# QuickSpecs

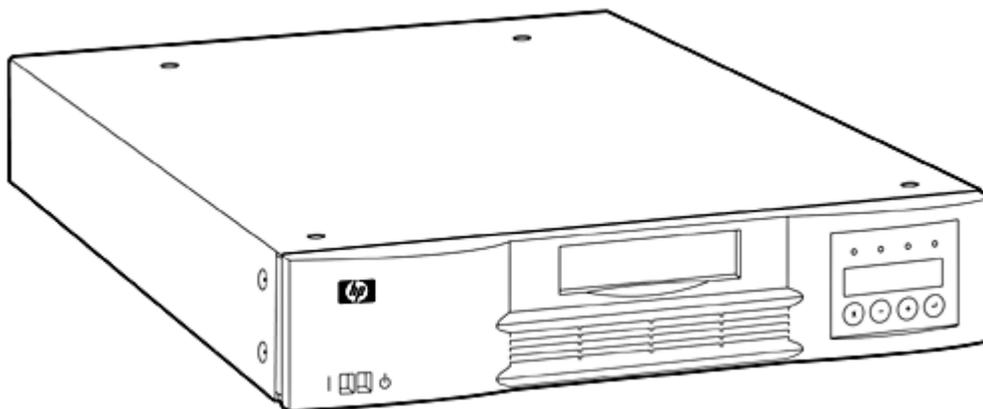*Overview*



## Introduction

The HP StorageWorks 1/8 Tape Autoloader provides cost-effective, easy-to-install unattended backup. Equally at home in a datacenter rack or on a desk next to the office server, the 1/8 Tape Autoloader in a 2U form factor is equipped with either an Ultrium 960, Ultrium 448, or a Ultrium 232 drive and can house up to eight cartridges. The autoloader is an ideal consolidated backup solution for multiple servers where high throughput and high capacity are required. All models come with HP StorageWorks Data Protector Express, Single Server Edition for Windows/Linux/NetWare and HP OpenView Storage Data Protector, Single Server Edition for Windows®.

## What's New

- Includes a single server edition of HP StorageWorks Data Protector Express for Windows/Linux/NetWare.

## Models

**1/8 Ultrium 960 Tape Autoloader**                                                            AF204A
NOTE: One Ultrium 960 drive, eight slot autoloader, desktop model; autoloader can be rack mounted with optional rack mount kit.

**1/8 Ultrium 448 Tape Autoloader**                                                            AF203A
NOTE: One Ultrium 448 drive, eight slot autoloader, desktop model; autoloader can be rack mounted with optional rack mount kit.

**1/8 Ultrium 232 Tape Autoloader**                                                            AF202A
NOTE: One Ultrium 232 drive, eight slot autoloader, desktop model; autoloader can be rack mounted with optional rack mount kit.

## Key Features

- 2U form factor (rack mount or desktop)
- Compressed capacity (2:1) up to 6.4 TB with Ultrium 960 tape technology
- Compressed data transfer rate (2:1) up to 160 MB/s with Ultrium 960 tape technology
- 1 drive to 8 data cartridge slot ratio provides for weekly automated backup
- Includes HP StorageWorks Data Protector Express, Single Server Edition for Windows/Linux/NetWare
- Includes HP OpenView Storage Data Protector, Single Server Edition for Windows

*Overview*

## Customer Benefits

- **Affordable:** Automates the backup process at a price comparable to standalone drives
- **High-capacity:** Stores up to 6.4 TB (compressed) of data with Ultrium 960 technology
- **Reliable:** Provides consistent backup and automatically changes tapes
- **Rack-optimized:** Occupies a minimum amount of rack space (2U)
- **Efficient:** Allows IT resources performing manual backups to work on other critical tasks
- **Compact:** Holds eight cartridges and one drive in 2U of space
- **Evolutionary:** Provides an easy transition from standalone tape into automated tape backup
- **Compatible:** Works with leading servers, operating systems and backup software
- **Investment Protection:** Ultrium 960 version backward read compatible with media written on by Ultrium 230, Ultrium 232, Ultrium 448 and Ultrium 460 drives; backward read/write compatible with media written on by Ultrium 460 and Ultrium 448 drives
- **Diverse:** Supports Ultrium 960, Ultrium 448 and Ultrium 232 drive technologies

*Family Comparison*

|  | 1/8 Ultrium 960 Tape Autoloader | 1/8 Ultrium 448 Tape Autoloader | 1/8 Ultrium 232 Tape Autoloader |
|---|---|---|---|
| Drive Technology | Ultrium 960 | Ultrium 448 | Ultrium 232 |
| Capacity (compressed) | 6.4 TB | 3.2 TB | 1.6 TB |
| Maximum Data Transfer (compressed) | 160 MB/s | 48 MB/s | 32 MB/s |
| SCSI Interface | Ultra320 SCSI LVD/SE | Ultra160 SCSI LVD/SE | Ultra160 SCSI LVD/SE |

*Product Highlights*

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| Data Rate Matching | Data Rate Matching combines sophisticated buffer management with HP's exclusive Infinitely Variable Adaptive Tape Speed technology, to allow the tape drive to match its transfer rate to the host speed dynamically and continuously across the whole range of transfer rates. This feature ensures that the tape drive continues to stream data regardless of the environment, and brings two big advantages: |

- It optimizes backup performance, regardless of the speed of the host or the network
- It minimizes rewinding and repositioning of the tape, thus reducing wear and increasing reliability

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| Easy Installation | The 1/8 Tape Autoloader is shipped as a desktop unit. A rack mount installation kit can be purchased separately for those customers wishing to use the autoloader in a standard 19" rack. |

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| Factory Express Portfolio for Servers and Storage | HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed. Customization must comply with all relevant product specifications and factory supported configurations.<br>Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, and HP 9000 servers as well as MSA, VA7xxx, EVA, and XP disk arrays, rackable tape libraries and configurable network switches.<br>Type of service support varies by platform and product family. For more information on Factory Express services for your specific server model or storage device please contact your sales representative or go to http://www.hp.com/go/factory-express. |

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| HP StorageWorks Library and Tape Tools | The 1/8 Tape Autoloader is supported on HP's industry-leading diagnostic tool - HP StorageWorks Library and Tape Tools (L&TT). L&TT is a single, convenient program that's a snap to install and simple to operate. L&TT's intuitive user interface eliminates the need for training and deploys in less than five minutes. This robust diagnostic tool is designed for both the experienced professional and the untrained administrator. It ensures product integrity through self-diagnostics and fast resolution to device concerns. Additional information on L&TT plus download information can be found at http://www.hp.com/support/tapetools. |

## Product Highlights

**HP Ultrium WORM**

Critical to the success of data retention policies in highly regulated environments is the ability to store and manage data in an unalterable state. Following stringent guidelines set forth by regulatory agencies such as the SEC and HIPPA, IT organizations must now integrate new solutions and policies that can verify the integrity of stored data for periods that can extend well beyond seven years.

The new Ultrium 960 tape drive features the ability to archive and store data in a non-rewriteable format that meets the most stringent regulatory guidelines. Using a combination of integrated fail-safe features in the drive firmware, cartridge memory, and tape formatting, the Ultrium 960 can archive large amounts of data for periods of up to 30 years in a secure, untampered state. Since all Ultrium 960 tape drives include support for both rewritable and WORM media, IT organizations can now easily integrate a secure, long-term archiving solution into their current data protection strategy. As compared to other technologies that feature support for WORM storage, the Ultrium 960 offers the advantages of:

- A single drive to support all backup and archiving needs
- Two distinctive tape cartridges to easily distinguish and manage both rewriteable and WORM data cartridges
- A specially designed WORM data cartridge with multiple integrated fail-safe features to prevent accidental or intentional overwriting of data
- High-capacity, low-cost HP WORM media that can store 800GB of data on a single data cartridge
- Support from many backup and archiving software vendors, providing the most comprehensive and mainstream support in the industry
- The LTO open standard that offers greater choice and compatibility across all third-generation Ultrium products

NOTE: While all HP Ultrium 960 tape drives support LTO Ultrium WORM media, some third-generation LTO Ultrium tape drives from other manufacturers may not include read and write support for LTO Ultrium WORM media. For non-HP third-generation LTO Ultrium tape drives, please check the manufacturers' specifications to ensure this support is provided if you are using your WORM media. If WORM support is not provided, the drive will eject the WORM tape cartridge immediately upon insertion into to the tape drive.

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**LTO Ultrium Technology**

HP StorageWorks LTO (Linear Tape Open) Ultrium Tape Drives use best of breed technology. By taking the best features from other tape technologies and combining them into a single new technology, Ultrium tape drives are in a league of their own. Inclusion of innovative features such as Adaptive Tape Speed (ATS) ensure that Ultrium drives can meet the performance and reliability demands of a library environment. LTO technology is an open industry standard format; thus data written on HP StorageWorks Ultrium Tape Drives can be interchanged directly with Ultrium Tape Drives from other vendors.

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**HP Storage Media**

HP recommends that you use HP-branded cartridges in your HP autoloader to assure the highest level of protection for your valuable data. Our test program for HP media is the most thorough and comprehensive in the industry.

All HP cartridges must satisfy an exhaustive battery of additional tests that relate directly to real life situations, where real data and real businesses are at stake. The benefit of the HP brand specification for media is consistent quality. Through the testing of thousands of HP drives and HP cartridges, the ideal formulation for backup performance is defined and then continuously monitored. This hugely resource-intensive process is unique to HP and affords deep insight into the HP+HP backup solution for a wide range of environments and duty cycles. Your best choice for ease of support and maximum dependability is to use HP-branded Ultrium cartridges at all times.

*Software Components*

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| **HP StorageWorks Data Protector Express** | The 1/8 Tape Autoloader includes HP StorageWorks Data Protector Express, Single Server Edition for Windows/Linux/NetWare. This application allows you to securely back up, and if necessary recover, a single Windows/Linux/NetWare machine to/from your HP StorageWorks tape drive or tape autoloader. |
| **HP OpenView Storage Data Protector** | The 1/8 Tape Autoloader includes HP OpenView Storage Data Protector, Single Server Edition for Windows. This data protection software automates routine tasks to maximize the effectiveness of the IT staff, ensuring recovery from any potential disruption - from Instant Recovery through system or site disaster recovery. It is scalable from a single server to an enterprise layout; across applications, operating environments, storage and protection approaches. |
| **Compatibility Note** | HP StorageWorks Data Protector Express, Single Server Edition and HP OpenView Storage Data Protector, Single Server Edition and NOT compatible. Tape cartridges should NOT be shared between autoloaders and libraries running Data Protector and Data Protector Express. |

*Compatibility*

HP's extensive compatibility testing program assures that your HP StorageWorks 1/8 Tape Autoloader works with leading servers, operating systems, and backup applications - and not just those sold by HP. The 1/8 Tape Autoloader works seamlessly in many environments, making them especially suitable if you have a mixed system environment. For the latest list of servers, workstations, operating systems, and backup software that support HP StorageWorks 1/8 Tape Autoloader, check the tape backup compatibility pages on our Web site at http://www.hp.com/go/ebs.

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| **Server Compatibility** | The HP StorageWorks 1/8 Tape Autoloader is supported on a wide range of HP systems. For details of which 1/8 Tape Autoloader works with which systems, including third-party systems, reference the EBS compatibility matrix at http://www.hp.com/go/ebs for the latest hardware compatibility information. |
| **OS Support** | Reference the EBS compatibility matrix for the most up-to-date OS compatibility information at http://www.hp.com/go/ebs. |
| **Software Support** | Reference the EBS compatibility matrix for the most up-to-date software compatibility information at http://www.hp.com/go/ebs. |

*Service and Support, HP Care Pack, and Warranty Information*

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| **Warranty** | The warranty for this product consists of 1-year parts exchange, next business day. |

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| **Warranty Upgrade Options** | Response – Upgrade on-site response from next business day to same day 4-hours |
| | Coverage – Extend hours of coverage from 9 hours x 5 days to 24 hours x 7 days |
| | Duration – Select duration of coverage for a period of 1 or multiple years |

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| **HP Care Pack Information** | HP Care Pack is defined as an upgrade to the product warranty attribute, available for a specific duration and hours of coverage. |
| | HP Care Pack is not available for less than the product's warranty duration. |
| | HP Care Pack is available for sale anytime during the warranty period for most products, but the commencement date will be the same as the Warranty Start Date (delivery date to end user customer). Proof of purchase may be required. |
| | HP Care Pack services are prepaid. |
| | For additional HP Care Pack (hardware & software) information, as well as orderable part numbers, please refer to the URL http://www.hp.com/hps/carepack/. |

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| **Hardware Product Services** | Installation services |
| | On-site maintenance (includes warranty support) |
| | Response time upgrades during the warranty period |
| | Post-warranty coverage |
| | RAID setup and performance consulting via statement of work |
| | For additional hardware installation and maintenance information, please refer to the URL listed below: http://www.hp.com/hps/hardware/. |

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| **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 <br> 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) <br> • Efficient logging and tracking of support cases <br> • Collaboration with other business and IT professionals <br> • Download of patches and drivers <br> • Access to diagnostic tools |
| | Proactive notification of relevant information <br> Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit http://www.hp.com/support. |

## Service and Support, HP Care Pack, and Warranty Information

**Support Services**

Optional HP Support Services provide a three-year, limited warranty, fully supported by a worldwide network of resellers and service providers and 9x5 hardware technical phone support during the warranty period. In addition, available service offerings include a full range of optional packaged hardware and software services:

- Installation and start up
- Extended coverage hours and enhanced response times
- System management and performance services
- Availability and recovery services

**Software Product Support**

The wide range of service offerings enables you to choose the support program that best matches your needs. Options include:

- Customer Support: phone-in assistance; 8X5 unlimited telephone support, timely software updates; versions and revisions. This option is included in the price of each HP OpenView software product
- Customer Support 24 x 7: includes all benefits of customer support plus 24 X 7 phone-in assistance.
- OpenView Premier Service: encompasses a proactive, personalized service for large or complex, multi platform environments. Provides dedicated support personnel focused around three key activities: business alliance mgmt; proactive problem avoidance, and onsite technical services.
- OpenView Critical Premier Service: maximizes system uptime/availability by providing specialized resources for fast recovery mission critical service level agreements (delivered by HP mission critical team).
- eCare: Provides fast, efficient access to HP OpenView knowledge. Includes access to always-on solution self-help and business self-help through 20,000 technical knowledge resources as well as online calling. For customers with support contracts, eCare is available also for submitting cases (calls) as well as phone-in assistance.

The new HP Backup and Recovery Solution service provides for the complete implementation of Data Protector in a SAN environment. There are two levels of this service based on the size and complexity of the backup environment to be implemented for the SAN. Installation services are also available for non-SAN environments.

For additional software product support information, please refer to the URL listed below:
http://www.hp.com/go/openview.

**Components**

The following brick level options/components do not have individual HP Care Pack Services. These items will be included in product HP Care Pack Services into which they are installed.

| Disk Drives | Tape Drives | CD/DVD ROM | SCSI Hubs in SBBs | Adapters |
|---|---|---|---|---|
| Bus Converters | Backplane RAID Controllers | Power Supplies | Cabling | Fans |

*Configuration Information*

The HP StorageWorks 1/8 Tape Autoloader comes standard as a one drive, eight slot unit which is ready for desk-side installation. The specific regional power cord option must be selected at time of purchase. If the unit will be rack-mounted, the 1/8 Tape Autoloader rack kit is required for installation.

## Step 1 - Base Configuration

Select one:

| Model Number | Model Description | Part Number |
|---|---|---|
| 1/8 Ultrium 960 | HP StorageWorks 1/8 Ultrium 960 Tape Autoloader | AF204A |
| 1/8 Ultrium 448 | HP StorageWorks 1/8 Ultrium 448 Tape Autoloader | AF203A |
| 1/8 Ultrium 232 | HP StorageWorks 1/8 Ultrium 232 Tape Autoloader | AF202A |

**Supplied with each autoloader:**

(1) One drive, eight slot tape autoloader

(1) 1.9 meter 68-pin HDTS to 68-pin VHDCI cable

(1) 68-pin LVD SCSI terminator

Documentation kit including manual (CD) and quick start poster

HP StorageWorks Data Protector Express CD (for use in downloading Single Server Edition for Windows/Linux/NetWare)

HP OpenView Storage Data Protector flier (for use in downloading Single Server Edition for Windows)

## Step 2 - Required Options

Select each required option with quantities specified.

| Quantity | Description with Parts Shipped | Part Number |
|---|---|---|
| 1 each | U.S. power cord | #ABA |
| 1 each | Europe power cord | #ABB |
| 1 each | Australia power cord | #ABG |
| 1 each | United Kingdom power cord | #ABU |
| 1 each | No power cord | #AC3 |
| 1 each | Switzerland power cord | #ACD |
| 1 each | Denmark power cord | #ACE |
| 1 each | Japan power cord | #ACF |
| 1 each | South Africa power cord | #ACQ |
| 1 each | Israel power cord | #AKJ |
| 1 each | China power cord | #AKM |
| 1 each | Latin America power cord | #AKY |
| 1 each | Taiwan power cord | #ARB |

**NOTE:** One power cord is required per 1/8 Tape Autoloader; select the correct power cord option for your geography.

**WARNING:** This product can ONLY be used with an HP approved power cord for your specific geographic region. Use of a non-HP approved power cord may result in: 1) not meeting individual country specific safety requirements; 2) insufficient conductor amperage that could result in overheating with potential personal injury and/or property damage; and 3) an unapproved power cord could fracture resulting in the internal contacts being exposed, which potentially could subject the user to a shock hazard. HP disclaims all liability in the event a non-HP approved power cord is used.

*Related Options*

| Factory Racking | Factory integrate the 1/8 Tape Autoloader with other HP products such as HP ProLiant Servers. | #0D1 |
|---|---|---|

NOTE: #0D1 will appear after the 1/8 Tape Autoloader part number on the sales order if HP factory integration is indicated.

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| Rack Mount Kit | HP 1/8 Tape Autoloader Rack Kit | C9268R |
|---|---|---|

NOTE: Required to install the unit in a standard 19-inch rack; includes rails and rack mount instructions

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| Media | HP Ultrium 800 GB Data Cartridge (1 pack) | C7973A |
|---|---|---|
| | HP Ultrium 800 GB WORM Data Cartridge (1 pack) | C7973W |
| | HP Ultrium 400 GB Data Cartridge (1 pack) | C7972A |
| | HP Ultrium 200 GB Data Cartridge (1 pack) | C7971A |
| | HP Ultrium Universal Cleaning Cartridge (1 pack) | C7978A |

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| Rack Cabinets | 10622 (22U) Universal Rack Cabinet - Shock Pallet | AF022A |
|---|---|---|
| | 10636 (36U) Universal Rack Cabinet - Shock Pallet | AF012A |
| | 10636 (36U) Universal Rack Cabinet with extension - Shock Pallet | AF014A |
| | 10636 (36U) Universal Rack Cabinet, no door - Shock Pallet | AF015A |
| | 10636 (36U) Universal Rack Cabinet with extension, no door - Shock Pallet | AF016A |
| | 10642 (42U) Universal Rack Cabinet - Shock Pallet | AF002A |
| | 10642 (42U) Universal Rack Cabinet with extension - Shock Pallet | AF004A |
| | 10642 (42U) Universal Rack Cabinet , no door - Shock Pallet | AF005A |

NOTE: The 1/8 Tape Autoloader is certified to ship in HP 10000 series racks which include a shock pallet. It is mandatory to use a shock pallet in order to ship racks with equipment installed.

| | 5642 (42U) Rack Cabinet | 358254-B21 |
|---|---|---|

NOTE: This rack ships unassembled and boxed on a standard size pallet. It is an industry standard 19" wide rack with side panels and rear doors; does not ship with the front door or casters.

NOTE: for additional HP ProLiant rack information, visit http://h18004.www1.hp.com/products/servers/proliantstorage/racks/index.html

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| SCSI Cables | .5m HDTS to HDTS, 68-pin multimode cable | C2978B |
|---|---|---|
| | 1.0m VHDCI to HDTS, 68-pin multimode cable | C2361B |
| | 2.5m VHDCI to HDTS, 68-pin multimode cable | C2362B |
| | 5m VHDCI to HDTS, 68-pin multimode cable | C2365B |
| | 10m VHDCI to HDTS, 68-pin multimode cable | C2363B |

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| Host Bus Adapters | Reference the EBS matrix for the most up-to-date SCSI HBA compatibility information at http://www.hp.com/go/ebs. |
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*Related Options*

| HP Care Pack Options | **Same Day Response** | |
|---|---|---|
| | Warranty upgrade to 1-year, 13x5, 4 hour response/onsite, electronic | U6364E |
| | Warranty upgrade to 1-year, 24x7, 4 hour response/onsite, electronic | U6365E |
| | Warranty upgrade to 1-year, 24x7, call-to-repair, 6 hour response/onsite, electronic | U6366E |
| | Warranty upgrade to 3-year, 13x5, 4 hour response/onsite, electronic | H5526E |
| | Warranty upgrade to 3-year, 24x7, 4 hour response/onsite, electronic | H4624E |
| | Warranty upgrade to 3-year, 24x7, call-to-repair, 6 hour response/onsite, electronic | U6367E |
| | Warranty upgrade to 5-year, 13x5, 4 hour response/onsite, electronic | U9376E |
| | Warranty upgrade to 5-year, 24x7, call-to-repair, 6 hour response/onsite, electronic | U9377E |
| | **Next Business Day Response** | |
| | Warranty upgrade to 3-year next business day/parts exchange, electronic | H2698E |
| | Warranty upgrade to 3-year next business day/onsite, electronic | H4619E |
| | **Hardware Services** | |
| | Installation services, electronic | U2090E |

# QuickSpecs

*Technical Specifications*

|  |  | 1/8 Ultrium 960 | 1/8 Ultrium 448 | 1/8 Ultrium 232 |
|---|---|---|---|---|
| Capacity (native) |  | 3.2 TB | 1.6 TB | 800 GB |
| Capacity (compressed) |  | 6.4 TB | 3.2 TB | 1.6 TB |
| Interface |  | Ultra320 SCSI LVD/SE | Ultra160 SCSI LVD/SE | Ultra160 SCSI LVD/SE |
| Maximum Transfer Rate (native) |  | 80 MB/s (288 GB/hr) | 24 MB/s (86.4 GB/hr) | 16 MB/s (57.6 GB/hr) |
| Maximum Transfer Rate (compressed) |  | 160 MB/s (576 GB/hr) | 48 MB/s (172.8 GB/hr) | 32 MB/s (115.2 GB/hr) |
| Reliability |  | 250,000 mean swaps between failures (MSBF) | | |
| Dimensions (HxWxD) | Out of box | 3.34 x 16 x 24 in (8.5 x 41.9 x 61.7 cm) | | |
|  | Shipping | 9.2 x 23.5 x 30.6 in (23.5 x 60.2 x 78.5 cm) | | |
| Weight | Out of box | 22 lb (10 kg) | | |
|  | Shipping | 25 lb (11.4 kg) | | |
| Connectors/Cables | Connectors | (2) 68-pin HD (on rear of 1/8 autoloader) | | |
|  | Cables | (1) 1.9 m 68-pin HDTS to 68-pin VHDCI cable (included in the box) | | |
| Input Requirements |  | 100-127 VAC/200-240 VAC @ 50/60 Hz | | |
| Power |  | 70 Watts (max) | | |
| Relative Humidity (non-condensing) | Operating | 20% to 80% | | |
|  | Shipping | 10% to 90% | | |
| Temperature Range | Operating | 50° to 95° F (10° to 35° C) | | |
|  | Shipping | -40° to 149° F (-40° to 60° C) | | |