PS312e2

SAS Expansion Enclosure

User Manual

1/30/2019

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About This Manual

Safety Symbols

The following symbols are placed on some components of the system to alert the user to potential hazards,

Safety Symbols

Icon or Format	Instruction
⚠	**NOTE: Indicates important information that helps you make better use of your computer**
⚠	**CAUTION: There is a risk of personal injury and equipment damage. Follow the instructions.**
⚠	**CAUTION: Hot surface. Avoid contact. Surfaces are hot and may cause personal injury if touched.**
⚠	**CAUTION: Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.**
⚠	**WARNING: Indicates a potential for property damage, personal injury, or death.**
italics	**Book or document name;** **Fill in the content**
>	**Menu links at all levels**
Bold	**Menu, Button, Options**

Environmental Specification

Temperature and Temperature Gradient		
Operating	**Ambient Temperature**	**5 to 35ºC**
	Max Temperature Gradient	**10ºC per hour**
Non-Operating	**Ambient Non-Operating**	**-40 to 60 ºC**
Humidity		
Operating	**Ambient Operating (Non-condensing)**	**5 to 85 % R.H**
Non-Operating	**Ambient Non-Operating (Non-condensing)**	**5 to 90 % R.H**
Altitude		
Operating		**35ºC at 3,000 ft, Meet ASHRAE Class A3 requirement**
Non-Operating		**25ºC at 40,000 ft**

Table of Contents

General Overview

1. General Overview

This document describes the high-level functional requirements and characteristics for the Rasilient SBB JBOD Storage Enclosure product which is designed based on 12G SAS. It is a SBB 2.1 compliant enclosure which houses two enclosure controller units in one single 2U chassis to 12 3.5 inch hard drives.

1.1 Feature Summary

The following are the major features of the PS312e2storage disk enclosure:

- **Enclosure**
  - **2U rack-mounted storage enclosure, SBB 2.1 compliant**
  - **Dimensions: 2U (H) x 446.8mm (W) x 531mm (L)**
- **Disk Drive**
  - **Front access disk drive**
  - **Support 12 3.5 inch per enclosure**
  - **Drive power control via pin 3 of the drive connector (Need drive to support the power control function)**
  - **SAS, NL SAS,SSD and SATA drive support**
- **Power Supply**
  - **Redundant 600W**
  - **System input: 100-240VAC, 47Hz-63Hz**
  - **High efficiency (80Plus Silver Level)**
  - **Hot-pluggable from rear of chassis**
  - **42mm (H) x 215.75mm (W) x 277.2mm (D)**
  - **Integrated fans for PSU and Canister cooling controlled by internal microcontroller**
  - **Support N+1 fan failure**
- **Canister**
  - **1U, SBB 2.1 compliant**
  - **Dimensions: 274.5mm (L) x 209.55mm (W) x 38.1mm (H)**
  - **Hot-pluggable from rear of chassis**

1.2 System Overview

Figure 1-1 ~ Figure 1-3 below, are view of PS312e2.
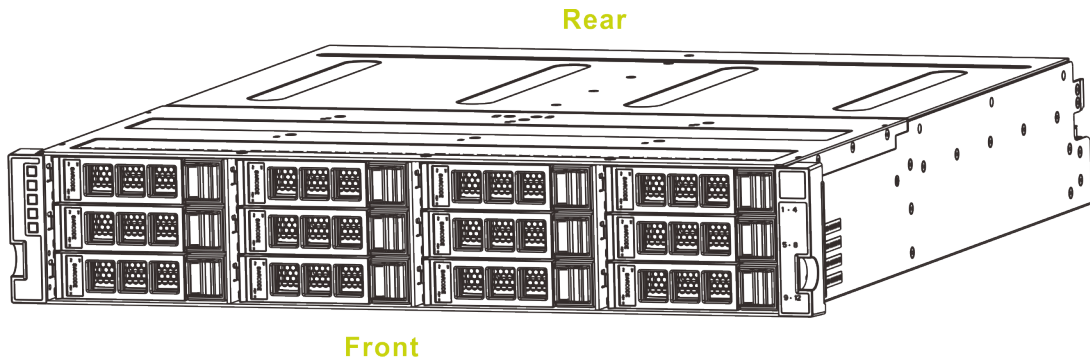
Figure 1-1: Trimetric View of PS312e2 Enclosure (3.5 inch drives)
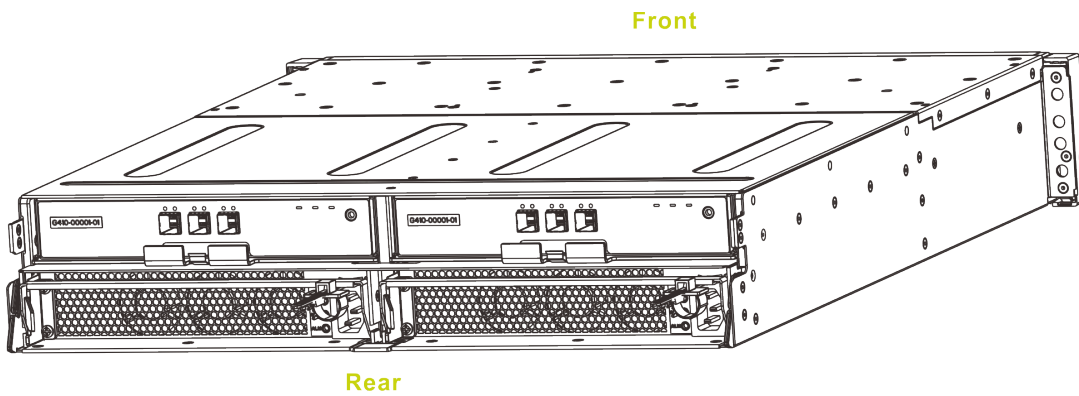
Figure 1-2 PS312e2 Rearview

Figure 1-3 below, is view of the front of PS312e2:
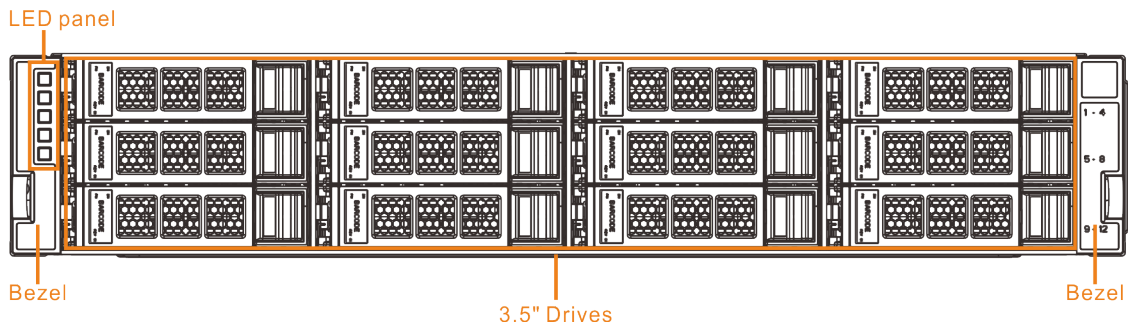
Figure 1-3: PS312e2 Enclosure

As **Figure 1-4** below, is view of the rear of PS312e2.

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Canister 1   Canister 2

Power supply unit 1   Power supply unit 2

Figure 1-4: PS312e2 Enclosure

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Storage Enclosure Installation

2. Storage Enclosure Installation

These instructions are intended to ensure that the user can use the product correctly to avoid danger or property loss. Please read this Guide carefully before using the product, and keep it properly for future reference. If the product cannot work normally or is damaged because the user does not follow the safety instructions, we shall not assume any responsibility.

2.1 Safety Instructions

This section maybe not applicable to all products, it's only for reference, and it's not limited.

Read this section before beginning any procedure. The following text provides safety precautions to follow when installing the product.

2.1.1   Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions and instructions marked on the equipment.
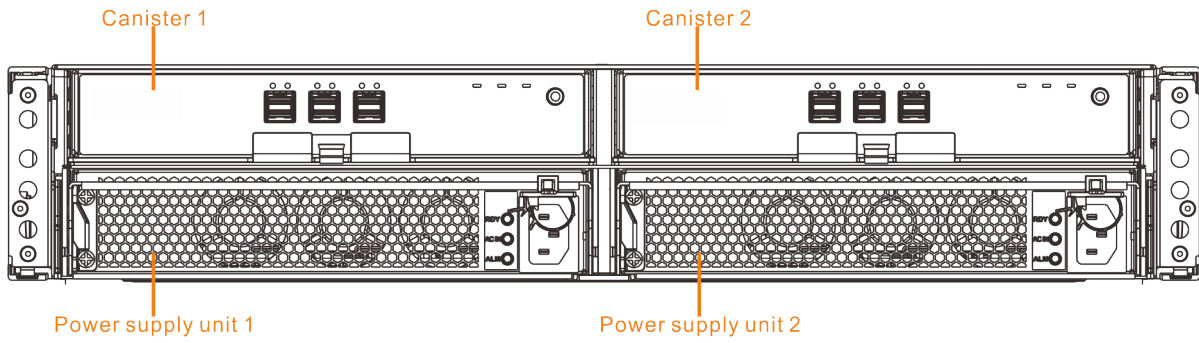- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Never push objects of any kind through openings in the equipment. Dangerous voltages, energy or moving part may be present. Conductive external objects could produce a short circuit that could cause fire, electric shock, or damage to your equipment.
- Do not block or cover the openings of your product. Never place a product near a radiator or heat register. Failure to follow these guidelines can cause overheating and affect the reliability of your product.
- Do not operate products without the cover in place. Failure to take this precaution may result in and system damage.
- This product is intended for restricted access whereby access is controlled through the use of a means of security (for example, key, lock, tool, badge access) and personnel authorized for access have been instructed on the reasons for the restrictions and any precautions that need to be taken.
- Do not drop the product or subject it to physical shock.

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- **Keep the product away from water or any liquid.**
- **While shipping the product, pack it inside of the qualified package and ship with pallet.**
- **The equipment should be used in data center or lab.**

2.1.2 Power Cord Connection

Installation of this equipment must comply with local and regional electrical regulations governing the installation of information technology equipment by licensed electricians. For electrical power ratings on options, refer to the power rating label or the user documentation supplied with that option.

⚠ CAUTION: this product is designed to work with power systems having a grounded neutral (grounded return for DC-powered products). To reduce the risk of electric shock, do not plug products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.

⚠ CAUTION: Not all power cords have the same current ratings. Do not use the power cord provided with your equipment for any other products or use. Do not use household extension cords with your product.

⚠ 注意 – 添付の電源コードを他の装置や用途に使用しない
添付の電源コードは本装置に接続し、使用することを目的として設計され、その安全性が確認されているものです。決して他の装置や用途に使用しないでください。火災や感電の原因となる恐れがあります。

⚠ CAUTION: For products with multiple power cords, all power cords must be disconnected to completely remove power from the system.

Below mark is used when multiple power supplies are installed in a system.

2.1.3 Electro-Static Discharge (ESD) Caution and Warnings

⚠ WARNING:

1) **In order to maximize overall product quality and eliminate the possibility of damage from electro-static discharge, please observe ESD handling procedures wherever this symbol occurs during the system integration.**
2) **All Employees must attend an ESD training class prior to performing any system or board handling.**

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3) **Required use of heel straps on both feet and/or wrists strap where applicable to ensure that you are properly grounded by testing the continuity of the straps at a certified ESD station.**
4) **If you remove your heel straps or wrist straps for any reason, you must retest to insure proper grounding.**
5) **To ensure the policies regarding ESD (Electrostatic discharge) controls for all personnel who work in the manufacturing departments are enforced.**

2.1.4 Protection against moving fan blade

A warning symbol as below or a similar symbol combined with the triangle shaped warning sign from ISO 3864-2 is required to be placed closely to the moving part and can be easily found by user during servicing.

CAUTION: Keep fingers and other body parts away from the moving blade. Failure to take this precaution may result in personal injury.

2.1.5 Rack System Instructions

The following or similar rack-mount instructions are included with the installation instructions:

- **Elevated Operating Ambient– If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.**
- **Reduced Air Flow– Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.**
- **Mechanical Loading– Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.**
- **Circuit Overloading– Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on over-current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.**
- **Reliable Earthing– Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (for example, use of power strips).**

CAUTION: Rack mounted equipment must not be used as a shelf or workspace.

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Do not add weight to rack mounted equipment.

The following warnings apply to Racks and Rack Mounted systems:

⚠ **CAUTION: For safety, equipment should always be loaded from the bottom up. That is, install the equipment that will be mounted in the lowest space of the rack first, then the next higher space, etc.**

⚠ **CAUTION: To prevent the rack from tipping during equipment installation, the anti-tilt bar on the rack must be deployed.**

2.1.6 Others warnings and cautions

⚠ **WARNING: This storage is very heavy. To reduce the risk of personal injury or damage to the equipment:**

1) **Observe local occupational health and safety requirements and guidelines for manual material handling.**
2) **Get help to lift and stabilize the product during installation or removal, especially when the product is not fastened to the rails. When the storage weighs more than 22.5 kg (50 lb), at least two people must lift the storage into the rack together. A third person may be required to help align the storage if the server is installed higher than chest level.**

⚠ **WARNING: The drives and the internal system components maybe too hot to hurt, users should not touch them before they cool down.**

2.1.7 Regulatory Information
FCC (US)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

⚠ **NOTICE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.**

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⚠ **NOTICE: Any modifications made to this device that are not approved by Rasilient may void the authority granted to the user by the FCC to operate this equipment.**

ICES-003 (Canada)

This Class A digital apparatus complies with Canadian ICES-003.

Cetappareilnumérique de la classe A estconforme à la norme NMB-003 du Canada.

CE (European Community)

This product conforms to the following European Directive(s) and Standard(s): Application of Council Directive: 2014/35/EU, 2014/30/EU, 2011/65/EU.

Standards to which Conformity is declared: EN55022, EN55024, EN61000-3-2, EN61000-3-3, EN60950-1.

This is a class A product.

In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Waste Electrical and Electronic Equipment (WEEE)
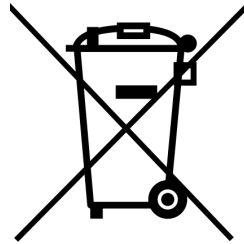
In accordance with European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE), the presence of the above symbol on the product or on its packaging indicates that this item must not be disposed of in the normal unsorted municipal waste stream. Instead, it is the user's responsibility to dispose of this product by returning it to a collection point designated for the recycling of electrical and electronic equipment waste. Separate collection of this waste helps to optimize the recovery and recycling of any reclaimable materials and also reduces the impact on human health and the environment.

For more information concerning the correct disposal of this product, please contact your local authority or the retailer where this product was purchased.

VCCI (Japan)

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI).

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If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

この装置は、情報処理装置等電波障害自主規制協議会**(VCCI)**の基準に基づくクラス **A** 情報技術装置です。

この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

中国环保使用期限标志

此产品环保使用期限是 **30** 年，在此期限内可安全放心使用，到期后必须进入回收环节。

2.2 Necessary Tools

We recommend the users to prepare and use the following tools for equipment installation:

1) **ESD Protection: the users can wrap them around the wrist.**

Figure 2-1: ESD Protection

2) **Protective gloves:**

Figure 2-2: Protective gloves

3) **Screw drive:**

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$\oplus$ 0.3   Used for install 2.5" HDD

$\oplus$ 0.6   Used for other screws
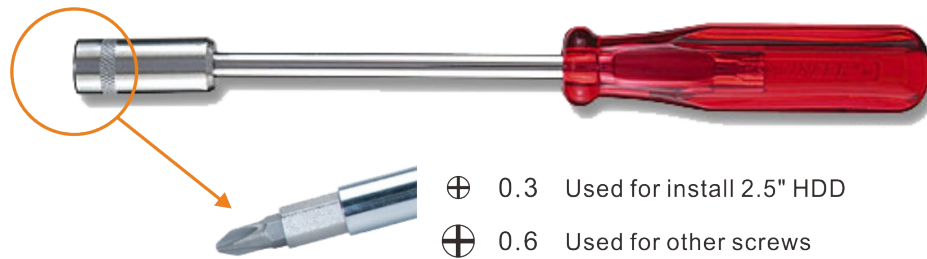
Figure 2-3: Screw drive

2.3 Safety Instruction

- **Please adopt power supply in the safety voltage range.**
- **If the product does not work properly, please contact your dealer**
- **Do not drop the product or subject it to physical shock.**
- **When cleaning the product, please use a rubber dust blower to remove the dirt. Never apply any cleanser with ethanol or benzene in it.**
- **Do not expose the product in the environment not defined in the Guide.**
- **Keep the product away from water or any liquid.**
- **While shipping the product, pack it in the factory packing and ship with pallet.**
- **When it is necessary to replace a part, please contact your dealer in advance and replace the part with specified model or part of the same features. We shall not assume any responsibility for problems caused by unauthorized replacement.**

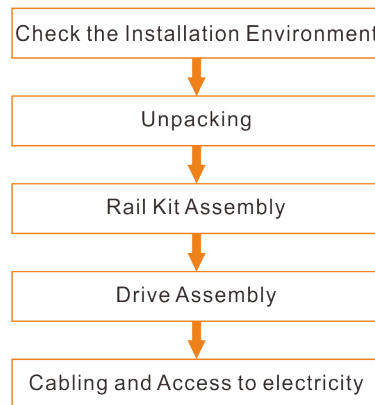**For security reasons, it is recommended that the equipment should be installed as the flow chart as shows.**

Figure 2-4: flow chart

2.4 Check the Installation Environment

- **Check the cabinet or mounting bracket: ensure that rack or mounting bracket should be able to hold eight times of the total weight of equipment.**
- **Check the cooling space: ensure thermal dissipation space has been enough.**

Check another installation environment requirements, please refer to the preface of this user manual.

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2.5 Unpacking

Follow the following steps to unpack the product:

1) **Inspect the package to make sure that it has not been damaged.**
   If you find damage, contact the local authorized Rasilient agent.

2) **Open the package and check whether any item on the packing list is missing.**

3) **Take all items out of the package and check whether any item is in poor condition.**
   If you find damage, contact the local authorized Rasilient agent.

After unpacking, please be sure to examine and check the parts in good condition; after the check, suggest to install equipment or put to the cabinet.

2.6 Rail Kit

This section introduces the PS312e212G chassis install on the rack with rail.

Step 1: Install the rail on the rack and rotate 4 buckles back.
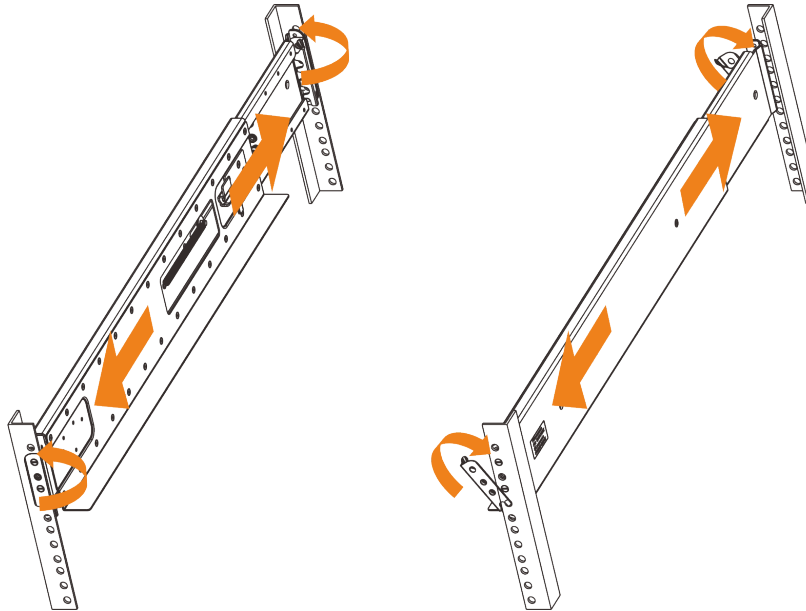
Figure 2-5: Step 1

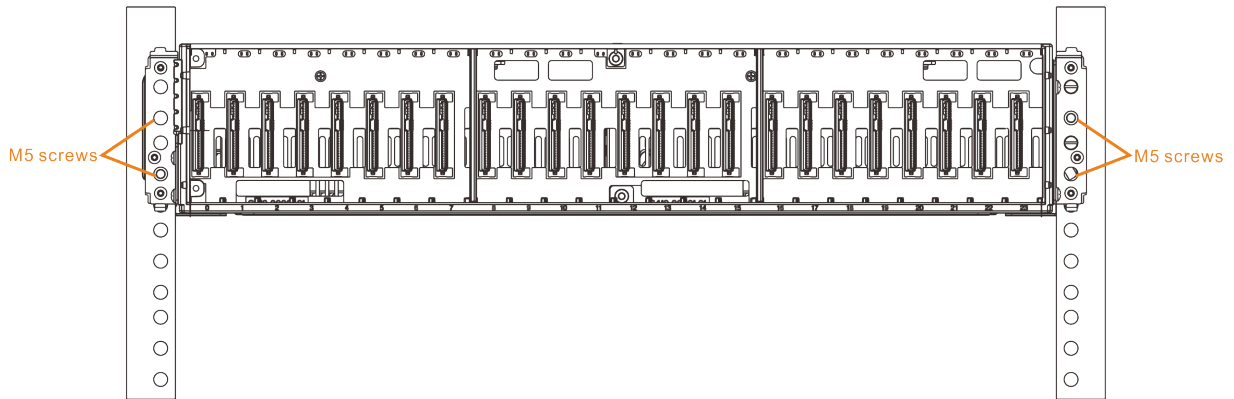**Step 2: Put the chassis on the rail and push it into the rack.**
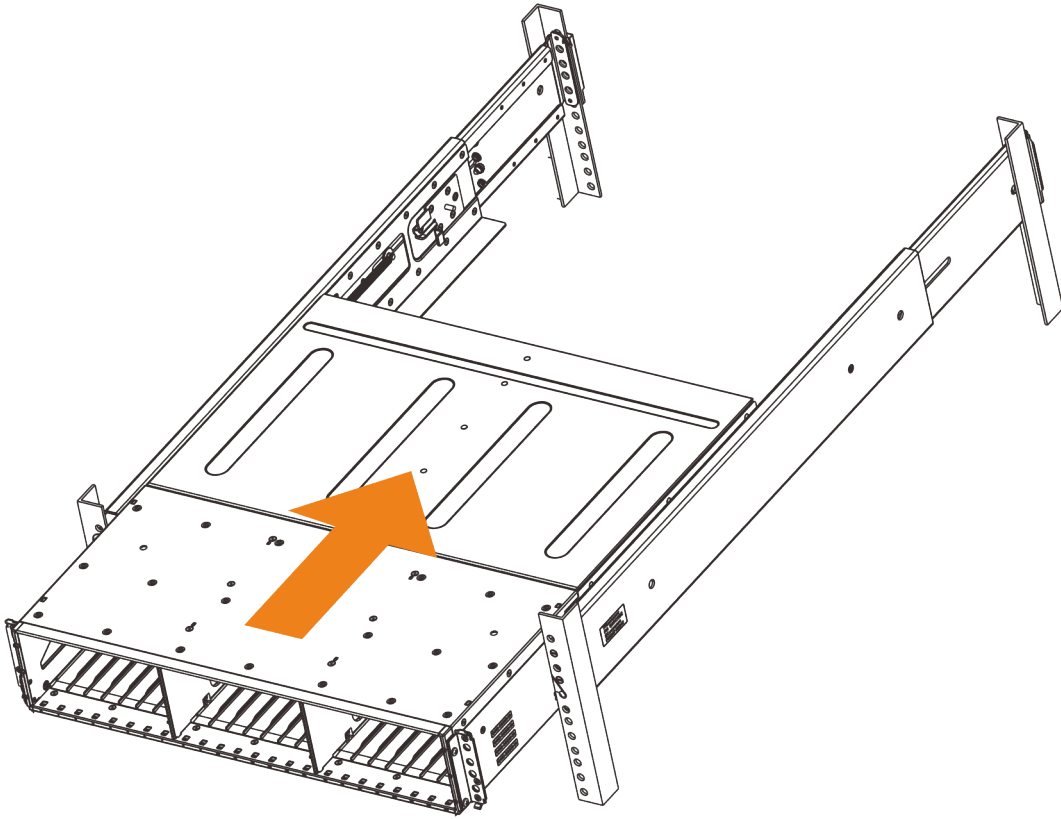
Figure 2-6: Step 2

Step 3: Open the buckles to buckle the ears of chassis rotation, then use screws to fasten the chassis on the rack.
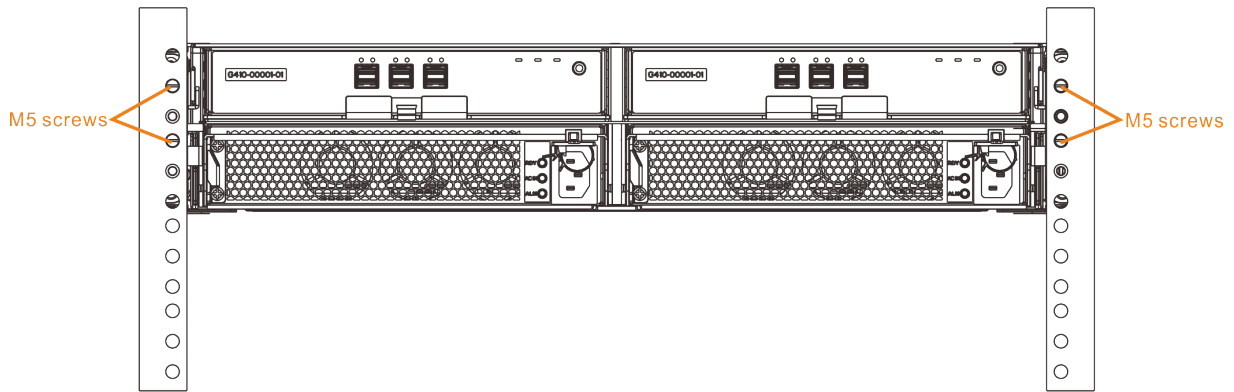

M5 screws

M5 screws

M5 screws

M5 screws

Figure 2-7: Step 3

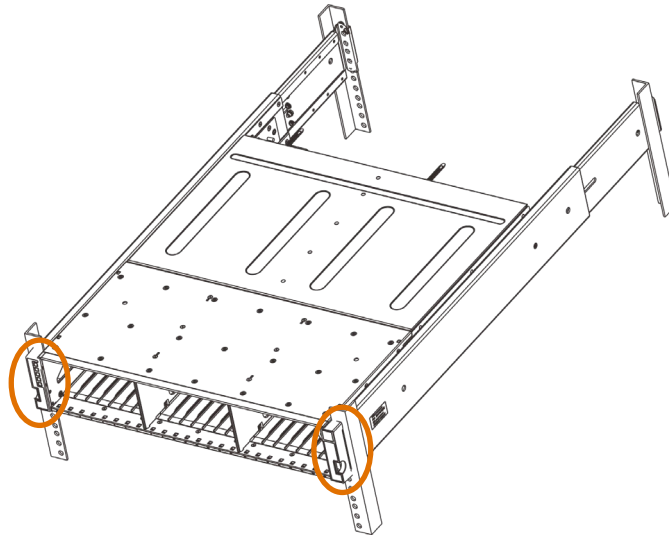**Step 4: Install the bezel on two sides' ear.**

Figure 2-8: Step 4

2.7 Drive Assembly

This section simply introduces the HDD assemble process which will happen on customer side.
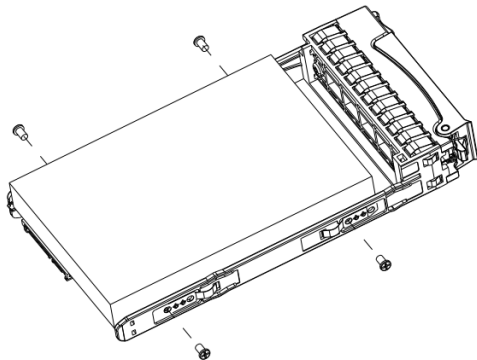
Step 1: Install the HDD with HDD carrier.

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Figure 2-9: Install the 3.5 HDD with HDD carrier
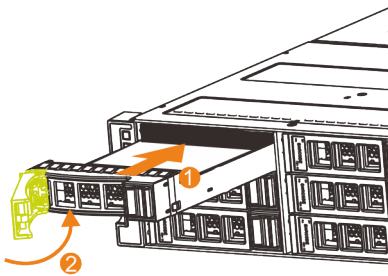
Step 2: Install the HDD carrier.

Figure 2-10: Install the 3.5 HDD carrier to chassis

2.8 Cabling and Access to electricity

After the equipment has been installed, please check again that the equipment has been fixed safety, after the check, please wire the equipment and access to electricity.

2.8.1　Connect the system's power cable(s)

1) **Connect the system's power cable(s) to the system.**
   There is no power button for the system, when there is specific input power (100-240V AC input, auto ranging, 47~63Hz) support to the PSU, the system will power up.
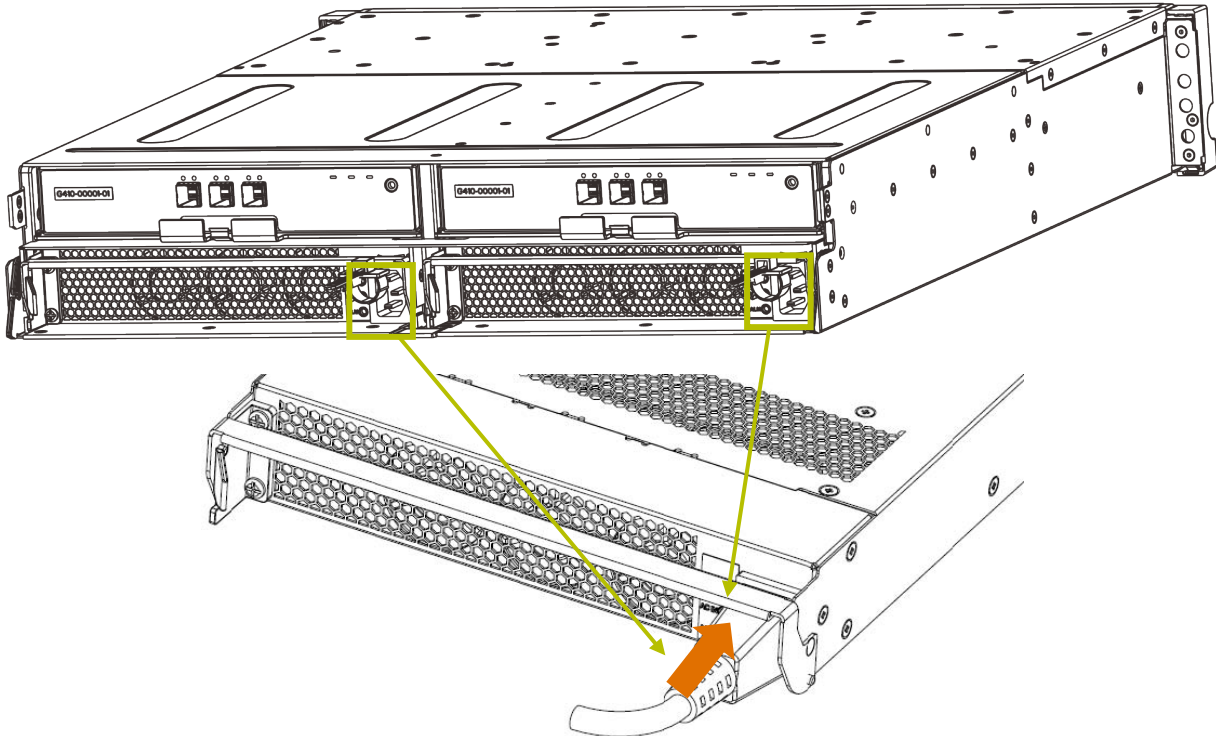

Figure 2-11　Connecting the Power Cable(s)

There is no power button for the system, when the input power is cut off or the power cable plug out, the system will power off.
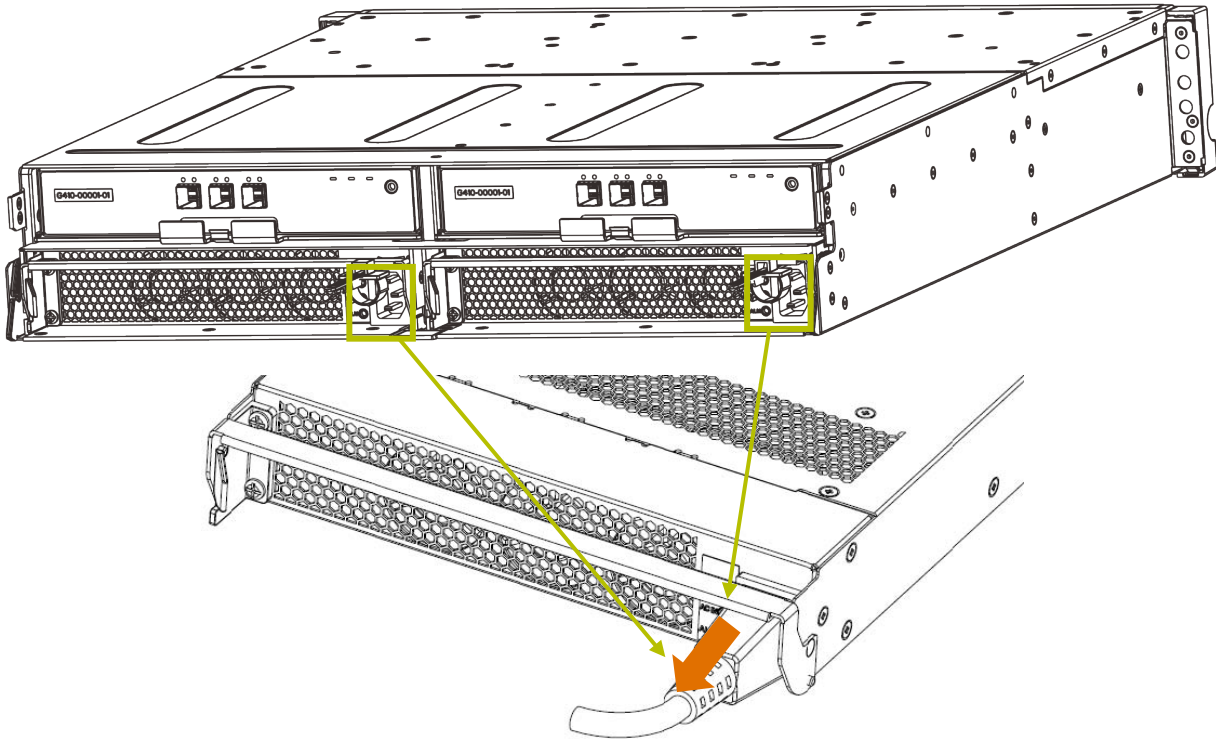
Figure 2-12 Disconnecting the Power Cable(s)

⚠️ **NOTE: When power on, check all the LEDs are lighting normally. If not, check the cables or**

reference *Table 3-1: Front LED Define*.

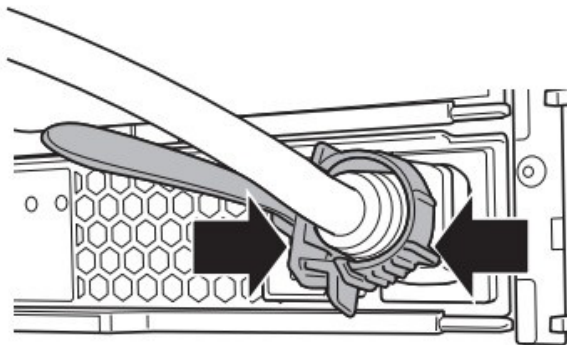2) **After connecting the power cable(s), as shown in the illustration, and attach to the cable strap.**

Figure 2-13   Securing the power cable(s)

2.8.2   Connect the enclosure

To connect the enclosure to a host system:

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1) **Connect the SAS cable to Canister MiniSAS HD connector on the storage enclosure and to the RAID controller or HBA on the host system. Push the cable into the connector until it clicks into place.**

⚠️ **NOTE:**

1) **Connectors on both ends of the SAS cable are universally keyed. You can connect either end of the cable to the Canister or the RAID controller.**
2) **To remove the SAS cable, pull the pull-tab to release the cable from the connector on the Canister and the host system.**
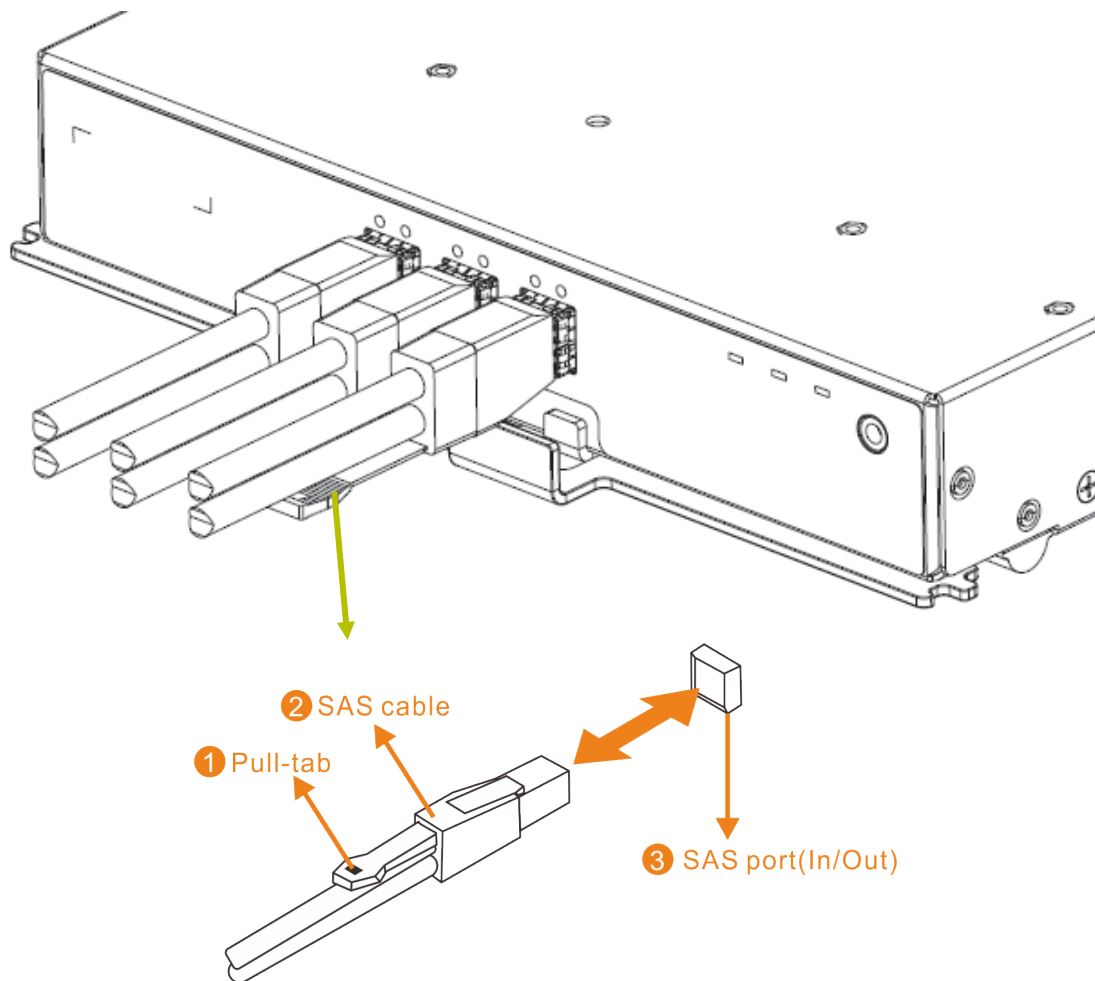

Figure 2-14 Connecting a SAS cable

2) **Check the LED indicators on the front panel of the storage enclosure.**

For more information about LED indicators, see the *3.1*.

2.8.3   SAS Cable Connections

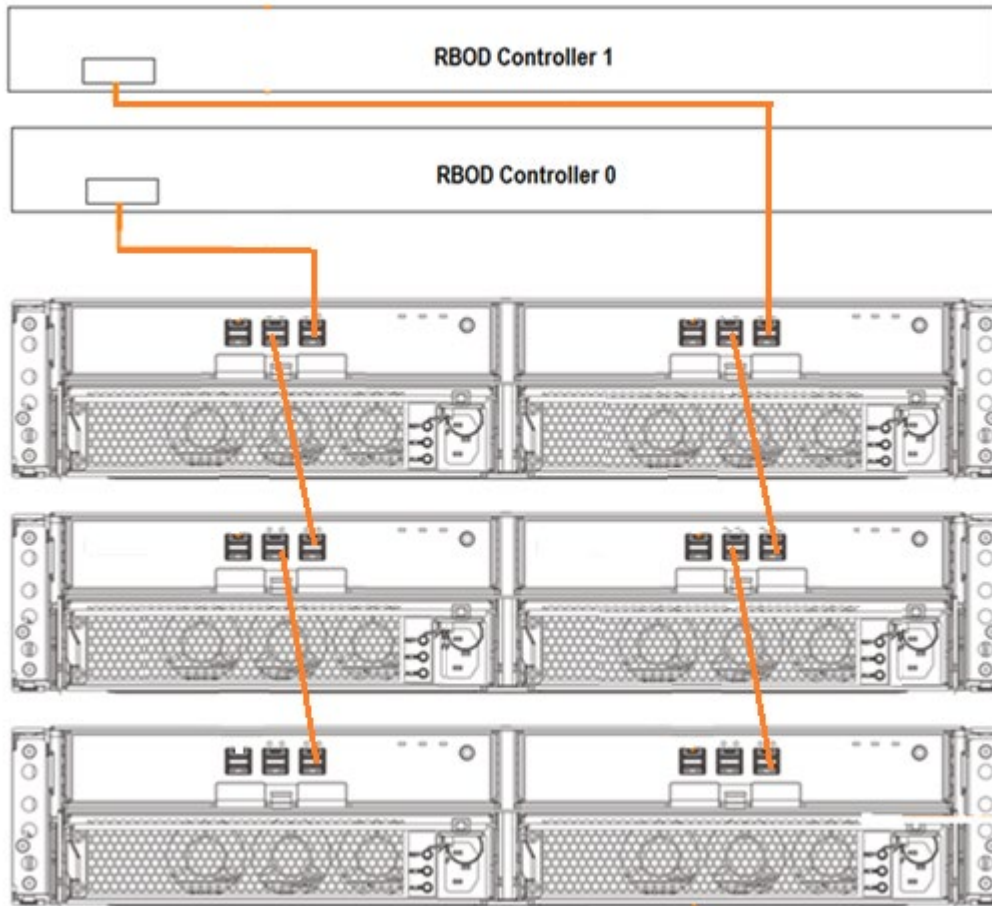This section give a proposal of the SAS IO cable connection.

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Figure 2-15: The SAS IO cable connection

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Hardware Overview

3. Hardware Overview

3.1 System Service Indicators

3.1.1   PS312e2Chassis Front LED

3.1.1.1   PS312e2LED Panel
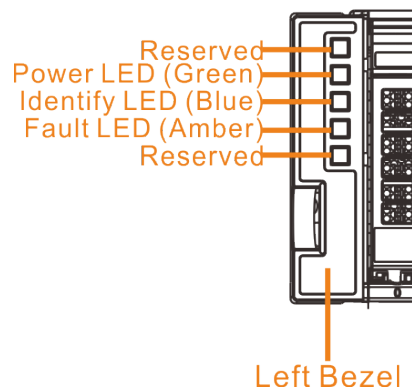As Figure 3-1below, is view of the PS312e2 LED panel.

Reserved
Power LED (Green)
Identify LED (Blue)
Fault LED (Amber)
Reserved

Left Bezel

Figure 3-1: PS312e2 LED Panel

LED Name	LED Color	LED Status	Description
Power LED	Green	ON	Enclosure power is on
		OFF	Enclosure power is off
Identify LED	Blue	ON	Enclosure identified
		OFF	Normal operation
Fault LED	Amber	ON	Fault conditions exit in the enclosure
		OFF	Normal operation

Table 3-1: Front LED Define

3.1.1.2   PS312e2 Drive LED

Active LED (Green)

Fault LED (Amber)
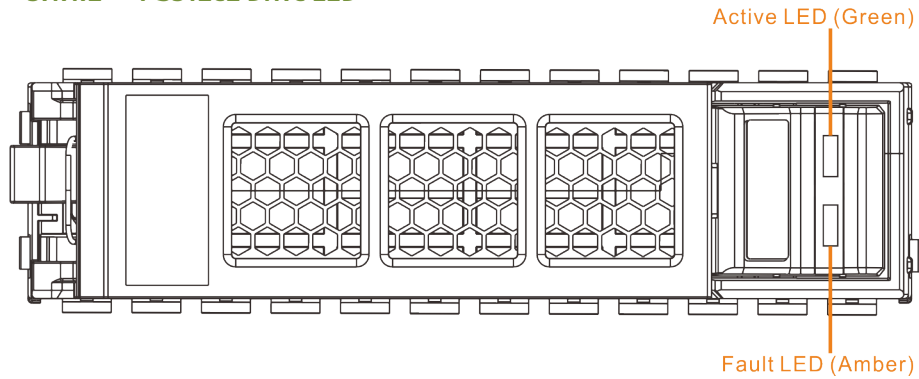
Figure 3-2: PS312e2 Drive LEDs

	DRIVE 0	DRIVE 1	DRIVE 2	DRIVE 3
	DRIVE 4	DRIVE 5	DRIVE 6	DRIVE 7
	DRIVE 8	DRIVE 9	DRIVE 10	DRIVE 11

Figure 3-3: PS312e2 Drive Slot Numbers

LED Name	LED Color	LED Status	Description
Active LED	Green	ON	This LED is controlled by the HDD itself; refer to the HDD spec for the LED definition.
		OFF	
		Blink	
Fault LED	Amber	ON	Fault conditions exiton this HDD
		OFF	Normal operation

Table 3-2: HDD LED Define

3.1.2   Rear Indicators

The two canisters and the two power supply units in the PS312e2 enclosure can be removed and replaced from the rear of the unit.
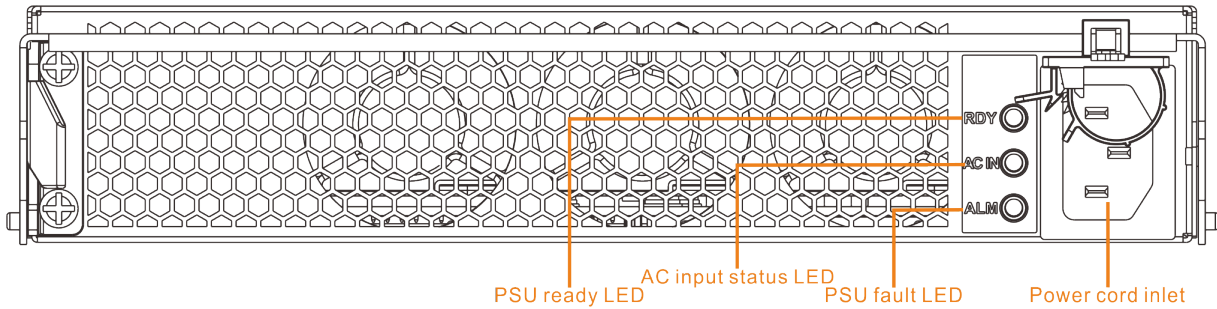
3.1.2.1 PS312e2 PSU LED

Figure 3-4 PS312e2 PSU LED

LED Name	LED Color	LED Status	Description
AC input status LED	Green	ON	The PSU input voltage is within specification
		OFF	The input voltage is not OK
Ready LED	Green	ON	PSU 12V and 5V outputs are within specification
		OFF	PSU output is out of specification
Fault LED	Red	ON	Fault conditions exit on the PSU
		OFF	Normal operation

Table 3-3: PSU LED Define

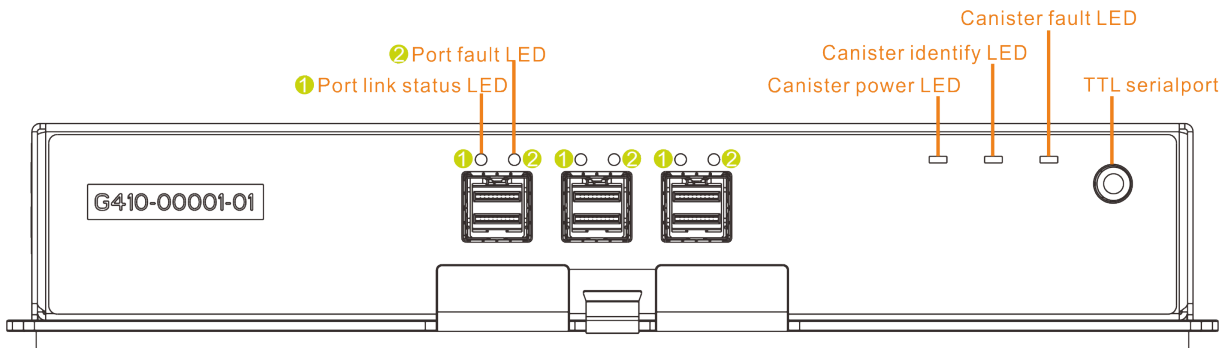### 3.1.2.2 PS312e2 Canister LED

PS312e2 canister real view is as below.

Figure 3-5PS312e2 Canister LED

LED Name	LED Color	LED Status	Description
Link Status	Green	OFF	Loss of link on all of the 4 channels on this port
		ON	Link established, any or all of the 4 channels on this port are linked
Port Fault	Amber	ON	A fault exits on this port
		OFF	Normal operation
Power LED	Green	ON	Canister power is on

		OFF	Canister power is off
Identify LED	Blue	ON	Canister identified
		OFF	Normal operation
Fault LED	Amber	ON	Fault conditions exit on this canister
		OFF	Normal operation

Table 3-4: Canister LED Define

3.2 HDD

The PS312e2 Enclosure utilizes a custom HDD carrier design to support hot insertion and removal of HDDs.

This section simply introduces the Drive assemble process which will happen on customer side.

See section *2.7.*

3.3 PSU (Power Supply Unit)

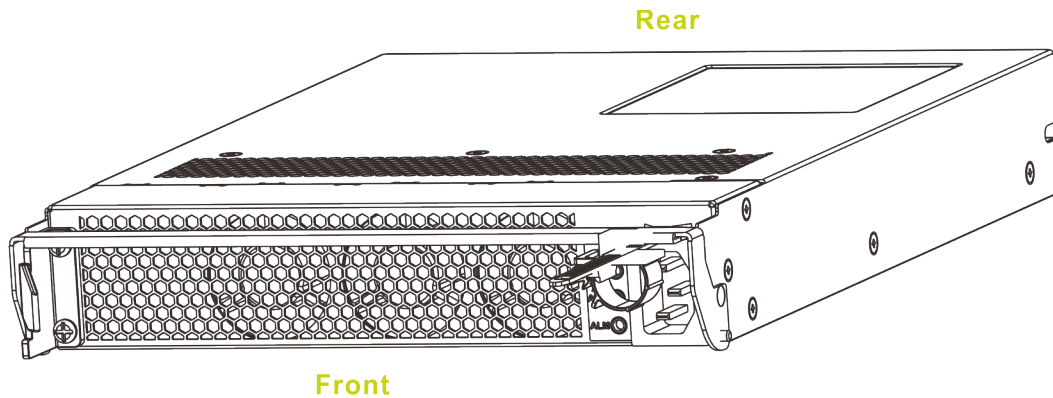As Figure 3-8 below, shows a trimetric view of the PSU.

Rear

Front

Figure 3-6: PS312e2PSU

- 90-264VAC input via standard IEC grounded connector
- High efficiency, 80Plus Silver certified
- Hot pluggable and N+1 redundant
  - Redundant +5V 40A DC Output (supports current sharing)
  - Redundant +12V 36A DC Output (supports current sharing)
  - Redundant +5V 1.0A Standby DC Output
  - Single Molex "TEN60" hot plug output connector
- Combined output power 637W continuous
- Three 40mm dual counter rotating fans for system cooling controlled by internal micro controller
- I2C VPD and Controller Interface for system communication
- The I2C interface of PSU supports parity check sum
- Input Power Monitoring
- Output Voltage and Current Monitoring
- Output Voltage Margining
- Extended Input Hold-Up

3.3.1 PSU Removal

Step 1: Rotate the handle.

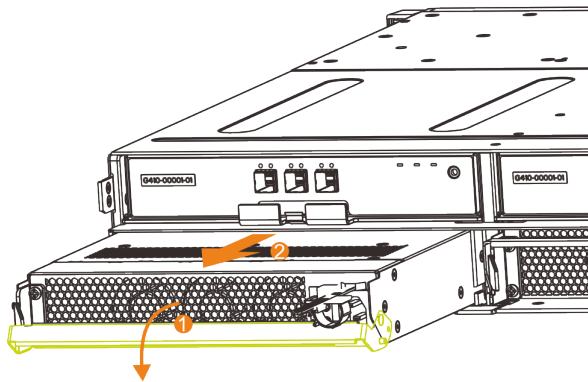**Step 2: Move the PSU out of the chassis.**

Figure 3-7: PSU Removal

3.3.2 PSU Installation

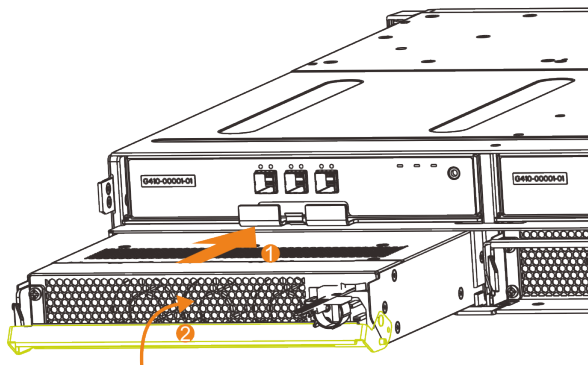**Step 1: Push the PSU into the chassis.**

Step 2: Rotate the PSU handle to close.

Figure 3-8: PSU Installation

3.4 Canister

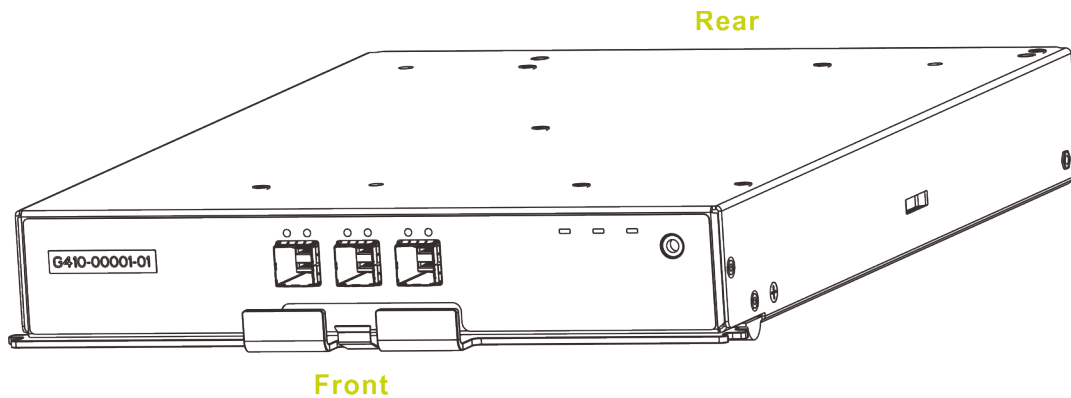**As Figure 3-11 below, shows a trimetric view of the canister.**

Rear

Front

Figure 3-9: PS312e2 Canister

- **SBB 2.1 compliant canister design**
- **SAS 3.0 12G × 36-port SAS expander**
  - **24x SAS to SBB midplane for disk connection**
  - **Three (3) 4x SAS to MiniSAS HD connector**
  - **Integrated SCSI Enclosure Service firmware**
- **Three (3) MiniSAS HD ports for JBOD upstream/downstream connection**
- **Supports hot-pluggable operation**

3.4.1 Canister Removal

Step 1: Keep pressing down the button until the handles are rotated.
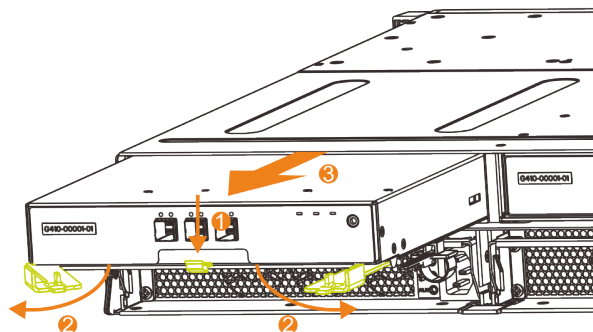
Step 2: Move the canister out of the chassis.

Figure 3-10: Canister Removal

3.4.2 Canister Installation

Step 1: Push the Canister into the chassis.
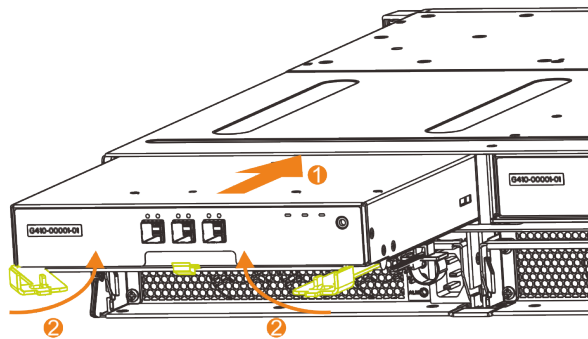
Step 2: Rotate the Canister handle to close.

Figure 3-11: Canister Installation

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