

User Manual



Powersys 48V/4kW 1U Power Supply System

Safety Precautions

1. The equipment represents an energy hazard and failure to observe this could cause terminal injury and invalidate our warranty.
2. There are hazardous voltages inside the power system. As the modules incorporate large charged capacitors, it is dangerous to work inside the system even if the mains supply is disconnected.
3. Large current in the equipment, must connect the ground before connected the telecommunication equipments.
4. Please read the manual carefully before using the equipment.

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1 Application Range

Powersys 1U 48V/4kW Power supply system is one of the direct communication equipments. The switch with high frequency and technical applications substantially reduce the size and weight of equipment for fast output effect. Modules can withstand a very wide range of input voltage.



Power factor > 0.99 (50% -100% loading). Output voltage ripples wave Peak-Peak <200 mV.

GR4830L module comply with all eu provided the necessary standards. Please read the installation instructions to help you to correctly open the system.

In addition, the handbooks also display the light directing and failure condition. The manual also display the working requests, such as the temperature, humidity and noise.

2 Warning

In using powersys 1u 48v system must also read manuals. Manuals use some marks to help you more easily find or understand.

Marker	Meaning
	This mark represent the content is very important or crucial information
	This mark represent the content is necessary remark or important advice

3 About this guide

3.1 System description

Powersys System is a specially designed for the communications industry development compact structure, and large, the cost of the dc power supply system economic.

The power system will connect external AC power, two modules (inside 1U power rack), one controller unit and DC output. This is the choice of the system components.

3.1.1 Internal mechanical description

The power systems include the following parts of the 1u power rack

1U power rack (Max. 2 PCS GR4830L 48V/2kW)

Controller Unit

AC、DC rear panel

1 channel or 2 channels AC input

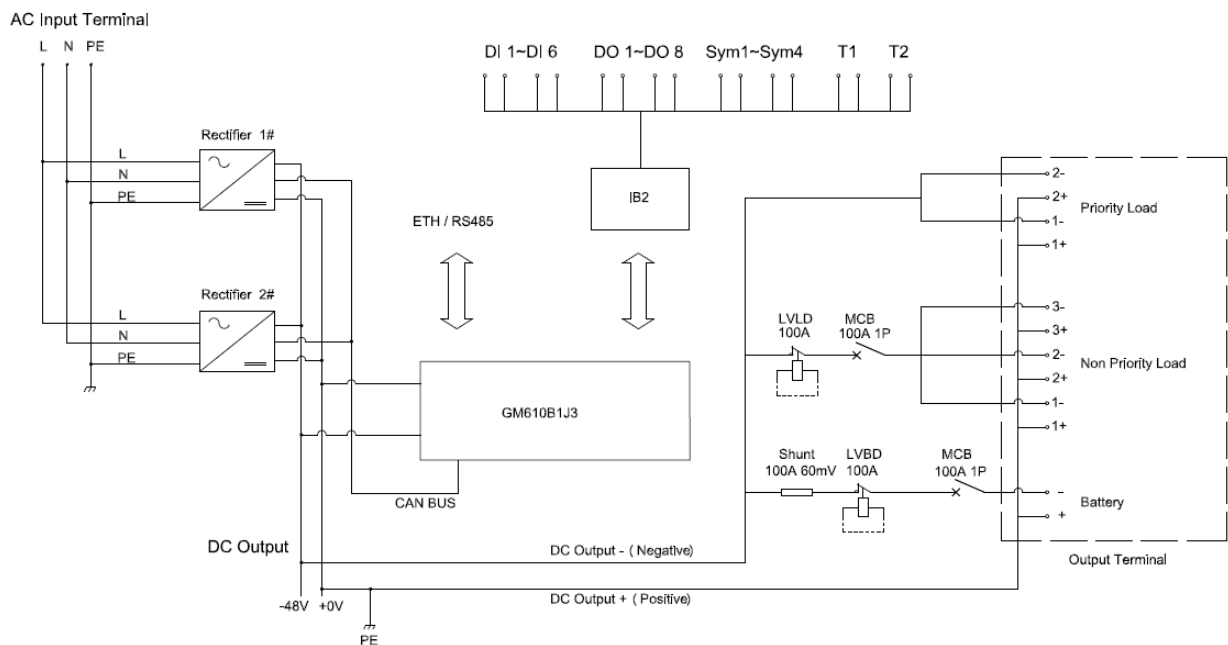


Figure 1 – System Diagram

3.1.2 Parts list

Part name	Quantity	Unit
Powersys 1U Power Rack system	1	pcs
GR4830L 48V/2kW modules	0-2	pcs
Controller unit	1	pcs



Figure 2 Powersys 1U Power Rack



Figure 3 - GR4830L 48V/2kW module

3.2 GR4830L 48V/2kW module

GR4830L module is used to charge the battery and communication equipments, provides high quality of the dc power supply and that similar applications.

Rectifier modules can work alone or with other rectifiers in parallel. This module or this system modules can communicate with monitoring module by the CAN bus.

3.2.1 Rectifier Characteristics

✓High power factor

They were well topology technology in the use of the modules efficiency in the industry in the first place, and the dimension of this module is more compact.

✓Digital control technique

The main from the control procedures are available in digital control dsp technology, which gives monitor distinguished monitoring and control character,the technology apply can reduce 40% components, and so has greatly increased its reliability and performance was greatly increased, failure rate was reduced.

Temperature management

Wind channel is from front to back, using heatsink and enclosure made a wide range of modules, which can adapt to the work environment, and therefore the system solutions to achieve more convenient.

CAN bus

GR4830L module can connect to internet and control with the other modules.

Special connected way

Hot plug connect to system, reduce the installation cost and save the installation time.

Global approvals

GR4830L apply CE、UL standard requirements.

3.2.2 Connection PINS of modules

GR4830L module will be fully inserted into the power rack; the modules will connect to the backplate of the power rack.

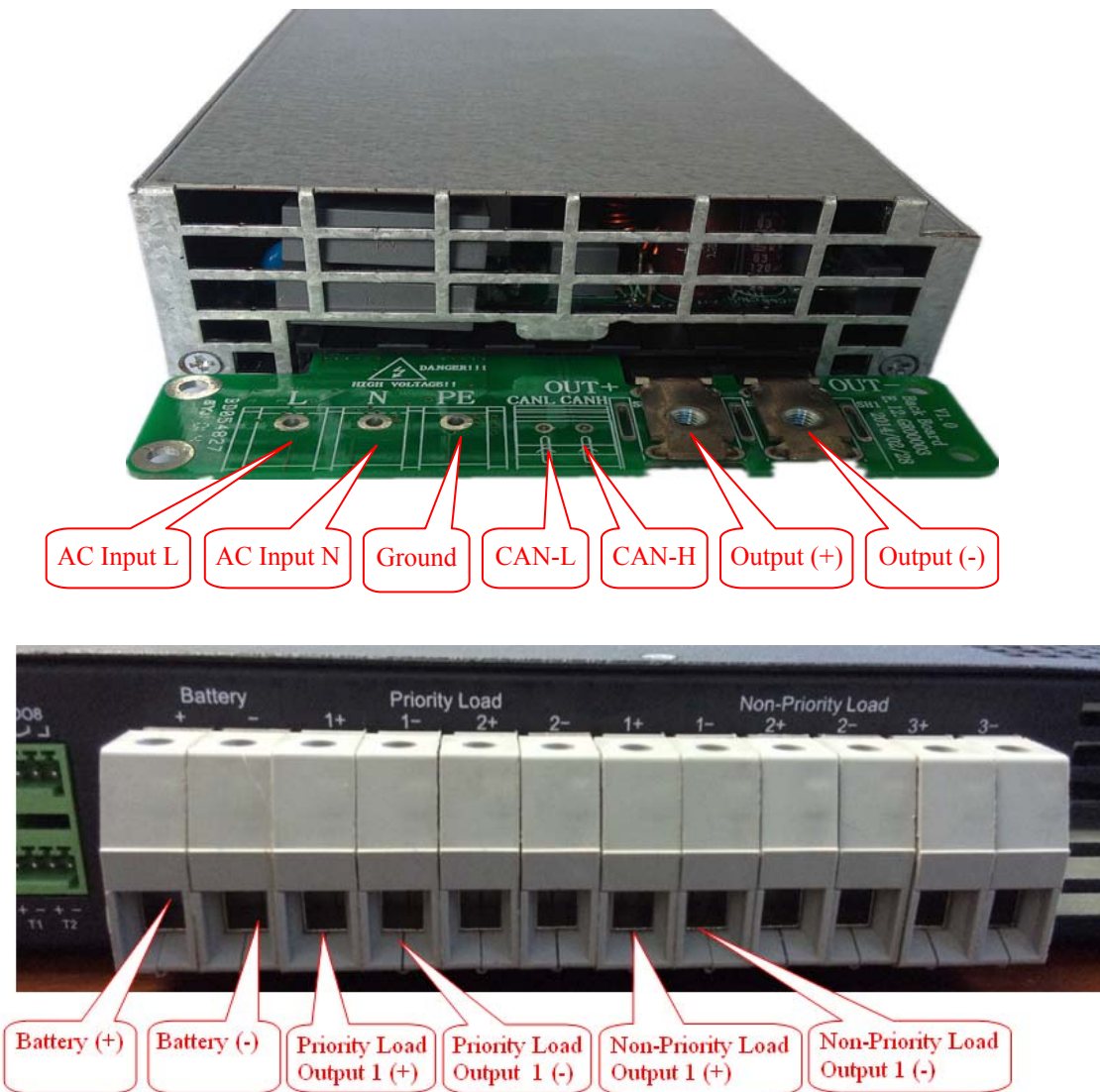


Figure 4 – the connection between modules and the system backplate

3.3 Controller module

The controller module can communicate with the CAN bus and rectifiers. You can interact with the controller by 4 keys and LCD. Also you can interact with the controller via WEB, SNMP and RS232. Both Ethernet and RS232 interface were on the front panel.

3.3.1 Main Functions

Background Communication

The monitoring module provides a RS232/Ethernet and eight groups of alarm dry contact outputs used to communicate with the monitoring computer. Purchase a network port plate if you need to use Ethernet communication.

RS232 communication mode

The RS232 mode is mainly used for short distance end-to-end communication, with an electric distance of no more than 15 meters. During communication, just connect the RS232 port of the monitoring module to the RS232 port of your computer.

Dry contact output mode

The monitoring module provides eight groups of alarm dry contact outputs. The contacts include normally open and normally closed contacts. Before the occurrence of the alarm event, each dry contact shall be configured in advance. Each group of dry contact corresponds to a certain type of alarms or a certain alarm type group, which is realized by certain logic relation. In this way, once the alarm event or a group of alarm events satisfying the logic relation occurs/occur, the dry contacts will act and generate an alarm.

If you have other intelligent monitoring, the alarm dry contact can be connected to the interface of other intelligent monitoring equipment, so as to conveniently realize the dry contact networking and complete the level isolation transmission of the fault signal.

Dry contact capacity: 2A@30Vdc; 0.5A@125Vac. Maximal power consumption: 60W.

Multiple Monitoring Functions

The monitoring computer can realize the following monitoring functions on the power supply system through the monitoring module in the RS232 communication modes.

Remote acquiring analog signals: The monitoring computer can obtain the analog signal of the system in real time through the monitoring module.

Remote acquiring digital signals: The monitoring computer can obtain the digital signal of the system in real time through the monitoring module.

Remote control function: The monitoring computer can realize the rectifier on/off, system boost charge/float charge, system control mode changeover, alarm silence and start/stop battery test.

Setting Dry Contact Alarm Types

A certain type of alarms can be output by a certain dry contact by setting the 'associated relay' parameters in the alarm parameters of the alarm type. Once the alarm event occurs, the corresponding dry contact will act and generate an alarm. Eight groups of alarm dry contacts have been configured to output the default alarm types before delivery.

Different Authorities Protected By Different Password Levels

You have the authority to conduct 'control output' and 'parameter setting' on the monitoring module before you input the correct password. The monitoring module has three passwords with different operation authorities: user level password, engineer level password and administrator level password. There three passwords have the same

authorities for 'control output'. But during the setting of 'system parameters' under 'parameter setting', the parameters for the setting and the operation functions are different. The engineer level password will have more operation authorities than the user level password, including 'reset system, reset password and change system type'. The administrator level password has more operation authorities than the engineer level password, including 'change password', referring to rectifier serial numbers, software version and setting digital value parameters. The password levels and the operation authorities are listed in 0.

Password levels and operation authorities

Password level	Operation authority	Default password
User level	All maintenance operation, without resetting system, resetting password and changing system type, modifying password and controlling alarm volume pages	1
Engineer level	All the user's authorities, resetting system, resetting password and changing system type pages, without modifying password and controlling alarm volume pages	2
Administrator level	All the engineer's authorities, resetting system, resetting password and changing system type and modifying password pages, browsing serial No., version and DI status of the monitoring module	640275

3.3.2 Controller front and rear panel diagram





Figure 5

3.3.3 Electrical specification

Power supply

There is only one power supply means for the controller unit (48Vdc input)

Input voltage and current

The controller unit apply 48V system.

Input voltage range: 20Vdc to 60Vdc

Input current is : < 100mA

3.3.4 Front Panel

The front panel of the monitoring module provides backlit LCD display, functional keypad, indicators and positioning pin, as shown in 0.

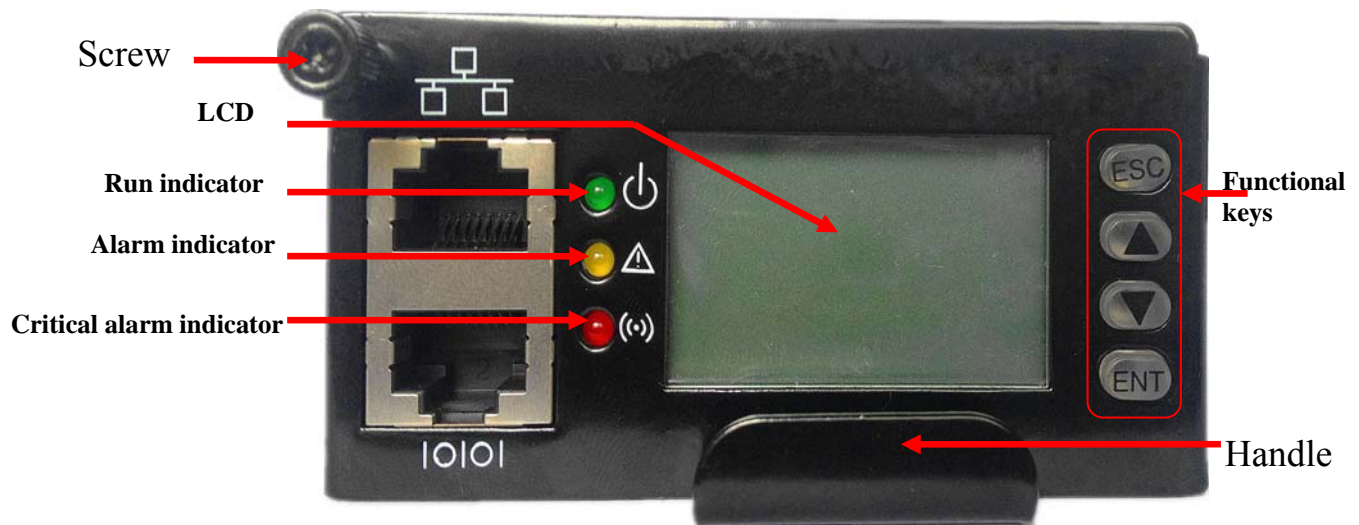


Figure 6 Front panel of the monitoring module

Description of the indicators on the front panel is given in table below.

Monitoring module indicator description

Indicator	Color	Normal state	Fault state	Fault cause
Run indicator	Green	On	Off	No operation power supply
Alarm indicator	Yellow	Off	On	There are observation alarms
Critical alarm indicator	Red	Off	On	There are major or critical alarms

LCD: The monitoring module uses a 128 × 64 LCD, and a keypad with six keys (listed in the table below). The Interface language is Chinese/English optional.

Description of monitoring module keypad

Key	Function
ESC	Return to the upper level menu
ENT	Enter the main menu or confirm the menu operation
▲ and ▼	Shift among parallel menus. For a character string, these two keys can be used to shift among different options Change values at a value setting interface.

Mounting and Removing the Controller module: put the module to the control rack, module will contact to the backplate well, Loosen the **screws** and catch the **handle** to pull the module out, before the module is completely out ,please take the modules by hands.

Locking module: tight the **screws** of the module into the hole, the module will be locked safely in the control rack.

3.3.5 Communication port

This is the service system and monitoring module of the system of control.

The monitoring units can read the voltage, current, temperature of the rectifiers and the warning state, and can transmit this information to computer services through the network port.

CAN Bus

The controller unit can provides a separate communication interface by power system。 Can provide warning information to the modules, and also support the load sharing for these modules.

Network communication

The control unit can be connected to remote monitor through SNMP and Web.

RS232 communication port

Provides RS232 interface for communication with a software background.

4 Installation program

4.1 Installation rectifiers

✓ **Note:**

Module maybe heat, please don't use hands to pull the handle

Before insert the modules in power rack, please Loosen the screw.

4.1.1 Installation prepared

Remove the packing and check the equipment

Check received all parts, correct power system and files.

Check the face of equipment is good or not.

Take out the modules from the packing; refer to below program to install.

4.1.2 Mounting and removing the rectifiers

Mounting and Removing the rectifiers: put the modules to the power rack, module will contact to the backplate well, Loosen the screws and catch the handle to pull the module out, before the module is completely out ,please take the modules by hands.

Locking modules: tight the screws of the modules into the hole, the modules will be locked safely in the power rack.



Figure 7

4.2 Electrical connection

✓ **Close the power**

4.2.1 Let the power of the system turns off

Disconnect all switches.

4.2.2 AC power connection

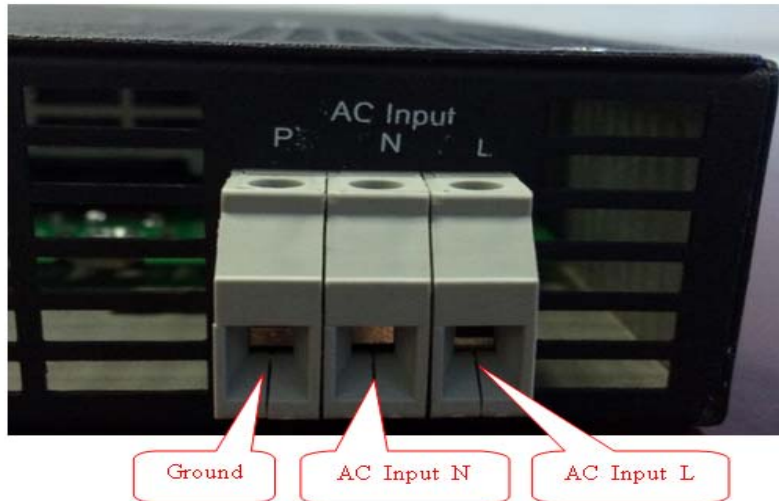


Figure 8— AC Line and ground connection

4.2.3 DC connection

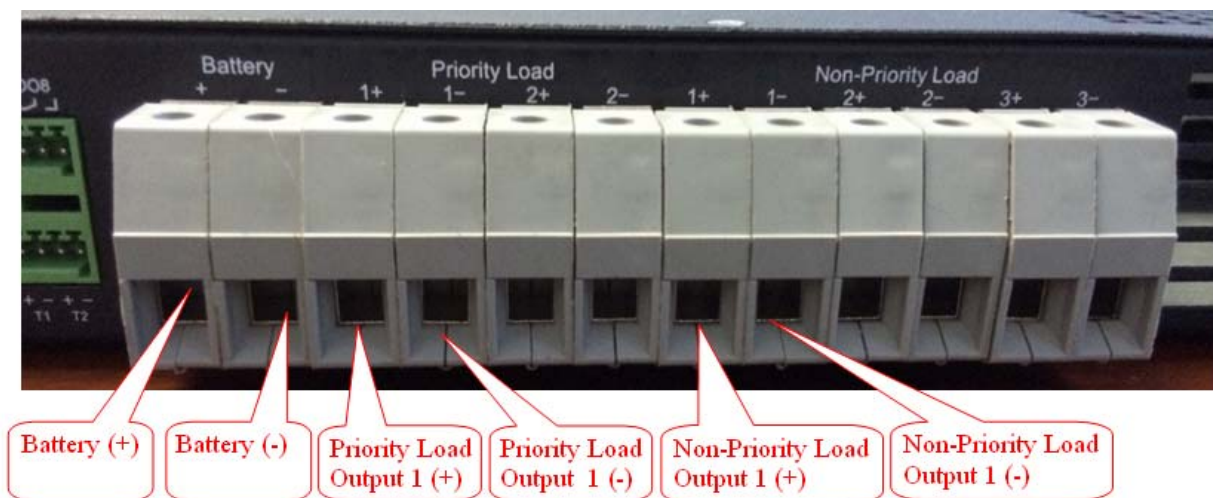


Figure 9 – DC output cable connection

There are two types of DC Output mode of the system. One is Priority Load DC Output; the other is Non-Priority Load DC Output. There are two types of the Priority Load DC Output ,DC Output 1 and DC Output 2. There are three types of the Non-Priority Load DC Output ,DC Output 1, DC Output 2and DC Output 3. So this Powersys 1U 48V/ Power supply system can provide six types of DC Output .Connect the positive cables (10AWG, UL758 or UL1015 red) to the positive of the system's DC output by feed-through connector, Connect the negative cables (1/0 AWG, UL758 or UL1015, black) to the negative of the system's DC output by feed-through connector (Refer to Figure 9).

5 The equipment start up and operation

5.1 Start up and adjust

✓ System power turns on

1. Disconnect all modules; don't take out them from power rack

Turn on AC input power (external fuse)

2. Turn on power system

Measure the AC input voltage on the connection point of the input equipment

3. Measure and ensure the AC input voltage is meet the requirement

Measure the AC input voltage of the power cabinet.

Check the AC voltage range

4. Mounting all modules into the power rack

Insert all modules into the power rack –insert each module interval between two seconds, then lock the module handle

Check the module's working state through the LED indicates of the monitor unit.

The modules have no any warning information.

5. To ensure all modules are working normally: LED lamp is light

Checking the operation is correct, all modules and controller unit have no any warning information.

6. Measure DC output voltage

Measure the DC output voltage by millimetre.

Check the DC output voltage is in normal range. (such as: 53.5Vdc)

6 Specification

6.1 AC Input

Voltage	90-300 VAC (Nominal 185 – 280 VAC)
Frequency	45 to 66Hz
Maximum Current	12.5 Arms maximum at nominal input and full load
Power Factor	> 0.99 at 50% load or more
Input Protection	Varsities for transient protection Mains fuse in both lines Disconnect above 315 VAC

6.2 DC Output

Voltage	53.5 VDC (adj. range: 42-58 VDC)
Output Power	2000 W at nominal input

Maximum Current	41.667 Amps at 48 VDC and nominal input
Current Sharing	±5% of maximum current from 10% to 100% load

Static voltage regulation	±0.5% from 10% to 100% load
Dynamic voltage regulation	±5.0% for 10-90% or 90-10% load variation, regulation time <4ms

Hold up time	> 10ms; output voltage > 42 VDC at 2000W load
Ripple and Noise	< 200 mV peak to peak, 20 MHz bandwidth < 1 mV rms psophometric
Output Protection	Over voltage shutdown Short circuit proof

	High temperature protection
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6.3 Other Specifications

Efficiency	Typical 93%, min. 92% at 40-90% load
Isolation	4242VDC – input and output 2121VDC – input earth 707VDC – output earth

Alarms:	Low mains shutdown High temperature shutdown Rectifier Failure Overvoltage shutdown on output Fan failure, flashing. Low voltage alarm at 40V CAN bus failure Low temperature shutdown Input voltage out of range
Warnings:	Rectifier in power derate mode Current Sharing failure

Visual indications	Green LED: ON, no faults Red LED: rectifier failure Yellow LED : rectifier warning
Operating temp	-40 to +75°C (-40 to +158°F)
Storage temp	-40 to +85°C (-40 to +185°F)
Cooling	1 fans (front to back airflow)
Fan Speed	Temperature and current regulated

MTBF	> 350, 000 hours Telcordia SR-332 Issue I, method III (a)
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	(Tambient : 25°C)
Acoustic Noise	< 55dBA at nominal input and full load (Tambient < 30°C)
Humidity	Operating: 5% to 95% RH non-condensing Storage: 0% to 99% RH non-condensing
Dimensions	107.6 x 40.8 x 330mm (wxhxd) (4.24 x 1.61 x 13")

6.4 Applicable Standards

Electrical safety	IEC 60950-1 UL 60950-1
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Mains Harmonics	EN 61000-3-2
Environment	RoHS compliant

EMC	ETSI EN 300 386 V.1.3.2 (telecommunication network) EN 61000-6-1 (immunity, light industry) EN 61000-6-2 (immunity, industry) EN 61000-6-3 (emission, light industry) EN 61000-6-4 (emission, industry) Telcordia NEBS GR1089 CORE
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