

PS390e

SAS Expansion Enclosure

User Manual

3/9/2022



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About This Manual






Safety Symbols

Environmental Specifications


About This Manual

Safety Symbols

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

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.
<i>italics</i>	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 35°C
	Max Temperature Gradient	20°C per hour
Non-Operating	Ambient Non-Operating	-40 to 60 °C
Humidity		
Operating	Ambient Operating (Non-condensing)	8 to 85 % R.H
Non-Operating	Ambient Non-Operating (Non-condensing)	8 to 95 % R.H
Altitude		
Operating	3050m (support for up to 3050m requires temperature de-rating) [950m@ 35°C , 3050m@ 28°C]  NOTE: De-rate max operating temperature 1 °C /300m above 950m altitude.	
Non-Operating	Maximum Altitude of 12,000 meters (39,370 feet)	

Cooling specification

The thermal solution supports drive up to 13 W maximum power dissipation per drive slot.

- Fan failure:

System can keep normal operation when one of two fans in the fan module failed. System fan module replacement maximum time is 10 minutes.
- Drive failure:

The cooling system will ensure that the system continues while the top cover is removed for drive failure.

Drive replacement maximum time is 10 minutes.
- PSU failure:

The system can operate during a PSU replacement service interval of 10 minutes without experiencing an over temperature condition in the canister.

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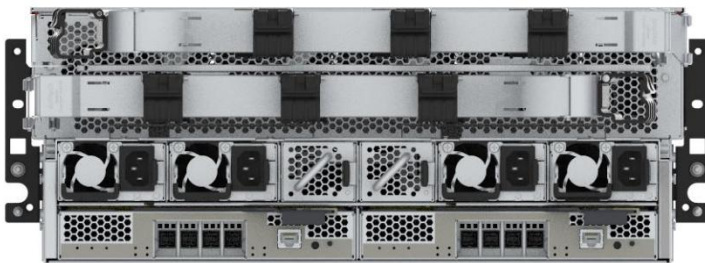
General Overview

1. General Overview

The PS390E JBOD product is a high availability, 4U high density enterprise-class JBOD storage enclosure for up to 90 Drives, which supports both 3.5 inch and 2.5 inch 12Gbps SAS3.0 and SATA3.0 disk drives that fits within a 1100 mm rack (not include door space) including space for cable management. The PS390e product pictures are as shown below:



PS390e Front



PS390e Rear 1

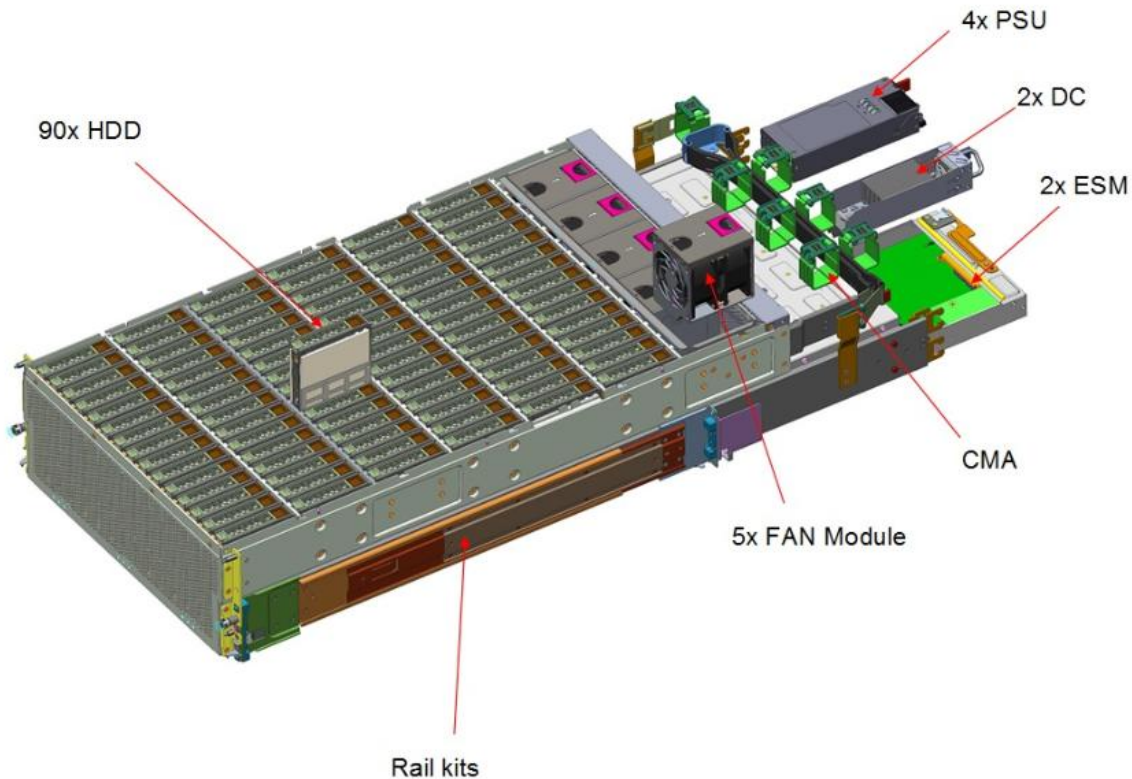


PS390e Rear 2

The PDU location in customer Rack is required to define to avoid the interference with CMA and the FRUs removal from chassis rear side, so the wider rack width is recommended to use by customer to select the suitable PDU and power cord plug orientation.

- Enclosure
 - 4U rack-mounted storage enclosure with slide rail and cable management assembly.
 - Dimensions (with CMA): 175.3mm (H) x 446mm (W) x 1080mm (D)
 - Fits in 1100 mm rack (not include door space) with CMA added.
 - Weight: 4U Assembly with full configuration: 118kg
- Disk Drives
 - 90 top loading drives
 - System supports SAS 2.0/ SAS 3.0 and SATA 2.0/3.0 drives.
 - Up to 13W per drive slot.
- ESM Canister
 - 4 x Mini-SAS HD IO ports.
 - Hot-pluggable from rear of chassis.
 - Supports single or dual
 - Redundant ESM canisters to provide SAS port fan out for all 90 drives.
 - Base on Broadcom SAS35x48 12G SAS Expander.
- Power Supply
 - 2+2 Redundant 1200w PSU
 - System input: 90-264VAC, 47Hz-63Hz via an IEC 320 C-14 power inlet
 - High efficiency (80Plus Platinum level)
 - 100A @ 12V and 3.0A @ 12VSB (200-240V)
 - Hot-pluggable service from rear of chassis, AC power cord on the rear of the chassis
 - 73.5mm(W) x 40 mm (H) x 185 mm (L)
- Fan module

- o Five(5) Hot- pluggable, top loading Fan Modules in chassis
- o Each fan module contains two 80mm fans(dual-rotor)
- o Supports single fan failure



PS390e Enclosure Overview

Feature Summary

The PS390e 4U90 enclosure supports the following high-level features:

- Enclosure
 - o 4U rack-mounted storage enclosure with slide rail
 - o Cable less in enclosure, cable management assembly outside for optical or copper SAS cable
 - o Dual path or Active-Active design
- Disk Drive or SSD
 - o 90 top loading drives
 - o Support both 3.5" and 2.5" form factor in a common carrier
 - o Support SAS3.0 12Gb/s, SAS2.0 6Gb/s and SATA3.0 6Gb/s data speed drive or SSD
 - o Dual port SAS drive support / Single port for SATA
 - o Up to 13W per drive slot
 - o Power control for 12Gb/s SAS drive via pin3
- Power Supply
 - o Four 1200W PSU support redundant 2+2

- System input: 90-264VAC, 47Hz-63Hz via an IEC 320 C-14 power inlet
 - High efficiency (80Plus Platinum level)
 - Energy Star[®] for Storage compliant
 - 98A @ 12V
 - 2A @ 12VSB
 - Rear Access
 - 73.5mm(W) x 40 mm (H) x 185 mm (L)
- Cooling module
 - All airflow comes through the drives via a 5 X 2 array of 80mm X 38mm fans in the middle of the unit
 - Holes cut in drive PCB to bring cool air under the board to the back row of drives.
 - Power supply and 5V DC-DC Board air is delivered from the exhaust side of the system FANs into the rear of the power supplies which house their own FANs, Front to back cooling maintained.
 - ESM cooling is provided by the system fans through a dedicated duct. Front to back cooling maintained.
 - ESM module
 - Two Redundant 1U ESM modules
 - Support for up to 80W per ESM
 - Hot pluggable from rear of the bottom 1U chassis
 - Drive Board
 - One passive Drive Board (DB) to provide physical connection between disk drives to ESM and connect to PIB for providing disk's Power rail(12V and 5V)
 - Power Interconnect Board
 - One passive Power Interconnect Board (PIB) to provide system power rail(12V and 12VSB) from PSU and connect to 5V DC-DC board for providing disk's Power rail(5V)
 - Front Bezel

Product Appearance

Figure below, is a trimetric view of the chassis.

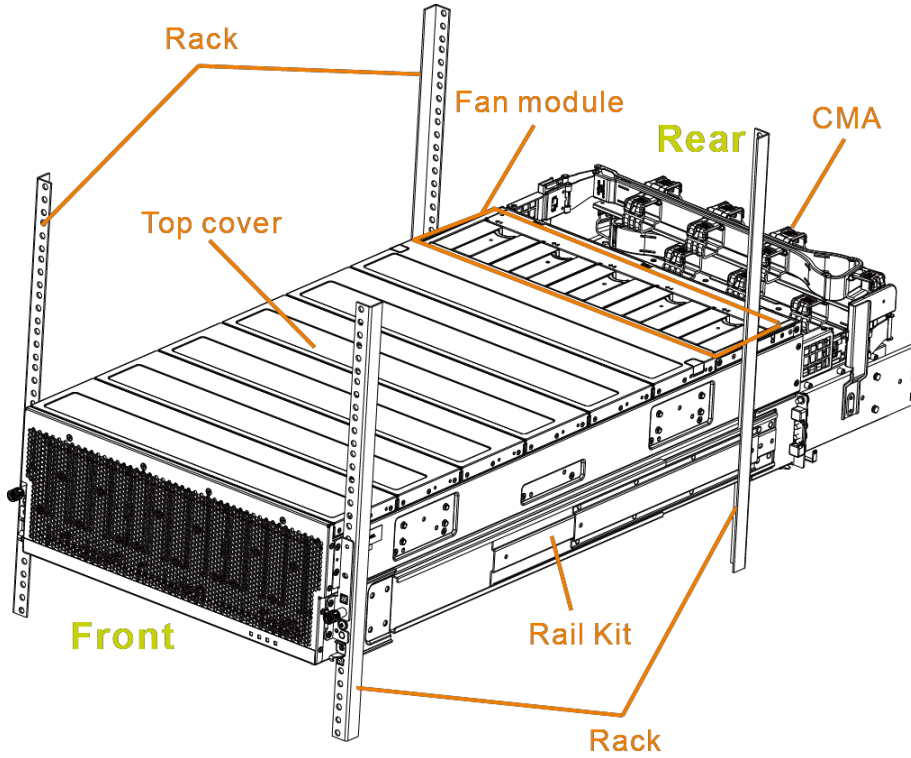


Figure 1: PS390e System Trimetric View

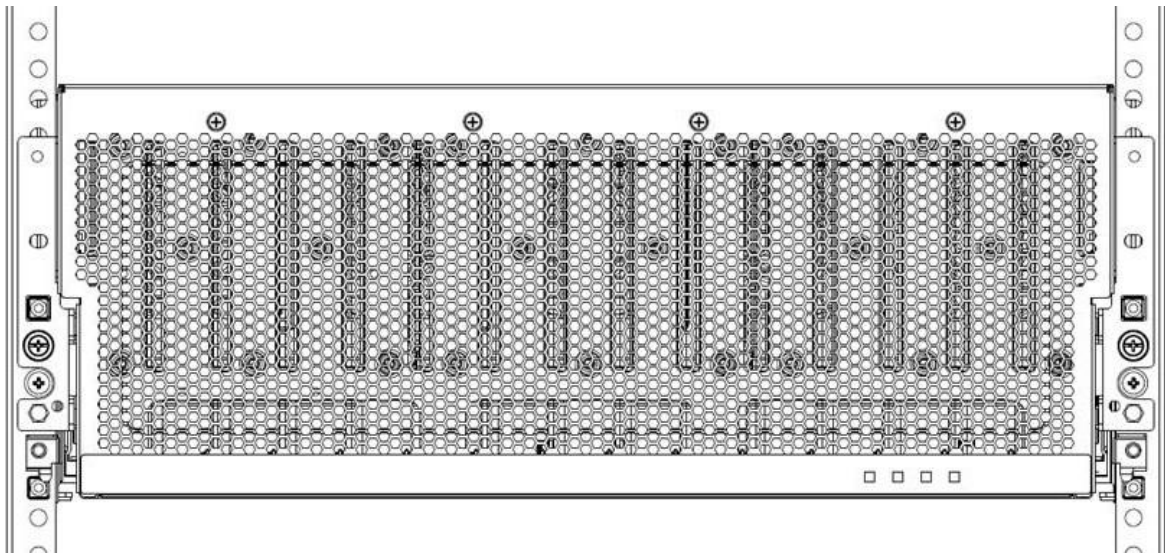


Figure 2: PS390e Front View

Figure below, is a rear view of the chassis, showing PSU, DC-DC and ESM canisters.

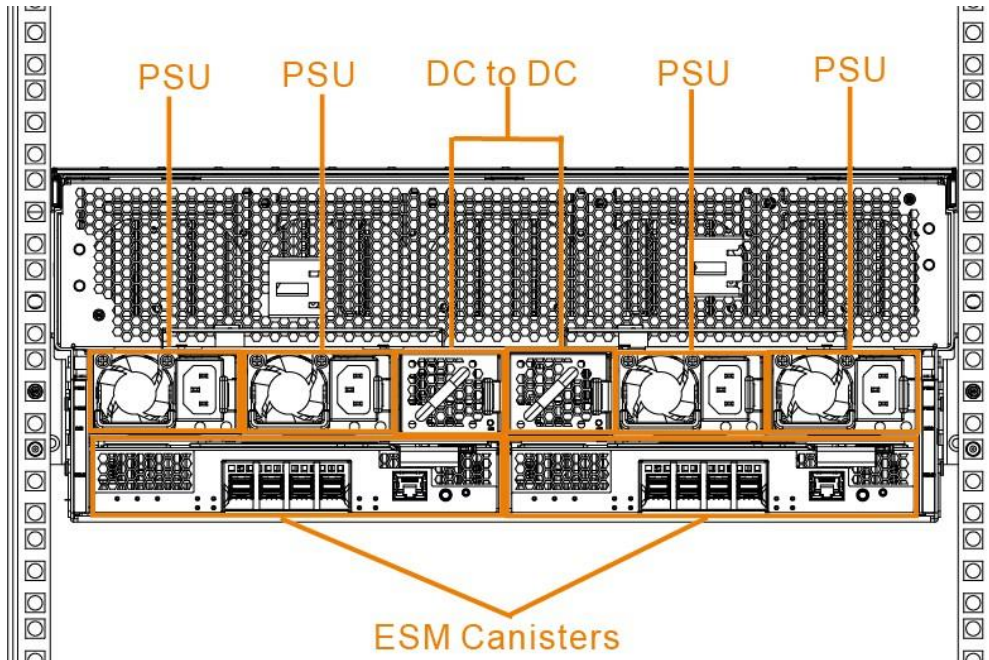


Figure 3: PS390e Rear View

Figures below, show the indicator information on PS390E JBOD.

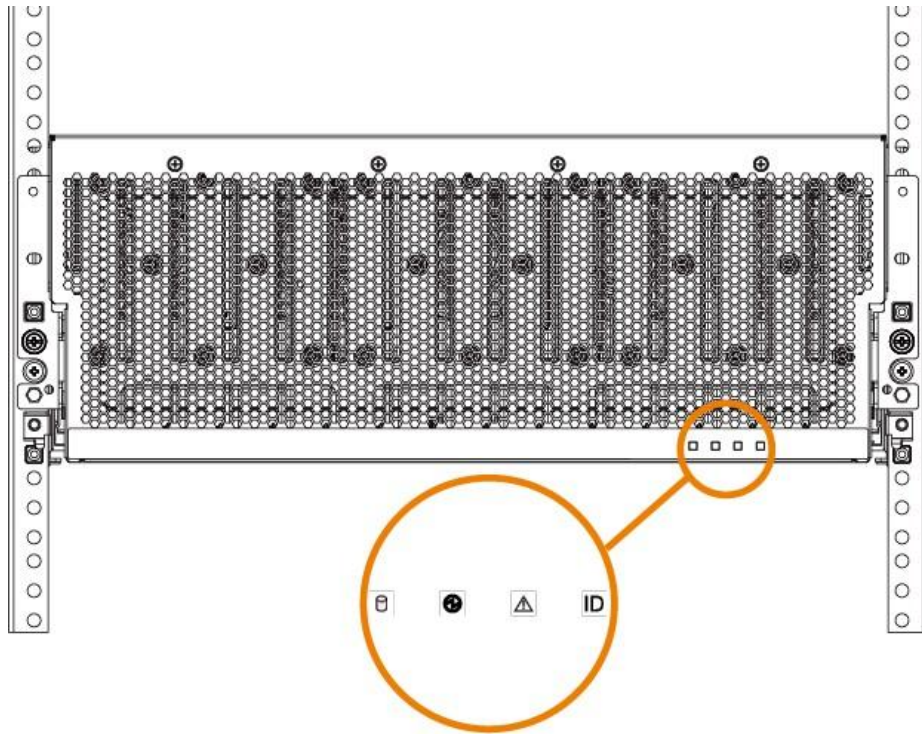


Figure 4: PS390e Front Indicators




Indicator information	Description	
	Drive Fault Summary LED (Amber)	On – Any Drive have fault in the enclosure
		Off – All Drives works fine
	Enclosure Power LED (Green):	On – Enclosure Power LED
		Off – Enclosure power is off
	Enclosure Fault LED (AMBER)	On – Fault conditions exist in enclosure
		Off – Normal operation
ID	Enclosure Identify LED-UID (BLUE)	On – Enclosure identify LED
		Off – Normal operation

Table 1-1 Indicator information on the front of PS390E

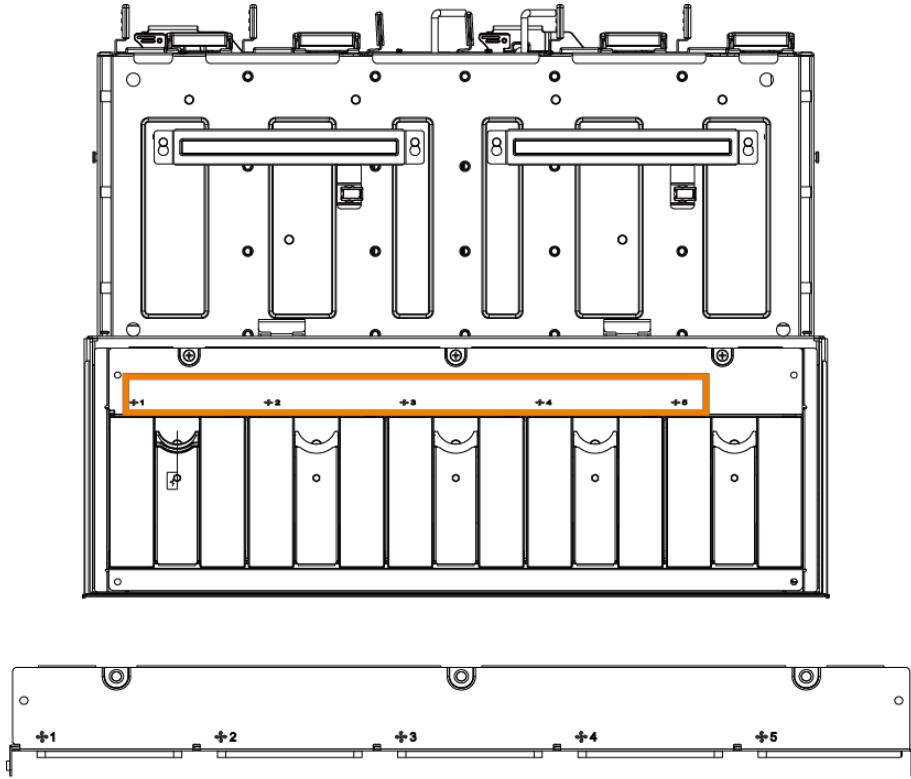


Figure 5: Indicators on Top of PS390e



Indicator information	Description
 1 ~  5	Fan 1~ Fan 5: Fan fault indicators.

Table 1-2 Indicator information on the top of PS390E cover

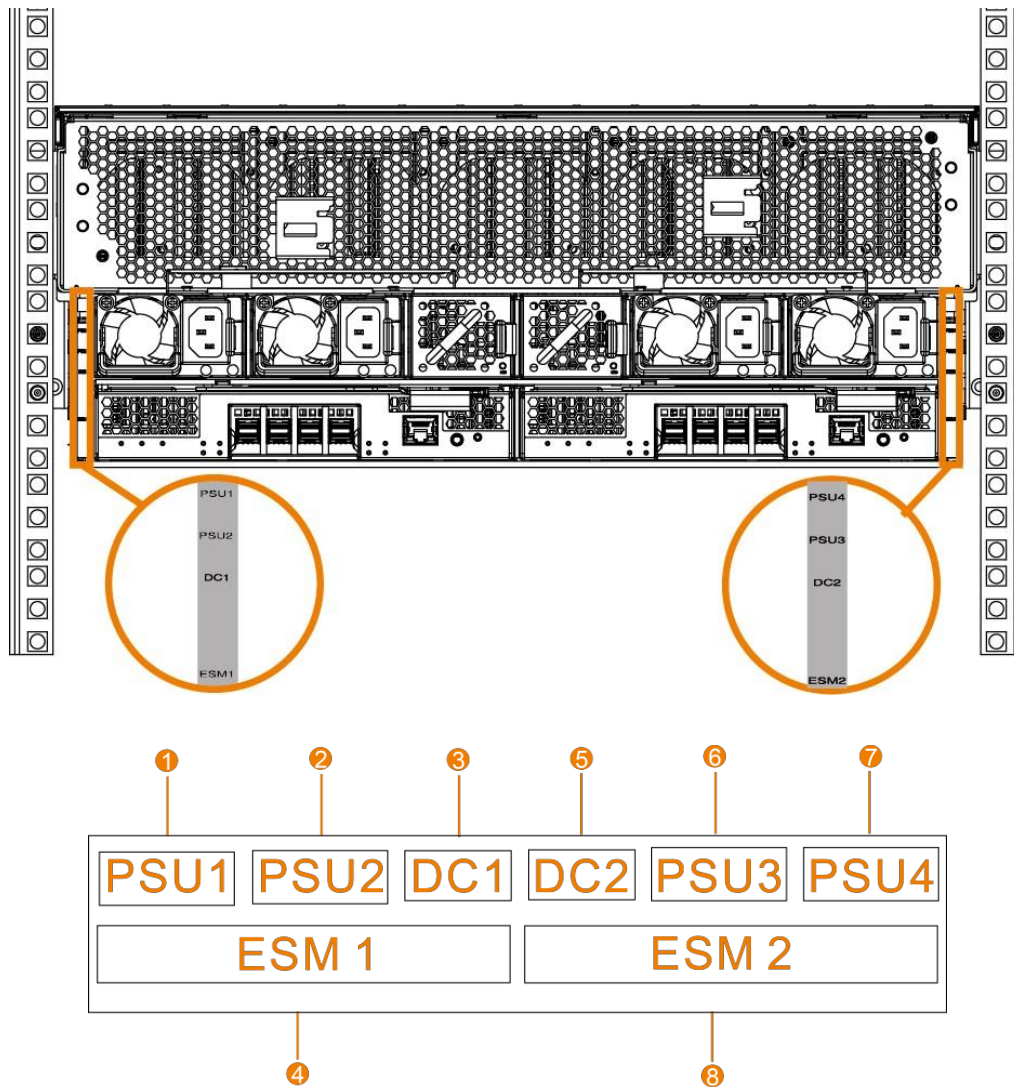


Figure 6: Indicators on Rear of PS390e

Indicator	Description
① PSU1	PSU 1
② PSU2	PSU 2
③ DC1	DC-DC Module 1
④ ESM1	ESM Canister A

⑤ DC2	DC-DC Module 2
⑥ PSU3	PSU 3
⑦ PSU4	PSU 4
⑧ ESM2	ESM Canister B

Table 1-3 Indicator information on the rear of PS390E

Figure below, top view of the chassis, showing PS390E numbering as well.



Figure 7: Drive Slot Map

Drive slots 0-11 are best to use for SSD performance. When install the drive start from the front slot to the rear slot. At Minimum 15 drives need to be installed.

Product Exploded View

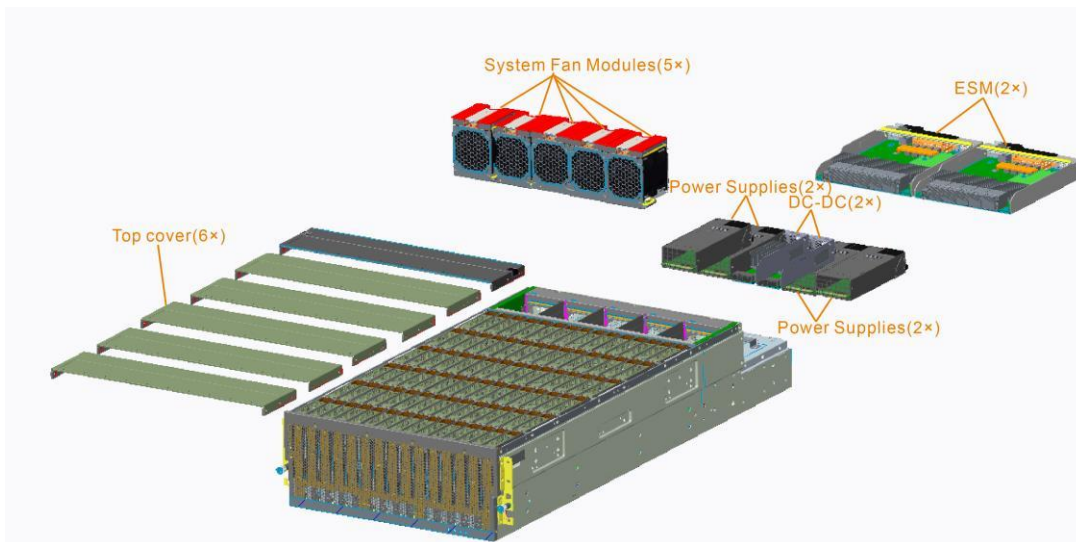


Figure 8: PS390e Exploded View

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.

Safety Instructions

This section may be 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.

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 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.
- 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.

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.

The outlet for the DC power supply should not be far away from the equipment when using.

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



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. If you have not been properly trained contact your immediate supervisor to schedule training.
- 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.

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 (T_{ma}) 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.



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.

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.

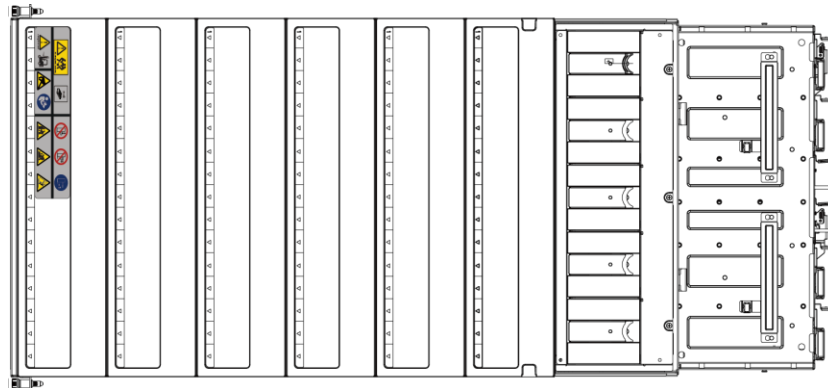


Figure 9: Weight Label



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

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 own expense.



NOTICE: Any modifications made to this device that are not approved by Rasilent 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.

Cet appareil numérique de la classe A est conforme 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).

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。

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 10: ESD Protection

2) Protective gloves:



Figure 11: Protective Gloves

3) Screwdriver:



⊕ #1 Philips Used for install 2.5" HDD

⊕ #2 Philips Used for other screws

Figure 12: Screw Driver

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

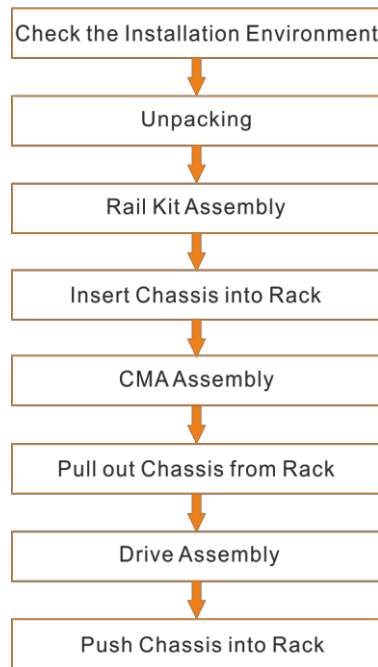


Figure 13: Flow Chart

- **Unpacking**
- **Rail Kit Assembly**
- **Insert Chassis into Rack**
- **CMA Assembly**
- **Pull out Chassis from Rack**
- **Drive Assembly**
- **Push Chassis into Rack**

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 requirement, please reference the preface of this user manual.

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.

Rail Kit

Rail Kit Installation

The rail kit sample from the package is as below. The middle rail and external rail are shipped as a combination part.

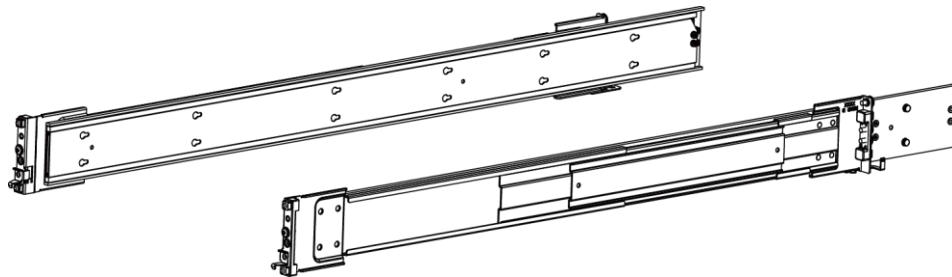


Figure 14: Slide Rails

Step 1:

1) Remove the inner rail.

2) Push (a) and slide middle rail back.

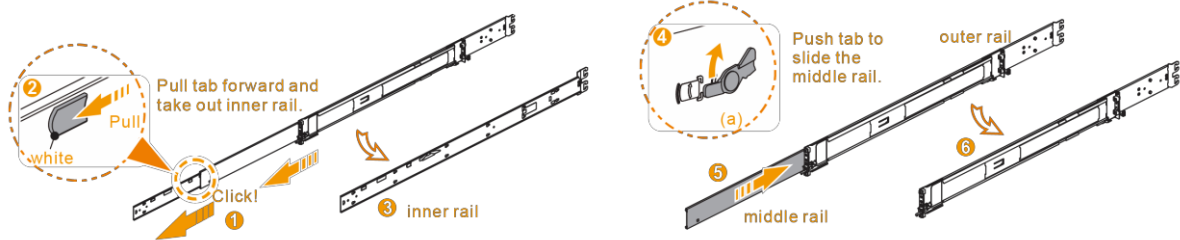


Figure 15: Remove the Inner Rail

Step 2: Install the inner member onto the chassis.

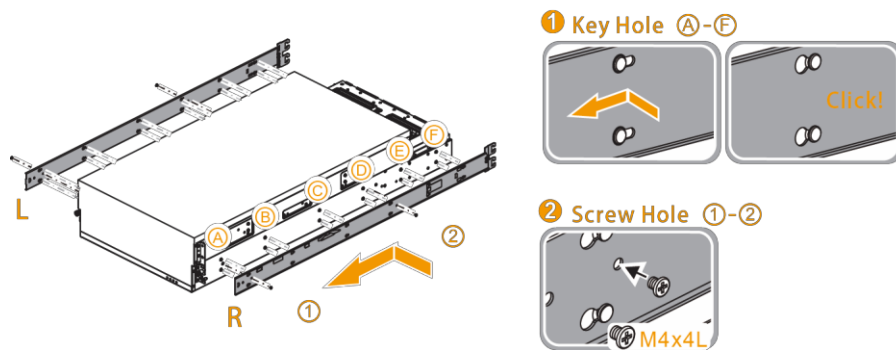


Figure 16: Install the inner member onto the chassis

The inner rail fixed on chassis by 8 pcs screw, on each side 4 pcs screw (M4xL6).

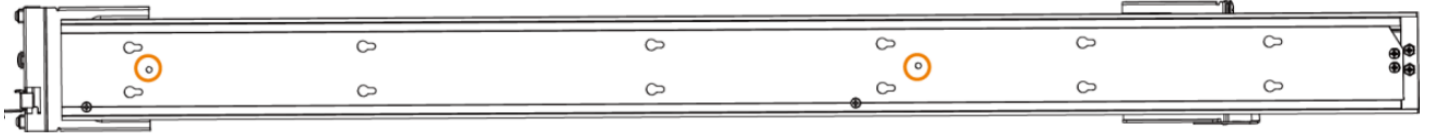


Figure 17: Fix Inner Rail to Chassis

Step 3: Install the CMA bracket.

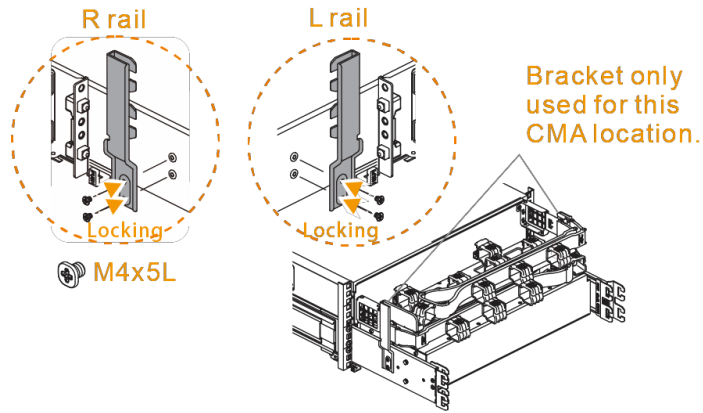


Figure 18: Install CMA Bracket

Step 4: Install the outer rail onto the rack post.

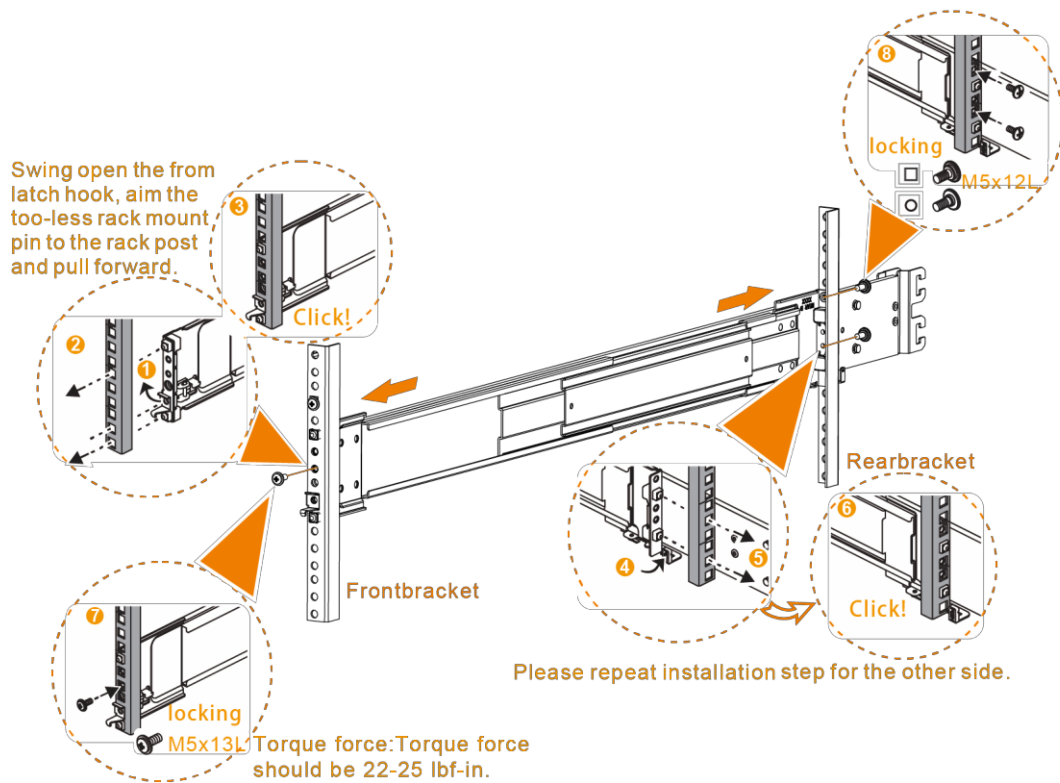


Figure 19: Rail Assembled on Rack

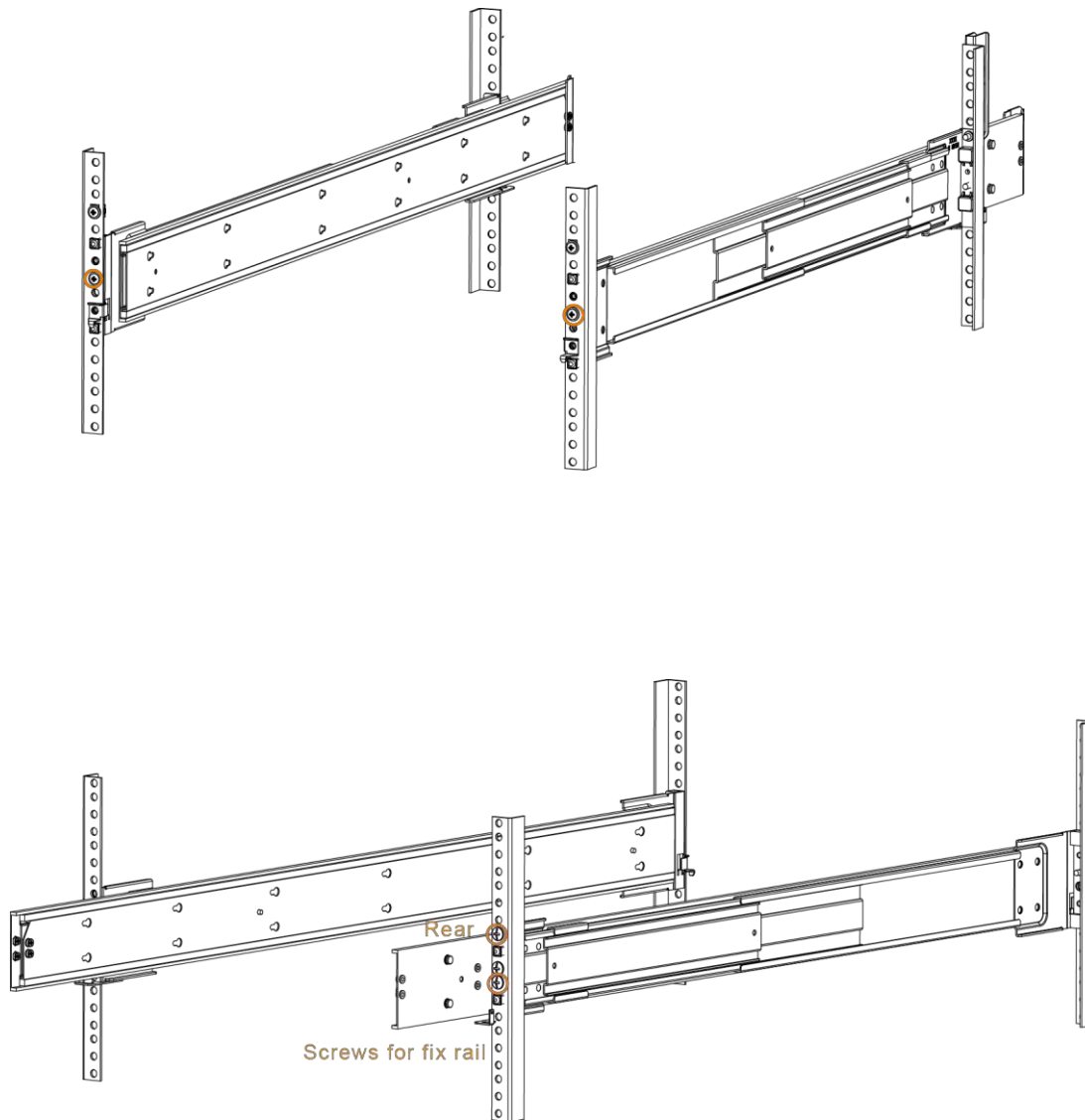


Figure 20: Fixing Rail on Rack

Step 5: Insert the chassis to complete the installation.

- 1) Pull the middle rail fully extended in locked position.
- 2) Ensure ball bearing retainer is located at the front of the middle rail.
- 3) Aim the rear end of inner rail to middle rail, insert the chassis horizontally to middle and out rail.
- 4) & 5) When the chassis is locked, push release blue tab on both sides and continue sliding the chassis to the rack.

6) Tighten chassis with rack by thumb screw on chassis ear during normal operating, and the shipping screw is tightened during rack shipment only.

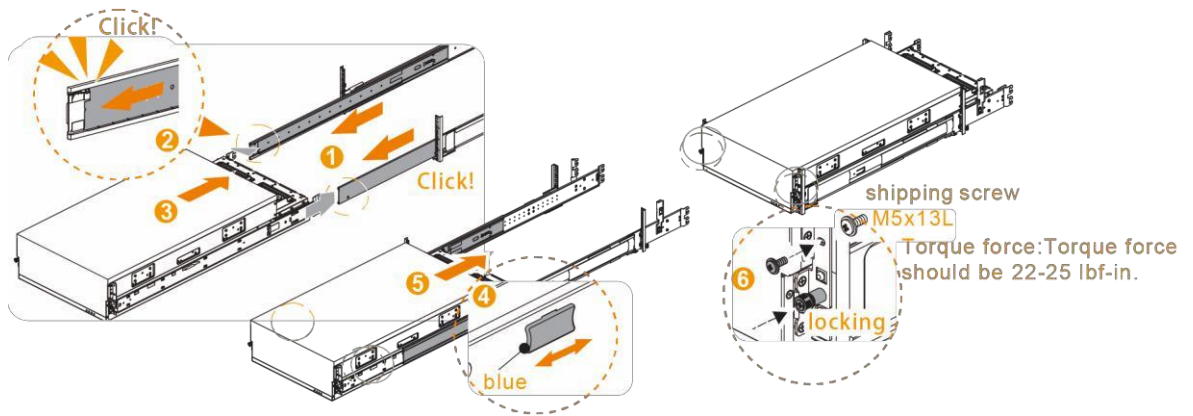


Figure 21: Push Chassis into Rack

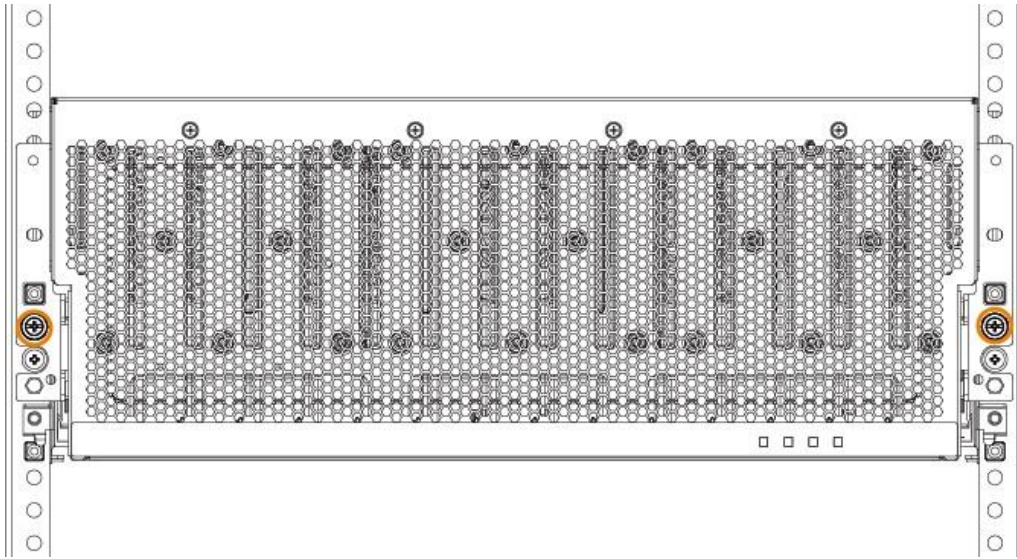


Figure 22: Front Bezel Screw

Rail Kit Removal

Step 1: Remove the chassis from the rack.

- 1) Loosen shipping screw to pull out chassis.
- 2) Pull the disconnect tab forward to remove chassis.

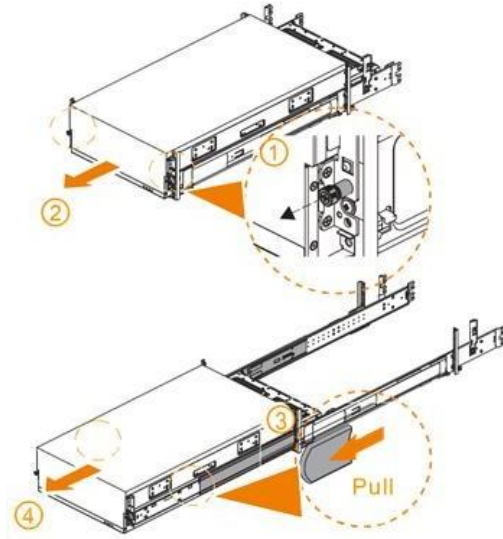


Figure 23: Pull Chassis from Rack

Step 2: Remove the bracket.

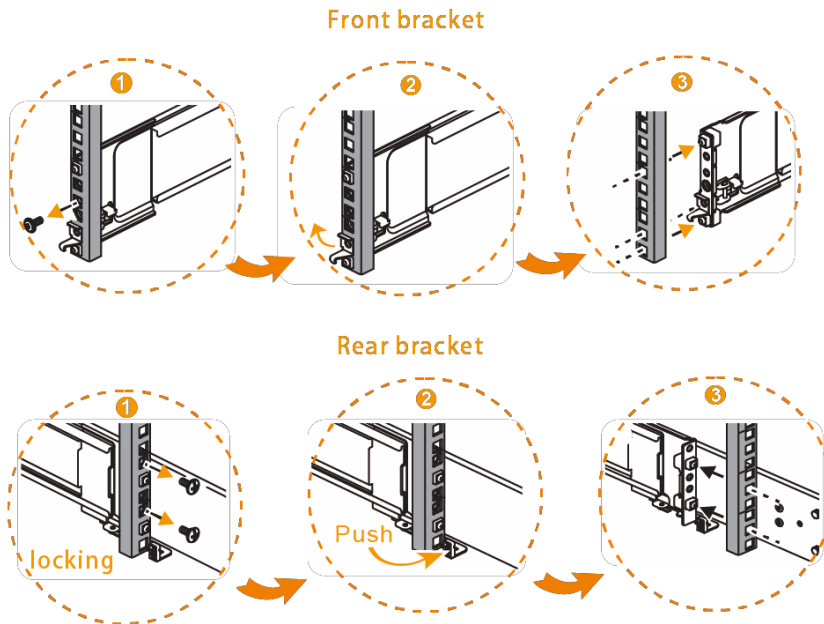


Figure 24: Removing Bracket

Drive

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

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

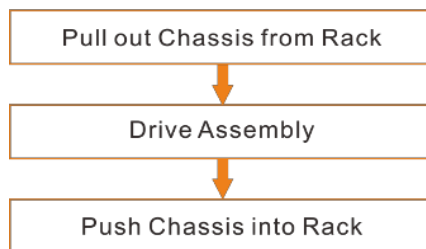


Figure 25: Drive Assembly Flow Chart

- **Pull out Chassis from Rack**
- **Push Chassis into Rack**



WARNING: Hard drive configuration (for safe installation and use):

- 1) When the equipment is installed with rack, install hard drive in sequential from slot 1 to 90.
- 2) When the equipment is putted on the plane, install hard drive in order on drive slot, but all empty slot must be filled with HDD carrier.

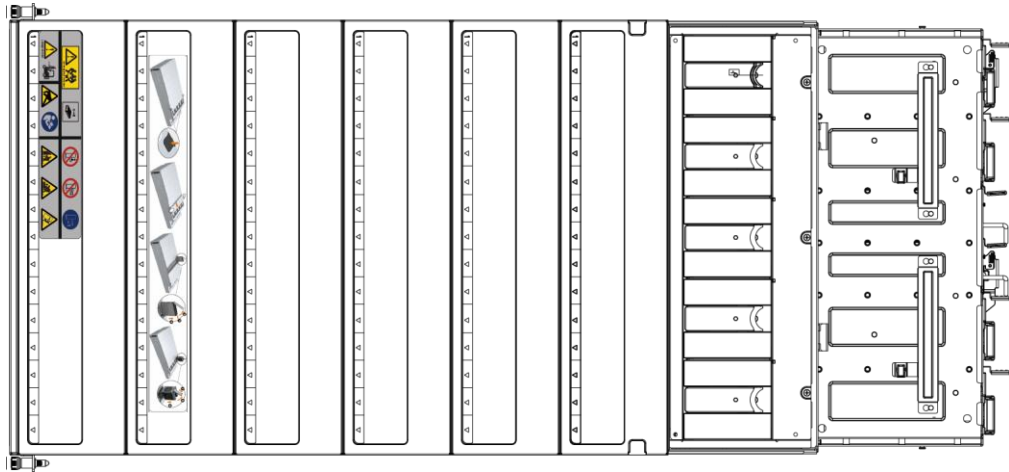


Figure 26: Service Label

Pull out Chassis from Rack

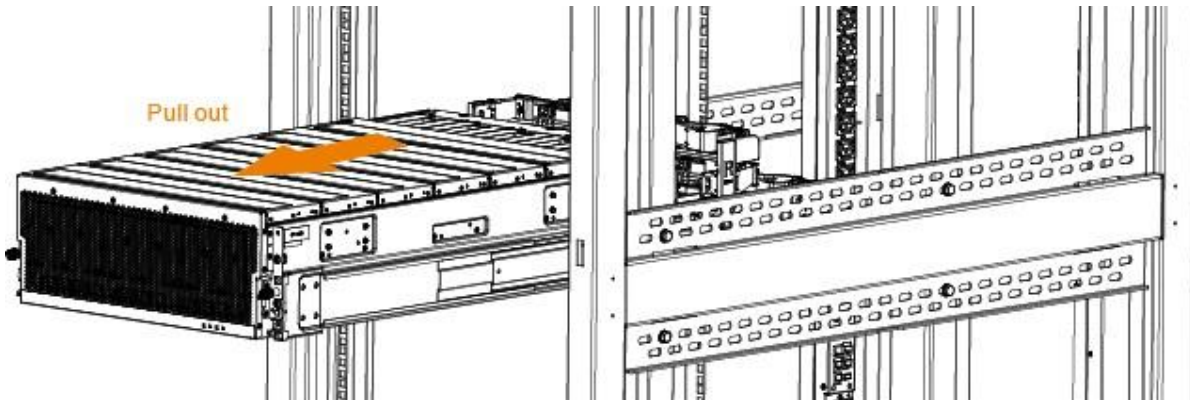


Figure 27: Pull out chassis from rack



WARNING: To avoid the risk of personal injury or equipment damage, be sure that the rack is adequately stabilized before extending a component from the rack.



WARNING: To avoid the risk of personal injury, be careful when sliding the chassis into the rack. The sliding rails could pinch your fingers.



WARNING: When install the system in the rack be sure to start from the bottom to the top. Do not install the system in the rack from top to bottom.

Drive Installation

Install 3.5 inch Drive into carrier

Both 3.5 inch and 2.5 inch can be easily assembled in the same carrier. Raslient will provide a kit with all the parts necessary for the installation.

Step: Install 3.5 inch drive to the carrier.

Figures below show a detail sequence of pictures that show the proper kits and method of assembling. These methods must be followed or failure could occur to the isolator if not properly installed.

3.5 inch Drive

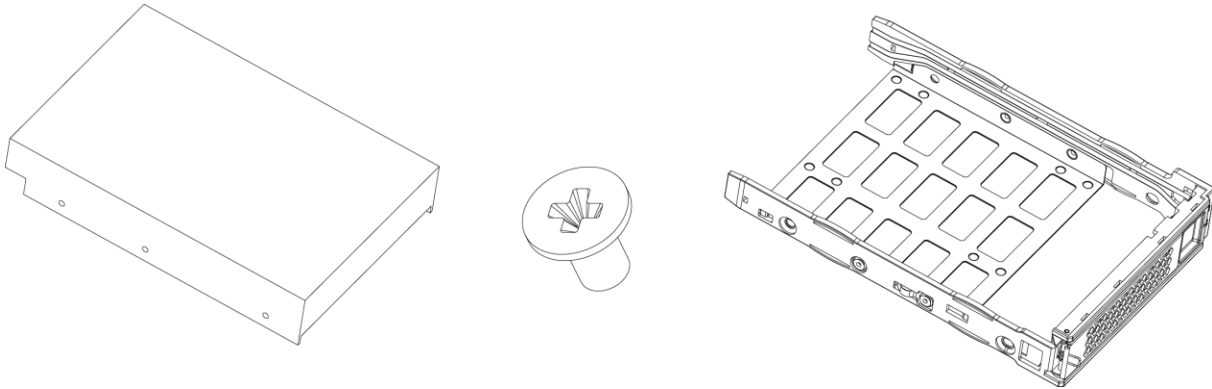


Figure 28: Drive Carrier Kit for 3.5" Drive

3.5 inch Hard Disk X1

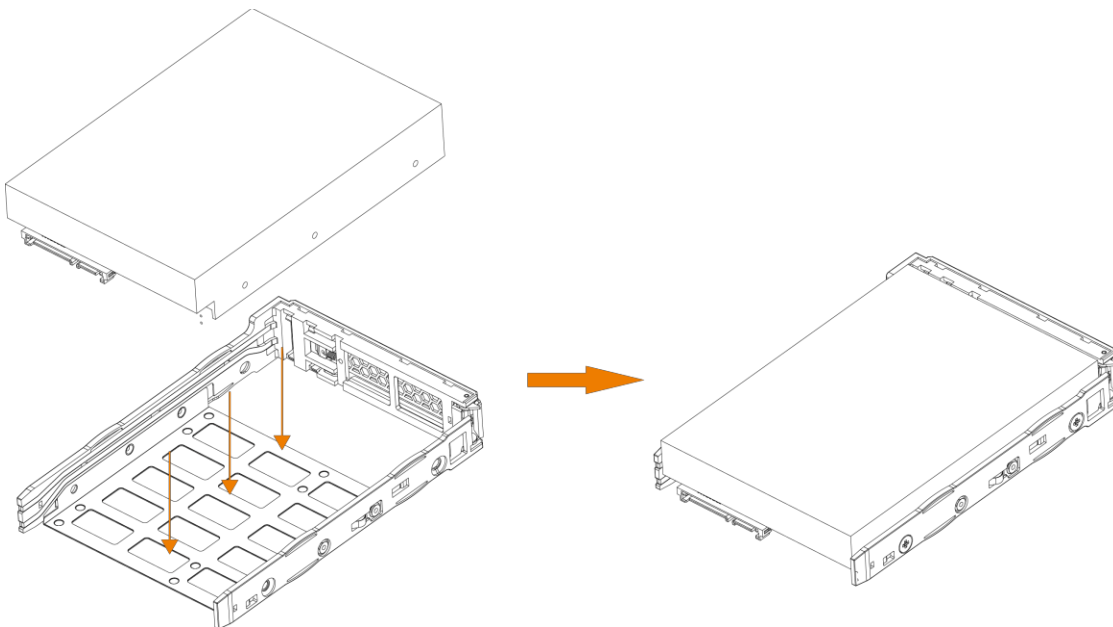
Screw X 4 #6-32 L5, NYLOK

Carrier X 1

Screwdriver used: PH2

Screw torque: 6 +/- 0.5 kgf.cm(5 lbf.inch)

Step 1: Put hard disk into carrier.



Step 2: Fixed hard disk by screws.

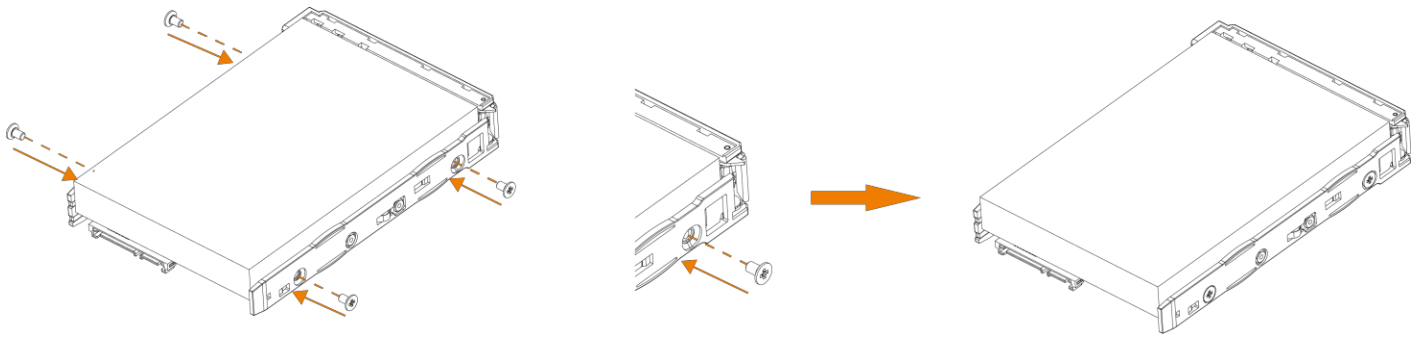


Figure 29: 3.5" Drive Assembly Sequence

Install 2.5 inch Drive into carrier

Both 3.5 inch and 2.5 inch can be easily assembled in the same carrier. Rasilient will provide a kit with all the parts necessary for the installation.

Step: As Figures below show a detail sequence of pictures that show the proper kits and method of assembling. These methods must be followed or failure could occur to the isolator if not properly installed.

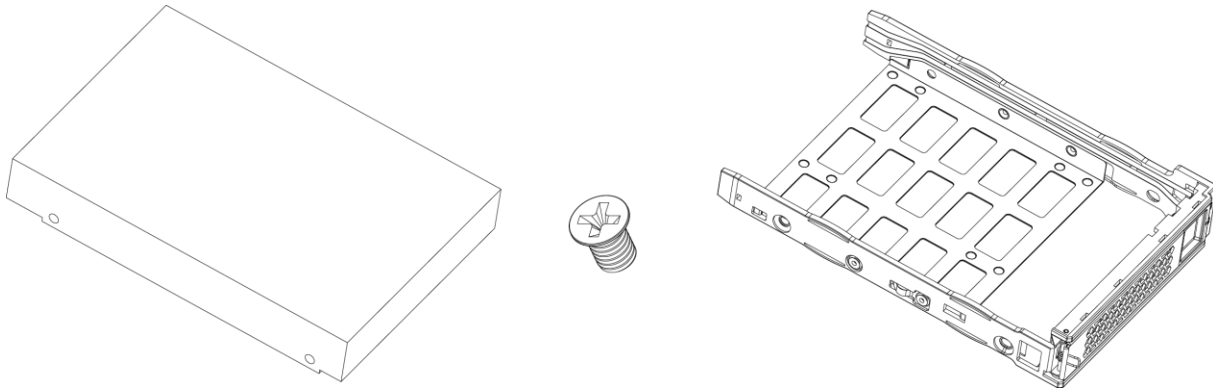


Figure 30: Drive Carrier Kit for 2.5" Drive

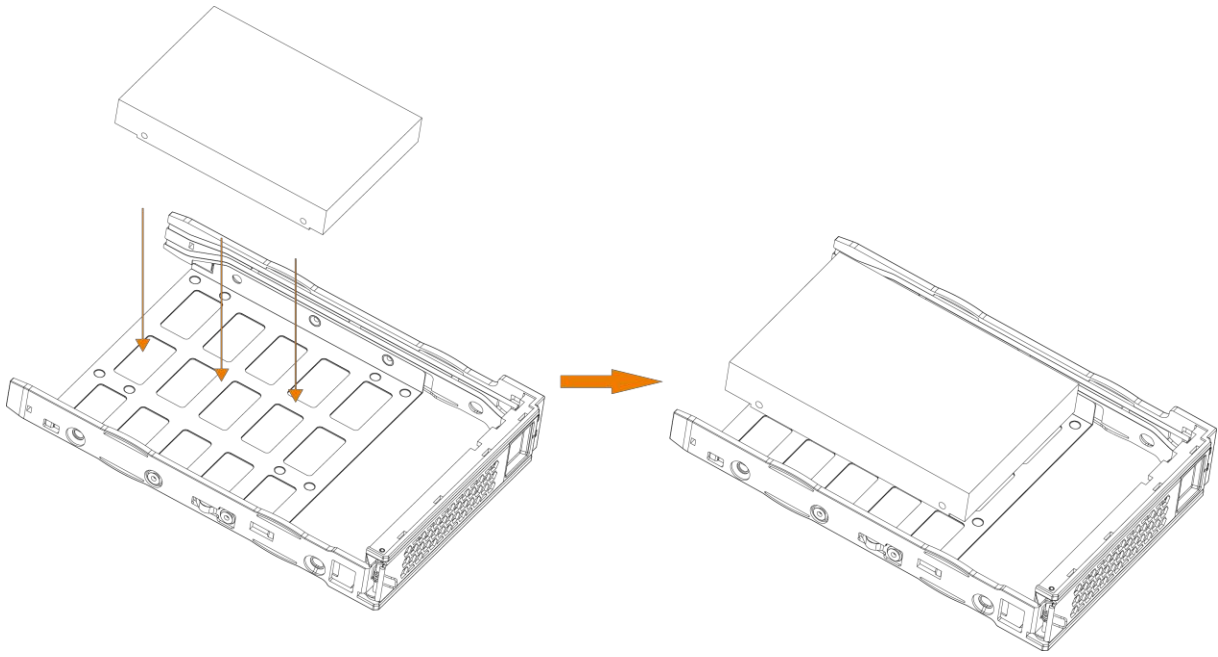
2.5 inch Hard Disk X1

SCREW X4, M3X0.5X4.7, PH, FLT, ST, ZN

Screwdriver used: PH2

Screw torque: 4.5 +/- 0.5kgf.cm(4 lbf.inch)

Step 1: Place hard disk into carrier by locating four holes.



Step 2: Fixed hard disk by screws.

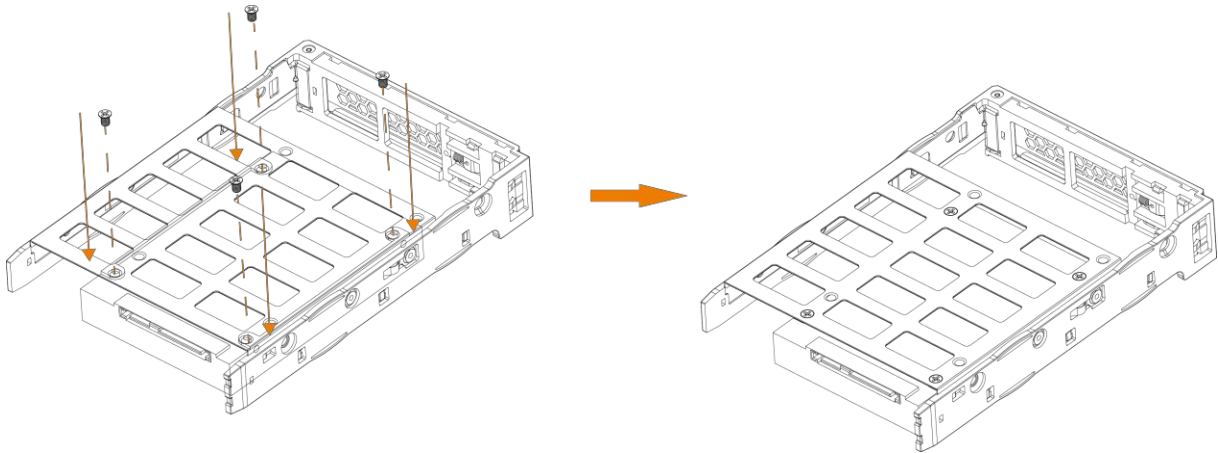


Figure 31: 2.5" Drive Assembly Sequence



NOTE: Please make sure the Drives have been installed correctly and tightly, otherwise will affect the use.

Install Drives into chassis

Step 1: Open the chassis top cover.

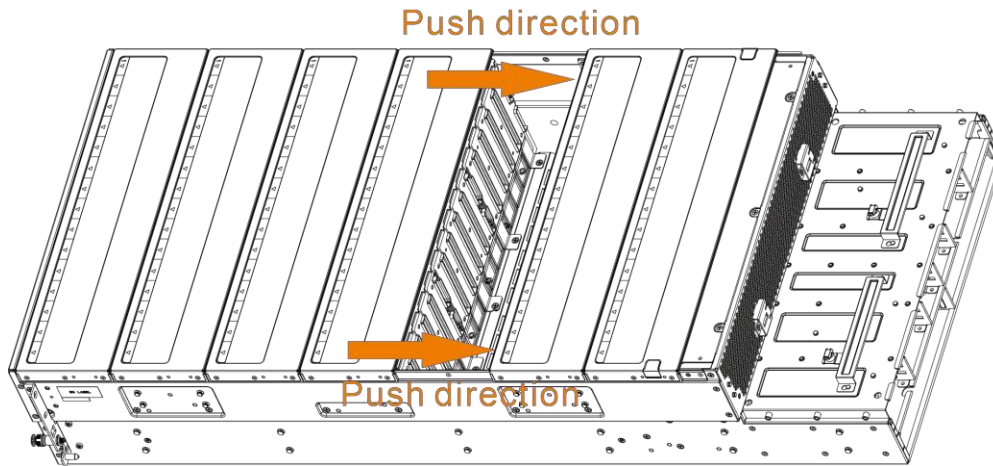
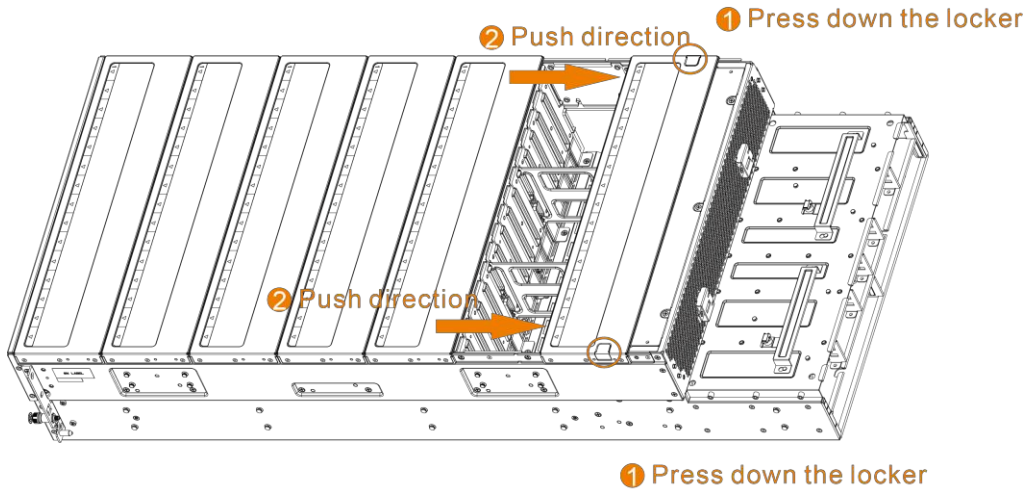


Figure 32: Or other top cover

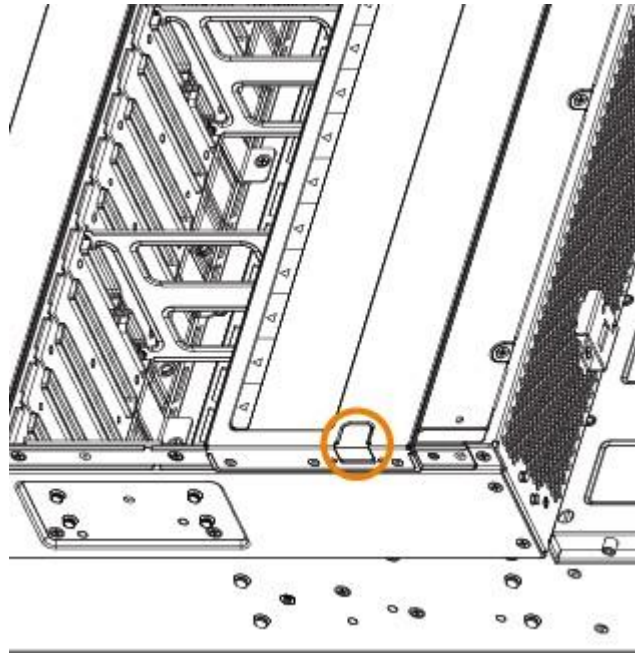


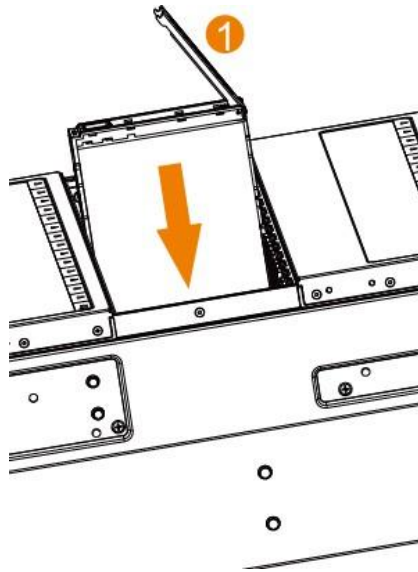
Figure 33: Locker

Step 2: Pull out / install the Drive carrier.

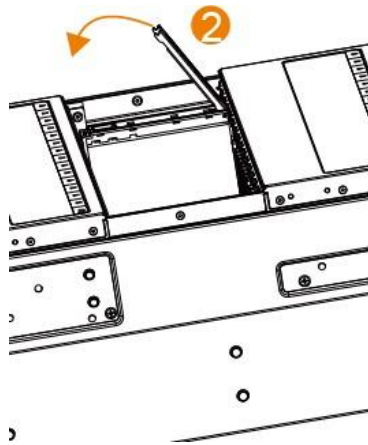
Pictures below will show the details for proper drive installation and removal process.

Assemble HDD into Chassis

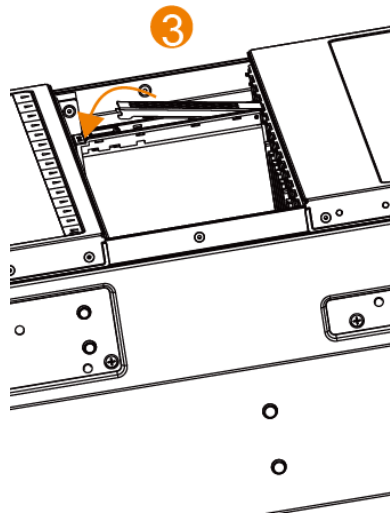
- 1) Aligning the HDD and HDD slot then push HDD down until the latch top toe touches the partition.



2) Rotate the handle down to lock the HDD into the chassis.



3) The bottom toe will engage on the first step.



4) The second stage will engage to fully close.

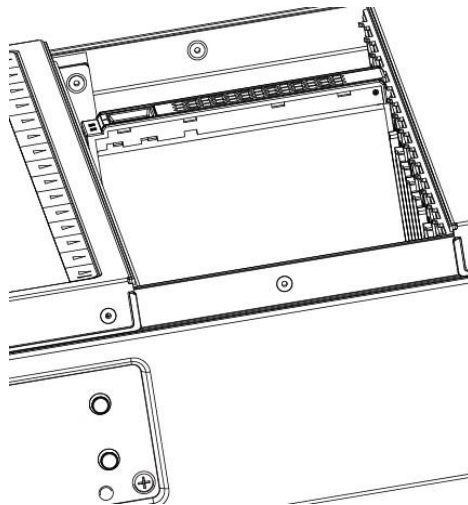
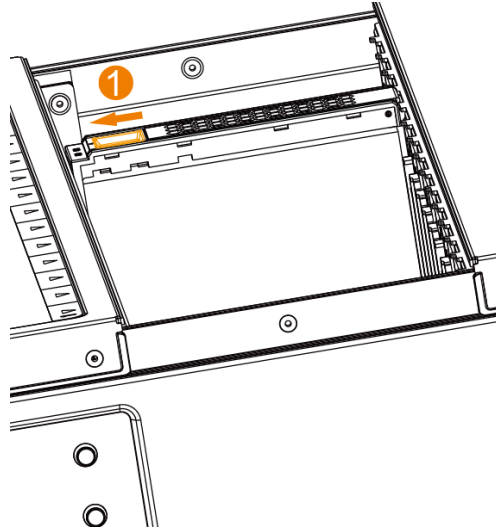


Figure 34: Assemble HDD into Chassis

Remove HDD from Chassis

Step 1: To release the carrier, simply push/slide into the touch point.



Step 2: The handle will open automatically. Pull the drive out of the chassis.

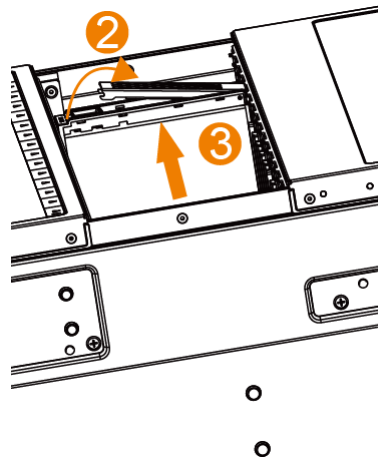


Figure 35: Installing and remove Drive Carriers into Chassis

Step 3: Close the chassis.

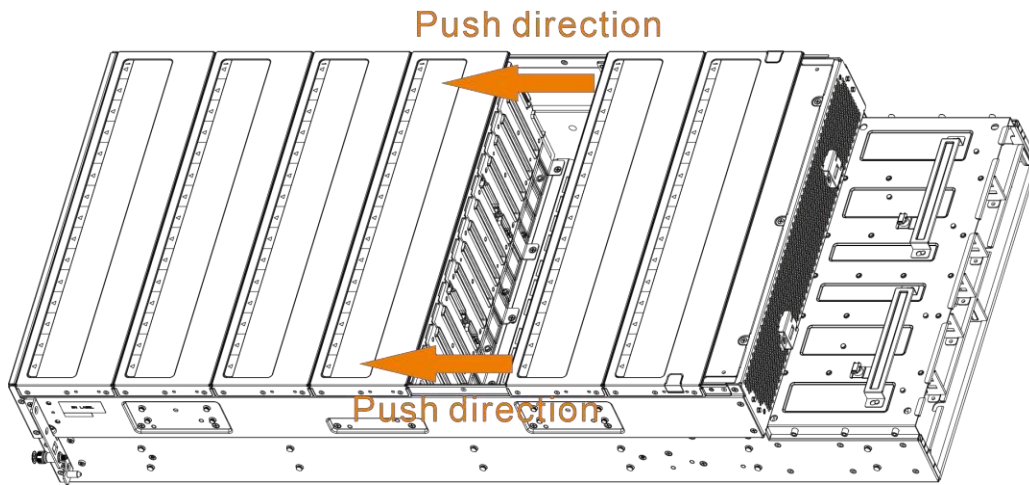


Figure 36: Close Chassis

Push Chassis into Rack

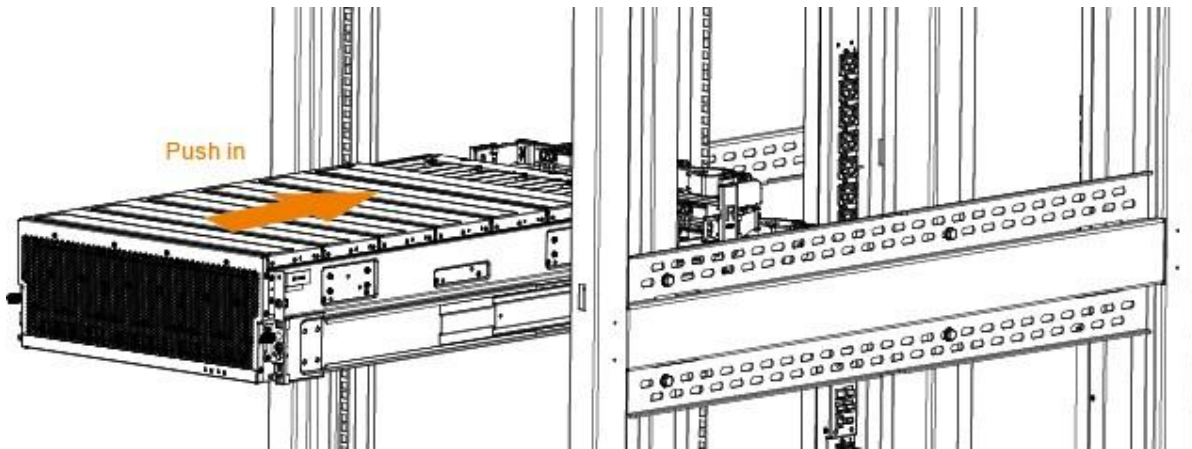


Figure 37: Push Chassis into Rack

Hardware Overview

3. Hardware Overview



NOTE: The ESM, PSU, Fan Modules, HDD and DC-DC module are all hot-pluggable.



WARNING: User should replace drive FRU one by one, not recommend to pull out multiple drive FRUs at the same time without putting new HDD or dummy carrier in place.



WARNING: The hardware element replacement maximum time, that is, from the hardware element to replace and install a new one for this period, please refer to the following:

- 1) Canister replacement maximum time is 10 minutes.
- 2) PSU replacement maximum time is 10 minutes.
- 3) System fan module replacement maximum time is 10 minutes.
- 4) DC-DC module replacement maximum time is 10 minutes.
- 5) Drive replacement maximum time is 10 minutes.

ESM Canister-Expander Storage Module Canister

Overview

The canister module provides external SAS connectivity for the four (4) Mini-SAS HDs from the rear of the canister and provides four external SAS 4 lane Mini-SAS HD(SFF-8644) connectors, a RS-232 serial port (audio jack), and eleven status LEDs.

ESM Canister LED

ESM canister front view refers to the picture below. There are eleven LEDs on the canister face. Three LEDs are for canister power, locate and fault identification. Two LEDs are for each Mini-SAS HD port active status identification.

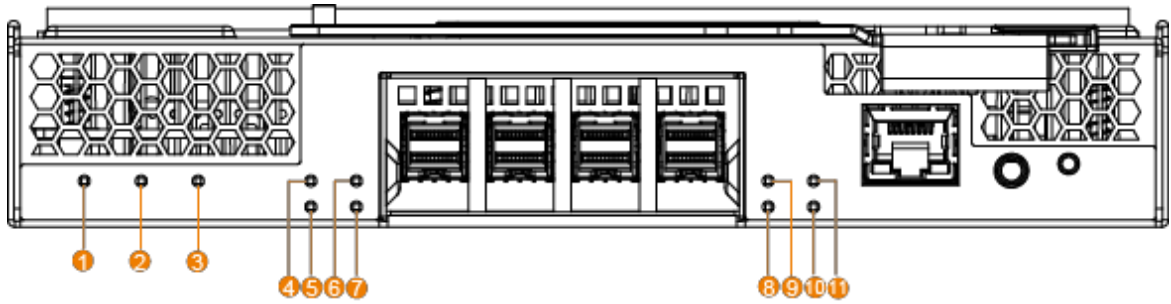


Figure 38: ESM Canister Front View

Below is description for each LED:

- No.1: Power LED(Green)
 - o On – ESM Power LED
 - o Off – ESM Power is off
- No.2: Fault LED(Amber)
 - o On – Fault conditions exist in ESM
 - o Off – Normal operation
- No.3: Identify LED-UID(Blue)
 - o On – ESM identify LED
 - o Off – Normal operation
- No.4/No.6/No.9/No.11: ESM Mini-SAS HD link status LED(Green)
 - o Steady On – Linked
 - o Blink – data transfer
 - o Off–No Link
- No.5/No.7/No.8/No.10: ESM Mini-SAS HD link fault LED(Amber)
 - o On – Link fault
 - o Off – Normal

Mini-SAS HD port

There are eight Mini-SAS HD ports on PS390E system, each canister has four ports.

- Four Mini-SAS HD port for JBOD upstream/downstream connection.
- 12G SAS 4X wide port.
- Support passive cable.

Debug port

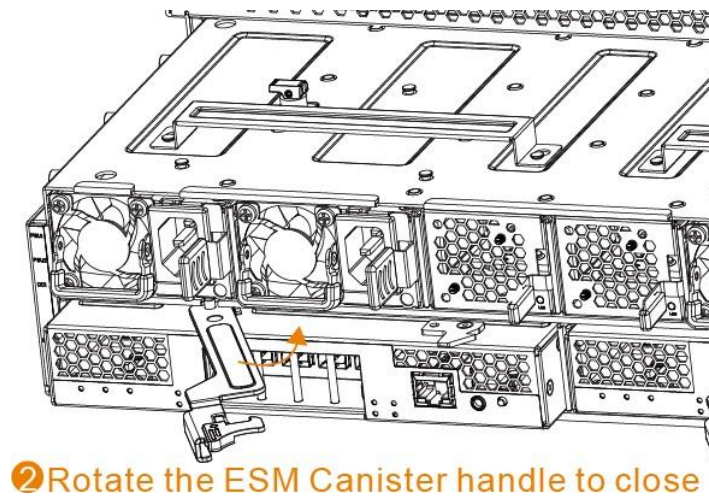
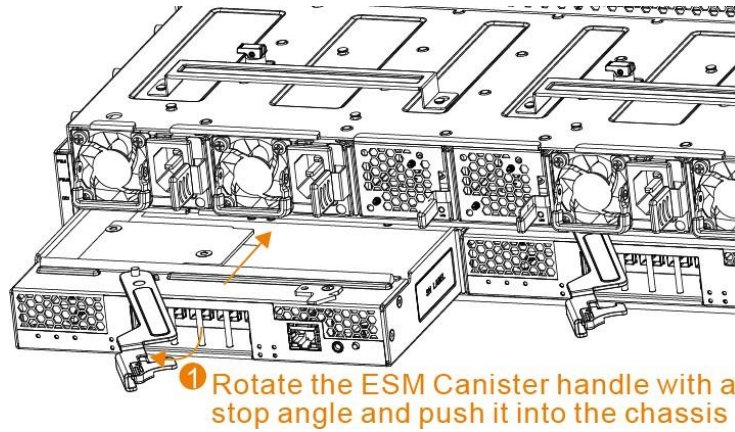
There is a console port on each canister for software debug with 3.3V TTL serial port in 3.5mm Audio Jack connector. Following is a list of commands for ESM console (only for reference purpose):

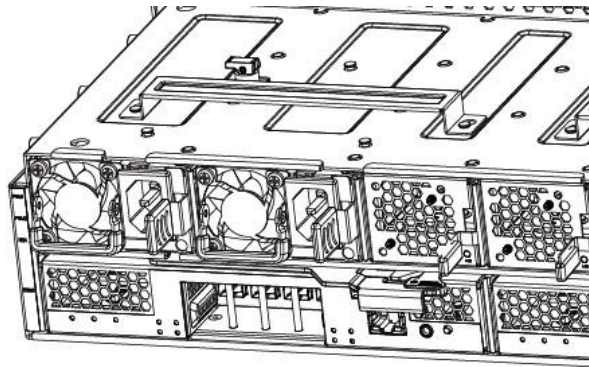
Command	Description
about	Display firmware version and copyright information
drv	Show array device slot elements status
esm	Show enclosure service control electronics element status
fan	Show/Set working mode and speed of cooling fans
help	Show the command list
mode	Display/Config ESM state
fru	Display/Change system inventory information of FRUs and enclosure
log	Display /Clear system event and operation log
port	SAS Expander port status display
power	Display/Change power status of FRU/Drives
threshold	Display or set threshold values for various sensors
temp	Display temperature sensors reading
checklist	Show/configure SBB compatibility check list
reset	Reset local/peer Canister
config	Display/Reset user configuration
debug	Toggle system debug information
errlog	Display/Clear firmware application error log
led	Show/Set status of various LED indicators
vpd	Display/Program various VPD
spin	Drive spin up control
phy	PHY enable/disable/reset
flash	Toggle the boot selection

ESM Canister

ESM Canister Installation

Press the latch and rotate the ESM Canister handle with a stop angle and push it into the chassis. Then rotate the ESM Canister handle to close.



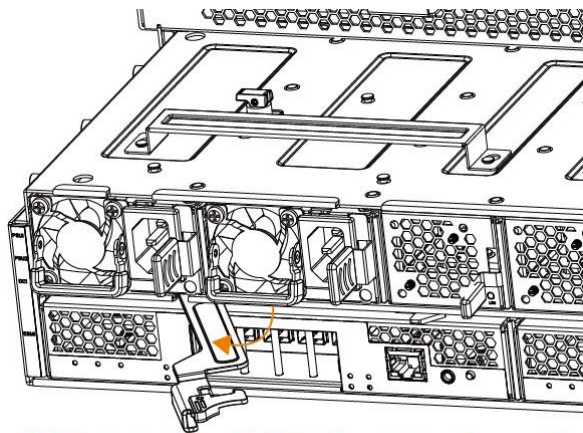


3 Done

Figure 39: ESM Canister Installation

ESM Canister Removal

Press the latch and rotate the ESM Canister handle then pull the canister out of the chassis.



1 Rotate the ESM Canister handle

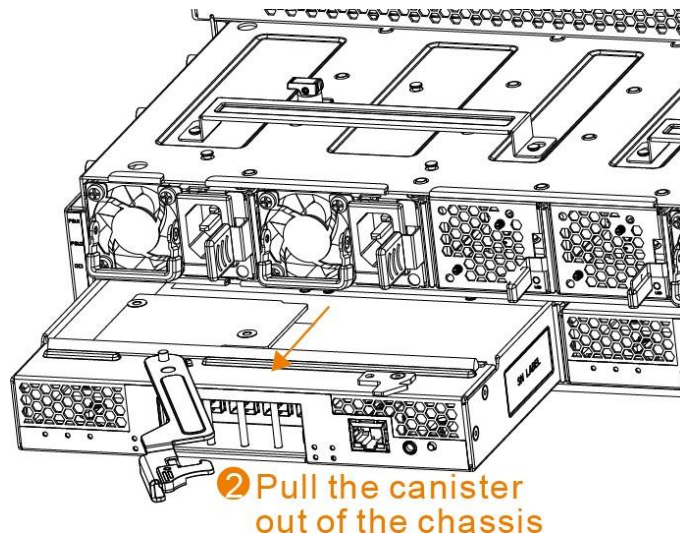


Figure 40: ESM Canister Removal

PSU- Power Supply Unit

Overview

The PS390E storage enclosure is powered by four 1200 watt redundant Power Supply Units with following features.

- 1200w 2+2 Redundant (80Plus Platinum Level)
- Input: 200-240VAC via IEC 320 C-14 inlet on the system rear

PSU LED

Refer to the picture below for the PSU front view. There is one indicator LED located on the front faceplate.

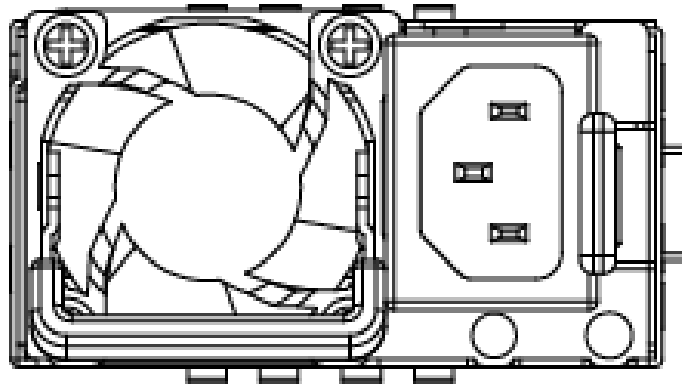


Figure 41: PSU Front View

- Output ON and OK or in Cold Redundant Slave mode(Green)
- AC present / only 12Vsb on (PS off)(1Hz Blink Green)
- AC cord unplugged or AC power lost; with a second power supply in parallel still with AC input power(AMBER)
- Power supply warning events where the power supply continues to operate high temp, high power, high current, slow FAN.(1Hz Blink Amber)
- Power supply critical event causing a shutdown; failure, OCP, OVP, FAN fail. (Amber)

AC Power Cord

The AC power cord is located on the chassis rear side, not on the front (PSU) side. The AC cord type at PS390E side is C14, and the power cable with USA and China power cord can be chosen, so users can use system attached C13 to C14 power cable. Contact with Rasiliant for other options if want to use other types of power cord.



NOTE: The PSU AC input range: 180 to 264V rms.

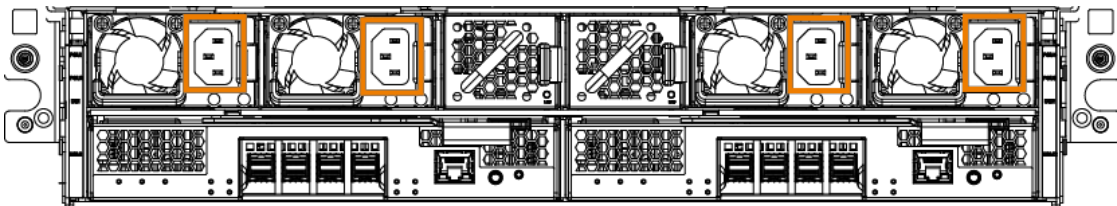


Figure 42: AC Power Cord

PSU

The appearance of PSU is shown as below:

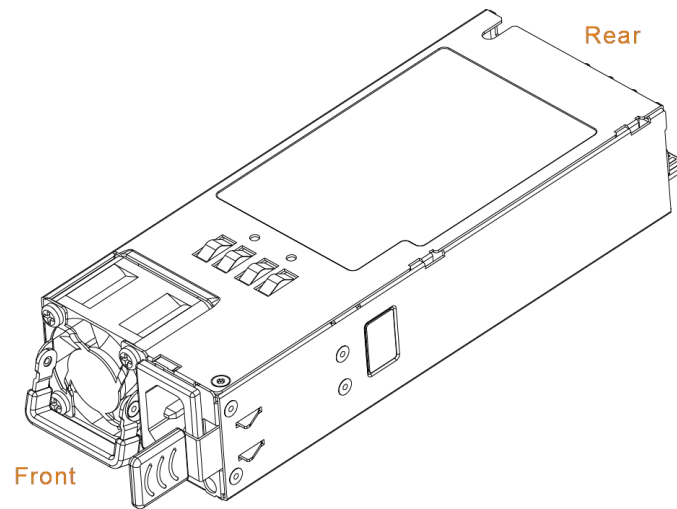


Figure 43: PSU Overview

PSU Installation

Rotate the PSU handle with a suitable angle and push the PSU into the chassis. Then rotate the PSU handle to close.

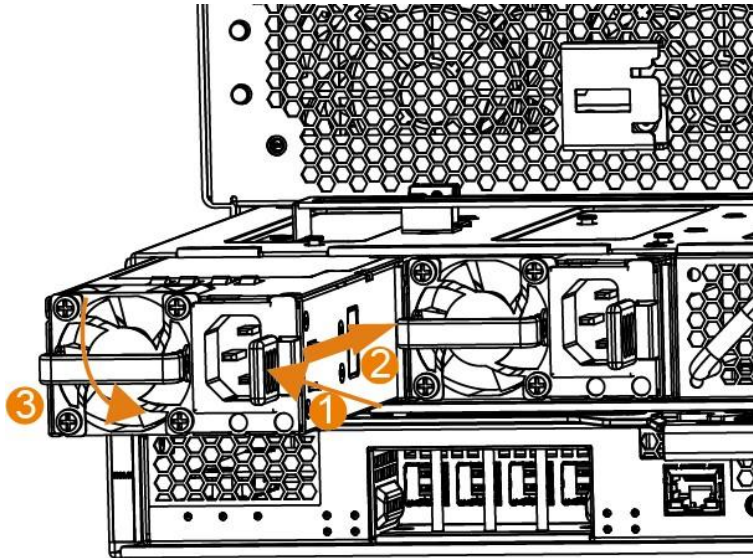


Figure 44: PSU Installation

PSU Removal

Rotate the handle and then pull the PSU out of the chassis.

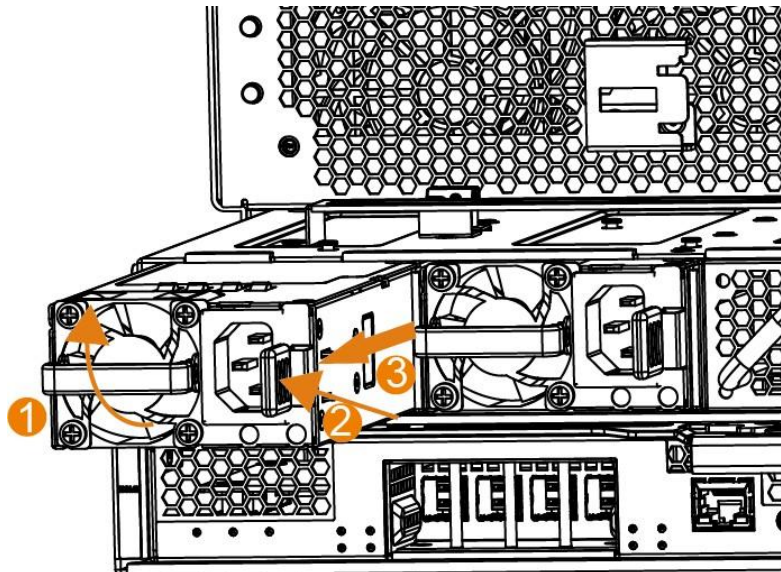


Figure 45: PSU Removal

Fan Modules

Overview

The PS390E enclosure houses five fan modules in the rear for drive.

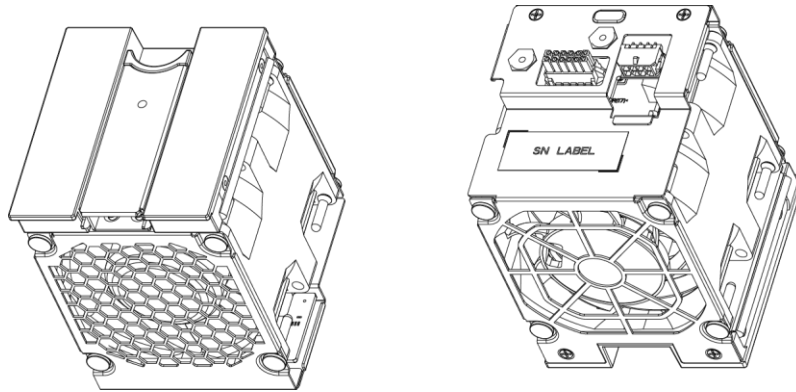


Figure 46: Fan Modules

Fan Module LED

Refer to the picture below for the Fan Module top view. Each Fan Module has one status LED.

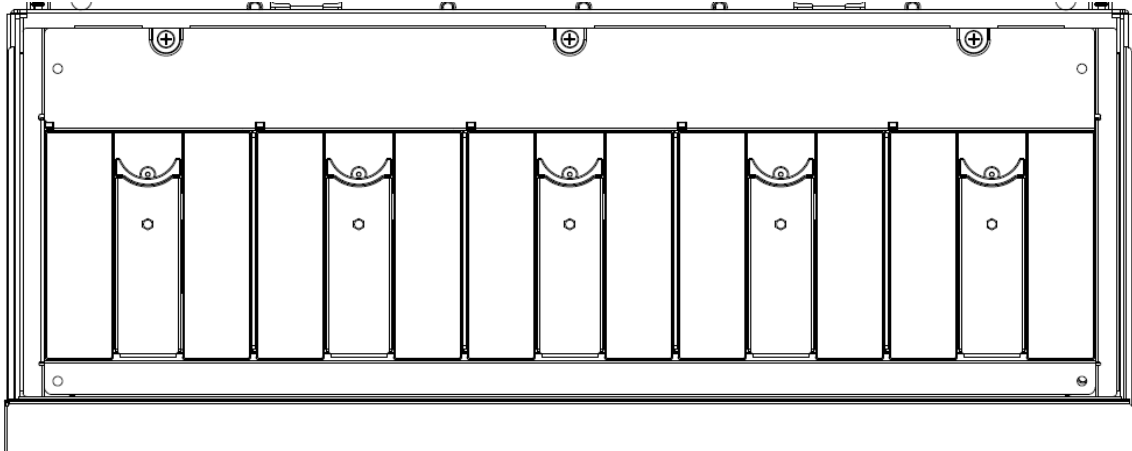


Figure 47: Fan Module Assembly Top View

- Fan Fault LED (Amber)
 - On –FAN fault
 - Off – Normal

Fan Modules

This section simply introduces the fan modules installation process.

Fan Module Installation

Make the fan module and fan slot alignment, then insert fan module in the system. Rotate the handle down until heard "Click" the installation is finished.

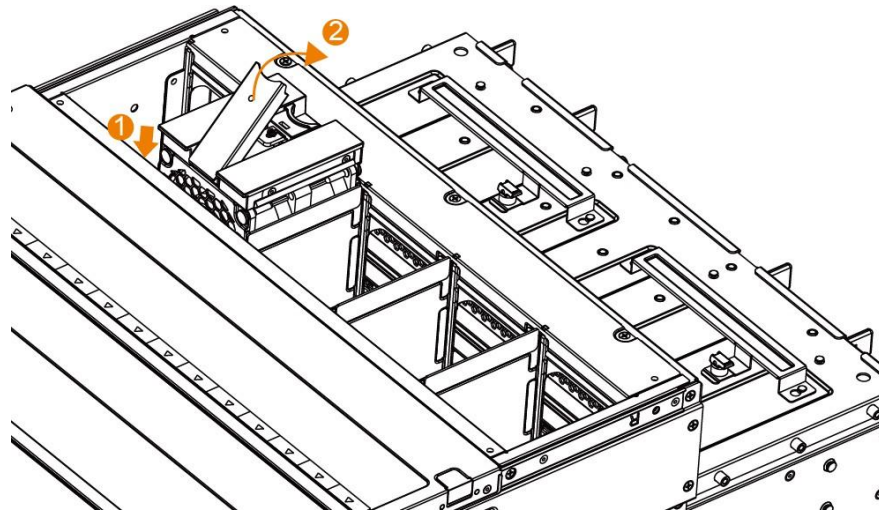


Figure 48: Fan Module Installation

Fan Module Removal

Pull the latch and the handle will open automatically then pull out fan module from the system.

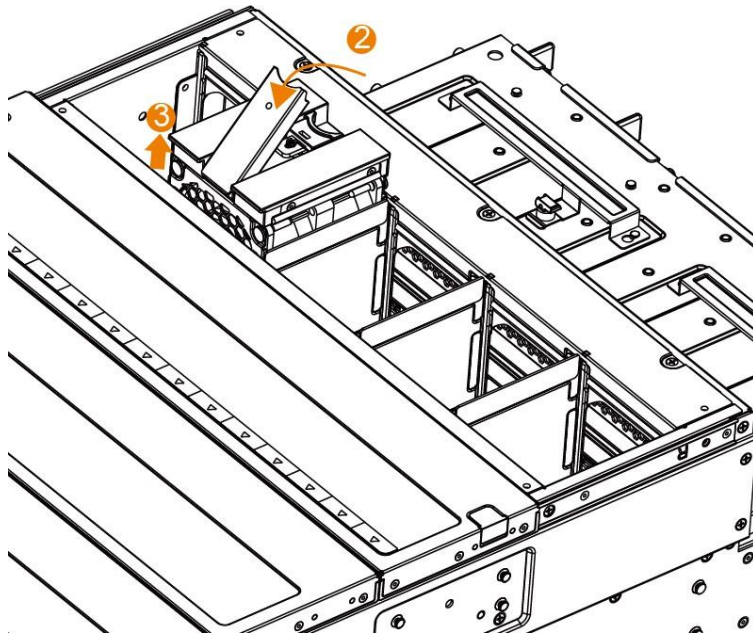
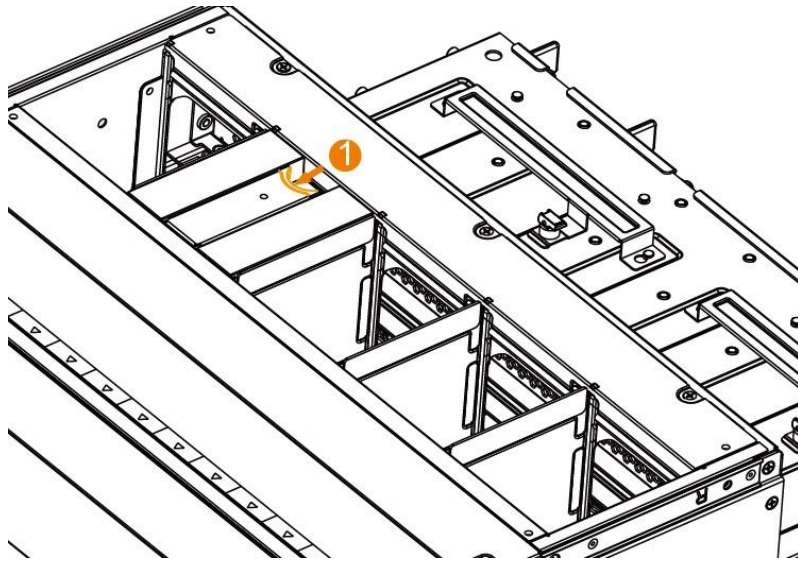


Figure 49: Fan Module Removal



NOTE: Users should not disassemble the fan module without Raslient engineer authority.

DC to DC

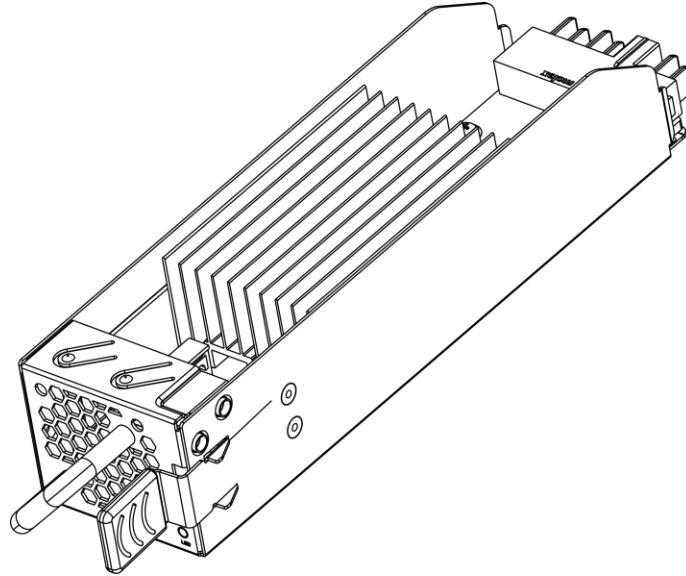


Figure 50: DC-DC Module View

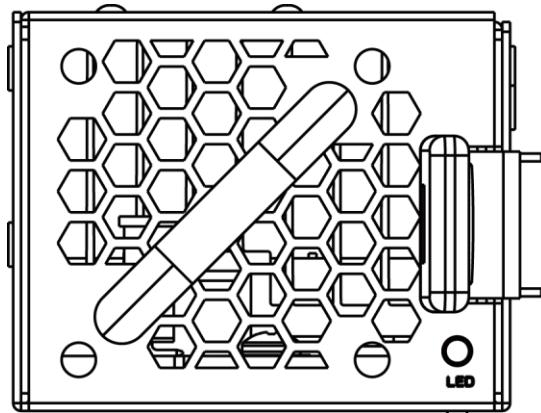


Figure 51: DC-DC Front View

Assemble into chassis

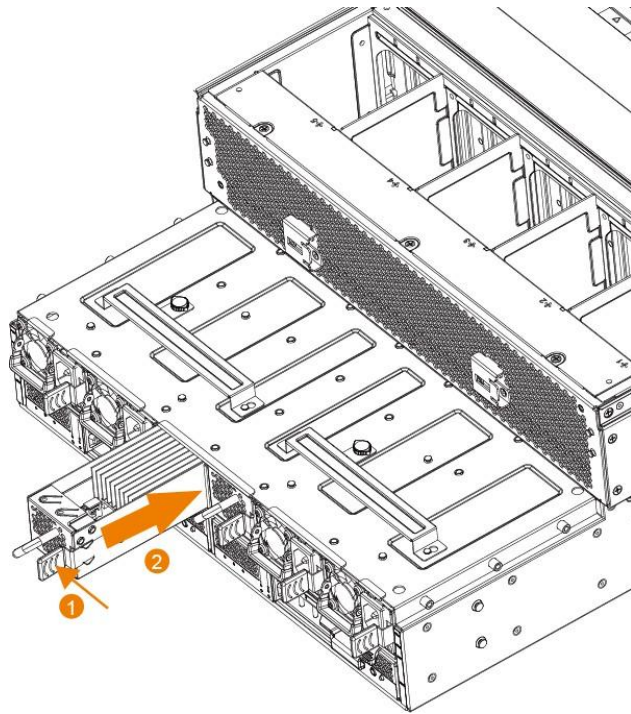


Figure 52: Assemble DC-DC into Chassis

Remove DC-DC from Chassis

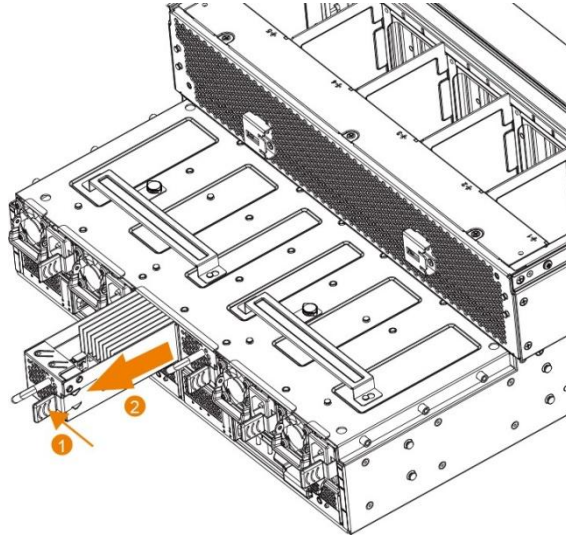


Figure 53: Remove DC-DC from Chassis

Drive Carrier

Drive Carrier

3.4.1.1 Overview

The drive carrier side view refers to below. It is designed to support both 2.5 inch and 3.5 inch drive.

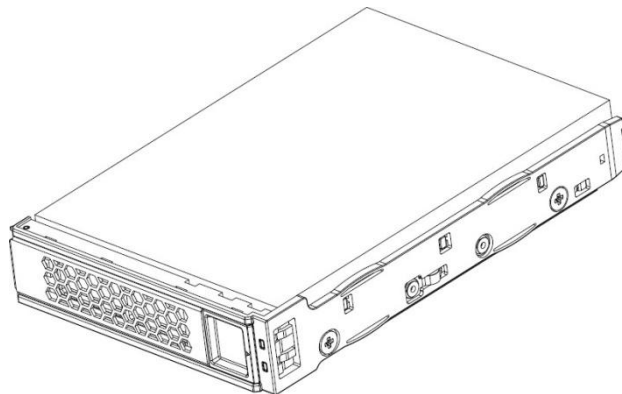


Figure 54: Drive Carrier Side View

Drive LED

Refer to the picture below for the Drive Carrier front view. There are two indicators on the front face. One shows drive link/active status. The other one is the drive fault LED.

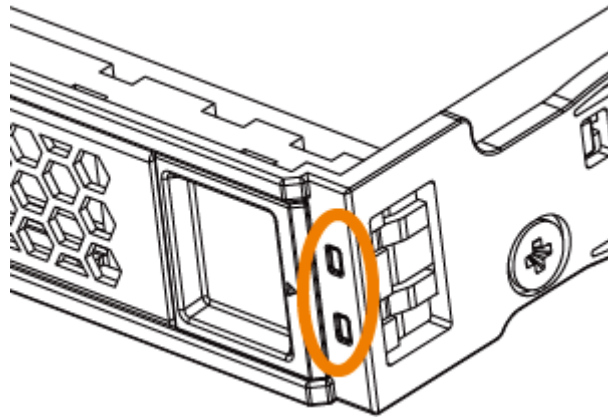


Figure 55: Drive Carrier Front View

- Drive Active/Ready LED (Green)
Controlled by drives directly.
- Drive Fault/Status LEDs (Amber)
 - o Solid On – Drive fault
 - o Blink @ 4Hz – Loc [REDACTED] 1st priority
 - o On – Drive fault [REDACTED] 2nd priority
 - o Blink @ 1Hz – Reb [REDACTED] 3rd priority
 - o Off – Normal operation

Cabling and Power

4. Cabling and Power

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

Follow the steps below:

- 1) Connecting the power cable(s) and electricity, see ***Connecting and securing the power cable(s)***.
- 2) Connecting another cables, see ***Connect the enclosure***.
- 3) Self-inspection, see ***Self-inspection***.

Connecting and securing the power cable(s)

Connecting the power cable(s)

- 1) Connect the system's power cable(s) to the rear side of system.
- 2) Connect power cord to the power source.

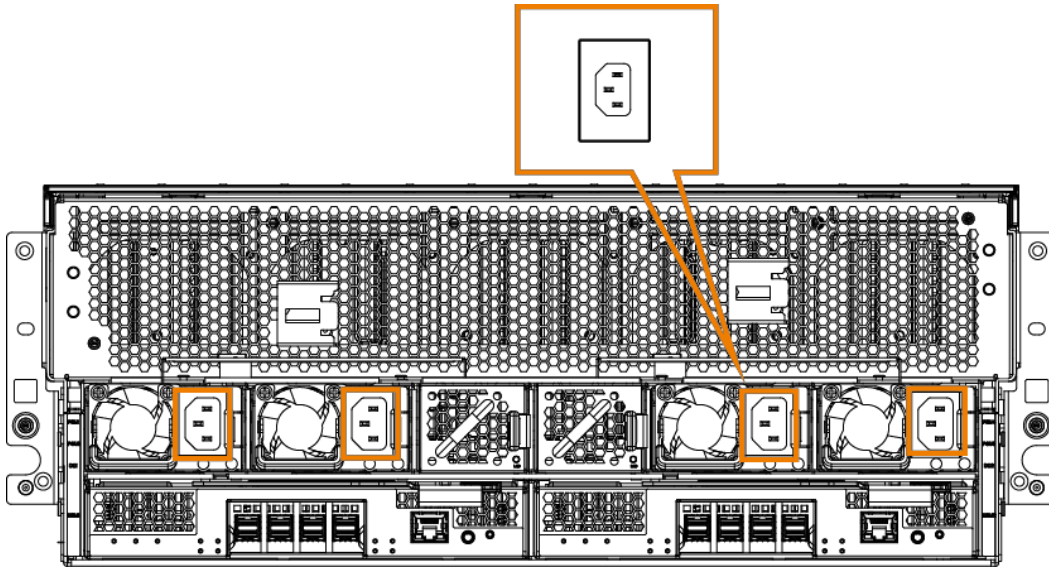


Figure 56: Connecting Power Cables



NOTE: Turn on your enclosure, check all the LEDs are lighting normally. If not, check the cables or reference *Troubleshooting enclosure startup failure*.

Securing the power cable(s)

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

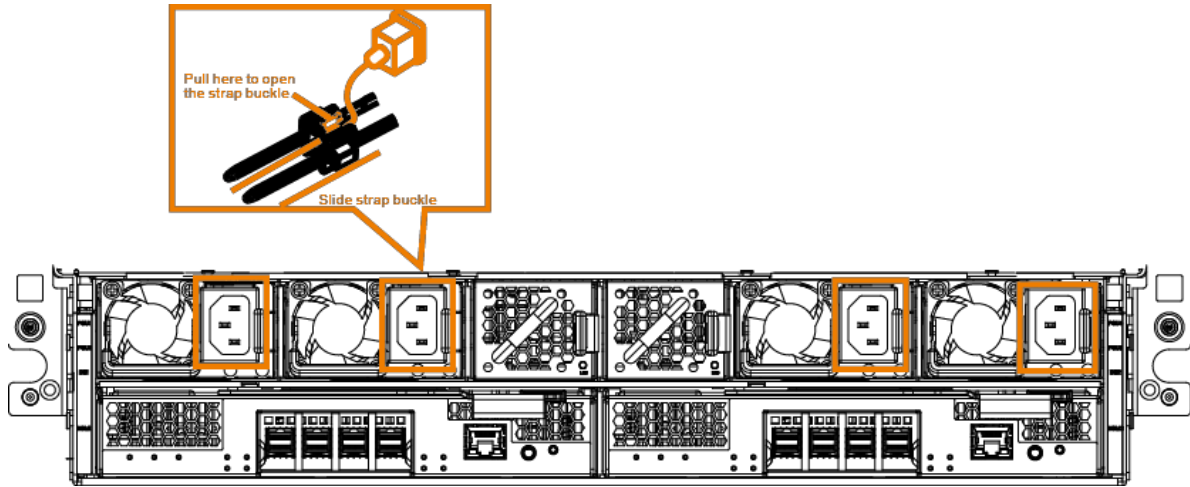


Figure 57: Securing Power Cables

Open Status of Routing the cables.



Figure 58: Bottom Layer CMA



Figure 59: Top Layer CMA



Figure 60: Open Status of Routing the cables

Close Status of Routing the cables

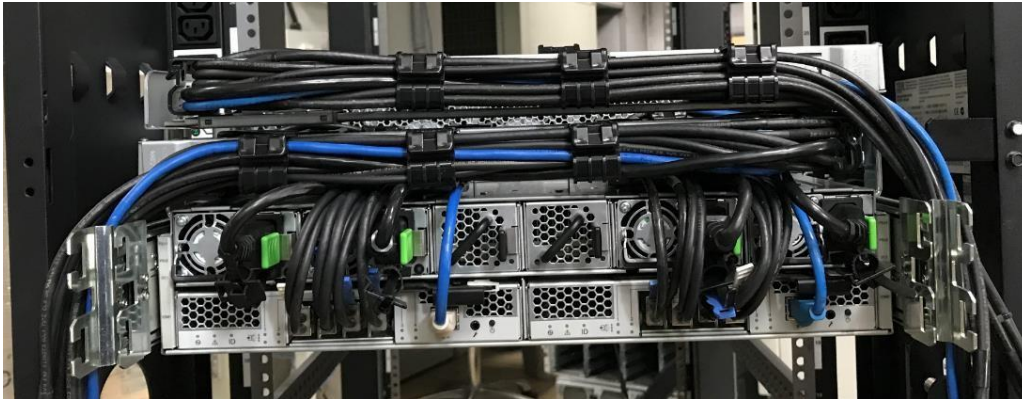


Figure 61: Open Status of Routing the Cables 2

Connect the enclosure

To connect the enclosure to a host system:

- 1) Connect the SAS cable to ESM Mini-SAS HD connector on the storage enclosure and to the PS7012 or PS5012 Raid Application Controllers. 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 ESM or the RAID Application controller.
- 2) To remove the SAS cable, pull the pull-tab to release the cable from the connector on the ESM and the RAID Application Controllers.

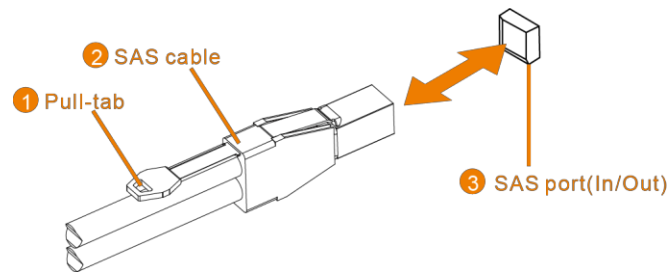


Figure 62: Connecting SAS Cables

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

For more information about LED indicators, see the 4. **Hardware Element Overview**; for more information about cabling your enclosure, see the **Port configuration**.

Configuration

Port Configuration

PS390e can be used in a dual-controller configuration (for SAS drives). It only supports single controller configuration for SATA drives.

Single port configuration

Single Port configuration the enclosures are daisy-chained with one of the ESMs connected to a single port on the controller card.

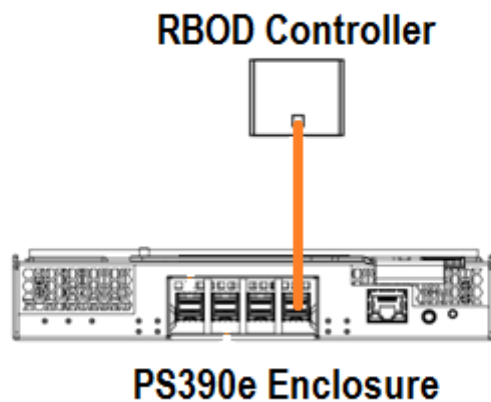


Figure 63: Single Port Configuration

Redundant configuration

In Redundant configuration, the enclosures are daisy-chained with both of the ESMs connected to both the ports on the controller card.

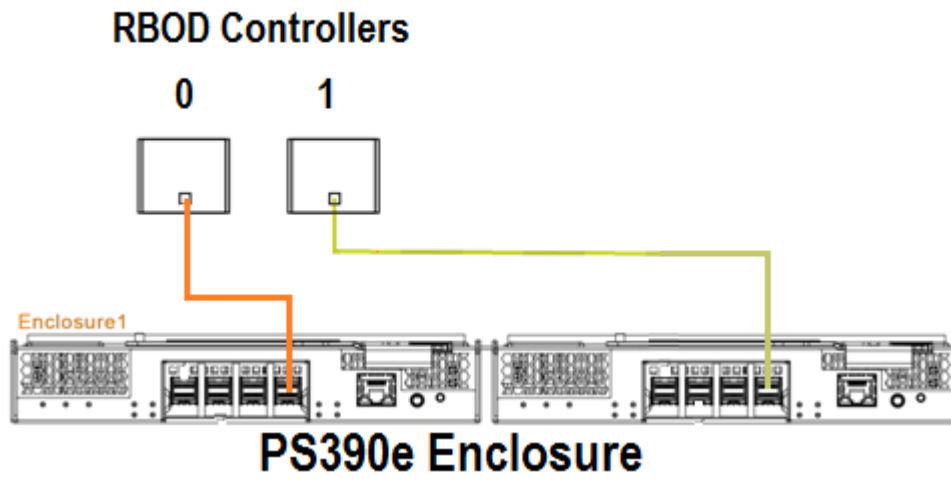


Figure 64: Redundant Configuration

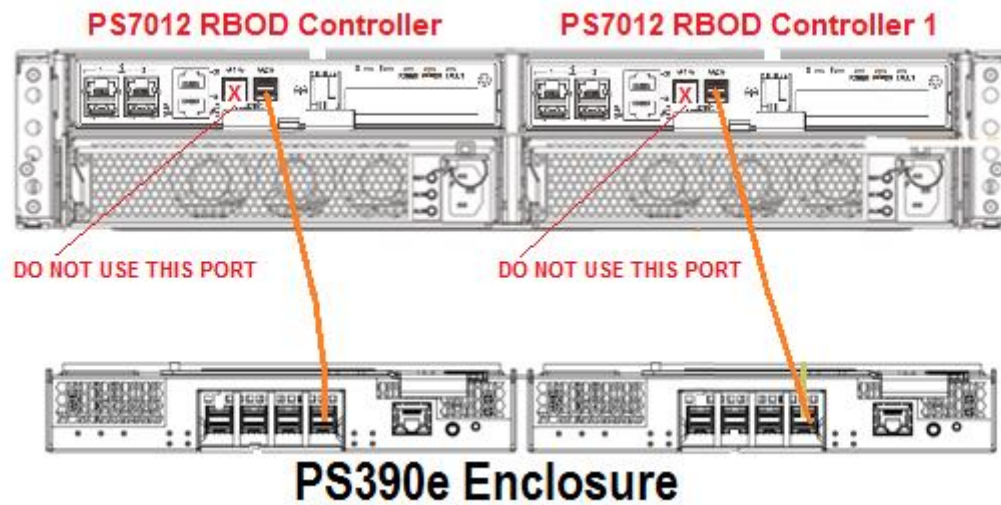


Figure 65: PS7012 to PS390e SAS connections

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