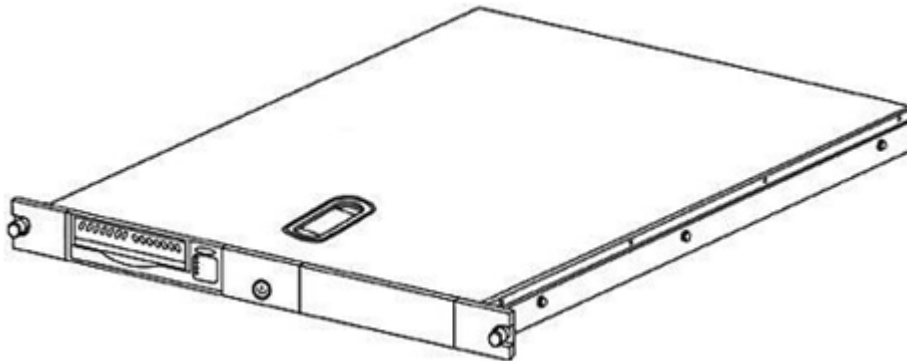# QuickSpecs

Overview

The HP StorageWorks Rack-Mount Kits provide a high-density, rack-mountable tape drive and removable hard disk drive enclosure for direct-attach SCSI, USB, and SAS backup and archiving applications. Because these enclosures use standard internal tape drives and internal removable hard disk drives, they provide a cost-effective means of mounting tape drives and removable hard disk drives in rack server environments. These enclosures provide customers with scalability, allowing the customer to add drives and migrate to new tape or removable hard disk drive technologies as their capacity and performance needs grow. HP StorageWorks Rack-Mount Kits are supported by ProLiant, HP Integrity, and AlphaServer platforms.
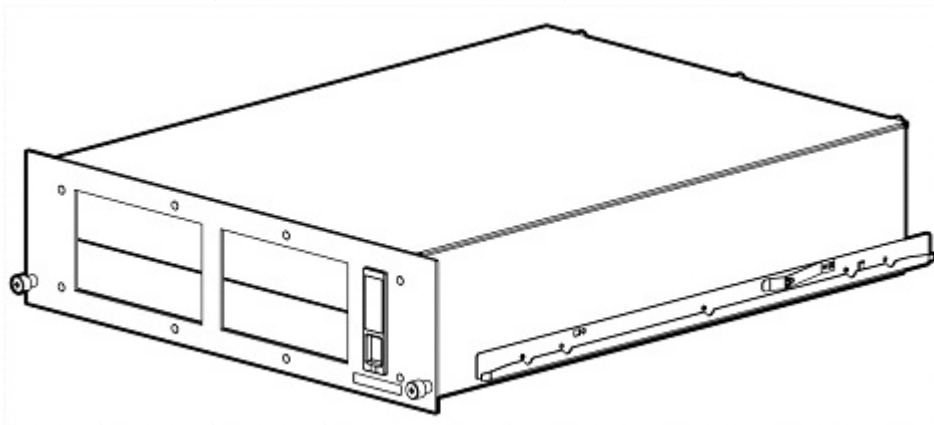
1U Rack-Mount Kit

Available in SCSI, SAS and USB interfaces, the 1U Rack-Mount Kit accommodates up to two half-height internal tape drives and supports a range of tape technologies, including DAT, DLT VS, and half-height Ultrium, with a maximum capacity of 6 TB using two LTO-5 Ultrium 3000 drives. The USB enclosure supports DAT 40, DAT 72, DAT 160 and the DAT 320 USB tape drives with a maximum capacity of 640 GB per backup session when using two DAT 320 USB drives. The 1U USB enclosure also supports HP RDX 160, 320 and 500 Removable Disk Backup Systems with a maximum capacity of 1 TB per backup session when using two RDX 500 USB removable hard disk drives. The 1U SAS enclosure supports up to two DAT 160 SAS, DAT 320 SAS, Ultrium 448 SAS, Ultrium 920 SAS, Ultrium 1760 SAS and Ultrium 3000 SAS tape drives with a maximum capacity of 6 TB when using two LTO-5 Ultrium 3000 SAS drives (assuming 2:1 data compression).

HP StorageWorks 1U Rack-Mount Kit

3U Rack-Mount Kit

Available in SCSI and SAS interfaces. The 3U Rack-Mount Kit holds up to two full-height internal tape drives, four half-height internal tape drives, or a combination of one full-height and two half-height tape drives. This enclosure supports a wide range of tape technologies, including DAT, DLT VS, SDLT, and Ultrium, with a maximum capacity of 6 TB using two LTO-5 Ultrium 3280 or 12 TB with four LTO-5 Ultrium 3000 SAS drives (assuming 2:1 data compression).

HP StorageWorks 3U Rack-Mount Kit

Overview

What's New

- 3U SAS Rack-mount Kit support for HP StorageWorks LTO-5 Ultrium 3280 SAS Tape Drive
- 1U SAS Rack-mount Kit support for HP StorageWorks LTO-5 Ultrium 3000 SAS Tape Drive
- Support for 6Gb SAS interface
- The new latching switch for the 1U SAS Rack-mount Kit allows for auto restart after power has been interrupted and restore

QuickSpecs

Models

NOTE: The HP StorageWorks Rack-Mount Kits are supported by HP ProLiant, AlphaServer, and HP-UX platforms.

HP StorageWorks Rack-Mount Tape Drive Kits for ProLiant and AlphaServer		
	HP StorageWorks 1U SCSI Rack-Mount Kit	A7445B
	HP Storage Works 1U USB Rack-Mount Kit	A8007A
	HP Storage Works 1U SAS Rack-Mount Kit	AE459B
	HP StorageWorks 3U SCSI Rack-Mount Kit	274338-B22
	HP StorageWorks 3U SAS Rack-Mount Kit	AG576B

NOTE: #0D1 will appear after the part number on the sales order if HP factory integration is indicated.

Pre-Configured Models		
	HP StorageWorks 1U USB Rack-mount Kit with one DAT 320 USB drive	AP835A
	HP StorageWorks 1U USB Rack-Mount Kit with one DAT 160 USB drive	AG703A
	HP StorageWorks 1U USB Rack-Mount Kit with one DAT 72 USB drive	AG594A
	HP StorageWorks 1U Rack-Mount Kit with one LTO-2 Ultrium 448 drive	DW028B
	HP StorageWorks 1U Rack-Mount Kit with one LTO-3 Ultrium 920 drive	EH903A
	HP StorageWorks 1U SAS Rack-Mount Kit with one LTO-4 Ultrium 1760 SAS drive	EH946B
	HP StorageWorks 1U SAS Rack-mount Kit with one LTO-5 Ultrium 3000 SAS drive	EJ014A
	HP StorageWorks 3U Rack-Mount Kit with one LTO-3 Ultrium 960 drive	Q1595B
	HP StorageWorks 3U Rack-Mount Kit with one LTO-4 Ultrium 1840 drive	EH926A
	HP StorageWorks 3U Rack-Mount Kit with one LTO-5 Ultrium 3280 SAS drive	EJ013A

NOTE: When ordering this product factory racked, an additional drive cannot be added in the factory. An additional drive can be installed by the customer.

NOTE: #0D1 will appear after the part number on the sales order if HP factory integration is indicated.

Key Features

1U SCSI Rack-Mount Kit
- High-density 1U rack-mount form factor
- The SCSI enclosure is capable of mixing technologies and is compatible with a wide range of single-ended and LVD SCSI internal tape drives, including:
  - DAT 40, DAT 72 and DAT 160 SCSI Tape Drives
  - DLT VS160 SCSI Tape Drives
  - LTO-1 Ultrium 232, LTO-2 Ultrium 448, LTO-3 Ultrium 920 and LTO-4 Ultrium 1760 SCSI Tape Drives
- SCSI enclosure Provides up to 3.2 TB of storage capacity (assuming 2:1 compression using two LTO-4 Ultrium 1760 drives)
- Data transfer rates up to 1 TB/hr (assuming 2:1 data compression using two LTO-4 Ultrium 1760 drives)
- SAS Upgrade Kit available in order to support one SAS drive and one SCSI drive.

1U USB Rack-Mount Kit
- High-density 1U rack-mount form factor
- The USB enclosure supports , DAT 40 USB, DAT 72USB, DAT 160 USB and DAT 320 USB tape drives and also supports RDX 160GB, RDX 320GB and RDX 500GB removable hard disk drives.
- USB enclosure provides up to 640 GB of storage capacity, using two DAT 320 USB drives and up to 1 TB of storage capacity using two RDX 500GB removable hard disk drives.
- Data transfer rates of 86.4G/hour (assuming 2:1 data compression) using two DAT 320 drives

Models

and up to 108H/hour using two RDX removable hard disk drives.
- SAS Upgrade Kit available in order to support one SAS drive and one USB drive

1U SAS Rack-Mount Kit
- High-density 1U rack-mount form factor with auto-configuring 1.5Gb, 3Gb and 6Gb SAS support
- The SAS enclosure supports up to two DAT 160 SAS, DAT 320 SAS, Ultrium 448 SAS, Ultrium 920 SAS, Ultrium 1760 SAS or Ultrium 3000 SAS tape drives.
- Provides up to 6 TB of storage capacity (assuming 2:1 compression) using two Ultrium 3000 drives.
- Data transfer rates up to 2 TB/hr (assuming 2:1 compression) using two Ultrium 3000 drives
- Latching switch for the 1U rack allows for auto restart after power has been interrupted and restore
- Supports up to two separate SAS channels for connectivity to two separate servers or two separate HBA ports.

3U SCSI Rack-Mount Kit
- Provides up to 3.2 TB of compressed storage capacity using two LTO-4 Ultrium 1840 or 6.4 TB with four LTO-4 Ultrium 1760 tape drives
- 3U rack-mount form factor.
- Supports two full-height or four half-height SCSI-based tape drives, or a combination one full-height and two half-height devices.
- Includes new ease-of-use features for easier integration and management of HP tape devices
- Compatible with a wide range of single-ended and LVD SCSI internal tape drives, including:
  - DAT 40, DAT 72 and DAT 160 SCSI Tape Drives
  - DAT 72x6 Tape Autoloader
  - DLT VS160 SCSI Tape Drives
  - SDLT 600 SCSI Tape Drives
  - LTO-1 Ultrium 232, LTO-2 Ultrium 448, LTO-3 Ultrium 920, LTO-3 Ultrium 960, LTO-4 Ultrium 1760 and LTO-4 Ultrium 1840 SCSI Tape Drives
- Supports up to four separate SCSI buses
- Top access and removable drive trays allow customers to slide unit out of rack for easier access to tape drives

3U SAS Rack-Mount Kit
- Provides up to 6 TB of compressed storage capacity using two LTO-5 Ultrium 3280 SAS drives or 12 TB using 4 LTO-5 3000 SAS drives.
- 3U rack-mount form factor with auto-configuring 1.5Gb, 3Gb and 6Gb SAS support
- Supports up to four SAS-based, half-height tape drives (DAT 160 SAS, Ultrium 448 SAS, Ultrium 920 SAS, Ultrium 1760 SAS, Ultrium 3000 SAS) or two SAS-based, full-height tape drives (Ultrium 1840 SAS, Ultrium 3280 SAS)
- Includes new ease-of-use features for easier integration and management of HP tape devices
- Supports up to four separate SAS channels for connectivity to four separate servers or four separate HBA ports.Top access and removable drive trays allow customers to slide unit out of rack for easier access to tape drives

Models

Customer Benefits

- Small footprint allows the customer to consolidate external storage needs within a high-density form factor.
- Scalability allows customers to add tape drives and migrate to new tape drive technologies that meet their capacity and performance needs as their storage requirements change.
- Support of multiple tape drive technologies as well as RDX removable hard disk drive technology, which reduces risk and protect customers' investments.
- Support of multiple interfaces including SCSI, SAS, and USB.
- Latching switch for 3U and 1U SAS rack-mount kits allows auto restart after power has been interrupted and restored
- New ease-of-use features increase the customer's efficiency in configuring, integrating, and managing external storage devices.
- Affordable pricing allows customer to match their level investment in storage to their current or future business needs.
- Thoroughly tested and qualified with HP ProLiant, HP Integrity and AlphaServer platforms and industry leading software, resulting in easier installation and fewer problems.

Family Comparison

	1U Rack-Mount Kit	3U Rack-Mount Kit	Tape Array 5300
Maximum Capacity (compressed)	3.2 TB (SCSI) 6 TB (SAS) 1 TB (USB)	6.4 TB (SCSI) 12 TB (SAS)	3.2 TB (SCSI)
Maximum Number of Drives	2 half-height	4 half-height or 2 full-height	4 half-height or 2 full-height
Drives Supported	RDX 160 RDX 320 RDX 500 DAT 40 DAT 72 DAT 160 DAT 320 Ultrium 232 Ultrium 448 Ultrium 920 Ultrium 1760 Ultrium 3000 (SAS)	Half-Height Devices: DAT 40 SCSI DAT 72 SCSI DAT 160 Ultrium 232 Ultrium 448 Ultrium 920 Ultrium 1760 Ultrium 3000 (SAS) Full-Height Devices: Ultrium 960 Ultrium 1840 Ultrium 3280 (SAS)	Half-Height Devices: DVD+RW DAT 40 DAT 72 DAT 160 Ultrium 232 Ultrium 448 Full-Height Devices: Ultrium 960 Ultrium 1840
Interface	SCSI (LVD/SE), 6Gb SAS, USB	SCSI (LVD/SE), 6Gb SAS	SCSI (LVD/SE)
High-Availability Features	None	None	Offline hot-swap drives Redundant hot-swap PSU and fan (optional)

Product Highlights

Scalability	HP StorageWorks Rack-Mount kits support up to four tape drives in the 3U and two tape drives or two RDX removable hard disk drives in the 1U. Tape drives and RDX removable hard disk drives can be added at any time, allowing flexibility to add capacity or change tape technologies at any time.
Configuration	**SCSI**: The standard bus configuration includes two SCSI buses with support for up to two drives per bus. Customers can purchase an LVD Cable Kit that will extend the unit to four SCSI buses supporting one drive per bus on the 3U Using independent SCSI buses for each drive provides the best performance. **SAS**: The standard configuration includes two SAS channels on the 1U and four SAS channels on the 3U. **USB**: The standard configuration includes two USB ports on the 1U.
Ease-of-Use Features	HP StorageWorks Rack-Mount kits include features designed to provide for easier access and management of installed tape drives and RDX removable hard disk drives . The cover is easily unscrewed and slid off for ease of access. Each unit also includes two slide-out drive trays that allow for easy removal of the internal tape drives and RDX removable hard disk drives through the top access cover . LEDs on the front panel indicate when the power is on and when service is required.
Compatibility and Integration Testing	HP StorageWorks Rack-Mount Kits use in-house technology, which ensures the customer of full compatibility with HP ProLiant, Integrity and AlphaServer platforms. HP thoroughly tests products with leading backup software and operating systems.

HP Server Compatibility

NOTE: Connecting a Rack-Mount Kit to any of the supported ProLiant, AlphaServer, and HP Integrity platforms may require the use of a secondary controller, host bus adapter, or Smart Array controller. Please see the list of supported controllers, host bus adapters, and Smart Array controllers at www.hp.com/go/connect to select the appropriate model.

HP StorageWorks Rack-Mount Kits are supported on the following classes of HP systems:

- HP ProLiant servers
- HP Alpha servers
- HP rx and rp series servers
- HP tc series servers

For details of which tape drive and RDX removable hard disk drive models work with which systems, including third-party systems, visit http://www.hp.com/go/connect for the latest hardware compatibility information

OS Support	Operating system compatibility will depend on the drives used in the rack enclosure. For the latest list of servers, operating systems, and backup software that support HP StorageWorks tape drives and RDX removable hard disk drives, check the tape/RDX removable hard disk drive backup compatibility pages on our web site at: http://www.hp.com/go/connect.
Software Support	Backup application compatibility also depends on the drives used in the Rack-Mount Kit. For the latest list of servers, operating systems, and backup software that support HP StorageWorks tape drives and RDX removable hard disk drives, check the tape/RDX removable hard disk drive backup compatibility pages on our web site at: http://www.hp.com/go/connect.

Service and Support, HP Care Pack, and Warranty Information

Warranty	3-0-0 (Three year parts)

For increased uptime, productivity and ROI -HP Care Pack packaged services for Storage
These days, you need to get the most out of your storage investment-you can't afford not to. When you buy HP storage products and solutions, it's also a good time to think about what levels of service and support you may need. To help take the worry out of deploying, designing, maintaining, and managing your environment, we've designed a portfolio of service options that are as: flexible, reliable and scalable as your storage. Unlike storage-only vendors, we take a holistic approach to your entire environment, bridging storage, servers, blades, software and network infrastructures with our HP Care Pack packaged services for Storage.

Protect your business beyond the warranty
When it comes to robustness and reliability, standard warranties on today's computing equipment have matured just as the technologies have matured. Good news on some fronts-but also a source of potential problems and subsequent consequences that come from depending on standard warranties alone. Standard warranty protects against product defects and some causes of downtime- but not the business. By using a standard approach to warranty uplifts, such as HP Care Pack Services, you can reduce downtime risks and be more certain of operational consistency for both mission-critical and standard business computing. Simply put, HP Care Pack Services normalize the warranty of combined products - helping you proactively guard against unplanned downtime.

Extending warranties with HP Care Pack Services
For cost-effective upgrading or extending your standard warranty, HP Care Pack Services offer a suite of standard reactive hardware and software support services that are sold separately, or combined as with our Support Plus and Support Plus 24 services. The portfolio also provides a combination of proactive and reactive services, such as Proactive 24 Service and Critical Service. In addition, with HP Proactive Select we offer an innovative approach to service delivery that gives you the flexibility to acquire the specific proactive services you need today, then add services as your needs evolve. HP Proactive Select offers a broad set of technical or per-event type service options - including server, storage, and network, SAN device, and software, environment, installation and education services. Services that you can mix and match depending on your specific requirements, from preliminary planning and equipment delivery to installation, configuration, integration, and testing, through every level of ongoing support. Our HP Care Pack packaged services for Storage assures help when you need it most. And for many products, post-warranty HP Care Pack Services are available when your original warranty has expired.

HP Storage Services: Offering reliability, flexibility and value-just like your storage
HP Storage Services offers a full spectrum of customer care, from technology support to complex migrations to complete completely managed services. HP Factory Express provides customization, integration and deployment services for turnkey solutions. HP Education offers flexible, comprehensive training on storage networking, disk storage systems, and storage software to help your IT staff get the most out of your investments. And HP Financial solutions extend innovative financing and asset management programs to cost-effective buy, manage and eventually retire your older equipment.

HP Storage Services, the trusted business technology experts who manage your technology in action, because when technology works, business works. http://www.hp.com/hps/storage

NOTE: Care Pack Services availability may vary by product and country.

HP Care Pack Services are sold by HP and HP Authorized Service Partners:

- Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools.
- Customers purchasing from a commercial reseller can find HP Care Pack Services at
  http://www.hp.com/go/lookuptool

Service and Support, HP Care Pack, and Warranty Information

Recommended HP Care Pack Services for optimal satisfaction with your HP product.

Recommended Support	**3-Year HP Support Plus 24**

For a higher return on your storage investment, HP Support Plus 24 provides integrated hardware and software support services designed specifically for your technology. Available 24x7, this 3-year combined reactive support option delivers onsite hardware support and over-the-phone software support around-the-clock. Leverage the full strength of HP Technology Services - customers can trust the services professionals at HP to work collaboratively with them, putting our strategic and technical know-how to work across their entire infrastructure.

- Improve uptime with responsive hardware and software services
- Enjoy consistent service coverage across geographically dispersed sites
- Update HP software at a predictable cost
- Increase customer satisfaction-with no interoperability gaps

http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6638EN.pdf

Recommended Deployment	**HP Install Storage Autoloader/Tape Drive Array Service**

For smooth start up and better business outcomes, HP Install Storage Autoloader/Tape Drive Array Service- this service provides initial hardware installation into your server technology environment (system configuration is not included). Leverage the full strength of HP Technology Services - customers can trust the services professionals at HP to work collaboratively with them, putting our strategic and technical know-how to work across their entire infrastructure.

- Allows your IT resources to stay focused on their core tasks and priorities
- Reduces implementation time, impact and risk to your storage environment

http://h71028.www7.hp.com/ERC/downloads/5981-9356EN.pdf

Related HP Care Pack Services that will enhance your HP product experience.

Related Services	**HP Backup and Recovery Solution Service**

For customers who need help implementing their backup software:
Rapid recovery from system downtime can hinge on the efficiency of your backup and recovery management environment - and on how well that environment is integrated with your storage infrastructure. But integration processes can be time-consuming and complex, and your IT resources are already stretched thin. Where can you find the expert help you need?

For fast, effective integration of your backup solution into an existing or new storage infrastructure, turn to the storage experts at HP Services. Our Backup and Recovery Solution Service (BRSS) provides end-to-end management of your backup integration process. The BRSS team works with you to analyze your business and IT environment; develop a comprehensive integration plan and timetable; design an architecture that suits your critical requirements; install backup software; implement your solution; and validate your configuration.

http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-7441EN.pdf

Service and Support, HP Care Pack, and Warranty Information

eSupport

HP eSupport is a portfolio of technology-based services that assist you with managing your business environment - from the desktop to the data center.

Support Portal
The HP support portal provides one-stop access to the information, tools and services you need to manage the daily operations of your IT environment.

Features include:

- Access to self-solve tools (including search technical knowledge base)
- Efficient logging and tracking of support cases
- Collaboration with other business and IT professionals
- Download of patches and drivers
- Access to diagnostic tools
- Proactive notification of relevant information

Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit: http://www.hp.com/support

Customer Technical Training

Consider education as an integral part of your strategy to get the best return on investment for your HP storage solution. HP offers a variety of training courses on storage software, networking, archiving and disk storage systems. Our classes are available in many delivery modalities from traditional instructor-led courses at one of our 80 training centers worldwide to on-site training customized to your needs or online. www.hp.com/learn/storage

HP Services Awards

HP Services continues to be recognized for service and support excellence by customers, partners, industry organizations and publications around the world. Recent honors and award reflect our services team's dedications, technical expertise, professionalism and uncompromising commitment to customer satisfaction. For a list of all our awards, please visit:
http://h20219.www2.hp.com/services/cache/433028-0-0-225-121.htm

Additional Services Information

For more information about HP Care Pack Services for Storage, please visit:
http://www.hp.com/hps/storage

If you have specific questions, contact your local HP representative. Contact information for a representative in your area can be found at "Contact HP" http://www.hp.com

QuickSpecs

Configuration Information

Step 1 - 1U/3U Rack-Mount Kit

Select one:

Model	Model Description	Part Number
1U USB Rack-Mount Kit (Carbon)	USB rack-mountable enclosure (1U) with power supply, 4 meter USB cable, fans, power cord, quick deploy rail kit including sliding universal rails for ProLiant, AlphaServer and Rack System/E racks quick release levers for fast and easy serviceability and in-rack tool-less access, user's guide on CD and documentation. NOTE: #0D1 will appear after the part number on the sales order if HP factory integration is indicated.	A8007A
1U SCSI Rack-Mount Kit (Carbon)	Wide SCSI LVD rack-mountable enclosure (1U) with power supply, HD - VHDC 12' SCSI cable, fans, power cord, quick deploy rail kit including sliding universal rails for ProLiant, AlphaServer and Rack System/E racks, Velcro hood/loop strap and quick release levers for fast and easy serviceability and in-rack tool-less access, user's guide on CD and documentation. NOTE: #0D1 will appear after the part number on the sales order if HP factory integration is indicated.	A7445B
1U SAS Rack-Mount Kit (Carbon)	6Gb/sec SAS rack-mountable enclosure (1U) with power supply, fans, power cord, 4 meter SAS external split cable, quick deploy rail kit including sliding universal rails for ProLiant, AlphaServer and Rack System/E racks, Velcro hood/loop strap and quick release levers for fast and easy serviceability and in-rack tool-less access, user's guide on CD and documentation. NOTE: #0D1 will appear after the part number on the sales order if HP factory integration is indicated.	AE459B
3U SCSI Rack-Mount Kit (Carbon)	Wide SCSI LVD rack-mountable enclosure (3U) with power supply, HD - VHDC 12' SCSI cable, Ultra 320 SCSI Cable Kit, fans, power cord, 9000 and 10000 series rack compatible rail kit (Optional rail kit available for AlphaServer Rack and Rack System/E) User's Guide on CD, Documentation. NOTE: #0D1 will appear after the part number on the sales order if HP factory integration is indicated.	274338-B22
3U SAS Rack-Mount Kit (Carbon)	6Gb/sec SAS rack-mountable enclosure (3U) with power supply, fans, power cord, 9000 and 10000 series rack compatible rail kit (Optional rail kit available for AlphaServer Rack and Rack System/E) User's Guide on CD, Documentation. NOTE: #0D1 will appear after the part number on the sales order if HP factory integration is indicated.	AG576B

Step 2 – Additional/Related Options

Select each required option with quantities specified

NOTE: The following is a list of additional/related options. Some may be discontinued.

Tape Drives	Description	Part Number
	DAT 40 SCSI Internal Tape Drive NOTE: Supported by the 1U SCSI and 3U SCSI Rack-Mount Kits.	C5686C
	DAT 40 USB Internal Tape Drive NOTE: Supported by the 1U USB Rack-Mount Kit.	DW022A
	DAT 72 SCSI Internal Tape Drive NOTE: Supported by the 1U SCSI and 3U SCSI Rack-Mount Kits.	Q1522B

Configuration Information

DAT 72 USB Internal Tape Drive — DW026A
NOTE: Supported by the 1U USB Rack-Mount Kit.

DAT 160 SCSI Internal Tape Drive — Q1573A
NOTE: Supported by the 1U SCSI and 3U SCSI Rack-Mount Kits.

DAT 160 SAS Internal Tape Drive — Q1587A
NOTE: Supported by the 1U SAS and 3U SAS Rack-Mount Kits.

DAT 160 USB Internal Tape Drive — Q1580A
NOTE: Supported by the 1U USB Rack-Mount Kit.

DAT 320 SAS Internal Tape Drive — AJ830A
NOTE: Supported by the 1U SAS Rack-mount Kit.

DAT 320 USB Internal Tape Drive — AJ825A
NOTE: Supported by the 1U USB Rack-mount Kit.

LTO-1 Ultrium 232 SCSI Internal Tape Drive — DW064A
NOTE: Supported by the 1U SCSI and 3U SCSI Rack-Mount Kits.

LTO-2 Ultrium 448 SCSI Internal Tape Drive — DW016A
NOTE: Supported by the 1U SCSI and 3U SCSI Rack-Mount Kits.

LTO-2 Ultrium 448 SAS Internal Tape Drive — DW085A
NOTE: Supported by the 1U SAS and 3U SAS Rack-Mount Kit.

LTO-3 Ultrium 920 SCSI Internal Tape Drive — EH841A
NOTE: Supported by the 1U SCSI and 3U SCSI Rack-Mount Kit.

LTO-3 Ultrium 920 SAS Internal Tape Drive — EH847A
NOTE: Supported by the 1U SAS.

LTO-3 Ultrium 960 SCSI Internal Tape Drive — Q1538A
NOTE: Supported by the 3U SCSI Rack-mount Kits.

LTO-4 Ultrium 1760 SCSI Internal Tape Drive — EH921A
NOTE: Supported by the 1U SCSI and 3U SCSI Rack-mount Kits.

LTO-4 Ultrium 1760 SAS Internal Tape Drive — EH919A
NOTE: Supported by the 1U SAS.

LTO-4 Ultrium 1840 SCSI Internal Tape Drive — EH853A
NOTE: Supported by the 3U SCSI Rack-mount Kits.

LTO-4 Ultrium 1840 SAS Internal Tape Drive — EH860A
NOTE: Supported by the 3U SAS Rack-mount Kits.

TO-5 Ultrium 3000 SAS Internal Tape Drive — EH957A
NOTE: Supported by the 1U (AE459B) and 3U (AG576B) SAS rack-mount kits.
Requires the AE463B SAS upgrade kit when installed in an existing (SCSI, USB, 3Gb
SAS) Rack-mount Kit.

LTO-5 Ultrium 3280 SAS Internal Tape Drive — EH899A
NOTE: Supported by the 3U (AG576B) SAS Rack-mount Kit. Requires the AE463B
SAS upgrade kit when installed in an existing (SCSI, 3Gb SAS) Rack-mount Kit.

Removable Disk Drive	Description	Part Number
	HP RDX160 Internal Removable Disk Backup System	AJ765A
	NOTE: Supported by the 1U USB Rack-Mount Kit.	
	LTO-5 Ultrium 3000 SAS Internal Tape Drive	EH957A
	NOTE: Supported by the 1U and 3U SAS.	

Configuration Information

	LTO-5 Ultrium 3280 SAS Internal Tape Drive	EH899A
	NOTE: Supported by the 3U SAS.	
	HP RDX320 Internal Removable Disk Backup System	AJ767A
	NOTE: Supported by the 1U USB Rack-Mount Kit.	
	HP RDX500 Internal Removable Disk Backup System	AJ934A
	NOTE: Supported by the 1U USB Rack-Mount Kit.	

Q Media	HP DDS-3 data cartridge	C5708A
	HP DDS-4 data cartridge	C5718A
	HP DAT 72 data cartridge	C8010A
	HP DAT 160 data cartridge	C8011A
	HP DAT 320 data cartridge	Q2032A
	HP DDS Universal cleaning cartridge	C5709A
	HP RDX 160GB removable disk cartridge	Q2040A
	HP RDX 320GB removable disk cartridge	Q2041A
	HP RDX 500GB removable disk cartridge	Q2042A
	HP DLTIV data cartridge	C5141F
	HP DLT IV data cartridge (Europe only)	C5141L
	HP DLTtape VS1 160GB Data Cartridge (for use with the DLT VS160 Drive)	C8007A
	HP DLT VS1 Cleaning Cartridge (for use with the DLT VS160 Drive)	C8016A
	HP DLT VS cleaning cartridge	C7998A
	NOTE: For DLT VS drive only.	
	HP DLT cleaning cartridge	C5142A
	NOTE: For non-DLT VS drives only.	
	HP SDLT 220-320 GB data cartridge	C7980A
	HP Super DLTtape II 600GB data cartridge	Q2020A
	HP SDLT cleaning cartridge (for use with the SDLT 320 and SDLT 600)	C7982A
	HP Ultrium 200GB data cartridge	C7971A
	HP Ultrium 400GB data cartridge	C7972A
	HP Ultrium 800 GB RW data cartridge (for use with the Ultrium 960 Drive)	C7973A
	HP Ultrium 800 GB WORM cartridge (for use with the Ultrium 960 Drive)	C7973W
	HP Ultrium 1.6TB RW data cartridge (for use with the LTO-4 Drives)	C7974A
	HP Ultrium 1.6 TB WORM cartridge (for use with the LTO-4 Drives)	C7974W
	HP Ultrium 3TB RW data cartridge (for use with the LTO-5 Drives)	C7975A
	HP Ultrium 3TB WORM cartridge (for use with the LTO-5 Drives)	C7975W
	HP Ultrium Universal Cleaning Cartridge	C7978A

Configuration Information

USB Cable Kit	1U USB Cable Option Kit This cable kit can be purchased to convert a 1U SCSI rack-mount kit to a USB interface to support the DAT USB drives. It includes 1 - 5 meter USB cable, 1- plastic grommet, 1- metallic panel, and documentation. All pieces are pre-assembled for easy implementation.	396114-B21
SAS Upgrade Kit	SAS Upgrade Kit This upgrade kit provides the parts needed to upgrade a rack-mount kit from parallel SCSI, USB, or 3Gb SAS to an auto-sensing 1.5Gb, 3Gb and 6Gb SAS interface. It includes cables and interface (SAS interface board AS#012769-002) for back panel.	AE463B

NOTE: Go to http://www.hp.com/go/connect/ to confirm what cable is needed.

Optional SCSI Cable - add additional SCSI buses to the 3U Rack-mount Kits for use with certain legacy tape drives.	HP Ultra 320 SCSI Cable Kit A field upgrade kit required when going from 2 to 4 ports on the 3U rack-mount kit. Also required for the following rack-mount kits when adding ultra 160 or greater drives (350546-B21, 350545-B21, 350544-B21, 274338-B21), or to any of the 5U Rack-Mount Kits.	DW063B
Required External SCSI Cables - Required cables needed to connect the enclosure/drives to the host(s). Once cable per bus is needed.	68-pin HD to 68-pin VHDCI, 12ft NOTE: For SE and LVD SCSI tape devices.	341177-B21
Optional External SAS Cable	Mini SAS 4M External Split Cable 3X by1X (3Hard Disk Drive x 1 Tape Drive) NOTE: This cable is needed to connect SAS enclosure/drives to the motherboard on certain servers. See http://www.hp.com/go/connect for support details.	AE464A
	External Split 4M SAS Cable for ProLiant DL360G5 and DL365G5 (mini-SAS connector) NOTE: This cable is required to connect SAS enclosure/drives to the motherboard on HP ProLiant DL360G5 and DL365G5 SAS servers	AG452A
	External 4M Hybrid SAS Cable 8088/8470 NOTE: This cable is needed to connect to SAS SC44Ge HBA external port on server	AE468A
	External 2M Hybrid SAS Cable 8088/8470 NOTE: This cable is used to connect to SAS SC44Ge HBA external port on server	AE466A
	External 2M mini-SAS (8088) Cable NOTE: This cable is used to connect to SAS HBA mini-SAS external port on server (e.g., P212, P411, P800 Smart Array Controllers)	AE470A
	External 4M mini-SAS (8088) Cable NOTE: This cable is used to connect to SAS HBA mini-SAS external port on server (e.g., P212, P411, P800 Smart Array Controllers)	AE465A
	External 2M 1 mini-SAS (8088) Cable to 4 mini-SAS NOTE: This cable is used to connect up to 4 SAS tape drives to one SAS HBA mini-SAS external port on server (e.g., P212, P411, P800 Smart Array Controllers)	AN975A
	External 4M 1 mini-SAS (8088) Cable to 4 mini-SAS NOTE: This cable is used to connect up to 4 SAS tape drives to one SAS HBA mini-SAS external port on server (e.g., P212, P411, P800 Smart Array Controllers)	AN976A

Configuration Information

	External 2M 1 SAS (8047) Cable to 4 mini-SAS (8088) NOTE: This cable is used to connect up to 4 SAS tape drives to one SAS HBA 8047 external port on server (e.g., SC44Ge Controller)	AN975A
Rail Kit	3U Alpha Rail Kit NOTE: Required for installation of 3U Rack-Mount Kit in AlphaServer rack. NOTE: The rail kit option listed above can also be used to install HP Rack-Mount Kits in HP Rack System/E cabinets.	280571-001
Host Bus Adapters, Controllers, and Accessories for ProLiant Servers	**SCSI Controllers** HP SC11Xe Host Bus Adapter NOTE: Recommended SCSI HBA for connecting Ultrium tape drives to G6/G7 ProLiant servers. Please visit: http://www.hp.com/go/connect for a complete list of Ultrium tape drive compatibility with ProLiant servers and other industry standard servers.	412911-B21
	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2 NOTE: Recommended SCSI HBA for connecting Ultrium tape drives to G5 ProLiant servers. Please visit: http://www.hp.com/go/connect for a complete list of Ultrium tape drive compatibility with ProLiant servers and other industry standard servers.	374654-B21
	SAS Controllers HP SC44Ge SAS Host Bus Adapter NOTE: Recommended SAS HBA for connecting Ultrium tape drives to G5 ProLiant servers. Please visit: http://www.hp.com/go/connect for a complete list of Ultrium tape drive compatibility with ProLiant servers and other industry standard servers.	416096-B21
	HP Smart Array P212 NOTE: Recommended SAS HBA for connecting Ultrium tape drives to G6/G7 ProLiant servers. Please visit: http://www.hp.com/go/connect for a complete list of Ultrium tape drive compatibility with ProLiant servers and other industry standard servers.	462828-B21
	HP Smart Array P400/256MB Controller	405132-B21
	HP Smart Array P400/512MB Controller	411064-B21
	HP 8 Internal Port SAS HBA with RAID 0/1 NOTE: PCI-X interface	347786-B21
	HP Smart Array P800/512 BBWC Controller	381513-B21
	HP Smart Array E500 Controller	435129-B21
	HP Smart Array P700m/256MB Controller NOTE: Recommended SAS HBA for connecting HP StorageWorks tape drives to HP ProLiant Blade servers	507925-B21
	HP Smart Array P700m/512MB Controller NOTE: Recommended SAS HBA for connecting HP StorageWorks tape drives to HP ProLiant Blade servers	508226-B21
Host Bus Adapters, Controllers, and Accessories for HP AlphaServers	Single Channel Ultra2 SCSI, LVD	3X-KZPCA-AA
	Dual Channel PCI Ultra3 LVD Multimode	3X-KZPEA-DB
	Triple-Function Combo Adapter: LVD / SCSI II, 10/100 UTP Ethernet, and 2D Graphics	3X-DEPVZ-AA

Configuration Information

You will need to connect Ultrium 460 ,Ultrium 960 and Ultrium 1840 tape drives to a dedicated SCSI Host Bus Adaptor (HBA) that is Ultra160 or higher. To supply data to the drive fast enough to achieve full performance from the tape drive, you will need at least eight disks as part of a RAID 5 array with read cache enabled. You can test the speed of your system with tools provided at http://www.hp.com/support/pat or with HP's StorageWorks Library and Tape Tools application.

To achieve full performance from your tape drive, do not use the native backup application within the operating system (e.g., NT® Backup, Windows® 2000 Backup). For full details of supported backup applications, see http://www.hp.com/products1/storage/compatibility/tapebackup/index.html

QuickSpecs

Technical Specifications

		1U Rack-Mount	3U Rack-Mount
Dimensions	Form Factor	1U - Rack-Mount	3U - Rack-Mount
	Physical (HxWxD)	1.7 x 19 x 25.3 in (4.32 x 42.88 x 64.14 cm)	5.2 x 16.8 x 23.0 in (13.20 x 42.70 x 58.40 cm)
	Shipping (HxWxD)	12.0 x 23.5 x 33.5 in (30.48 x 59.69 x 85.09 cm)	15.8 x 23.8 x 33.5 in (40.01 x 60.33 x 85.09 cm)
Weight	Out of box	17.8 lb (8.07 kg)	27 lb (12.3 kg)
	Shipping	25 lb (11.3 kg)	45 lb (20.5 kg)
Interface	SCSI/USB/SAS Interface	Wide SCSI LVD/SE USB2.0 3Gb and 6Gb SAS	Wide SCSI LVD & SE 3Gb and 6Gb SAS
	SCSI/USB/SAS Connector	Two 68-pin HD Two USB 2.0 ports Two mini-SAS 8088 connectors	Two 68-pin HD standard, Can be expanded to more Four mini-SAS 8088 connectors
	Ports	1U SCSI--Two SCSI buses, 1 half-height drive per bus or can be configured with 2 half height on one bus. 1U USB-Two USB buses, 1 half-height drive per bus. 1U SAS - Two SAS ports, 1 half-height drive per port	3U SCSI - Two SCSI buses, 2 half-height or 1 full-height drive per bus. Optional: Can increase to four SCSI buses with one half-height drive per bus with LVD Cable Kit. 3U SAS - Four SAS ports, 1 half-height drive per port
Power Specifications	Power Requirements	140 Watts, max 100 to 240 Vrms Nominal Line Voltage 90 to 264 Vrms Range Line Voltage 47/63 Hz 2.4 A max Input Current (@120 VAC)	200 Watts, max 100 to 240 Vrms Nominal Line Voltage 90 to 264 Vrms Range Line Voltage 47/63 Hz 3.1 A max Input Current
Environmental Specifications	Temperature	Operating	41° to 104° F (5° to 40° C)
		Storage	-22° to 104° F (-30° to 60° C)
	Non-Condensing Humidity	Operating	20% to 80%
		Storage	5% to 95%

Drives Supported	1U Rack-Mount	3U Rack-Mount	Capacity (native)	Transfer rate (native)	Form Factor
	DAT 40 SCSI	DAT 40 SCSI	20 GB	3.2 MB/s	Half-Height
	DAT 40 USB	-	20 GB	3.2 MB/s	Half-Height
	DAT 72 SCSI	DAT 72 SCSI	36 GB	3.2 MB/s	Half-Height
	DAT 72 USB	-	36 GB	3.2 MB/s	Half-Height
	DAT 160 SCSI	DAT 160 SCSI	80 GB	6.9 MB/s	Half-Height
	DAT 160 SAS	DAT 160 SAS	80 GB	6.9 MB/s	Half-Height
	DAT 160 USB	-	80 GB	6.9MB/s	Half-Height
	DAT 320 SAS	-	160 GB	12 MB/s	Half-Height
	DAT 320 USB	-	160 GB	12MB/s	Half-Height

Technical Specifications

	RDX 160GB USB	-	160 GB	30 MB/s	Half-Height
	RDX 320GB USB	-	320 GB	30 MB/s	Half-Height
	RDX 500GB USB	-	500 GB	30 MB/s	Half-Height
	Ultrium 232 SCSI	Ultrium 232 SCSI	100 GB	16 MB/s	Half-Height
	Ultrium 448 SCSI	Ultrium 448 SCSI	200 GB	24 MB/s	Half-Height
	Ultrium 448 SAS	Ultrium 448 SAS	200 GB	24 MB/s	Half-Height
	Ultrium 920 SCSI	Ultrium 920 SCSI	400 GB	60 MB/s	Half-Height
	Ultrium 920 SAS	Ultrium 920 SAS	400 GB	60 MB/s	Half-Height
	-	Ultrium 960	400 GB	80MB/s	Full-Height
	Ultrium 1760 SAS	Ultrium 1760 SAS	800 GB	80MB/s	Half-Height
	Ultrium 1760 SCSI	Ultrium 1760 SCSI	800 GB	80MB/s	Half-Height
	-	Ultrium 1840 SCSI	800 GB	120MB/s	Full-Height
	-	Ultrium 1840 SAS	800 GB	120MB/s	Full-Height
	Ultrium 3000 SAS	Ultrium 3000 SAS	3TB	280MB/s	Half-Height
		Ultrium 3280 SAS	3TB	280MB/s	Full-Height
Max Number of drives	1U Rack-Mount	3U Rack-Mount			
	Two half-height internal drives	Two full-height internal drives or			
		Four half-height internal drives			
LED Indicators	1U Rack-Mount	3U Rack-Mount			
	Power Supply	Power Supply			