirm whether the monitoring module or the CAN bus of the host computer has a built-in default 120 Ω resistance, and ensure that the impedance of the CAN bus is 60 Ω.

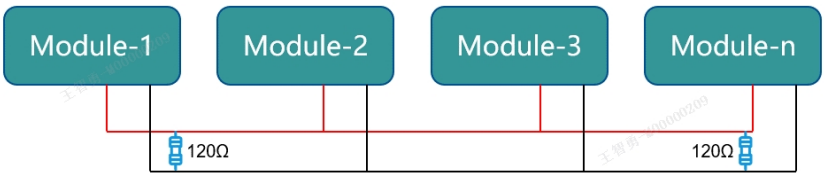


Figure 2-3 CAN bus T-type network without monitoring module

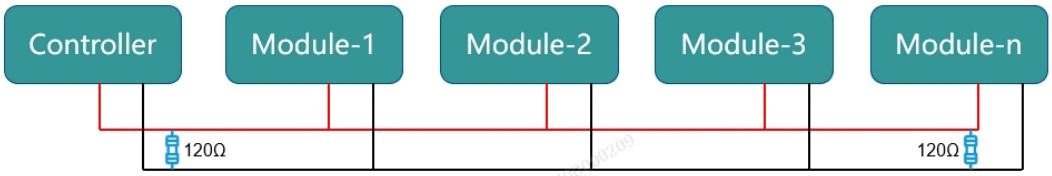


Figure 2-4 CAN bus T-type network with monitoring module

2.4 Hi-pot test

- The module has built-in lightning protection circuit, and the input L and N have gas discharge tubes to the ground. If the withstand voltage test is performed, the grounding screw of the lightning protection circuit needs to be removed (the red circle in the figure below), otherwise it will cause the withstand voltage test to fail.
- After the hi-pot test, replace the screw, otherwise the module may be damaged by lightning strikes.

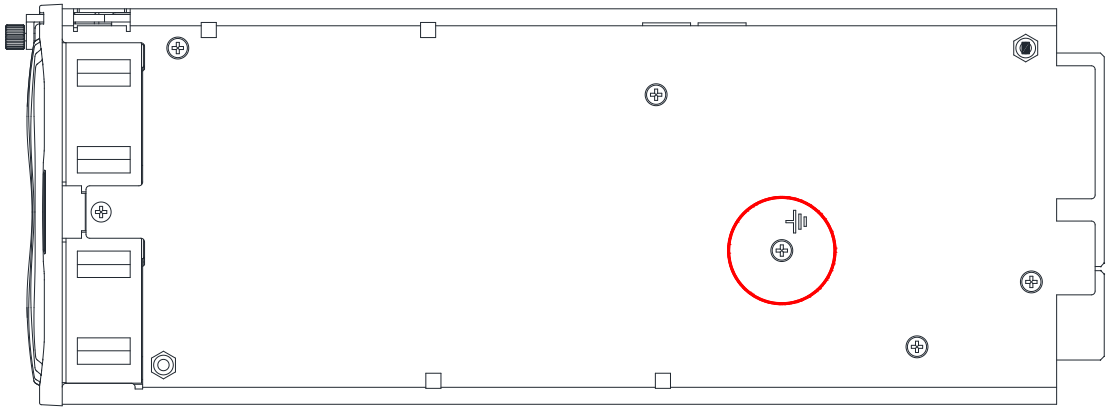


Figure 2-5 The location of the lightning protection grounding screw

2.5 Lightning protection design

- The rectifier module has a built-in D-level lightning protection circuit, which can withstand the lightning current of 5KA 8/20μs waveform. If the system needs to pass a higher level lightning current, such as a C-level (20KA 8/20μs) lightning strike, the system needs to install a C-level lightning protection device, and follow the classification principle of lightning protection design, between the C-level lightning protection device and the module. There should be enough distance (recommended distance should not be less than 5M) or install lightning protection decoupler or make hollow decoupling coil. Otherwise, the rectifier module may be damaged when struck by lightning;
- If the system needs to meet higher-level lightning protection requirements, such as B-level lightning protection. There needs to be a C-level lightning protection device between the B-level lightning protection and the rectifier module, and there must be sufficient distance or decoupling between the various levels of lightning protection.

2.6 Ventilation Requirements

The rectifier module is cooled by a fan, with forced ventilation from front to back. The design of the rectifier module mounting frame must ensure that the rectifier module is located in the vent and is not blocked, and the air temperature entering each rectifier module cannot exceed the specified range of the working ambient temperature.

2.7 Module replacement

The rectifier module can be uninstalled or installed while the power system is running (hot-swappable) for easy installation and maintenance.

 Danger!

Be careful when the copper is unloaded, the surface of the rectifier module can be very hot when it is running.

 Notice!

1) Removing a rectifier module from a running system will cause a system alarm. After the rectifier module is replaced, the system monitoring module must be reset. For additional information on rectifier module replacement, please refer to the separate documentation for the relevant power system or monitoring module.
2) The lock frame of the rectifier module is installed on the right side of the horizontal mortise lock module of the rectifier module. The positioning pin and the module handle are linked with each other.

 Warning!

To prevent damage to the module latch, make sure the handle is in the open position before pushing the module into the rack.

Steps

1. To replace the module, loosen the screw on the handle of the module (turn counterclockwise a few turns to loosen the screw), pivot the handle 90 degrees to the open position.
2. Grasp the handle and pull the module firmly from the rack.
3. To replace the module, loosen the screw on the module (turn counterclockwise a few turns to loosen the screw), pivot the handle 90 degrees to the open position.
4. Put the module into the rack mounting position and with the handle in the open position, push the module into the rack.
5. Push the handle into the front panel of the module to securely lock the module to the rack, then tighten the screw on the handle.