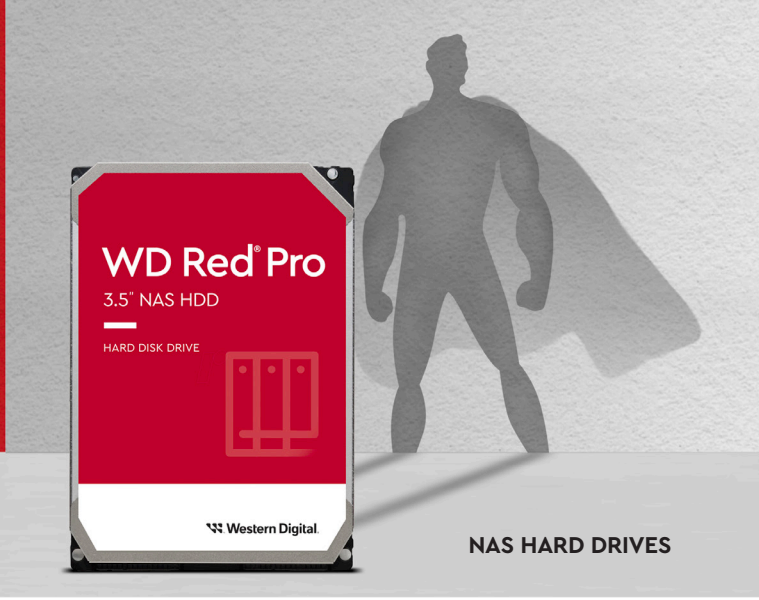
Western Digital.

WD Red® Pro



Enterprise-class hard drives engineered to deliver high performance and reliability.

NAS HARD DRIVES

WD Red® Pro drives are engineered to handle high-intensity workloads in 24×7 multi-user commercial and enterprise NAS environments. WD Red Pro drives deliver the performance, scalability and dependability businesses require to store, share and collaborate on large amounts of data in multi-bay RAID-optimized NAS systems.

Product Highlights

- Available in capacities ranging from 2TB to 24TB[1]
- For RAID-optimized NAS systems with unlimited # of bays
- Rated for 550TB/year workloads[2] and up to 2.5M hours MTBF[3]

Ideal for:

- Multimedia Creative Pros
- Medium to Large Businesses
- Commercial and Enterprise NAS systems

Tuned for NAS with NASware™

Western Digital's exclusive NASware™ technology **fine tunes drive parameters** to match NAS system workloads which helps increase performance and reliability.

Designed for Continuous Operation

WD Red Pro hard drives are designed to handle the rigorous demands of high- intensity **24×7 multi-user NAS environments** and increase system durability.

Tested for Dependable Compatibility

Western Digital partners with a wide range of NAS system vendors for **extensive testing** to ensure compatibility with most NAS enclosures.

Protected against Excessive Vibration

WD Red Pro drives include **Rotation Vibration (RV) sensors** that anticipate and proactively counteract disturbances caused by increased vibration. By dispersing excess vibration across the drive chassis, turbulence is minimized, performance is maintained and drives are protected.

Built to Absorb Shock

WD Red Pro hard drives include a **multi-axis shock sensor to** detect subtle shock events and automatically compensate with **dynamic fly height technology** to further protect the drives in NAS enclosures.

Engineered with Industry-Leading Technology

WD Red Pro 22 & 24TB[1] hard drives feature Western Digital's proprietary OptiNAND™ technology which leverages **integrated iNAND embedded flash** to perform key housekeeping functions, freeing up more capacity and improving the overall drive performance.

Specifications

Model Number[4]	WD240KFGX	WD221KFGX	WD201KFGX	WD181KFGX	WD161KFGX	WD142KFGX	WD121KFBX
Formatted capacity[1]	24TB	22TB	20TB	18TB	16TB	14TB	12TB
Recording technology	CMR	CMR	CMR	CMR	CMR	CMR	CMR
Interface	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s
Form factor	3.5-inch	3.5-inch	3.5-inch	3.5-inch	3.5-inch	3.5-inch	3.5-inch
Drive Technology	Helium	Helium	Helium	Helium	Helium	Helium	Air
RV Sensors	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Native command queuing	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OptiNAND™ technology	Yes	Yes	Yes	No	No	No	No
Advanced Format (AF)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RoHS compliant[5]	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Performance							
Interface speed (max)	6 Gb/s	6 Gb/s	6 Gb/s	6 Gb/s	6 Gb/s	6 Gb/s	6 Gb/s
Internal transfer rate (max)[6]	287 MB/s	265 MB/s	268 MB/s	272 MB/s	259 MB/s	265 MB/s	240 MB/s
Cache (MB)[1]	512	512	512	512	512	512	256
RPM	7200	7200	7200	7200	7200	7200	7200
Reliability/Data Integrity							
Load/unload cycles[7]	600,000	600,000	600,000	600,000	600,000	600,000	600,000
Non-recoverable errors per bits read	<1 in 10^15	<1 in 10^15	<1 in 10^15	<1 in 10^15	<1 in 10^15	<1 in 10^15	<1 in 10^15
MTBF (hours)[8]	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	2,000,000
Workload rate (TB/year)[2]	550	550	550	550	550	550	550
Limited warranty (years)[3]	5	5	5	5	5	5	5
Power Management[9]							
12VDC ±5% (A, peak)	1.7	1.7	1.8	1.8	1.8	1.8	1.8
5VDC ±5% (A, peak)							
Average power requirements (W)							
Read/Write	6.4	6.8	6.9	6.1	6.1	6.4	6.0
Idle	3.9	3.4	3.8	3.6	3.6	3.6	2.8
Standby and Sleep	1.2	1.2	1.6	0.9	0.9	0.9	0.6
Environmental Specifications							
Temperature (°C)							
Operating	0 to 65	0 to 65	0 to 65	0 to 65	0 to 65	0 to 65	0 to 65
Non-operating	-40 to 70	-40 to 70	-40 to 70	-40 to 70	-40 to 70	-40 to 70	-40 to 70
Shock (Gs)							
Operating, (2 ms, read/write)	40	40	30	30	30	30	30
Operating, (2 ms, read)	40	40	50	50	50	50	65
Non-operating (2 ms)	200	200	250	250	250	250	300
Acoustics (dBA)							
Idle	20	20	20	20	20	20	20
Seek (average)	32	32	32	36	36	36	36
Physical Dimensions							
Height (in./mm, max)	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1
Length (in./mm, max)	5.787/147	5.787/147	5.787/147	5.787/147	5.787/147	5.787/147	5.787/147
Width (in./mm, ± .01 in.)	4/101.6	4/101.6	4/101.6	4/101.6	4/101.6	4/101.6	4/101.6
Weight (lb/kg , ± 10%)	1.48/0.67	1.52/0.69	1.52/0.69	1.52/0.69	1.52/0.69	1.52/0.69	1.46/0.66

WD Red® Pro

PRODUCT BRIEF **NAS HARD DRIVES**

Specifications

Model Number[4]	WD102KFBX	WD8005FFBX	WD6005FFBX	WD4005FFBX	WD2002FFSX
Formatted capacity[1]	10TB	8TB	6TB	4TB	2TB
Recording technology	CMR	CMR	CMR	CMR	CMR
Interface	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s	SATA 6 Gb/s
Form factor	3.5-inch	3.5-inch	3.5-inch	3.5-inch	3.5-inch
Drive Technology	Air	Air	Air	Air	Air
RV Sensors	Yes	Yes	Yes	Yes	Yes
Native command queuing	Yes	Yes	Yes	Yes	Yes
OptiNAND™ technology	No	No	No	No	No
Advanced Format (AF)	Yes	Yes	Yes	Yes	Yes
RoHS compliant[5]	Yes	Yes	Yes	Yes	Yes
Performance					
Interface speed (max)	6 Gb/s	6 Gb/s	6 Gb/s	6 Gb/s	6 Gb/s
Internal transfer rate[6]	265 MB/s	267 MB/s	267 MB/s	267 MB/s	164 MB/s
Cache (MB)[1]	256	256	256	256	64
RPM	7200	7200	7200	7200	7200
Reliability/Data Integrity					
Load/unload cycles[7]	600,000	600,000	600,000	600,000	600,000
Non-recoverable errors per bits read	<1 in 10^15	<1 in 10^15	<1 in 10^15	<1 in 10^15	<1 in 10^15
MTBF (hours)[8]	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Workload rate (TB/year)[2]	550	550	550	550	550
Limited warranty (years)[3]	5	5	5	5	5
Power Management[9]					
12VDC ±5% (A, peak)	1.75	2.04	2.0	2.0	1.9
5VDC ±5% (A, peak)					
Average power requirements (W)					
Read/Write	8.4	6.9	6.9	5.8	7.8
Idle	4.6	4.9	4.9	4.0	6.0
Standby and Sleep	0.5	0.3	0.3	0.3	1.4
Environmental Specifications					
Temperature (°C)					
Operating	0 to 65	0 to 65	0 to 65	0 to 65	0 to 65
Non-operating	-40 to 70	-40 to 70	-40 to 70	-40 to 70	-40 to 70
Shock (Gs)					
Operating, (2 ms, read/write)	30	30	30	30	30
Operating, (2 ms, read)	65	65	65	65	65
Non-operating (2 ms)	250	300	300	300	300
Acoustics (dBA)					
Idle	34	29	29	29	29
Seek (average)	38	36	36	36	31
Physical Dimensions					
Height (in./mm, max)	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1	1.028/26.1
Length (in./mm, max)	5.787/147	5.787/147	5.787/147	5.787/147	5.787/147
Width (in./mm, ± .01 in.)	4/101.6	4/101.6	4/101.6	4/101.6	4/101.6
Weight (lb/kg , ± 10%)	1.65/0.75	1.58/0.72	1.58/0.72	1.58/0.72	1.58/0.72

[1] 1MB = 1 million bytes, 1GB = 1 billion bytes and 1TB = 1 trillion bytes. Actual user capacity may be less depending on operating environment.
[2] Annualized Workload Rate = TB transferred x (8760 / recorded power-on hours). The maximum rated workload is specified for operating at typical temperature of 40C. Workload Rate will vary depending on your hardware and software components and configurations.
[3] See http://support.wd.com/warranty for regionally specific warranty details.
[4] Not all products may be available in all regions of the world.
[5] This drive is in compliance with the European Union Directive 2011/65/EU and Directive (EU) 2015/863 on the restriction of the use of certain hazardous substances (RoHS) in electrical and electronic equipment.
[6] Up to stated speed. 1 MB/s = 1 million bytes per second. Based upon read speed, unless otherwise stated. Performance may vary depending upon host device, usage conditions, drive capacity and other factors.
[7] Controlled unload at ambient condition.
[8] Projected Values. When final, MTBF are based on a sample population and are estimated by statistical measurements and acceleration algorithms under typical operating conditions, workload of 220TB/year and drive temperature of 40C. Derating of MTBF will occur above these parameters, up to 550TB writes per year. MTBF do not predict an individual drive's reliability and do not constitute a warranty.
[9] Power measurements at room-ambient temperature.

Western Digital.

5601 Great Oaks Parkway
San Jose, CA 95119, USA
www.westerndigital.com