WARP Mechanics® High Capacity HDD
HGST Ultrastar® He[12]

Features & Benefits

- 12TB[1] capacity in 3.5”
- Reliable, field-proven, 4th generation design
- Industry’s best power efficiency (Watts/TB)
- 50% more capacity, 54% more efficient, & 25% more reliable vs 8TB air
- SATA 6Gb/s
- SAS 12Gb/s
- 2.5M hours MTBF[2] rating & 5-year warranty
- Security and encryption options

Industry’s Best Capacity, Power Efficiency and Reliability

HGST **Ultrastar He[12]** hard drives have the best capacity, performance, and reliability blend in the industry. The He[12] uses PMR technology, and is the industry’s first 12TB drive that is drop-in ready for enterprise applications. The stable internal environment created by fourth-generation HelioSeal® technology enables a new 8-disk design, increasing the capacity by 20% when compared to the 7-disk design of the prior generation. This highest capacity helium drive offers the lowest power profile in the industry to help data center architects meet eco-environmental goals and requirements. Targeted at 2.5M hours MTBF, the Ultrastar He[12] HDD provides the highest reliability rating available of all HDDs on the market today by building on the successful design of its 10TB, 8TB and 6TB predecessors.

ADVANCED 4Kn FORMAT

ADVANCED AF FORMAT

HelioSeal® Technology Solves Challenges for the Next Generation

Compared to 8TB air-filled drives, this HelioSeal hard drive provides 50% more capacity, uses 54% less power (Watts/TB), and is 25% more reliable, rated at 2.5M hours MTBF. Data-center ready features like a second generation dual-stage actuator — the HGST Micro Actuator — enhance head positioning accuracy to deliver better performance, data integrity and overall drive reliability, especially in multi-drive environments where operational vibration is present. A choice of 6Gb/s SATA and 12Gb/s SAS interface enables easy integration into high performance data centers.

Applications/Environments

- Drop-in ready for mainstream enterprise applications
- Massive scale-out high-density data centers (MSO)
- Distributed File Systems
- Object storage for Ceph™ and Hadoop®
- Centralized video surveillance
- Cloud & Hyperscale storage
- Big Data Analytics

54% LOWER WATTS/TB*

50% MORE CAPACITY*

25% MORE RELIABLE*

WARP Mechanics® HGST Ultrastar® He[12]

Technical Specifications

Specifications	SATA Models HUH721212ALE60y HUH721212ALN60y	SAS Models HUH721212AL420y HUH721212AL520y
Configuration		
Interface	SATA 6Gb/s	SAS 12Gb/s
Capacity[1] (TB)	12TB	←
Format: Sector size[3] (bytes)	4Kn: 4096 512e: 512	4Kn: 4096, 4112, 4160, 4224 512e: 512, 520, 528
Max. Areal density (Gbits/sq. in.)	864	←
Performance		
Data buffer[4] (MB)	256	←
Rotational speed (RPM)	7200	←
Latency avg (ms)	4.16	←
Interface transfer rate (MB/s, max)	600	1200
Sustained transfer rate[5]		
(MiB/s, typical)	243	←
(MB/s, typical)	255	←
Seek time[6] (read/write, ms, typical)	8.0/8.6	←
Acoustics		
Idle (Bels, typical)	2.0/3.6	←
Physical size		
z-height (mm)	26.1	←
Dimensions (width x depth, mm)	101.6 (+/-0.25) x 147	←
Weight (g, max)	660	←

	SATA Models	SAS Models
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)	24x7	←
MTBF[2] (M hours)	2.5	←
AFR[2] (Ann. Failure Rate)	0.35%	←
Warranty (yrs)	5	←
Power		
Requirement	+5 VDC, +12VDC	←
Operating[7]	7.2	9.8
Idle[8] (W)	5.3	6.1
Power consumption efficiency at Idle (W/TB)		
(Watts/TB)	0.44	0.51
(Watts/GB)	0.00044	0.00051
Environmental (Operating)		
Ambient temperature	5° to 60° C	←
Shock (half-sine wave 2ms, G)	70	←
Vibration (G RMS 5 to 500Hz)	0.67 (XYZ)	←
Environmental (Non-Operating)		
Ambient temperature	-40° to 70° C	←
Shock (half-sine wave, G)	300 (2ms) / 150 (11ms)	←
Random vibration (G RMS 2 to 200Hz)	1.04 (XYZ)	←

1 1 MB = 1 million bytes, 1 GB = 1 billion bytes, 1 TB = 1 trillion bytes. Accessible capacity varies due to formatting and partitioning of the hard drive, the computer's operating system, and other factors.

2 Based on a sample population estimated by statistical measurements under median operating conditions. 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 MiB/s is 220 bytes, MB/s is 106 bytes

6 Excludes command overhead

7 SATA models: 8K Queue Depth = 1, SAS models: 4K Queue Depth = 4

8 Idle specification is based on use of Idle_A