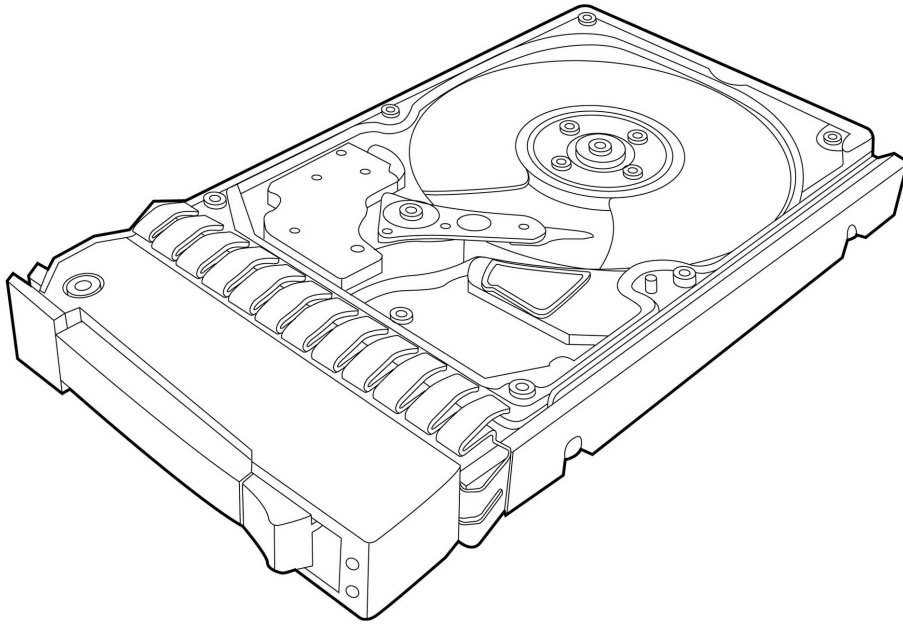


### Overview

Serial Attached SCSI (SAS) provides a superior storage solution. With some storage requirements escalating and others becoming more complex, factors such as flexibility, performance, increased reliability, greater density, security, scalability and accessibility are more critical than ever. Today's organizations consist of different kinds of environments. Enterprise data centers must be online 24X7, fulfill requests from numerous users simultaneously, and allow for constant growth and expansion while in operation. Other customer environments require high capacity storage and high data availability for low I/O environments. HP's portfolio of SAS drives meets all these demands.



### What's New

- HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive

### Models

#### HP SAS Hot Plug SmartDrive Carriers for Gen8 Servers only

#### SAS Hot Plug with SmartDrive SFF (2.5-inch) Enterprise Drives

HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Dual Port Enterprise 3yr Warranty Hard Drive	718162-B21
HP 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652589-B21
HP 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652583-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652572-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652564-B21
HP 300GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652611-B21
HP 146GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652605-B21

#### SAS Hot Plug SmartDrive SFF (2.5-inch) Midline Drives

HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652749-B21
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### Overview

HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652745-B21
<b>SAS Hot Plug SmartDrive LFF (3.5-inch) Enterprise Drives</b>	
HP 600GB 6G SAS 15K rpm LFF (3.5-inch) SC Enterprise 3yr Warranty Hard Drive	652620-B21
HP 450GB 6G SAS 15K rpm LFF (3.5-inch) SC Enterprise 3yr Warranty Hard Drive	652615-B21
<b>SAS Hot Plug SmartDrive LFF (3.5-inch) Midline Drives</b>	
HP 4TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	695510-B21
HP 3TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	652766-B21
HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	652757-B21
HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	652753-B21
<b>HP SAS Hot Plug Drives</b>	
<b>NOTE:</b> These drives are not supported by Gen8 servers	
<b>SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives</b>	
HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	718160-B21
HP 900GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	619291-B21
HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581286-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581284-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21
HP 300GB 6G SAS 15K rpm SFF (2.5-inch) Hot Plug Enterprise 3yr Warranty Hard Drive	627117-B21
HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21
<b>SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives</b>	
HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516828-B21
HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516816-B21
HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516814-B21
<b>SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives</b>	
HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive	605835-B21
HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507610-B21
<b>SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives</b>	
HP 4TB 6G SAS 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	693689-B21
HP 3TB 6G SAS 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	625031-B21
HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507616-B21
HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507614-B21
<b>HP SAS Non-Hot Plug Drives</b>	
<b>SAS Non-Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives</b>	
HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	590698-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	537809-B21
<b>SAS Non-Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives</b>	
HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	516830-B21
HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	516826-B21
HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	516824-B21
<b>HP SAS Quick Release Drives</b>	
<b>SAS Quick Release SFF (2.5-inch) Enterprise (ENT) Drives</b>	
HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) Quick Release Dual Port ENT 3yr Warranty Hard Drive	718164-B21
HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) Quick-release Dual Port Enterprise 3yr Warranty Hard Drive	697572-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Quick-release Dual Port Enterprise 3yr Warranty Hard Drive	574879-B21
<b>SAS Quick Release LFF (3.5-inch) Enterprise (ENT) Drives</b>	

### Overview

HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Quick-release Dual Port Enterprise 3yr Warranty Hard Drive	574758-B21
HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Quick-release Dual Port Enterprise 3yr Warranty Hard Drive	585980-B21
<b>SAS Quick Release LFF (3.5-inch) Midline (MDL) Drives</b>	
HP 4TB 6G SAS 7.2k rpm LFF (3.5-inch) Quick-release Midline 1yr Warranty Hard Drive	697956-B21
HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) Quick-release Dual Port Midline 1yr Warranty Hard Drive	574761-B21

**NOTE:** Refer to the appropriate server QuickSpecs for full compatibility details

### Standard Features

#### What is SAS?

Serial Attached SCSI (SAS) is the evolution of the SCSI interface. SAS Enterprise drives satisfy the enterprise data center requirement of scalability, performance, reliability and manageability, while providing an enterprise storage infrastructure for both enterprise SAS drives and SATA disk drives. SAS Midline drives provide the lowest dollars per gigabyte and economical reliability and performance. The SAS interface is compatible with SATA devices. This compatibility provides users with unprecedented choices for server and storage subsystem deployment

#### Drive Quality and Performance

Today's distributed enterprise is seeing larger, more complex applications, an increase of mission-critical data moving to the server, increasing demand for transaction processing and critical server consolidation. In this environment, storage has become a critical component of the information system, significantly defining both the systems reliability and performance. This is why HP drives undergo an intense qualification process that eliminates firmware and O/S incompatibilities. All drive firmware is specific to our drives and is designed to maximize both functionality and compatibility. All drives are proven to perform in the HP systems for which they were designed.

While selecting the drives in our Enterprise portfolio, only those drives whose performance is suitable for an enterprise environment are selected through the HP qualification process and are labeled "best-in-class." All our Enterprise drives are proven to be reliable and tuned for optimum performance in the HP equipment for which they were designed. The drives in our Midline portfolio undergo a similar qualification process to ensure that you get the economical reliability and performance you need for your low workload (less than 40% I/O) environments.

#### Performance

Only those drives whose performance is suitable for an enterprise environment are selected through the HP qualification process and are labeled "best-in-class." All our drives are proven to be reliable and tuned for optimum performance in the HP equipment for which they were designed.

#### Pre-Failure Alert

When used in conjunction with a SMART Array Controller and Systems Insight Manager, the SMART capable firmware in HP hard drives enables extensive fault prediction capabilities. If potential problems develop in one of the drives, the Smart Array Controller, Systems Insight Manager and/or SMART hard disk drive lets you know in advance so you can have the drive replaced, before it fails, under warranty.

**NOTE:** All drives are protected by a Pre-Failure Alert when used with a HP Smart Array controller and Systems Insight Manager, allowing hard drives to be replaced before failure under warranty. In addition, all drives are covered by a one or three-year limited on-site warranty period for the system in which they are installed. The drive warranty is automatically uplifted when used in a server or MSA for which a Care Pack is purchased. Please see the Support Services section below for additional services.

#### Integration

Many issues customers have with third party drives are "simple" integration issues. When buying from another supplier, there is no guarantee that a drive has been correctly set for proper operation with ProLiant servers and storage systems. These incompatibilities can create problems in configuration, can rob your system of performance, or at their worst, can cause you to lose data. HP hard drives are specifically designed and tested for flawless operation in your HP equipment. The integration of hard drives in HP systems means that cables, SCSI ID settings, termination, hot plug drive trays and firmware are right for your ProLiant server or storage system.

### Standard Features

**Support Matrix**

Please see the following URL for the latest list of supported servers and enclosures:  
<http://www.hpproliantoptions.com/>

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**Warranty**

SAS Enterprise hard drives have a 3 year limited warranty regardless of the warranty period for the system in which they are installed.  
SAS Midline hard drives have a 1 year limited warranty regardless of the warranty period for the system in which they are installed.

### Service and Support

#### Service and Support

#### HP Technology Services

HP Technology Services offers you consultants and support experts to solve your most complex infrastructure problems. We help keep your business running, boost availability and avoid downtime.

#### Protect your business beyond warranty with HP Care Pack Services

When you buy HP Options, it's also a good time to think about what level of service you may need. HP Care Pack services provide total care and support expertise with committed response choices designed to meet your IT and business need.

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

##### Recommended Services

#### 3-Year HP 24x7 4 hour Response, Hardware Support Onsite Service

Provides you with rapid remote support and if required an HP authorized representative who will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EEE.pdf>

#### HP ProLiant Server Hardware Installation

Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf>

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#### Related HP Care Pack Services to enhance your HP product experience

##### Related Services

#### 3-Year HP 6 hour Hardware Support Onsite Call-to-Repair Service

Provides an IT manager with a team of support specialists who will quickly begin troubleshooting the system to help return the hardware to operating condition within 6 hours of the initial service request to the HP Global Solution Center

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EN.pdf>

#### HP Proactive Select Service

Provides a flexible way to purchase HP best-in-class consultancy and technical services. You can buy Proactive Select Service Credits when you purchase your hardware and then use the credits over the next 12 months.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-3842ENN.pdf>

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##### Insight Remote Support

Delivers secure remote monitoring and support for HP servers and storage, 24x7 at no additional cost. Available as part of HP Warranty, Care Pack and Service Contract offers.

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##### Parts and materials

HP will provide HP-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements. Supplies and consumable parts will not be provided as part of this service; standard warranty terms and conditions apply. Parts and components that have exceeded their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual or the technical product data sheet will not be provided, repaired or replaced as part of this service.

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##### Coverage

For ProLiant servers and storage systems, this service covers HP-branded hardware options qualified for



### Service and Support

the server, purchased at the same time or afterward, internal to the enclosure, as well as external monitors up to 22" and tower UPS products; these items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been exceeded. Coverage of the UPS battery is not included; standard warranty terms and conditions apply.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HP due to malfunction. It does not apply to any exchange of Disk or SSD/Flash Drives that have not failed. SSD/Flash Drives that are specified by HP as consumable parts and/or that have exceeded maximum supported lifetime and/or the maximum usage limit as set forth in the manufacturer's operating manual or the technical data sheet are not eligible for the defective media retention service feature option.

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#### For more information

To learn more on services for HP ESSN Options, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: <http://www.hp.com/services/proliant> or [www.hp.com/services/bladesystem](http://www.hp.com/services/bladesystem)

### Technical Specifications

#### SAS Hot Plug SmartDrive SFF (2.5-inch) Enterprise Drives

**Application** SAS Enterprise drives are intended for servers and storage solutions with mission critical and high work load intensive applications where 24/7 duty cycles are a requirement, such as database applications and high transaction level applications.

**Transfer rate** The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

<b>HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Dual Port Enterprise 3yr Warranty Hard Drive</b>	718162-B21	<b>Capacity</b>	1,200,243MB	
		<b>Height</b>	0.62 in (15.6 mm)	
		<b>Width</b>	2.98 in (75.7 mm)	
		<b>Depth</b>	4.67 in (118.7 mm)	
		<b>Interface</b>	SAS	
		<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
		<b>Seek Time</b> (typical reads, including settling)	Single Track	0.3 ms
			Average	4.6 ms
			Full-Stroke	8.9 ms
		<b>Physical Configuration</b>	Rotational Speed	10,000 rpm
			Bytes/Sector	512
		Logical Blocks	2,344,225,968	
	<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)		

<b>HP 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive</b>	652589-B21	<b>Capacity</b>	900,185MB	
		<b>Height</b>	0.62 in (15.6 mm)	
		<b>Width</b>	2.98 in (75.7 mm)	
		<b>Depth</b>	4.67 in (118.7 mm)	
		<b>Interface</b>	SAS	
		<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
		<b>Seek Time</b> (typical reads, including settling)	Single Track	0.21 ms
			Average	3.8 ms
			Full-Stroke	7.4 ms
		<b>Physical Configuration</b>	Rotational Speed	10,000 rpm
			Bytes/Sector	512
		Logical Blocks	1,758,174,768	



### Technical Specifications

**Operating Temperature** 50° to 95° F (10° to 35° C)  
(System Inlet Air Temperature)

**HP 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive**

652583-B21

**Capacity** 600,127MB  
**Height** 0.62 in (15.6 mm)  
**Width** 2.98 in (75.7 mm)  
**Depth** 4.67 in (118.7 mm)  
**Interface** SAS  
**Transfer Rate Synchronous (Maximum)** 6 Gb/sec  
**Seek Time** (typical reads, including settling)  
 Single Track 0.3 ms  
 Average 4.0 ms  
 Full-Stroke 8.0 ms  
**Physical Configuration**  
 Rotational Speed 10,000 rpm  
 Bytes/Sector 512  
 Logical Blocks 1,172,123,568  
**Operating Temperature** 50° to 95° F (10° to 35° C)  
(System Inlet Air Temperature)

**HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) Quick Release Dual Port ENT 3yr Warranty Hard Drive**

718164-B21

**Capacity** 1,200,243MB  
**Height** 0.740 in (18.8 mm)  
**Width** 2.909 in (73.9 mm)  
**Depth** 3.945 in (100.2 mm)  
**Interface** SAS  
**Transfer Rate Synchronous (Maximum)** 6 Gb/sec  
**Seek Time** (typical reads, including settling)  
 Single Track 0.3ms  
 Average 4.6ms  
 Full-Stroke 8.9ms  
**Physical Configuration**  
 Rotational Speed 10,000rpm  
 Bytes/Sector 512  
 Logical Blocks 2,344,225,968  
**Operating Temperature** 50° to 95° F (10° to 35° C)  
(System Inlet Air Temperature)

### Technical Specifications

**HP 450GB 6G SAS 10K rpm  
SFF (2.5-inch) SC  
Enterprise 3yr Warranty  
Hard Drive**

652572-B21

<b>Capacity</b>	450,098MB	
<b>Height</b>	0.62 in (15.6 mm)	
<b>Width</b>	2.98 in (75.7 mm)	
<b>Depth</b>	4.67 in (118.7 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.3 ms
	Average	4.0 ms
	Full-Stroke	8.0 ms
<b>Physical Configuration</b>	Rotational Speed	10,000 rpm
	Bytes/Sector	512
	Logical Blocks	879,097,968
<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)	

**HP 300GB 6G SAS 10K rpm  
SFF (2.5-inch) SC  
Enterprise 3yr Warranty  
Hard Drive**

652564-B21

<b>Capacity</b>	300,000MB	
<b>Height</b>	0.62 in (15.6 mm)	
<b>Width</b>	2.98 in (75.7 mm)	
<b>Depth</b>	4.67 in (118.7 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.3 ms
	Average	4.0 ms
	Full-Stroke	8.0 ms
<b>Physical Configuration</b>	Rotational Speed	10,000 rpm
	Bytes/Sector	512
	Logical Blocks	585,937,500
<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)	

### Technical Specifications

**HP 300GB 6G SAS 15K rpm  
SFF (2.5-inch) SC  
Enterprise 3yr Warranty  
Hard Drive**

652611-B21

<b>Capacity</b>	300,000MB	
<b>Height</b>	0.62 in (15.6 mm)	
<b>Width</b>	2.98 in (75.7 mm)	
<b>Depth</b>	4.67 in (118.7 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.4 ms
	Average	2.9 ms
	Full-Stroke	5.3 ms
<b>Physical Configuration</b>	Rotational Speed	15,000 rpm
	Bytes/Sector	512
<b>Operating Temperature</b> (System Inlet Air Temperature)	Logical Blocks	585,937,500
	50° to 95° F (10° to 35° C)	

**HP 146GB 6G SAS 15K rpm  
SFF (2.5-inch) SC  
Enterprise 3yr Warranty  
Hard Drive**

652605-B21

<b>Capacity</b>	146,815MB	
<b>Height</b>	0.62 in (15.6 mm)	
<b>Width</b>	2.98 in (75.7 mm)	
<b>Depth</b>	4.67 in (118.7 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.4 ms
	Average	3.0 ms
	Full-Stroke	7.0 ms
<b>Physical Configuration</b>	Rotational Speed	15,000 rpm
	Bytes/Sector	512
<b>Operating Temperature</b> (System Inlet Air Temperature)	Logical Blocks	286,749,488
	50° to 95° F (10° to 35° C)	

### Technical Specifications

#### SAS Hot Plug SmartDrive SFF (2.5-inch) Midline Drives

**Application** SAS Midline drives are intended for servers and storage solutions where high capacities are required. These drives have moderately-priced reliability and performance for non-mission critical, low workload applications, such as disk backup, archival, and reference applications.

**Transfer rate** The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

<b>HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive</b>	652749-B21	<b>Capacity</b>	1,000,204MB	
		<b>Height</b>	0.62 in (15.6 mm)	
		<b>Width</b>	2.98 in (75.7 mm)	
		<b>Depth</b>	4.67 in (118.7 mm)	
		<b>Interface</b>	SAS	
		<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
		<b>Seek Time</b> (typical reads, including settling)	Single Track	0.7 ms
			Average	8.7 ms
			Full-Stroke	17.16 ms
		<b>Physical Configuration</b>	Rotational Speed	7200 rpm
			Bytes/Sector	512
Logical Blocks	1,953,525,168			
<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)			

<b>HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive</b>	652745-B21	<b>Capacity</b>	500,107MB	
		<b>Height</b>	0.62 in (15.6 mm)	
		<b>Width</b>	2.98 in (75.7 mm)	
		<b>Depth</b>	4.67 in (118.7 mm)	
		<b>Interface</b>	SAS	
		<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
		<b>Seek Time</b> (typical reads, including settling)	Single Track	0.7 ms
			Average	8.7 ms
			Full-Stroke	17.16 ms
		<b>Physical Configuration</b>	Rotational Speed	7200 rpm
			Bytes/Sector	512
Logical Blocks	976,773,168			

### Technical Specifications

**Operating Temperature** 50° to 95° F (10° to 35° C)  
(System Inlet Air  
Temperature)

### SAS Hot Plug SmartDrive LFF (3.5-inch) Enterprise Drives

**Application** SAS Enterprise drives are intended for servers and storage solutions with mission critical and high work load intensive applications where 24/7 duty cycles are a requirement, such as database applications and high transaction level applications.

**Transfer rate** The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

<b>HP 600GB 6G SAS 15K rpm LFF (3.5-inch) SC Enterprise 3yr Warranty Hard Drive</b>	652620-B21	<b>Capacity</b>	600,127MB	
		<b>Height</b>	1.06 in (26.8 mm)	
		<b>Width</b>	4.16 in (105.8 mm)	
		<b>Depth</b>	6.69 in (170.0 mm)	
		<b>Interface</b>	SAS	
		<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
		<b>Seek Time</b> (typical reads, including settling)	Single Track	0.2 ms
			Average	3.5 ms
			Full-Stroke	6.8 ms
		<b>Physical Configuration</b>	Rotational Speed	15000 rpm
			Bytes/Sector	512
			Logical Blocks	1,172,123,568
		<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)	

### Technical Specifications

**HP 450GB 6G SAS 15K rpm  
LFF (3.5-inch) SC  
Enterprise 3yr Warranty  
Hard Drive**

652615-B21

<b>Capacity</b>	450,098MB	
<b>Height</b>	1.06 in (26.8 mm)	
<b>Width</b>	4.16 in (105.8 mm)	
<b>Depth</b>	6.69 in (170.0 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.2 ms
	Average	3.5 ms
	Full-Stroke	6.8 ms
<b>Physical Configuration</b>	Rotational Speed	15000 rpm
	Bytes/Sector	512
<b>Operating Temperature</b> (System Inlet Air Temperature)	Logical Blocks	879,097,968
	50° to 95° F (10° to 35° C)	

### SAS Hot Plug SmartDrive LFF (3.5-inch) Midline Drives

#### Application

SAS Midline drives are intended for servers and storage solutions where high capacities are required. These drives have moderately-priced reliability and performance for non-mission critical, low workload applications, such as disk backup, archival, and reference applications.

#### Transfer rate

The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

**HP 4TB 6G SAS 7.2K rpm  
LFF (3.5-inch) SC Midline  
1yr Warranty Hard Drive**

695510-B21

<b>Capacity</b>	4,000,787MB	
<b>Height</b>	1.06 in (26.8 mm)	
<b>Width</b>	4.16 in (105.8 mm)	
<b>Depth</b>	6.69 in (170.0 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.7 ms
	Average	8.5 ms
	Full-Stroke	15.7 ms
<b>Physical Configuration</b>	Rotational Speed	7200 rpm
	Bytes/Sector	512
	Logical Blocks	7,814,037,168

### Technical Specifications

**Operating Temperature** 50° to 95° F (10° to 35° C)  
(System Inlet Air Temperature)

**NOTE:** To support HP hard drives exceeding 2.2 TB, HP Smart Array Firmware version 5.0 or later is required for the following controllers:

- HP Smart Array P212 Controller
- HP Smart Array P410 Controller
- HP Smart Array P411 Controller
- HP Smart Array P711m Controller
- HP Smart Array P812 Controller

To use hard drives exceeding 2.2 TB, you must create a boot volume using offline ACU version 8.75 or later. HP Smart Array controllers do not support boot volumes exceeding 2.2 TB. Other controllers are not supported

**HP 3TB 6G SAS 7.2K rpm  
LFF (3.5-inch) SC Midline  
1yr Warranty Hard Drive**

652766-B21

<b>Capacity</b>	3,000,592MB	
<b>Height</b>	1.06 in (26.8 mm)	
<b>Width</b>	4.16 in (105.8 mm)	
<b>Depth</b>	6.69 in (170.0 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate</b>	6 Gb/sec	
<b>Synchronous (Maximum)</b>		
<b>Seek Time</b>	Single Track	0.7 ms
(typical reads, including settling)	Average	8.3 ms
	Full-Stroke	15.7 ms
	Rotational Speed	7200 rpm
<b>Physical Configuration</b>	Bytes/Sector	512
	Logical Blocks	5,860,533,168
<b>Operating Temperature</b>	50° to 95° F (10° to 35° C)	
(System Inlet Air Temperature)		

**NOTE:** To support HP hard drives exceeding 2.2 TB, HP Smart Array Firmware version 5.0 or later is required for the following controllers:

- HP Smart Array P212 Controller
- HP Smart Array P410 Controller
- HP Smart Array P411 Controller
- HP Smart Array P711m Controller
- HP Smart Array P812 Controller

To use hard drives exceeding 2.2 TB, you must create a boot volume using offline ACU version 8.75 or later. HP Smart Array controllers do not support boot volumes exceeding 2.2 TB. Other controllers are not supported

### Technical Specifications

**HP 2TB 6G SAS 7.2K rpm  
LFF (3.5-inch) SC Midline  
1yr Warranty Hard Drive**

652757-B21

<b>Capacity</b>	2,000,398MB	
<b>Height</b>	1.06 in (26.8 mm)	
<b>Width</b>	4.16 in (105.8 mm)	
<b>Depth</b>	6.69 in (170.0 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.7 ms
	Average	8.5 ms
	Full-Stroke	18.2 ms
<b>Physical Configuration</b>	Rotational Speed	7200 rpm
	Bytes/Sector	512
	Logical Blocks	3,907,029,168
<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)	

**HP 1TB 6G SAS 7.2K rpm  
LFF (3.5-inch) SC Midline  
1yr Warranty Hard Drive**

652753-B21

<b>Capacity</b>	1,000,204MB	
<b>Height</b>	1.06 in (26.8 mm)	
<b>Width</b>	4.16 in (105.8 mm)	
<b>Depth</b>	6.69 in (170.0 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.7 ms
	Average	8.5 ms
	Full-Stroke	18.2 ms
<b>Physical Configuration</b>	Rotational Speed	7200 rpm
	Bytes/Sector	512
	Logical Blocks	1,953,525,168
<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)	



### Technical Specifications

#### SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives

**Application** SAS Enterprise drives are intended for servers and storage solutions with mission critical and high work load intensive applications where 24/7 duty cycles are a requirement, such as database applications and high transaction level applications.

**Transfer rate** The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

<b>HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive</b>	718160-B21	<b>Capacity</b>	1,200,243MB	
		<b>Height</b>	0.63 in (16.0 mm)	
		<b>Width</b>	3.1 in (78.7 mm)	
		<b>Depth</b>	5.45 in (138.4 mm)	
		<b>Interface</b>	SAS	
		<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
		<b>Seek Time</b> (typical reads, including settling)	Single Track	0.3 ms
			Average	4.6 ms
			Full-Stroke	8.9 ms
		<b>Physical Configuration</b>	Rotational Speed	10,000 rpm
			Bytes/Sector	512
		Logical Blocks	2,344,225,968	
	<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)		

<b>HP 900GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive</b>	619291-B21	<b>Capacity</b>	900,185,481,216	
		<b>Height</b>	0.63 in (16.0 mm)	
		<b>Width</b>	3.1 in (78.7 mm)	
		<b>Depth</b>	5.45 in (138.4 mm)	
		<b>Interface</b>	SAS	
		<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
		<b>Seek Time</b> (typical reads, including settling)	Single Track	0.21 ms
			Average	3.57 ms
			Full-Stroke	7.30 ms
		<b>Physical Configuration</b>	Rotational Speed	10,000 rpm
			Bytes/Sector	512
		Logical Blocks	1,758,174,768	

### Technical Specifications

**Operating Temperature** 50° to 95° F (10° to 35° C)  
(System Inlet Air Temperature)

**HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive**

581286-B21

**Capacity** 600,127,266,816  
**Height** 0.63 in (16.0 mm)  
**Width** 3.1 in (78.7 mm)  
**Depth** 5.45 in (138.4 mm)  
**Interface** SAS  
**Transfer Rate Synchronous (Maximum)** 6 Gb/sec  
**Seek Time** (typical reads, including settling)  
Single Track 0.4 ms  
Average 4.0 ms  
Full-Stroke 8.0 ms  
Rotational Speed 10,000 rpm  
**Physical Configuration**  
Bytes/Sector 512  
Logical Blocks 1,172,123,568  
**Operating Temperature** 50° to 95° F (10° to 35° C)  
(System Inlet Air Temperature)

**HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive**

581284-B21

**Capacity** 450,098,159,616  
**Height** 0.63 in (16.0 mm)  
**Width** 3.1 in (78.7 mm)  
**Depth** 5.45 in (138.4 mm)  
**Interface** SAS  
**Transfer Rate Synchronous (Maximum)** 6 Gb/sec  
**Seek Time** (typical reads, including settling)  
Single Track 0.4 ms  
Average 4.0 ms  
Full-Stroke 8.0 ms  
Rotational Speed 10,000 rpm  
**Physical Configuration**  
Bytes/Sector 512  
Logical Blocks 879,097,968  
**Operating Temperature** 50° to 95° F (10° to 35° C)  
(System Inlet Air Temperature)

### Technical Specifications

**HP 300GB 6G SAS 15K rpm  
SFF (2.5-inch) Hot Plug  
Enterprise 3 yr Warranty  
Hard Drive**

627117-B21

<b>Capacity</b>	300,000,000,000	
<b>Height</b>	0.63 in (16.0 mm)	
<b>Width</b>	3.1 in (78.7 mm)	
<b>Depth</b>	5.45 in (138.4 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.40 ms
	Average	2.9 ms
	Full-Stroke	5.30 ms
<b>Physical Configuration</b>	Rotational Speed	15,000 rpm
	Bytes/Sector	512
<b>Operating Temperature</b> (System Inlet Air Temperature)	Logical Blocks	585,937,500
	50° to 95° F (10° to 35° C)	

**HP 300GB 6G SAS 10K rpm  
SFF (2.5-inch) Dual Port  
Enterprise 3yr Warranty  
Hard Drive**

507127-B21

<b>Capacity</b>	300,000,000,000	
<b>Height</b>	0.63 in (16.0 mm)	
<b>Width</b>	3.1 in (78.7 mm)	
<b>Depth</b>	5.45 in (138.4 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.20 ms
	Average	4.0 ms
	Full-Stroke	7.45 ms
<b>Physical Configuration</b>	Rotational Speed	10,000 rpm
	Bytes/Sector	512
<b>Operating Temperature</b> (System Inlet Air Temperature)	Logical Blocks	585,937,500
	50° to 95° F (10° to 35° C)	

### Technical Specifications

**HP 300GB 6G SAS 15K rpm  
SFF (2.5-inch) Hot Plug  
Enterprise 3 yr Warranty  
Hard Drive**

627117-B21

<b>Capacity</b>	300,000,000,000	
<b>Height</b>	0.63 in (16.0 mm)	
<b>Width</b>	3.1 in (78.7 mm)	
<b>Depth</b>	5.45 in (138.4 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.40 ms
	Average	2.9 ms
	Full-Stroke	5.30 ms
<b>Physical Configuration</b>	Rotational Speed	15,000 rpm
	Bytes/Sector	512
<b>Operating Temperature</b> (System Inlet Air Temperature)	Logical Blocks	585,937,500
	50° to 95° F (10° to 35° C)	

**HP 146GB 6G SAS 15K rpm  
SFF (2.5-inch) Dual Port  
Enterprise 3yr Warranty  
Hard Drive**

512547-B21

<b>Capacity</b>	146,815,737,856	
<b>Height</b>	0.63 in (16.0 mm)	
<b>Width</b>	3.1 in (78.7 mm)	
<b>Depth</b>	5.45 in (138.4 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.4 ms
	Average	3.0 ms
	Full-Stroke	7.0 ms
<b>Physical Configuration</b>	Rotational Speed	15,000 rpm
	Bytes/Sector	512
<b>Operating Temperature</b> (System Inlet Air Temperature)	Logical Blocks	286,749,488
	50° to 95° F (10° to 35° C)	

### Technical Specifications

#### SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives

**Application** SAS Enterprise drives are intended for servers and storage solutions with mission critical and high work load intensive applications where 24/7 duty cycles are a requirement, such as database applications and high transaction level applications.

**Transfer rate** The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

<b>HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive</b>	516828-B21	<b>Capacity</b>	600,127,266,816	
		<b>Height</b>	1.04 in (26.4 mm)	
		<b>Width</b>	4.36 in (110.7 mm)	
		<b>Depth</b>	7.43 in (188.7 mm)	
		<b>Interface</b>	SAS	
		<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
		<b>Seek Time</b> (typical reads, including settling)	Single Track	0.2ms
			Average	3.5ms
			Full-Stroke	6.8ms
		<b>Physical Configuration</b>	Rotational Speed	15,000rpm
			Bytes/Sector	512
Logical Blocks	1,172,123,568			
<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)			

<b>HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive</b>	516816-B21	<b>Capacity</b>	450,098,159,616	
		<b>Height</b>	1.04 in (26.4 mm)	
		<b>Width</b>	4.36 in (110.7 mm)	
		<b>Depth</b>	7.43 in (188.7 mm)	
		<b>Interface</b>	SAS	
		<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
		<b>Seek Time</b> (typical reads, including settling)	Single Track	0.2ms
			Average	3.5ms
			Full-Stroke	6.8ms
		<b>Physical Configuration</b>	Rotational Speed	15,000rpm
			Bytes/Sector	512
Logical Blocks	879,097,968			

### Technical Specifications

**Operating Temperature** 50° to 95° F (10° to 35° C)  
(System Inlet Air Temperature)

**HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive**

516814-B21

**Capacity** 300,000,000,000  
**Height** 1.04 in (26.4 mm)  
**Width** 4.36 in (110.7 mm)  
**Depth** 7.43 in (188.7 mm)  
**Interface** SAS  
**Transfer Rate Synchronous (Maximum)** 6 Gb/sec  
**Seek Time** Single Track 0.2ms  
(typical reads, including settling) Average 3.5ms  
Full-Stroke 6.8ms  
Rotational Speed 15,000rpm  
**Physical Configuration** Bytes/Sector 512  
Logical Blocks 585,937,500  
**Operating Temperature** 50° to 95° F (10° to 35° C)  
(System Inlet Air Temperature)

### SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives

**Application**

SAS Midline drives are intended for servers and storage solutions where high capacities are required. These drives have moderately-priced reliability and performance for non-mission critical, low workload applications, such as disk backup, archival, and reference applications.

**Transfer rate**

The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

### Technical Specifications

**HP 1TB 6G SAS 7.2K rpm  
SFF (2.5-inch) Dual Port  
Midline 1yr Warranty Hard  
Drive**

605835-B21

<b>Capacity</b>	1,000,204,886,016	
<b>Height</b>	0.63 in (16.0 mm)	
<b>Width</b>	3.1 in (78.7 mm)	
<b>Depth</b>	5.45 in (138.4 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.5 ms
	Average	8.2ms
	Full-Stroke	17.55 ms
	Rotational Speed	7,200 rpm
<b>Physical Configuration</b>	Bytes/Sector	512
	Logical Blocks	976,773,168
<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)	

**HP 500GB 6G SAS 7.2K rpm  
SFF (2.5-inch) Dual Port  
Midline 1yr Warranty Hard  
Drive**

507610-B21

<b>Capacity</b>	500,107,862,016	
<b>Height</b>	0.63 in (16.0 mm)	
<b>Width</b>	3.1 in (78.7 mm)	
<b>Depth</b>	5.45 in (138.4 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.5 ms
	Average	8.2ms
	Full-Stroke	17.55 ms
	Rotational Speed	7,200 rpm
<b>Physical Configuration</b>	Bytes/Sector	512
	Logical Blocks	976,773,168
<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)	

### Technical Specifications

#### SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives

**Application** SAS Midline drives are intended for servers and storage solutions where high capacities are required. These drives have moderately-priced reliability and performance for non-mission critical, low workload applications, such as disk backup, archival, and reference applications.

**Transfer rate** The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

<b>HP 4TB 6G SAS 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive</b>	693689-B21	<b>Capacity</b>	4,000,787MB	
		<b>Height</b>	1.04 in (26.4 mm)	
		<b>Width</b>	4.36 in (110.7 mm)	
		<b>Depth</b>	7.43 in (188.7 mm)	
		<b>Interface</b>	SAS	
		<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
		<b>Seek Time</b> (typical reads, including settling)	Single Track	0.7 ms
			Average	8.5 ms
			Full-Stroke	15.7 ms
		<b>Physical Configuration</b>	Rotational Speed	7,200 rpm
			Bytes/Sector	512
			Logical Blocks	7,814,037,168
		<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)	

**NOTE:** To support HP hard drives exceeding 2.2 TB, HP Smart Array Firmware version 5.0 or later is required for the following controllers:

- HP Smart Array P212 Controller
- HP Smart Array P410 Controller
- HP Smart Array P411 Controller
- HP Smart Array P711m Controller
- HP Smart Array P812 Controller

To use hard drives exceeding 2.2 TB, you must create a boot volume using offline ACU version 8.75 or later. HP Smart Array controllers do not support boot volumes exceeding 2.2 TB. Other controllers are not supported



### Technical Specifications

**HP 3TB 6G SAS 7.2K rpm  
LFF (3.5-inch) Midline 1yr  
Warranty Hard Drive**

625031-B21

<b>Capacity</b>	3,000,592,982,016
<b>Height</b>	1.04 in (26.4 mm)
<b>Width</b>	4.36 in (110.7 mm)
<b>Depth</b>	7.43 in (188.7 mm)
<b>Interface</b>	SAS
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec
<b>Seek Time</b> (typical reads, including settling)	Single Track 0.5 ms Average <8.1 ms Full-Stroke 15.5 ms
	Rotational Speed 7,200 rpm
<b>Physical Configuration</b>	Bytes/Sector 512 Logical Blocks 5,860,533,168
<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)

**NOTE:** To support HP hard drives exceeding 2.2 TB, HP Smart Array Firmware version 5.0 or later is required for the following controllers:

- HP Smart Array P212 Controller
- HP Smart Array P410 Controller
- HP Smart Array P411 Controller
- HP Smart Array P711m Controller
- HP Smart Array P812 Controller

To use hard drives exceeding 2.2 TB, you must create a boot volume using offline ACU version 8.75 or later. HP Smart Array controllers do not support boot volumes exceeding 2.2 TB. Other controllers are not supported

**HP 2TB 6G SAS 7.2K rpm  
LFF (3.5-inch) Dual Port  
Midline 1yr Warranty Hard  
Drive**

507616-B21

<b>Capacity</b>	2,000,398,934,016
<b>Height</b>	1.04 in (26.4 mm)
<b>Width</b>	4.36 in (110.7 mm)
<b>Depth</b>	7.43 in (188.7 mm)
<b>Interface</b>	SAS
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec
<b>Seek Time</b> (typical reads, including settling)	Single Track 0.5 ms Average 8.5 ms Full-Stroke 16.2 ms
	Rotational Speed 7,200 rpm
<b>Physical Configuration</b>	Bytes/Sector 512 Logical Blocks 3,907,029,168

### Technical Specifications

**Operating Temperature** 50° to 95° F (10° to 35° C)  
(System Inlet Air Temperature)

**HP 1TB 6G SAS 7.2K rpm  
LFF (3.5-inch) Dual Port  
Midline 1yr Warranty Hard  
Drive**

507614-B21

**Capacity** 1,000,204,886,016  
**Height** 1.04 in (26.4 mm)  
**Width** 4.36 in (110.7 mm)  
**Depth** 7.43 in (188.7 mm)  
**Interface** SAS  
**Transfer Rate Synchronous (Maximum)** 6 Gb/sec  
**Seek Time** Single Track 0.5 ms  
(typical reads, including settling) Average 8.5 ms  
Full-Stroke 16.2 ms  
Rotational Speed 7,200 rpm  
**Physical Configuration** Bytes/Sector 512  
Logical Blocks 1,953,525,168  
**Operating Temperature** 50° to 95° F (10° to 35° C)  
(System Inlet Air Temperature)

### SAS Non-Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives

**Application** SAS Enterprise drives are intended for servers and storage solutions with mission critical and high work load intensive applications where 24/7 duty cycles are a requirement, such as database applications and high transaction level applications.

**Transfer rate** The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

### Technical Specifications

**HP 600GB 6G SAS 10K rpm  
SFF (2.5-inch) Non-hot  
Plug Dual Port Enterprise  
3yr Warranty Hard Drive**

590698-B21

<b>Capacity</b>	600,127,266,816	
<b>Height</b>	0.591 in (15.00 mm)	
<b>Width</b>	2.750 in (69.85 mm)	
<b>Depth</b>	3.937 in (100.0 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.4 ms
	Average	4.0 ms
	Full-Stroke	8.0 ms
<b>Physical Configuration</b>	Rotational Speed	10,000 rpm
	Bytes/Sector	512
	Logical Blocks	1,172,123,568
<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)	

**HP 300GB 6G SAS 10K rpm  
SFF (2.5-inch) Non-hot  
Plug Dual Port Enterprise  
3yr Warranty Hard Drive**

537809-B21

<b>Capacity</b>	300,000,000,000	
<b>Height</b>	0.591 in (15.00 mm)	
<b>Width</b>	2.750 in (69.85 mm)	
<b>Depth</b>	3.937 in (100.0 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6 Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.20 ms
	Average	4.0 ms
	Full-Stroke	7.45 ms
<b>Physical Configuration</b>	Rotational Speed	10,000 rpm
	Bytes/Sector	512
	Logical Blocks	585,937,500
<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)	

### Technical Specifications

#### SAS Non-Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives

**Application** SAS Enterprise drives are intended for servers and storage solutions with mission critical and high work load intensive applications where 24/7 duty cycles are a requirement, such as database applications and high transaction level applications.

**Transfer rate** The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

<b>HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive</b>	516830-B21	<b>Capacity</b>	600,127,266,816	
		<b>Height</b>	1.028 in (26.1 mm)	
		<b>Width</b>	4.0 in (101.6 mm)	
		<b>Depth</b>	5.787 in (147.0 mm)	
		<b>Interface</b>	SAS	
		<b>Transfer Rate Synchronous (Maximum)</b>	6Gb/sec	
		<b>Seek Time</b> (typical reads, including settling)	Single Track	0.2ms
			Average	3.5ms
			Full-Stroke	6.8ms
		<b>Physical Configuration</b>	Rotational Speed	15,000 rpm
			Bytes/Sector	512
			Logical Blocks	1,172,123,568
		<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)	

<b>HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive</b>	516826-B21	<b>Capacity</b>	450,098,159,616	
		<b>Height</b>	1.028 in (26.1 mm)	
		<b>Width</b>	4.0 in (101.6 mm)	
		<b>Depth</b>	5.787 in (147.0 mm)	
		<b>Interface</b>	SAS	
		<b>Transfer Rate Synchronous (Maximum)</b>	6Gb/sec	
		<b>Seek Time</b> (typical reads, including settling)	Single Track	0.2ms
			Average	3.5ms
			Full-Stroke	6.8ms
		<b>Physical Configuration</b>	Rotational Speed	15,000 rpm
			Bytes/Sector	512
			Logical Blocks	879,097,968

### Technical Specifications

**Operating Temperature** 50° to 95° F (10° to 35° C)  
(System Inlet Air Temperature)

**HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive**

516824-B21

**Capacity** 300,000,000,000  
**Height** 1.028 in (26.1 mm)  
**Width** 4.0 in (101.6 mm)  
**Depth** 5.787 in (147.0 mm)  
**Interface** SAS  
**Transfer Rate Synchronous (Maximum)** 3Gb/sec  
**Seek Time** Single Track 0.2ms  
(typical reads, including settling) Average 3.5ms  
Full-Stroke 6.8ms  
Rotational Speed 10,000rpm  
**Physical Configuration** Bytes/Sector 512  
Logical Blocks 585,937,500  
**Operating Temperature** 50° to 95° F (10° to 35° C)  
(System Inlet Air Temperature)

### SAS Quick Release SFF (2.5-inch) Enterprise (ENT) Drives

**Application**

SAS Enterprise drives are intended for servers and storage solutions with mission critical and high work load intensive applications where 24/7 duty cycles are a requirement, such as database applications and high transaction level applications.

**Transfer rate**

The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

### Technical Specifications

**HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) Quick-release Dual Port ENT 3y Warranty Hard Drive**

697572-B21

<b>Capacity</b>	1,200,243MB	
<b>Height</b>	0.740 in (18.8 mm)	
<b>Width</b>	2.909 in (73.9 mm)	
<b>Depth</b>	3.945 in (100.2 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	4.6ms
	Average	8.9ms
	Full-Stroke	8.0ms
<b>Physical Configuration</b>	Rotational Speed	10,000rpm
	Bytes/Sector	512
	Logical Blocks	2,344,225,968
<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)	

**HP 300 GB 6G SAS 10K SFF (2.5-inch) Quick-release Dual Port ENT 3y Warranty Hard Drive**

574879-B21

<b>Capacity</b>	300,000,000,000	
<b>Height</b>	0.740 in (18.8 mm)	
<b>Width</b>	2.909 in (73.9 mm)	
<b>Depth</b>	3.945 in (100.2 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6Gb/sec	
<b>Seek Time</b> (typical reads, including settling)	Single Track	0.3ms
	Average	4.0ms
	Full-Stroke	8.0ms
<b>Physical Configuration</b>	Rotational Speed	10,000rpm
	Bytes/Sector	512
	Logical Blocks	585,937,500
<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)	

### Technical Specifications

#### SAS Quick Release LFF (3.5-inch) Enterprise (ENT) Drives

**Application** SAS Enterprise drives are intended for servers and storage solutions with mission critical and high work load intensive applications where 24/7 duty cycles are a requirement, such as database applications and high transaction level applications.

**Transfer rate** The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

<b>HP 600 GB 6G SAS 15K LFF (3.5-inch) Quick-release Dual Port ENT 3y Warranty Hard Drive</b>	574758-B21	<b>Capacity</b>	600,127,266,816	
		<b>Height</b>	1.165 in (29.6 mm)	
		<b>Width</b>	4.157 in (105.6 mm)	
		<b>Depth</b>	5.787 in (147.0 mm)	
		<b>Interface</b>	SAS	
		<b>Transfer Rate Synchronous (Maximum)</b>	6Gb/sec	
		<b>Seek Time</b> (typical reads, including settling)	Single Track	0.2ms
			Average	3.5ms
			Full-Stroke	6.8ms
		<b>Physical Configuration</b>	Rotational Speed	15,000 rpm
			Bytes/Sector	512
			Logical Blocks	1,172,123,568
		<b>Operating Temperature</b> (System Inlet Air Temperature)	50° to 95° F (10° to 35° C)	

<b>HP 300 GB 6G SAS 15K LFF (3.5-inch) Quick-release Dual Port ENT 3y Warranty Hard Drive</b>	585980-B21	<b>Capacity</b>	300,000,000,000	
		<b>Height</b>	1.165 in (29.6 mm)	
		<b>Width</b>	4.157 in (105.6 mm)	
		<b>Depth</b>	5.787 in (147.0 mm)	
		<b>Interface</b>	SAS	
		<b>Transfer Rate Synchronous (Maximum)</b>	6Gb/sec	
		<b>Seek Time</b> (typical reads, including settling)	Single Track	0.2ms
			Average	3.5ms
			Full-Stroke	6.8ms
		<b>Physical Configuration</b>	Rotational Speed	15,000 rpm
			Bytes/Sector	512
			Logical Blocks	585,937,500

### Technical Specifications

**Operating Temperature** 50° to 95° F (10° to 35° C)  
(System Inlet Air Temperature)

### SAS Quick Release LFF (3.5-inch) Midline (MDL) Drives

**Application** SAS Midline drives are intended for servers and storage solutions where high capacities are required. These drives have moderately-priced reliability and performance for non-mission critical, low workload applications, such as disk backup, archival, and reference applications.

**Transfer rate** The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

**HP 4TB 6G SAS 7.2k rpm LFF (3.5-inch) Quick-release Dual Port MDL 1y Warranty Hard Drive**

697956-B21

<b>Capacity</b>	4,000,787MB
<b>Height</b>	1.165 in (29.6 mm)
<b>Width</b>	4.157 in (105.6 mm)
<b>Depth</b>	5.787 in (147.0 mm)
<b>Interface</b>	SAS
<b>Transfer Rate Synchronous (Maximum)</b>	6Gb/sec
<b>Seek Time</b>	Single Track 0.7 ms
(typical reads, including settling)	Average 8.5 ms
	Full-Stroke 15.7 ms
	Rotational Speed 7,200 rpm
<b>Physical Configuration</b>	Bytes/Sector 512
	Logical Blocks 7,814,037,168
<b>Operating Temperature</b>	50° to 95° F (10° to 35° C)
(System Inlet Air Temperature)	

**NOTE:** To support HP hard drives exceeding 2.2 TB, HP Smart Array Firmware version 5.0 or later is required for the following controllers:

- HP Smart Array P212 Controller
- HP Smart Array P410 Controller
- HP Smart Array P411 Controller
- HP Smart Array P711m Controller
- HP Smart Array P812 Controller

To use hard drives exceeding 2.2 TB, you must create a boot volume using offline ACU version 8.75 or later. HP Smart Array controllers do not support boot volumes exceeding 2.2 TB. Other controllers are not supported

**HP 2TB 6G SAS 7.2K rpm**

574761-B21

**Capacity** 2,000,398,934,016





### Technical Specifications

**LFF (3.5-inch) Quick-release Dual Port MDL 1yr Warranty Hard Drive**

<b>Height</b>	1.165 in (29.6 mm)	
<b>Width</b>	4.157 in (105.6 mm)	
<b>Depth</b>	5.787 in (147.0 mm)	
<b>Interface</b>	SAS	
<b>Transfer Rate Synchronous (Maximum)</b>	6Gb/sec	
<b>Seek Time</b>	Single Track	0.7 ms
(typical reads, including settling)	Average	8.5 ms
	Full-Stroke	18.2 ms
	Rotational Speed	7,200 rpm
<b>Physical Configuration</b>	Bytes/Sector	512
	Logical Blocks	3,907,029,168
<b>Operating Temperature</b>	50° to 95° F (10° to 35° C)	
(System Inlet Air Temperature)		

### Environment-friendly Products and Approach

### End-of-life Management and Recycling

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