



QNAP

JBOD Enclosure

TL-R1620Sdc

User Guide

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1. Preface





About This Guide

This guide provides information about the device and step-by-step instructions on installing the hardware. It also provides instructions on basic operations and troubleshooting information.

Audience

This document is intended for consumers and storage administrators. This guide assumes that the user has a basic understanding of storage and backup concepts.

Document Conventions

Symbol	Description
	Notes provide default configuration settings and other supplementary information.
	Important notes provide information on required configuration settings and other critical information.
	Tips provide recommendations or alternative methods of performing tasks or configuring settings.
	Warnings provide information that, when ignored, may result in potential loss, injury, or even death.

2. Product Overview

This chapter provides basic information about the QNAP device.

About the QNAP JBOD Enclosure

QNAP JBOD enclosures are designed to increase the capacity and utility of your NAS or server, providing a wide range of storage applications. You can manage installed drives independently or configure them as software RAID groups using the host device. The TL-R1620Sdc features sixteen 3.5-inch SAS 12 Gbps drive bays with three SFF-8644 ports per controller.

Hardware Specifications




Warning



- If your QNAP product has hardware defects, return the product to QNAP or a QNAP-authorized service center for maintenance or replacement. Any attempt to repair or perform maintenance procedures on the product by you or an unauthorized third party invalidates the warranty.
- QNAP is not responsible for any damage or data loss caused by unauthorized modifications and installation of unsupported third-party applications.
- For details, see the [QNAP Warranty Terms and Conditions](#).



Note

Model specifications are subject to change without prior notice. To see the latest specifications, go to <https://www.qnap.com>.

Component	TL-R1620Sdc
Storage	
Drive bays	<ul style="list-style-type: none"> • 16 x 3.5-inch SAS 12 Gbps • 16 x 3.5-inch SAS 6 Gbps
Drive compatibility	<p>3.5-inch bays:</p> <ul style="list-style-type: none"> • SAS drives <ul style="list-style-type: none"> • 3.5-inch SAS hard disk drives • 2.5-inch SAS hard disk drives • 2.5-inch SAS solid-state drives • SATA drives <ul style="list-style-type: none"> • 2.5-inch SATA hard disk drives • 2.5-inch SATA solid-state drives <p> Note The 2.5-inch SATA drives require a QDA-SA2 drive adapter.</p>
Hot-swapping	Supported
External I/O Ports & Expansion Slots	

Component	TL-R1620Sdc
SFF ports	3 x SFF-8644 per controller
RJ45	1 per controller  Note This port is only for engineering purposes.
Interface	
Buttons	<ul style="list-style-type: none"> • Power: 1 per controller • OLED panel power: 1 per controller
Dimensions	
Form factor	3U Rackmount
Dimensions (H x W x D)	131.3 x 482.2 x 425.3 mm (5.17 x 18.98 x 16.74 in)
Net weight	12.26 kg (27.03 lb)
Others	
Power supply unit	2 x 550W, 100-240V AC, 50/60 Hz
System battery	CR2032 lithium battery (3V, 225 mAh)
Sound level	28.8 db(A)  Note The sound level was tested at a bystander position, which is within one meter of the device. The test device operated at low speed with the maximum number of drives installed.
Fans	3 x 80 mm, 12V DC fan
Operating temperature	0°C to 40°C (32°F to 104°F)
Relative humidity	<ul style="list-style-type: none"> • Non-condensing relative humidity: 5% to 95% • Wet-bulb temperature: 27°C (80.6°F)

**Tip**

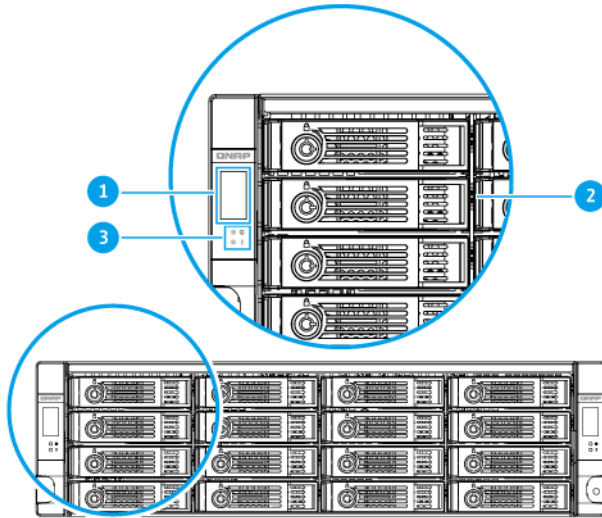
For the list of compatible drive models and expansion cards, go to <https://www.qnap.com/compatibility>.

Package Contents

Item	Quantity
JBOD enclosure	1
SAS cables	2
Power cords	2
Screws for 3.5-inch drives	64
Screws for 2.5-inch drives	48
Quick Installation Guide (QIG)	1

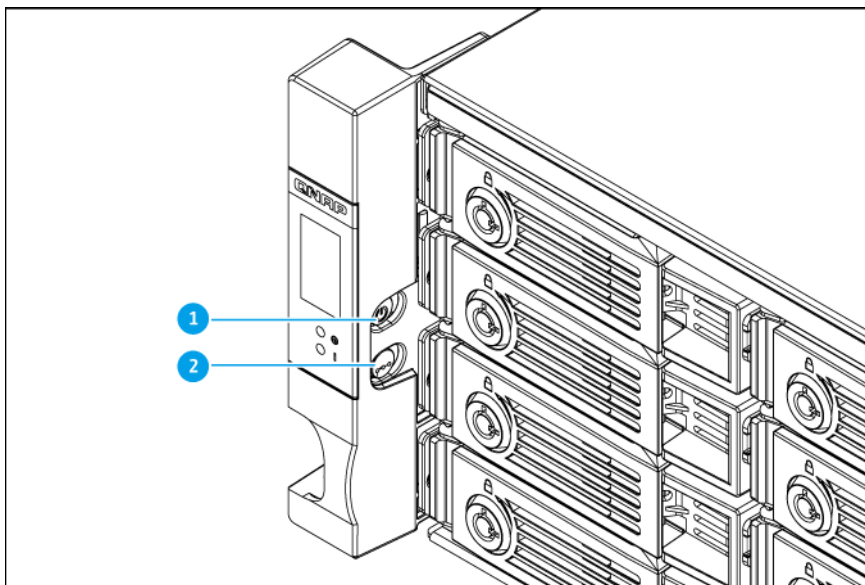
Components

Front Panel



No.	Component	No.	Component
1	OLED panel	3	Front panel LEDs
2	Drive LED	-	-


Front Panel Buttons



Note

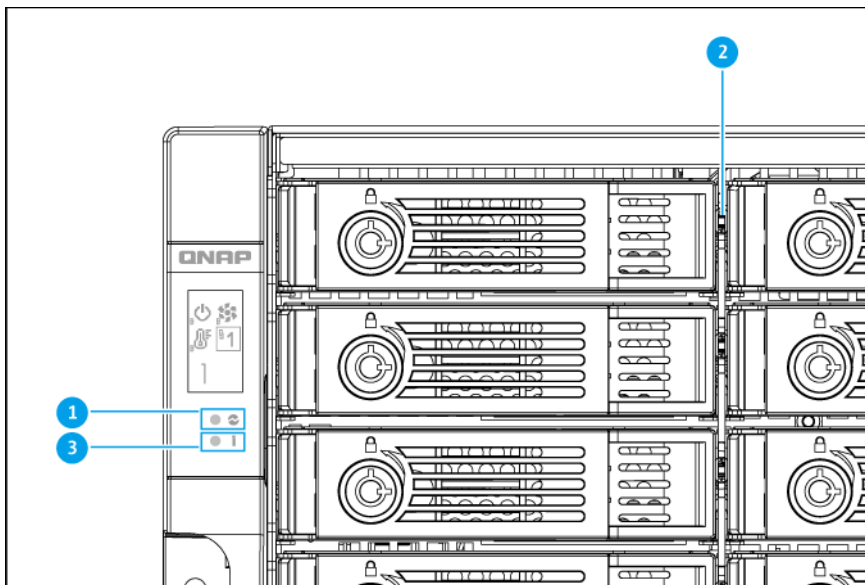
Each controller has its own power and OLED buttons.

No.	Component	No.	Component
1	Power button	2	OLED panel power button

Operation	User Action	Result
Power on the controller	Press the power button	The controller powers on. <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;">  </div> <div> <p>Tip</p> <ul style="list-style-type: none"> • QNAP recommends powering on the controller from the rear panel. For details, see Rear Panel and Storage Controller Power Button. • System startup takes 10 to 15 minutes, depending on the number of installed drives and connected devices. Check the rear panel LEDs to determine the startup status. For details, see Rear Panel LEDs. </div> </div>
Power on the OLED display	Press the OLED button.	The OLED display powers on.
Power off the OLED display	Press the OLED button.	The OLED display powers off.

Front Panel and Drive LEDs

The front panel LEDs indicate system status and related information when the device is powered on. The following LED information applies only when the drive is correctly installed and when the device is connected to the network.

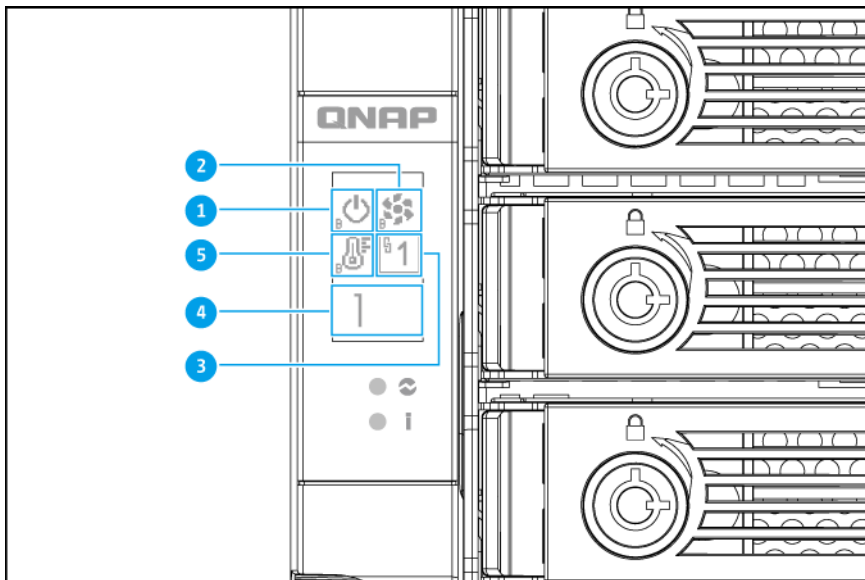


No.	Component	No.	Component
1	System power LED	3	System status LED
2	Drive LED	-	-

LED	Status	Description
System power	Blue	The controller is on.
	Off	The controller is off.
System Status	Green	The device is ready.
	Red	<ul style="list-style-type: none"> The power supply is not functioning. The system fan is not functioning. The system temperature is too high. The disk temperature is too high. The power supply unit is unplugged.
	Off	<ul style="list-style-type: none"> All drives are in standby mode. The device is powered off.
Drive	Green	<ul style="list-style-type: none"> The JBOD enclosure is powered on. The drive can be accessed.
	Flashes green	The drive is being accessed.
	Red	A drive read/write error occurred.
	Flashes red 5 times per second	The drive is being located in the operating system.
	Off	No drive was detected.






Front Panel OLED Display

The OLED display shows the status of the controllers and main components.

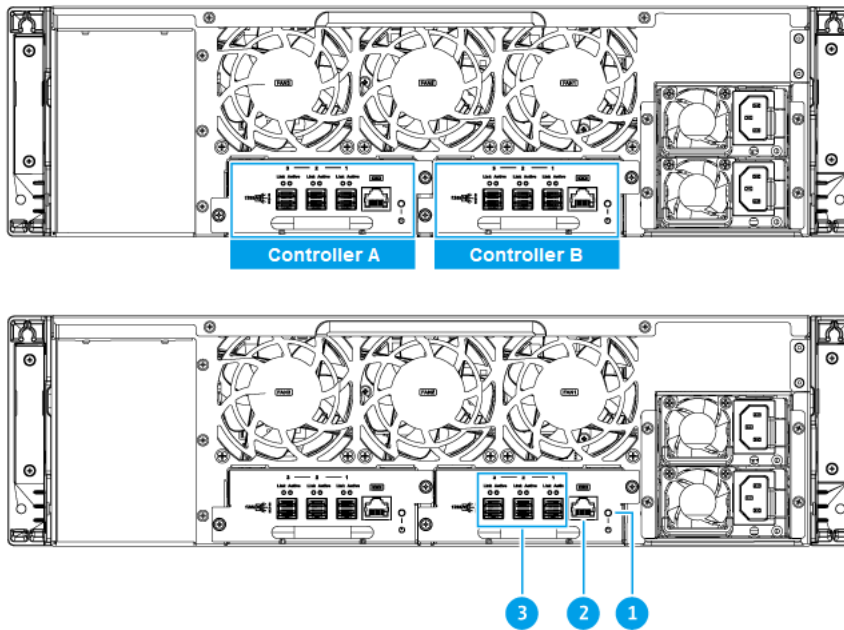



No.	Component	No.	Component
1	Controller power status	4	Enclosure ID
2	Fan status	5	Temperature status

No.	Component	No.	Component
3	SAS connector status	-	-

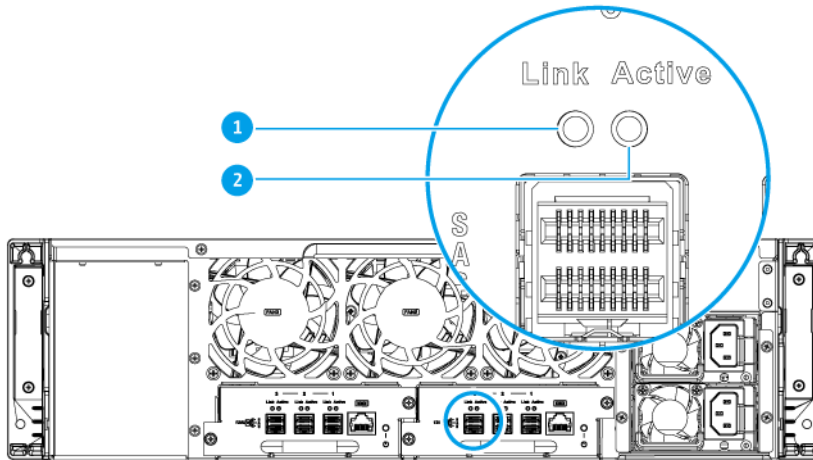
Icon name	Icon	Description
Controller power status		<ul style="list-style-type: none"> • On: The controller is powered on. • Off: The controller is off.
Controller fan status		<ul style="list-style-type: none"> • On: The fan modules of the controller are operating normally. • Flashing: The fan modules of the controller are operating incorrectly or are not installed. • Off: The controller is off.
Controller temperature status		<ul style="list-style-type: none"> • On: The temperature of the controller is normal. • Flashing: The temperature of the controller is too high or too low. • Off: The controller is off.
Controller SAS connector status		<ul style="list-style-type: none"> • On: The SAS connector status displays the linked SAS wide port numbers. • Flashing: An error has occurred in any of the physical layers. Below are a list of the possible errors. <ul style="list-style-type: none"> • One of the physical layers is disconnected or linked with a low speed (6 Gbps or 3 Gbps). • There are other link errors. • Off: The controller is off.
Controller enclosure ID		<ul style="list-style-type: none"> • The enclosure ID is configured by the host. • The enclosure ID represents the global controller ID.

Rear Panel



No.	Component	No.	Component
1	Controller power button	3	SFF-8644 ports
2	RJ45 console port	-	-
	 Note This port is only for engineering purposes.		

Rear Panel LEDs



No.	Component	No.	Component
1	Mini-SAS link LED	2	Mini-SAS activity LED

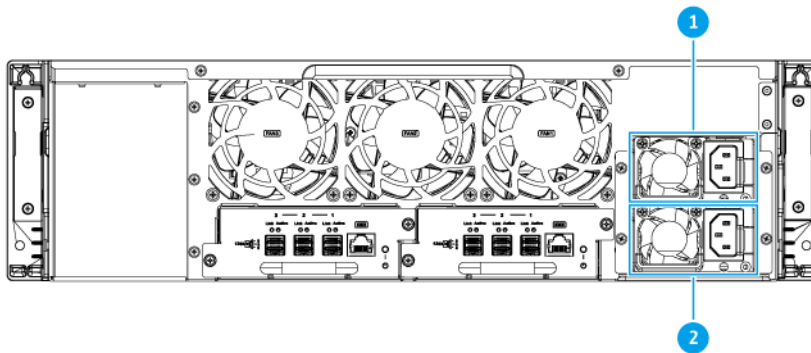
LED	Status	Description
Mini-SAS Link Connector	Green	The device is connected to the host.
	Orange	The device is not connected to the host.
Mini-SAS Activity Connector	Blue	The device is active.
	Off	The device is inactive.

Storage Controller Power Button

Operation	User Action	Result
Power on	Press the button once.	<ul style="list-style-type: none"> The OLED panel turns on. The controller powers on. <p>Note Depending on the button on the controller you press, controller A or B powers on.</p>
Power off	Press and hold for 4 seconds.	<ul style="list-style-type: none"> The OLED panel turns off. The controller powers off. <p>Note Depending on the button on the controller you press, controller A or B powers off.</p>

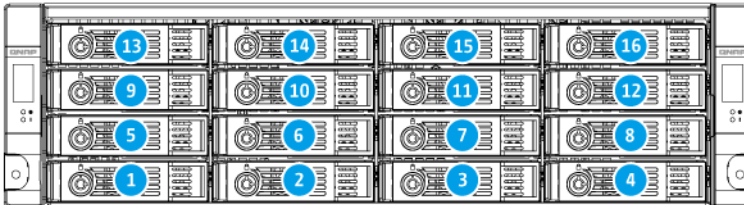
Operation	User Action	Result
Force power off	Press and hold the button for 10 seconds.	<ul style="list-style-type: none"> The OLED panel turns off. The controller powers off. <p>Note Depending on the button on the controller you press, controller A or B powers off.</p> <p>Warning Use this method only when the storage controller is unresponsive. This action may result in data loss.</p>

Power Supply Units



No.	Component	No.	Component
1	Power supply unit 1	2	Power supply unit 2

Drive Numbering



Audio Alert

Duration	Frequency	Description
Long beep	3 (every 5 minutes)	<ul style="list-style-type: none"> The system fan is not installed. The system fan is not functioning. The system temperature is over the threshold. <p>Note The default temperature warning threshold is 55°C. You can set the threshold to a temperature between 55°C and 69°C using QNAP JBOD Manager.</p>
	1 (every second)	The device is being located by QES or QNAP JBOD Manager.
Short beep	1	<ul style="list-style-type: none"> A cable connection between the device and the host has been established. A cable connection between the device and the host has been removed.

Safety Information

The following instructions help ensure personal safety and environmental safety. Read these instructions carefully before performing any operations.

General Instructions

- The device should be stored in a secure location with restricted access, controlled through the use of a tool, lock and key, or any means of security.

- Only qualified, skilled, and authorized persons with knowledge of all restrictions, safety precautions, and installation and maintenance procedures should have physical access to the device.
- To avoid potential injury or damage to components, ensure that the drives and other internal system components have cooled before touching them.
- Observe electrostatic discharge (ESD) procedures to avoid potential injury or damage to components.

Power

- To reduce the risk of fire or electric shock, ensure that you only connect the power cord to a properly grounded electrical outlet.

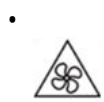


Devices with redundant power supply may have one or more power supply unit (PSU) cords. To avoid serious injuries, a trained service technician must disconnect all PSU cords from the device before installing or replacing system components.

System Battery

- To avoid potential battery explosion, causing injury or damage to components, ensure that you replace the existing battery with a battery of the same type.
- Dispose of used batteries properly according to local regulations or the instructions of the battery manufacturer.

Moving Parts




Moving fan blades: Keep your body parts away from moving fan blades while the device is connected to a power source.



Moving components: Keep your body parts away from other moving components.

Installation Requirements

Category	Item
Environment	<ul style="list-style-type: none"> • Room temperature: 0°C to 40°C (32°F to 104°F) • Non-condensing relative humidity: 5% to 95% • Wet-bulb temperature: 27°C (80.6°F) • Flat, anti-static surface without exposure to direct sunlight, liquids, or chemicals

Category	Item
Hardware and peripherals	<ul style="list-style-type: none"> • NAS or server • Storage drives <p> Tip For the list of compatible drive models, go to https://www.qnap.com/compatibility.</p> <ul style="list-style-type: none"> • One or more SFF-8644 or SFF-8644-to-SFF-8088 connector cables • Host bus adapter
Tools	<ul style="list-style-type: none"> • Phillips #1 or #2 screwdriver • Anti-static wrist strap

Setting Up the JBOD Enclosure



Note

Read all safety requirements and information carefully before setting up the JBOD or installing JBOD enclosure components.

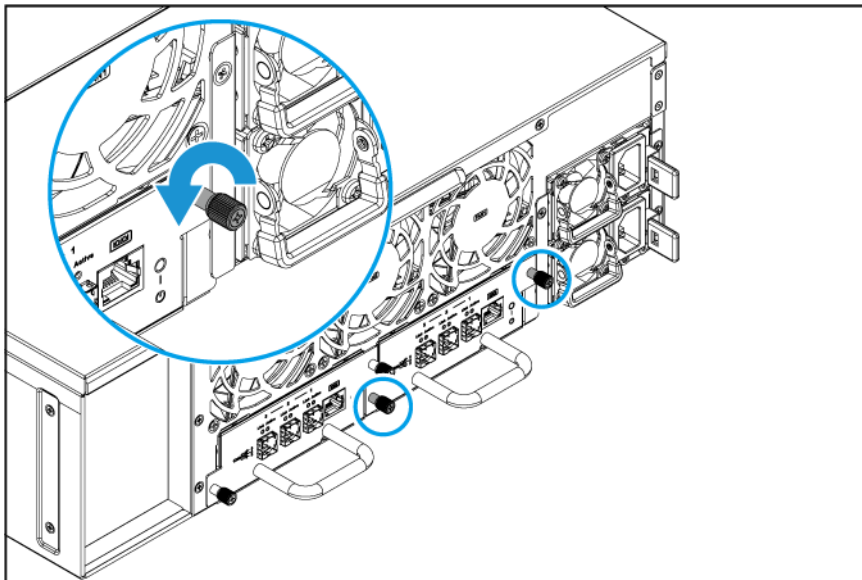
1. Place the JBOD enclosure in an environment that meets the requirements.
For details, see [Installation Requirements](#).
2. Install the JBOD enclosure on a rack.
For details, see [Rail Kits](#).
3. Install the drives.
For details, see the following topics:
 - [Installing 3.5-inch Hard Drives on 3.5-inch Trays](#)
 - [Installing 2.5-inch Hard Drives or Solid-State Drives on 3.5-inch Trays](#)
4. Connect the power cord and all applicable cables.
5. Connect the JBOD enclosure to the NAS or server.
For details, see the following topics:
 - [Connecting the TL-R1620Sdc to the NAS](#)
 - [Connecting the TL-R1620Sdc to a Server](#)
6. Power on the JBOD enclosure.

3. Hardware Installation

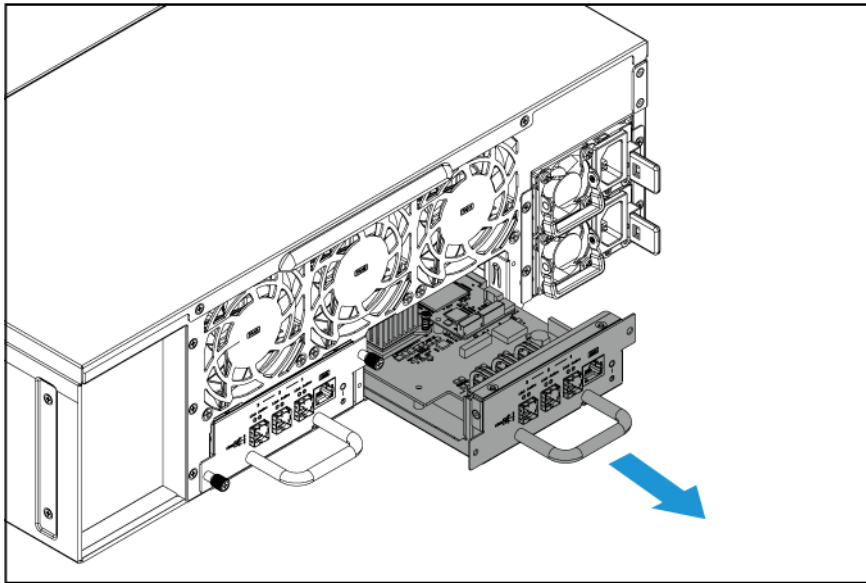
This section provides information on installing controllers, installing drives, connecting the JBOD enclosure to a NAS or a server, hot-swapping redundant power supply units, and rail kits.

Removing a Controller

1. Power off the JBOD enclosure.
2. Disconnect the power cord from the electrical outlet.
3. Disconnect all cables and external attachments.
4. Remove the controller.
 - a. Loosen the screws

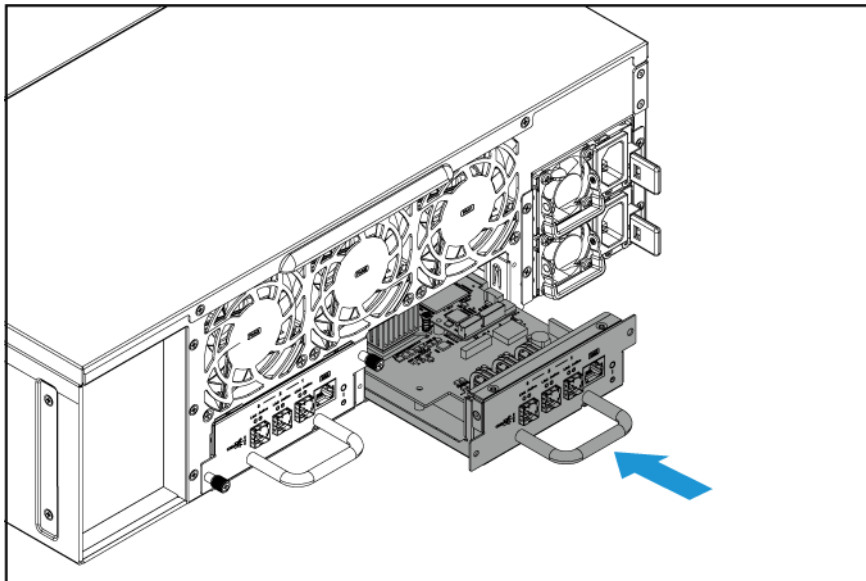


- b. Pull the handle to pull out the controller.

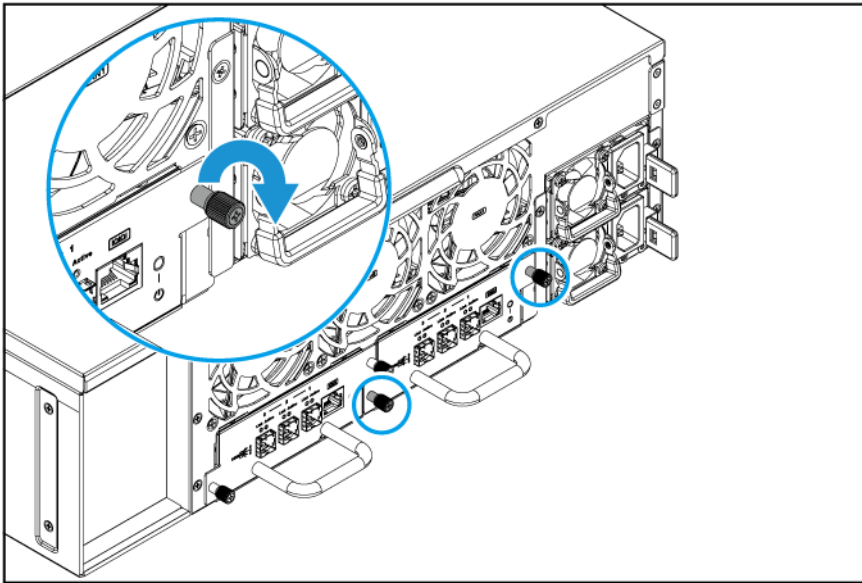


Installing a Controller

1. Load the controller into the JBOD device.
 - a. Insert the controller into the chassis.



2. Tighten the screws.



3. Connect all cables and external attachments.
4. Power on the device.

Drive Installation

The TL-R1620Sdc is compatible with 3.5-inch hard drives, 2.5-inch hard drives, and 2.5-inch solid-state drives.

Installing 3.5-inch Hard Drives on 3.5-inch Trays



Warning

- Installing a drive deletes all data on the drive.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

•



Moving fan blades: Keep your hands and other body parts away from moving fan blades.

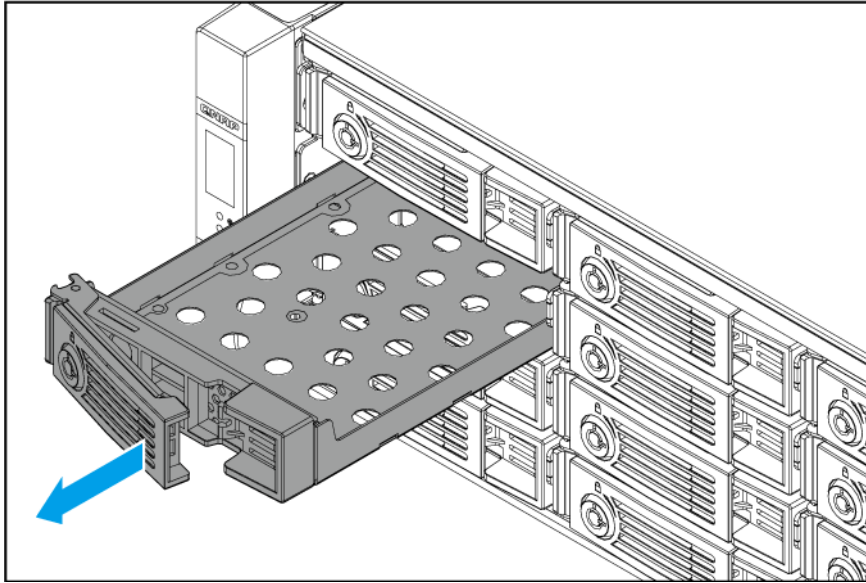
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Other moving components: Keep your hands and other body parts away from other moving components.

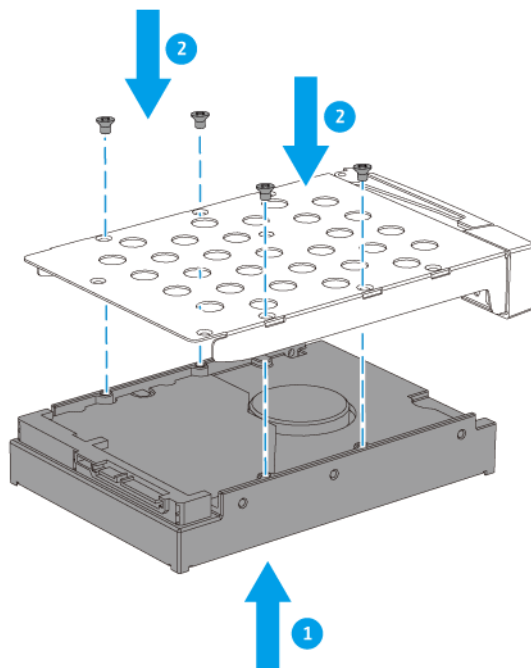
1. Power off the JBOD enclosure.
2. Remove the drive tray.
 - a. Pull the handle to release the tray.

- b.** Pull the tray out.



- 3.** Install a drive on the tray.

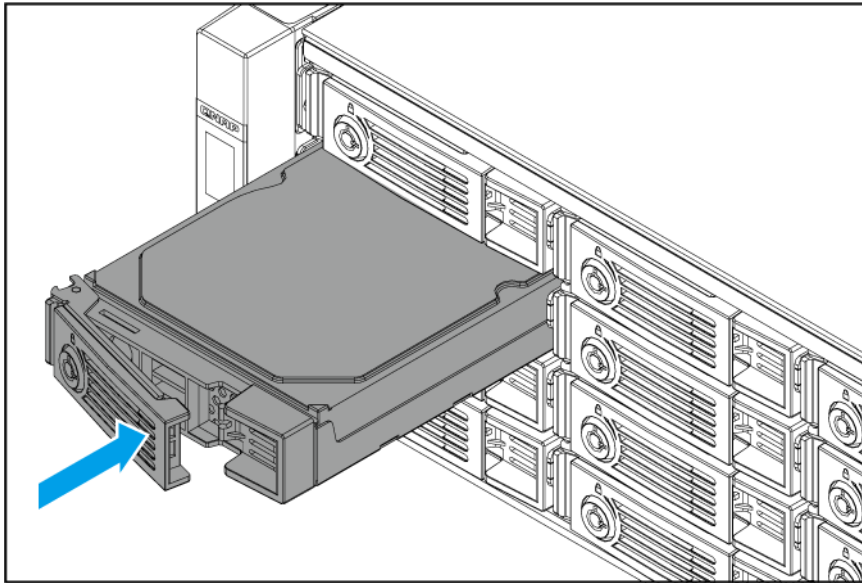
- a.** Place the drive on the tray so that the holes on the bottom of the drive are aligned with the holes on the bottom of the tray.
- b.** Attach the screws.



- 4.** Load the tray into the bay.

- a.** Insert the tray into the bay.

- b. Push the handle.



5. Power on the JBOD enclosure.


Note

The JBOD enclosure may take up to 30 seconds to detect the new device.

Installing 2.5-inch Hard Drives or Solid-State Drives on 3.5-inch Trays


Warning

- Installing a drive deletes all data on the drive.
- Observe electrostatic discharge (ESD) procedures to avoid damage to components.

•



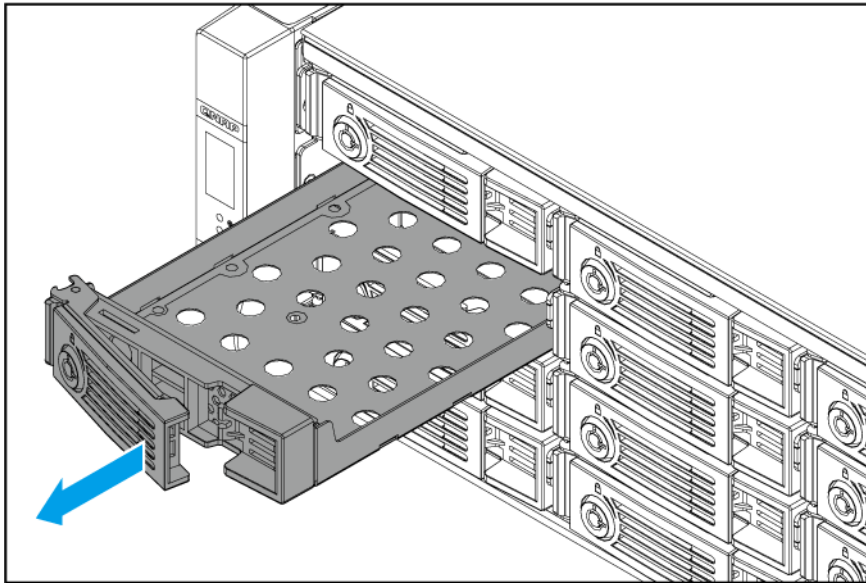
Moving fan blades: Keep your hands and other body parts away from moving fan blades.

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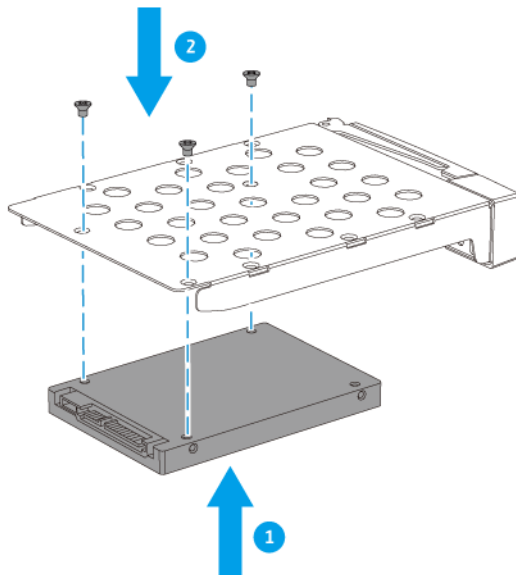
Other moving components: Keep your hands and other body parts away from other moving components.

1. Power off the JBOD enclosure.
2. Remove the drive tray.
 - a. Pull the handle to release the tray.
 - b. Pull the tray out.



3. Install a drive on the tray.

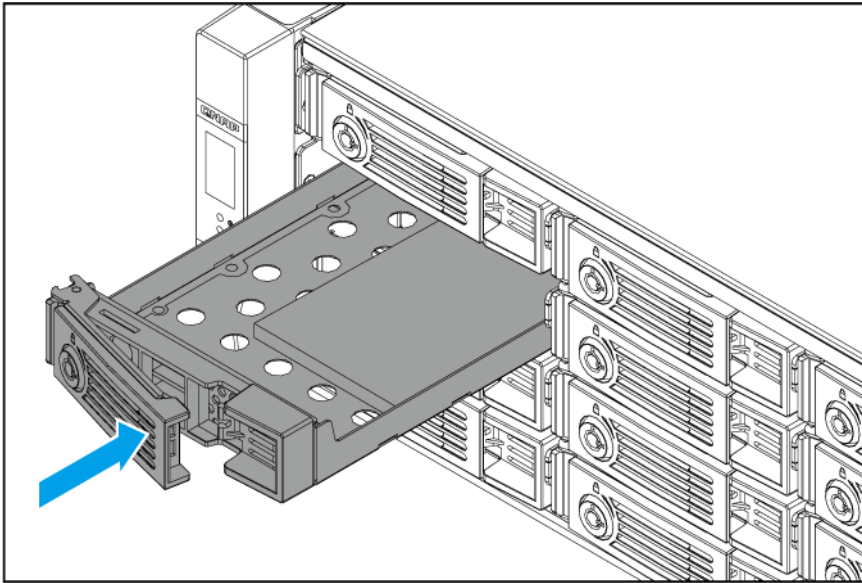
- a.** Place the drive on the tray so that the holes on the bottom of the drive are aligned with the holes on the bottom of the tray.
- b.** Attach the screws.



4. Load the tray into the bay.

- a.** Insert the tray into the bay.

- b. Push the handle.



5. Power on the JBOD enclosure.



Note

The JBOD enclosure may take up to 30 seconds to detect the new device.

JBOD Connections

This chapter provides information on the multiple connections for the JBOD enclosures.

Connecting the TL-R1620Sdc to the NAS

The NAS must run QES 2.1.1 (or later versions), and requires Mini-SAS HD ports (SAS 12Gb/s SFF-8644), Mini-SAS ports (SAS 6Gb/s SFF-8088), or installing SAS expansion cards with the mentioned port types (SAS-12G2E, QXP-820S-B3408, or QXP-1620S-B3616W).

For details on the maximum number of expansion units supported by your NAS, go to <https://www.qnap.com/go/compatibility-expansion>.



Important

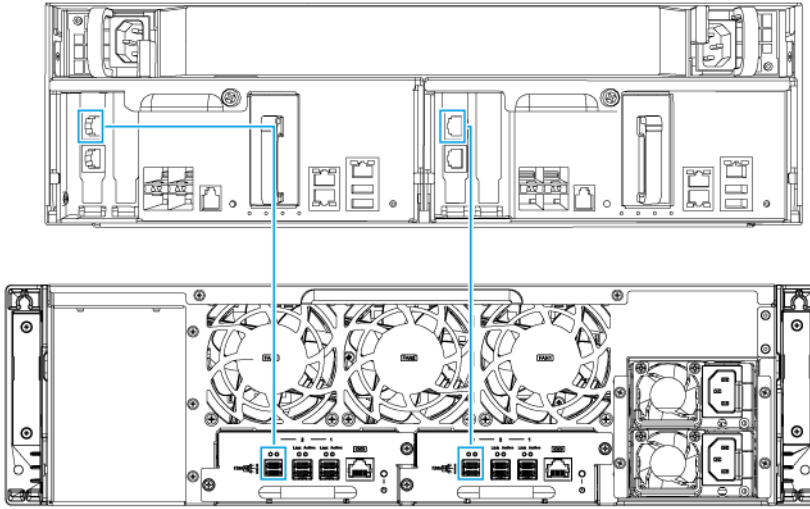
For your safety, ensure both the NAS and the JBOD enclosure are powered off before you start.

1. Connect the JBOD enclosure to the NAS.
 - a. Connect one or more SFF-8644 connector cables to the SFF-8644 ports on the JBOD enclosure.
 - b. Connect one or more SFF-8644 or SFF-8644-to-SFF-8088 connector cables to the SFF-8644 or SFF-8088 ports on the NAS or the host bus adapter installed in the NAS.

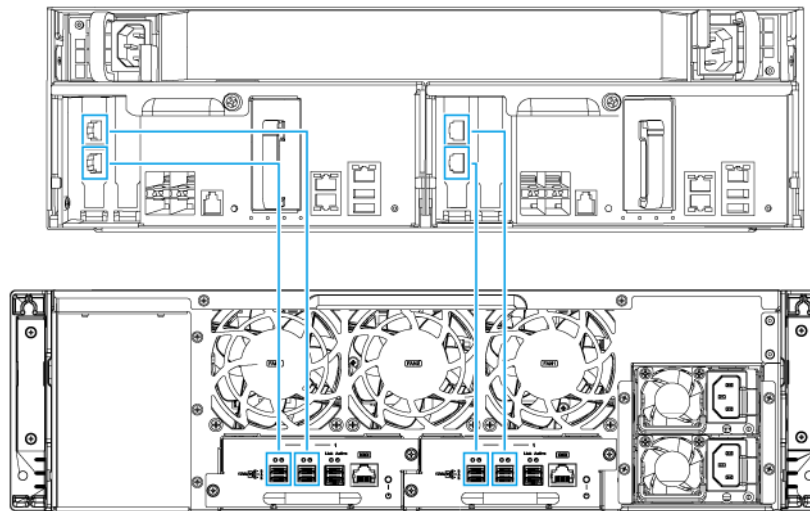


Note

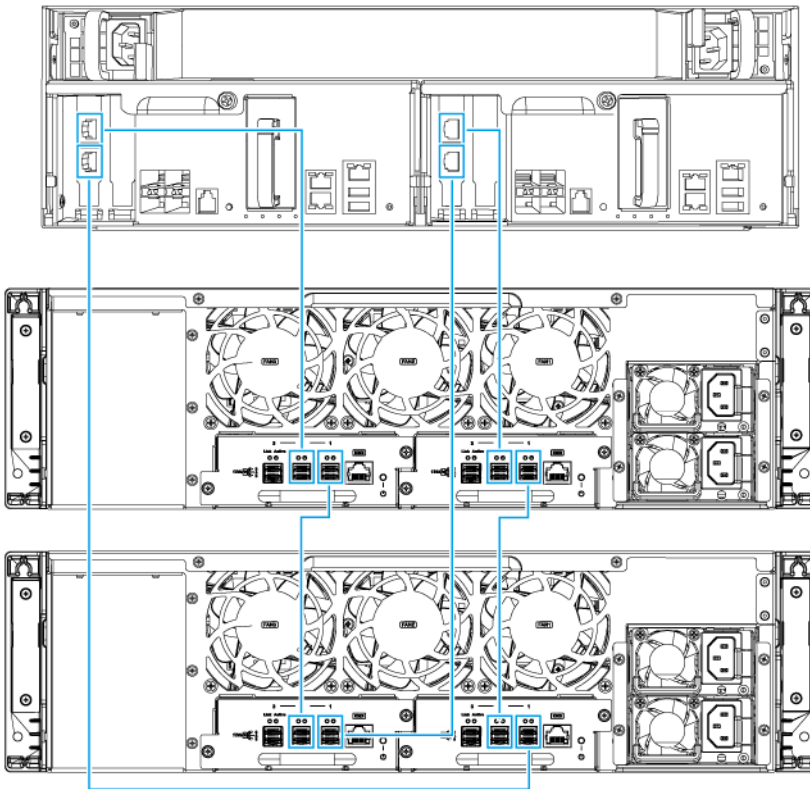
Refer to the hardware installation section of the NAS user guide for instructions on installing expansion cards.



Single-path configuration



Single-path link aggregation configuration



Dual-path configuration

2. Power on the JBOD enclosures.
3. Power on the NAS.
4. Verify that the JBOD enclosures are recognized by the NAS.
 - a. Log on to QES as administrator.
 - b. Go to **Main Menu > Storage Manager > Overview > System**.
 - c. Verify that the expansion units are listed.

Connecting the TL-R1620Sdc to a Server



Important

For your safety, ensure both the server and the JBOD enclosure are powered off before you start.

1. Connect the JBOD enclosure to a server.
 - a. Connect one or more SFF-8644 connector cables to the SFF-8644 ports on the JBOD enclosure.
 - b. Connect one or more SFF-8644 connector cables to the SFF-8644 ports on the server.



Note

For illustrations of valid connection configurations, see [Connecting the TL-R1620Sdc to the NAS](#).

- c. Connect additional JBOD enclosures to the server.
2. Power on the JBOD enclosures.
 3. Power on the server.
 4. Verify that the JBOD enclosure is recognized by the server.
 - a. Go to your server's disk management utility or open QNAP External RAID Manager in Windows or Linux.



Note

To download QNAP JBOD Manager, go to <https://download.qnap.com>.

- b. Verify that the JBOD enclosure is listed.

Hot-Swapping Redundant Power Supply Units

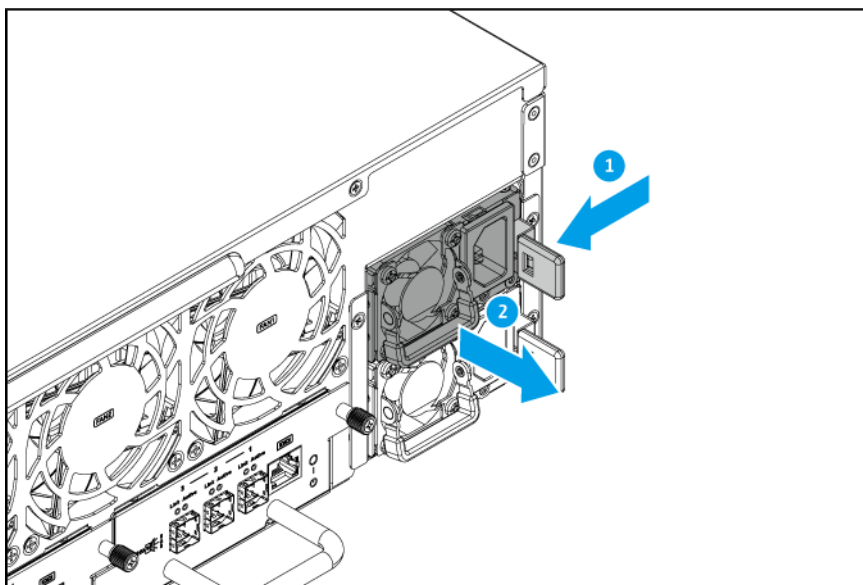


Warning

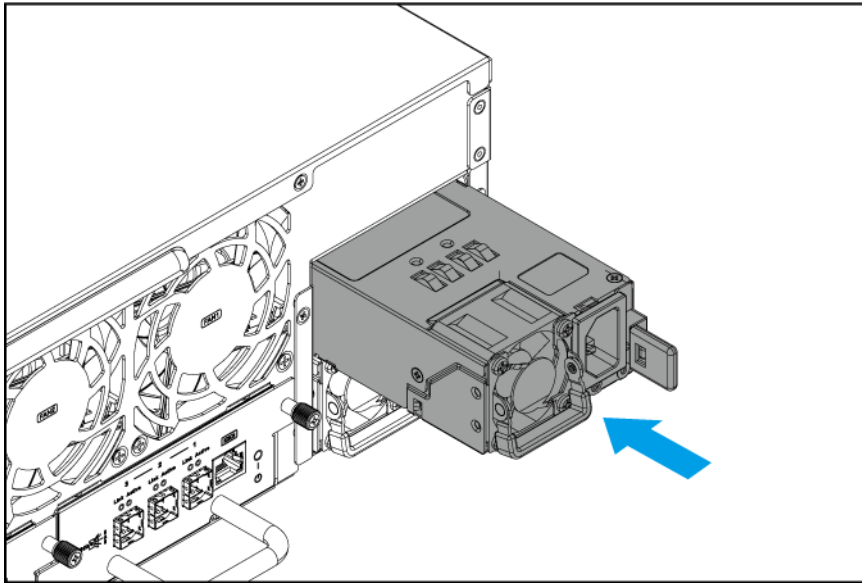


The NAS may have one or more power supply unit (PSU) cords. To avoid serious injuries, a trained service technician must disconnect all PSU cords before installing or replacing system components.

1. Power off the JBOD device.
2. Disconnect the power cord from the electrical outlet and the power supply unit (PSU) that you are replacing.
3. Firmly press the latch toward the handle and then pull the PSU out.



4. Insert the new PSU.



5. Connect the power cord to the PSU and the electrical outlet.
6. Power on the JBOD.

Rail Kits

Rail kits are not included with the NAS and must be purchased separately. For details, contact an authorized reseller or go to <http://shop.qnap.com>.

Model	Compatible Rail Kit
TL-R1620Sdc	RAIL-B02

You can find installation information in the rail kit package.

4. Troubleshooting

This chapter describes basic troubleshooting information.

Forcing Storage Manager or QNAP JBOD Manager to Recognize the JBOD Enclosure

If Storage Manager or QNAP JBOD Manager is unable to locate the JBOD enclosure during operation, the drives or data may be faulty.

1. Power off the JBOD enclosure.
2. Remove all drives.
3. Power on the JBOD enclosure.
4. Locate the JBOD enclosure using Storage Manager or QNAP JBOD Manager.
5. Reinsert the drives.
6. Continue with operation.

Hot-Swapping Failed Drives

When connected to a QES NAS, the JBOD enclosure supports hot-swapping of drives in the following situations:

RAID Type	Number of Disks	Situation
RAID 1	2	One member drive fails.
RAID 5	3 to 16	One member drive fails.
RAID 6	5 to 16	One or two member drives fail.
RAID 10	4 to 16 (Creating) 2 to 16 (Expanding)	One or two member drives in two different pairs fail.
RAID 50	3 to 16	One disk per subgroup fails.
RAID 60	5 to 16	Two disks per subgroup fail.
Triple Mirror	Multiple of 3. (For example, 3, 6, 9, 12 disks and so forth.)	One or two member drives fail.
RAID-TP	8 to 16	One, two, or three member drives fail.



Note

QES only supports up to 16 member drives per RAID group.

1. Log on to QES.
2. Go to **Main Menu > Storage Manager > Storage > Disks**.
3. Locate the failed drive.
4. Prepare a new hard drive with a capacity that is the same as or larger than the failed hard drive.
5. Remove the failed drive from the device.
6. Wait for 20 seconds or until the device beeps twice.
7. Remove the failed drive from the drive tray.

8. Insert the new drive into the drive tray.
9. Install the new drive.
The JBOD enclosure beeps twice.
10. Wait for 30 seconds or until the JBOD enclosure beeps twice.
11. Go to **Main Menu > Storage Manager > Storage Space** .
12. Locate the new drive and verify its status.

Support and Other Resources

QNAP provides the following resources:

Resource	URL
Documentation	https://download.qnap.com
Compatibility List	https://www.qnap.com/compatibility
NAS Migration Compatibility	https://www.qnap.com/en/nas-migration
Expansion Unit Compatibility	http://www.qnap.com/go/compatibility-expansion
Service Portal	https://service.qnap.com
Product Support Status	https://www.qnap.com/en/product/eol.php
Downloads	https://download.qnap.com
Community Forum	https://forum.qnap.com
QNAP Accessories Store	https://shop.qnap.com

5. Glossary

QES

QNAP NAS operating system

QNAP JBOD Manager

Software utility for Windows, Linux, and macOS that allows you to view and configure QNAP JBOD enclosures

Storage Manager

QES utility that allows you to view and configure QNAP external storage devices connected to a QNAP NAS

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Version 3, 29 June 2007

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	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
风扇组装	0	0	0	0	0	0
电力供应组装	0	0	0	0	0	0
电池	0	0	0	0	0	0
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。						
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。						