Western Digital.

Ultrastar® DC HC550

DATA SHEET

3.5-INCH HELIUM PLATFORM DATA CENTER HARD DRIVES

18/16TB | 7200 RPM SATA 6Gb/s and SAS 12Gb/s

Highlights

- 18/16TB capacity[1] in a standard 3.5-inch form factor
- CMR technology works with all capacity enterprise applications & environments
- Reliable, field-proven, 6th generation design
- Industry's first HDD with Energy-Assisted Magnetic Recording technology
- Industry's first Triple Stage Actuator
- HelioSeal® design delivers outstanding power efficiency
- 2.5M hours (projected) MTBF[2] rating & 5-year limited warranty
- Self-Encrypting Drive Options

Applications

- Cloud & Hyperscale storage
- Massive scale-out (MSO), high-density data centers
- Distributed File Systems
- Bulk storage using object storage solutions like Ceph™ and OpenStack® Swift
- Primary and secondary storage for Apache Hadoop® for Big Data Analytics

Total Cost of Ownership (TCO) Drives the Data Center Architecture

Data center decisions are driven by TCO. Higher capacity hard drives play a leading role in reducing TCO. An 18TB data center HDD provides 29% more capacity in the same form factor as a 14TB HDD. Higher capacity HDDs enable data centers to lower CapEx by reducing supporting hardware and system level costs when compared to lower capacity drives. Helium-sealed, low power, high reliability drives reduce energy and maintenance costs, contributing to OpEx savings. For example, a data center using 18TB HDDs vs. 14TB HDDs requires 22% fewer racks while consuming 21% less power per TB at idle, resulting in significant overall TCO reduction for data center environments.

Raising the Capacity Bar with New Technologies

Ultrastar DC HC550 integrates a suite of technologies on a 9-disk platform to create a new class of HDDs. 18TB capacity is achieved by combining technologies that improve areal density working together with technologies that improve performance and reduce power consumption.

- The first HDD in the industry to harness Energy-Assisted Magnetic Recording (EAMR) technology improves writability and therefore increases areal density.
- The industry's first Triple Stage Actuator (TSA) enhances head-positioning accuracy, delivering better performance and increased areal density.
- HelioSeal® technology is the foundation for Western Digital's high capacity HDDs and this is the 6th generation of HelioSeal product. Western Digital has shipped >65 million HelioSeal products to date.

Trusted Reliability and Quality for Data at Scale

With its massive capacity and 2.5M MTBF (projected) reliability rating, the Ultrastar DC HC550 is ideal for object storage implementations. Object storage systems with erasure coding provide better data durability compared to RAID systems, given their tolerance for simultaneous error conditions.

The DC HC550 offers security and encryption options to help protect data from unauthorized use, including SED models in both SATA & SAS. A SED-FIPS will be available in a SAS configuration.

Trust Western Digital and the Ultrastar DC HC550 hard drive to deliver highest capacity, lower TCO and more value to your data center.

29%
MORE CAPACITY*

21%
LOWER WATTS/TB*

Features and Benefits

	Feature / Function	Benefits
Capacity	• 18/16TB, enabled by EAMR	• Provides 29% more capacity than 14TB helium-filled drives
Power Efficiency	• Ultra-low Watts per Terabyte (W/TB)	• 21% lower idle W/TB than 14TB Ultrastar helium-filled drives
Performance	• Triple Stage Actuator and Two-Dimensional Magnetic Recording (TDMR) technology • Rotational Vibration Safeguard (RVS) • Media Cache Plus architecture • SATA 6Gb/s & SAS 12Gb/s • 512MB cache buffer	• More accurate head positioning, especially in multi-drive environments, for better performance and data integrity • Maintains drive performance in high rotational vibration environments and multi-drive systems • Better random write performance • Provides compatibility with high-performance data centers • Improves response time and data management
Reliability	• Dual Safe, RSA-signed firmware • 2.5M hours MTBF[2] and 0.35% AFR • 5-year limited warranty	• Retains previous firmware version for safe firmware updates, verified with an RSA signature • Unsurpassed reliability rating for Capacity Enterprise HDD for fewer failures/less service needs • Unbeaten for enterprise-class hard drives
Data Security	• Encryption options on both SATA and SAS models	• Hardware-based encryption helps protect data from unauthorized use (SED options)

* compared to 14TB Ultrastar DC HC530 HDD. Power at idle condition.

Ultrastar® DC HC550

DATA SHEET | **3.5-INCH HELIUM PLATFORM ENTERPRISE HARD DRIVES**

Specifications

	SATA Models	SAS Models
Model Numbers	WUH721818ALE6L1 WUH721818ALE6L4 WUH721816ALE6L1 WUH721816ALE6L4	WUH721818AL5200 WUH721818AL5201 WUH721818AL5204 WUH721818AL5205 WUH721816AL5201 WUH721816AL5204 WUH721816AL5205
Configuration		
Interface	SATA 6Gb/s	SAS 12Gb/s
Capacity[1]	18/16TB	←
Format: Sector size (bytes)[3]	4Kn: 4096 512e: 512	4Kn: 4096, 4160, 4224 512e: 512, 520, 528
Areal Density (Gbits/sq. in, max)	1022 (18TB), 918 (16TB)	←
Performance		
Data buffer[4] (MB)	512	←
Rotational speed (RPM)	7200	←
Latency average (ms)	4.16	←
Interface transfer rate (MB/s, max)	600	1200
Sustained transfer rate[5] (MB/s, max) / (MiB/s, max)	269/257 (18TB) 262/250 (16TB)	←
Reliability		
Error rate (non-recoverable bits read)	1 in 10^{15}	←
Load/Unload cycles (at 40°C)	600,000	←
Availability (hrs/day x days/wk)	24×7	←
MTBF[2] (M hours, projected)	2.5	←
Annualized Failure Rate[2] (AFR, projected)	0.35%	←
Workloads	Up to 550 TB/year	←
Limited warranty (yrs)	5	←

* See **How to Read Model Number** for possible values for z.

[1] One MB is equal to one million bytes, one GB is equal to one billion bytes and one TB equals 1,000GB (one trillion bytes). Actual user capacity may be less due to operating environment.

[2] Projected values. Final MTBF and AFR specifications will be based on a sample population and are estimated by statistical measurements and acceleration algorithms under typical operating conditions, workload 220TB/year and temperature 40C. Derating of MTBF and AFR will occur above these parameters, up to 550TB writes per year and 60°C ambient (65°C device temp). MTBF and AFR ratings do not predict an individual drive's reliability and do not constitute a warranty.

[3] Advanced Format drive: 4K (4096-byte) physical sectors.

[4] Portion of buffer capacity used for drive firmware

[5] Based on internal testing; performance may vary depending on host environment, drive capacity and other factors. 1MiB = 1,048,576 bytes (2^{20}), 1MB = 1,000,000 bytes (10^6)

[6] SATA models:
Random RW 50/50 8KB QD=1 @40 IOPS,
SAS models:
Random RW 50/50 4KB QD=4 @MAX IOPS

[7] Idle specification is based on use of Idle_A

	SATA Models	SAS Models
Acoustics		
Idle/Operating (Bels, typical)	2.0/3.6	←
Power		
Requirement	+5 VDC, +12VDC	←
Operating[6] (W)	6.5	8.8
Idle[7] (W)	5.6	5.8
Power consumption efficiency at idle (W/TB)		
18TB	0.31	0.32
16TB	0.35	0.36
Physical Size		
z-height (mm)	26.1	←
Dimensions (width x depth, mm)	101.6 (+/-0.25) x 147	←
Weight (g, max)	690	←
Environmental (Operating)		
Ambient temperature	5° to 60°C	←
Shock (half-sine wave, 2ms, G)	50	←
Vibration (G RMS, 5 to 500Hz)	0.67 (XYZ)	←
Environmental (Non-operating)		
Ambient temperature	-40° to 70°C	←
Shock (half-sine wave, 2ms, G)	250 (2ms)	←
Vibration (G RMS, 2 to 200Hz)	1.04 (XYZ)	←

How to Read Model Number

Example: WUH721818ALE6L4 = 7200 RPM, 18TB, 512e SATA 6Gb/s, Base(SE)

W = Western Digital
U = Ultrastar
H = Helium (vs. S for Standard)
72 = 7200 RPM
18 = Full capacity (18TB)
18 = Capacity this model (18TB)
A = Generation code
L = 26.1 z-height

E6 = Interface (512e SATA 6Gb/s)
(52 = 512e SAS 12Gb/s)
y = Power Disable Pin 3 status
(0 = Power Disable Pin 3 support
L = Legacy Pin 3 config – No Power Disable Support)
z = Data Security Mode
0 = Instant Secure Erase
1 = SED*: Self Encrypting Drive TCG-Enterprise and Sanitize Crypto Scramble / Erase
4 = Base (SE)*: No Encryption. Sanitize Overwrite only.
5 = SED-FIPS: SED w/ certification

* ATA Security Feature Set comes standard on SATA

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