

### Overview

## HP SAS (Serial Attached SCSI) Hard Drives for HP Workstations

### Introduction

HP SAS (Serial Attached SCSI) HDDs (Hard Drives) are high-performance, enterprise class hard drives, which are alternative to SATA hard drives. SAS hard drives combine faster data transfer rates with better error detection and recovery, as well as having higher reliability specifications.

SAS based hard drives are ideal for projects requiring transactional applications and performance oriented requirements requirements where throughput and reliability are critical.

### Performance

HP SAS Hard Drives offer sustained data transfer rates greater than 200 MB/s (Inner Diameter to Outer Diameter) for sequential read operations. Sustained data transfer rates vary with drive speed, capacity and model.

HP SAS 15K SFF Hard drives offer sustained performance of 260 MB/s to 175 MB/s (outer to inner diameter). They are full Enterprise class drives with the industry's highest reliability of 2.0M hours MTBF. The SAS 15K SFF drives offer the highest performance SAS drives available today. Drive format is 512e.

HP SAS 10K SFF Hard drives offer sustained performance of 230 MB/s to 105 MB/s (outer to inner diameter). They are full Enterprise class drives with the industry's highest reliability of 2.0M hours MTBF. The SAS 10K family offers greater capacity per drive than the SAS 15K family. Drive format is 512n.

### Models

600GB SAS 15K SFF HDD	L5B75AA
300GB SAS 15K SFF HDD	L5B74AA
HP 300GB SAS 10K SFF HDD	A2Z20AA
HP 600GB SAS 10K SFF HDD	A2Z21AA
HP 900GB SAS 10K SFF HDD	E2P03AA
HP 1.2TB SAS 10K SFF HDD	E2P04AA

### Benefits

- Higher hard drive performance compared to typical SATA drives
- Higher hard drive reliability compared to typical SATA drives
- "Star" topology (point-to-point, no hubs). Each device gets full bus bandwidth.
- Minimum device arbitration overhead

True full duplex communications, transfers both read and write data simultaneously on 1 port.

Features SMART and Drive Self Test hard drive technologies.

### Compatibility

Most HP SAS Hard Drives are compatible with the HP Z4xx, Z6xx, and Z8xx workstations (check individual workstation QuickSpecs documents to confirm specific drive support).

**NOTE:** 15K RPM drives spin at very high RPM, therefore they tend to vibrate more than 7200 RPM drives. The result is higher system acoustics. The 600GB drive exhibits this characteristic more than the other SAS drives.

### Service and Support



### Overview

SAS hard drives have a one-year Limited Warranty or the remainder of the warranty of the HP product in which it is installed (which ever is longer). Technical support is available seven days a week, 24 hours a day by phone, as well as in online support forums. Certain restrictions and exclusions apply.

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### Technical Specifications

<b>Storage / Hard Drives &amp; SSDs</b>	<b>600GB SAS 15K rpm 6Gb/s 3.5" HDD</b>	<b>Capacity</b>	600GB	
		<b>Reliability (MTBF)</b>	2.0M hours	
		<b>Rated Power On Hours</b>	8760/year	
		<b>Annualized Failure Rate</b> (based on Rated POH)	<0.44%	
		<b>Physical Size (Height)</b>	5.9 in; 15 cm	
		<b>Media Diameter</b>	2.5 in; 6.36 cm	
		<b>Interface</b>	12Gb/s SAS	
		<b>Synchronous Transfer Rate (Maximum)</b>	up to 1200 MB/s (SAS single port)	
		<b>Buffer</b>	128MB	
		<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Average</b>	2.0ms
		<b>Rotational Speed</b>	15K rpm	
		<b>Operating Temperature</b>	50° to 95° F (10° to 35° C)	
		<b>Performance</b>	Sequential Read	260 MB/s
			Sequential Write	175 MB/s

	<b>600GB SAS 15K rpm 6Gb/s 3.5" HDD</b>	<b>Capacity</b>	300GB	
		<b>Reliability (MTBF)</b>	2.0M hours	
		<b>Rated Power On Hours</b>	8760/year	
		<b>Annualized Failure Rate</b> (based on Rated POH)	<0.44%	
		<b>Rated for 24/7/365 operation</b>	YES	
		<b>Physical Size (Height)</b>	5.9 in; 15 cm	
		<b>Media Diameter</b>	2.5 in; 6.36 cm	
		<b>Interface</b>	12Gb/s SAS	
		<b>Synchronous Transfer Rate (Maximum)</b>	up to 1200 MB/s (SAS single port)	
		<b>Cache</b>	128MB	
		<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Average</b>	2.0ms
		<b>Rotational Speed</b>	15K rpm	
		<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	
		<b>Performance</b>	<b>Sequential Read</b>	260 MB/s
	<b>Sequential Write</b>	175 MB/s		

	<b>HP 300GB SAS 10K SFF HDD</b>	<b>Capacity</b>	300GB	
		<b>Reliability (MTBF)</b>	2.0M hours	
		<b>Rated Power On Hours</b>	8760/year	

### Technical Specifications

	<b>Annualized Failure Rate (based on Rated POH)</b>	<0.44%
	<b>Rated for 24/7/365 operation</b>	YES
	<b>Physical Size (Height)</b>	0.6 in; 1.53 cm
	<b>Physical Size (Width)</b>	2.75 in; 6.99 cm
	<b>Media Diameter</b>	2.75 in; 6.99 cm
	<b>Interface</b>	SAS 6Gb/s
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s
	<b>Buffer</b>	64MB
	<b>Cache</b>	multi-segmentable cache buffer
	<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b> 0.4 ms (max) <b>Average</b> 3.6 ms <b>Full Stroke</b> 7.3 ms
	<b>Rotational Speed</b>	10,000 rpm
	<b>Logical Blocks</b>	585,937,500
	<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)
	<b>Performance</b>	<b>Sequential Read</b> 230 MB/s <b>Sequential Write</b> 105 MB/s
<b>HP 600GB SAS 10K SFF HDD</b>	<b>Capacity</b>	600GB
	<b>Reliability (MTBF)</b>	2.0M hours
	<b>Rated Power On Hours</b>	8760/year
	<b>Annualized Failure Rate (based on Rated POH)</b>	<0.44%
	<b>Rated for 24/7/365 operation</b>	YES
	<b>Physical Size (Height)</b>	0.6 in; 1.53 cm
	<b>Physical Size (Width)</b>	2.75 in; 6.99 cm
	<b>Media Diameter</b>	2.5 in; 6.36 cm
	<b>Interface</b>	SAS 6Gb/s
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s
	<b>Buffer</b>	64MB
	<b>Cache</b>	multi-segmentable cache buffer
	<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b> 0.4 ms (max) <b>Average</b> 3.6 ms <b>Full Stroke</b> 7.3 ms
	<b>Rotational Speed</b>	10,000 rpm
	<b>Logical Blocks</b>	1,172,123,568
	<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)
	<b>Performance</b>	<b>Sequential Read</b> 230 MB/s <b>Sequential Write</b> 105 MB/s

### Technical Specifications

<b>HP 900GB SAS 10K SFF HDD</b>	<b>Capacity</b>	900GB		
	<b>Reliability (MTBF)</b>	2.0M hours		
	<b>Rated Power On Hours</b>	8760/year		
	<b>Annualized Failure Rate (based on Rated POH)</b>	<0.44%		
	<b>Rated for 24/7/365 operation</b>	YES		
	<b>Physical Size (Height)</b>	0.6 in; 1.53 cm		
	<b>Physical Size (Width)</b>	2.75 in; 6.99 cm		
	<b>Media Diameter</b>	2.5 in; 6.36 cm		
	<b>Interface</b>	SAS 6Gb/s		
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s		
	<b>Buffer</b>	64MB		
	<b>Cache</b>	multi-segmentable cache buffer		
	<b>Seek Time (typical reads, includes controller overhead, including settling)</b>	<b>Single Track</b>	0.2ms (max)	
		<b>Average</b>	3.5ms	
		<b>Full Stroke</b>	7.0ms	
	<b>Rotational Speed</b>	10,000 rpm		
	<b>Logical Blocks</b>	1,758,174,767		
	<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)		
	<b>Performance</b>	<b>Sequential Read</b>	230 MB/s	
		<b>Sequential Write</b>	105 MB/s	
<b>HP 1.2TB SAS 10K SFF HDD</b>	<b>Capacity</b>	1.2TB		
	<b>Reliability (MTBF)</b>	2.0M hours		
	<b>Rated Power On Hours</b>	8760/year		
	<b>Annualized Failure Rate (based on Rated POH)</b>	<0.44%		
	<b>Rated for 24/7/365 operation</b>	YES		
	<b>Physical Size (Height)</b>	0.6 in; 1.53 cm		
	<b>Physical Size (Width)</b>	2.75 in; 6.99 cm		
	<b>Media Diameter</b>	2.5 in; 6.36 cm		
	<b>Interface</b>	SAS 6Gb/s		
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s		
	<b>Buffer</b>	64MB		
	<b>Cache</b>	multi-segmentable cache buffer		
	<b>Seek Time (typical reads, includes controller overhead, including settling)</b>	<b>Single Track</b>	0.18ms (max)	
		<b>Average</b>	3.5ms	
		<b>Full Stroke</b>	7.17ms	
	<b>Rotational Speed</b>	10,000 rpm		
<b>Logical Blocks</b>	2,344,225,968			
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)			

### Technical Specifications

<b>Performance</b>	<b>Sequential Read</b>	230 MB/s
	<b>Sequential Write</b>	105 MB/s

Date of change:	Version History:		Description of change:
	From v1 to v2		
March 1, 2015	From v14 to v15	Added	Introduction messaging, Benefits
		Changed	SMART and Performance notes
		Removed	SATA 10K Introduction, Compatibility and messaging notes
April 1, 2015	From v15 to v16	Changed	Height for 600GB SAS 15K SFF in Technical Specifications
December 2, 2015	From v16 to v17	Added	MTBF in overview section
September 1, 2016	From v17 to v18	Changed	Performance and Compatibility sections, and all available HD specs

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