

### Overview

#### HP Z8 Fury G5 Workstation



#### Front View

1. Integrated Front Handle
2. Power Button
3. HDD Activity LED
4. Headphone/microphone combo
5. Front I/O Premium<sup>2</sup>:  
2 SuperSpeed USB Type-C™ 20 Gbps signaling rate (USB Power Delivery 3.0),  
2 SuperSpeed USB Type-A 5 Gbps signaling rate [left-most Type-A port supports BC1.2 (Battery Charging)]  
  
Front I/O Entry:  
4 SuperSpeed USB Type-A 5 Gbps signaling rate [left-most Type-A ports supports BC1.2 (Battery Charging)]
6. SD Card Reader
7. 2x External 5.25" bay<sup>1</sup>
8. 9.5mm Optical Drive Bay

<sup>1</sup>Only 1 external 5.25" drive configurable from factory

<sup>2</sup>Premium Front IO is shown on photography

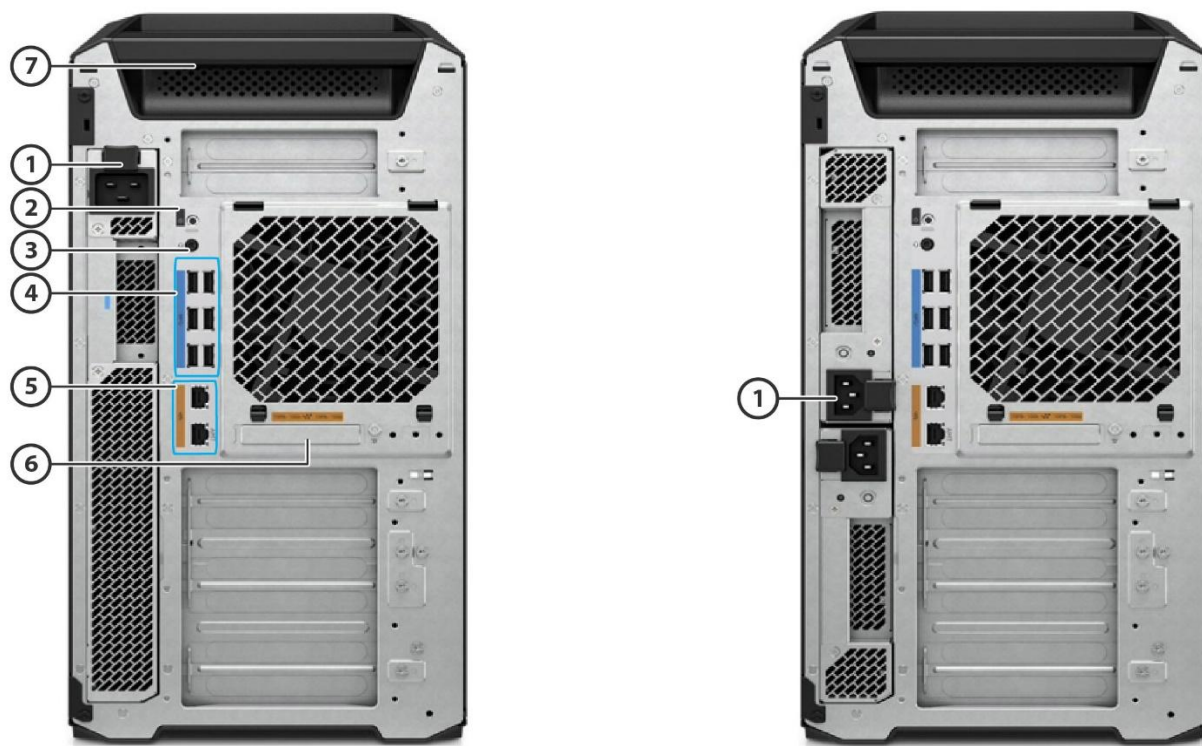
### Overview



### Internal View

1. Intel® Xeon® W-3400 processor (Sapphire Rapids)
2. 16 DIMM slots for DDR5 ECC Memory
3.
  - Slot 1: PCIe x16 Gen5
  - Slot 2: PCIe x4 Gen5
  - Slot 3: PCIe x16 Gen5
  - Slot 4: PCIe x4 Gen4
  - Slot 5: PCIe x16 Gen4
  - Slot 6: PCIe x8 Gen3
  - Slot 7: PCIe x16 Gen4
  - Slot 8: PCIe x4 Gen4
4. 2 PCIe x8 Gen4 configurable with 4x Z Turbo M.2 SSDs
5. 6 SATA ports
6. 3 Internal USB ports. 1 single USB2.0 port, 1 dual USB2.0 port, 1 USB3.0 port (for the SD card reader).
7. 4 Internal 3.5" bays
8. 2 External 5.25" bays and Slimline Optical Drive
9. 2 Internal NVMe connector to front removable M.2 carrier

### Overview



### Rear View

1. Choice of 90% Efficient Power Supplies:
  - Single 1125W @110V or 1450W @200V
  - Dual 1125W @110V or 1450W @200V (configurable in redundant mode or 2250W aggregate mode)
2. Rear Power Button
3. Audio in/out
4. 6 SuperSpeed USB Type-A 5 Gbps signaling rate
5. 2 RJ-45 integrated LAN ports (1 GbE AMT, 1GbE)
6. 2 10GbE LAN ports (optional)
7. Integrated Rear Handle

**Form Factor** Tower

### Operating Systems

#### Preinstalled:

- Windows 11 Pro 64 for Workstations<sup>2</sup>
- Windows 11 Pro for Workstations (preinstalled with Windows 10 Pro for Workstations Downgrade)<sup>2,3</sup>
- Ubuntu 22.04 LTS<sup>4</sup>
- HP Linux<sup>®</sup>-ready (minimal OS ready for customer OS installation)<sup>5</sup>

#### License Only:

- Red Hat<sup>®</sup> Enterprise Linux<sup>®</sup> Desktop Workstation (includes paper license with 1 year support; no preinstalled OS)<sup>6</sup>

#### Supported:

- Windows 11, version 22H2, 21H2<sup>2</sup>
- Windows 10, version 22H2, 21H2<sup>2</sup>
- Red Hat<sup>®</sup> Enterprise Linux<sup>®</sup> Workstation 8 & 9<sup>6</sup>
- SUSE Linux<sup>®</sup> Enterprise Desktop 15<sup>6</sup>

### Overview

- Ubuntu 20.04 & 22.04 LTS<sup>5</sup>

Web-supported only:

- Windows 11 Enterprise<sup>2,1</sup>
- Windows 10 Enterprise<sup>2,1</sup>

#### Operating System Design Behavior:

-Memory and rear chassis fans will spin at lowest achievable speed when unit enters into Sleep Mode. This is by engineering design to cool the higher wattage of DDR5 ECC memory. This allows the memory to stay within thermal specifications.

<sup>1</sup> Windows Enterprise sold separately and requires that customer have an enterprise license from Microsoft.

<sup>2</sup> Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows is automatically updated and enabled. High speed internet and Microsoft account required. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com>.

<sup>3</sup>This system is preinstalled with Windows 10 Pro software and also comes with a license for Windows 11 Pro software and provision for recovery software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.

<sup>4</sup> Not all features are available in all editions or versions of Ubuntu. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS to take full advantage of Ubuntu functionality. Ubuntu may be automatically updated. ISP fees may apply and additional requirements may apply over time for updates.

<sup>5</sup>A certified preloaded version of Ubuntu® 20.04 LTS is available from HP for this platform. Not all features are available in all editions or versions of Ubuntu. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS to take full advantage of Ubuntu functionality. Ubuntu may be automatically updated. ISP fees may apply, and additional requirements may apply over time for upgrades.

<sup>6</sup>For detailed Linux® OS/hardware support information, see:  
[http://www.hp.com/support/linux\\_hardware\\_matrix](http://www.hp.com/support/linux_hardware_matrix)

**NOTE:** Your product does not support Windows 8 or Windows 7. In accordance with Microsoft's support policy, HP does not support the Windows® 8 or Windows 7 operating system on products configured with Intel® and AMD® 7th generation and forward processors or provide any Windows® 8 or Windows 7 drivers on <http://www.support.hp.com>. A full list of HP products and the Windows 10 versions tested is available on the HP support website. <https://support.hp.com/us-en/document/c05195282>

### Overview

#### Processors

Name <sup>1</sup>	Cores	Threads	Frequency (GHz)			Cache (MB)	Max Memory Speed (MT/s)	TDP (W)
			Base Frequency	Max Turbo Frequency <sup>2</sup>	ITBM 3.0 Frequency <sup>2</sup>		1 DIMM per Channel	
Intel® Xeon® W9-3595X	60	120	2.0	4.8	4.8	112.5	4800	385
Intel® Xeon® W9-3575X	44	88	2.2	4.8	4.8	97.5	4800	340
Intel® Xeon® W7-3565X	32	64	2.5	4.8	4.8	82.5	4800	335
Intel® Xeon® W7-3555	28	56	2.7	4.8	4.8	75	4800	325
Intel® Xeon® W7-3545	24	48	2.7	4.8	4.8	67.5	4800	310
Intel® Xeon® W5-3535X	20	40	2.9	4.7	4.8	52.5	4800	300
Intel® Xeon® W5-3525	16	32	3.2	4.6	4.8	45	4800	290
Intel® Xeon® W5-3433	16	32	2.	4.2	4.2	45	4400	220
Intel® Xeon® W5-3425	12	24	3.2	4.6	4.6	30	4800	270
Intel® Xeon® W5-3423	12	24	2.1	4.2	4.2	30	4400	220

#### Notes:

- Xeon W-3400 processors all feature Intel® vPro® Technology<sup>3</sup>
- Xeon W-3400 processors all support Hyper-Threading
- Xeon W-3400 processors do not offer integrated graphics

<sup>1</sup> Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.

<sup>2</sup> Intel Turbo Boost Max (ITBM) performance varies depending on hardware, software and overall system configuration. See <http://www.intel.com/technology/turboboost> for more information.

<sup>3</sup> Intel vPro® requires Windows 10 Pro 64 bit or higher, a vPro supported processor, vPro enabled chipset, vPro enabled wired LAN and/or Wi-Fi 6E WLAN and TPM 2.0. Some functionality requires additional 3rd party software in order to run. Features of vPro® Essentials and Enterprise vary. See <http://intel.com/vpro>

### Overview

<b>Color</b>	Black
<b>Convertibility</b>	No
<b>Expansion Slots</b> (see system board section for more details)	<ul style="list-style-type: none"> <li>•Slot 1: PCIe x16 Gen5</li> <li>•Slot 2: PCIe x4 Gen5</li> <li>•Slot 3: PCIe x16 Gen5</li> <li>•Slot 4: PCIe x4 Gen4</li> <li>•Slot 5: PCIe x16 Gen4</li> <li>•Slot 6: PCIe x8 Gen3</li> <li>•Slot 7: PCIe x16 Gen4</li> <li>•Slot 8: PCIe x4 Gen4</li> </ul>
<b>Expansion Bays</b> (see storage section for more details)	4 internal 3.5" bays (All 4 include acoustic dampening rail assemblies) 2 external 5.25" bays (175mm depth limit) 1 dedicated 9.5mm slim optical disk drive bay
<b>Front I/O</b>	Front I/O Premium: 2 SuperSpeed USB Type-C™ 20 Gbps signaling rate (USB Power Delivery 3.0), 2 SuperSpeed USB Type-A 5 Gbps signaling rate, 1 headphone/microphone combo, SD card reader (optional). [left-most Type-A ports supports BC1.2 (Battery Charging)]
<b>Internal I/O [5]</b>	Front I/O Entry: 4 SuperSpeed USB Type-A 5 Gbps signaling rate, 1 headphone/microphone combo, SD card reader (optional). [left-most Type-A ports supports BC1.2 (Battery Charging)] 3 Internal USB ports and 6 SATA ports
<b>Rear I/O</b>	Audio in/out, 6 SuperSpeed USB Type-A 5 Gbps signaling rate, 2 RJ-45 integrated LAN ports (1 GbE AMT, 1 GbE)
<b>Optional I/O</b>	2 10GbE LAN ports
<b>On-board RAID Support</b>	RAID 0 Striped Array RAID 1 Mirrored Array RAID 10 Striped/Mirrored RAID 5 Parity Array (See System Board section for further details and configuration options)
<b>Chassis Dimensions (H x W x D)</b>	Footprint: H: 17.5" [444.5mm] W: 8.5" [215.9mm] D: 21.7" [551.2mm] (measured to the rear of service panel) Maximum: H: 17.5" [444.5mm] W: 8.5" [215.9mm] D: 21.85" [555.2mm] (measured to the embossment for the rear chassis fans)
<b>Packaged Dimensions</b>	H: 25" (636mm) W: 13.1" (332mm) D: 28.9" (734mm)
<b>Palletization Profile</b>	4 units x 3 layers = 12 units per pallet 1200x1000x2034mm (pallet included)
<b>Rack Dimensions</b>	5U
<b>Weight</b>	Exact weights depend upon configuration (System weight only). Minimum: 22kg (48.9lbs.) Typical: 23.1kg (50.9lbs.) Maximum: 36kg (79.4lbs.)
<b>Temperature</b>	Operating: 5° to 40°C (40° to 104°F) <sup>1</sup> Non-operating: -40° to 60°C (-40° to 140°F) Above 1524 m (5,000 feet) altitude, the maximum operating temperature is reduced by 1° C (1.8° F) for every 305 m (1,000 feet) increase in elevation Maximum rate of change: 10 °C/hr



### Overview

No direct sustained sunlight

<sup>1</sup>40°C has been validated for configs up to a 300W CPU, 2x NVIDIA® RTX A4000 graphics cards, 8x64GB RAM, 4x 2TB M.2 storage, 2x 2TB HDD storage, and 1125W full-height PSU

#### Humidity

Operating: 8% to 85% RH, non-condensing, 35° C maximum wet bulb  
Non-operating: 8% to 90%, non-condensing, 35° C maximum wet bulb

#### Maximum Altitude (non-pressurized)<sup>6</sup>

Operating (with Rotational Hard Drives): 3,048 m (10,000 feet)  
Operating (with only Solid-State Drives): 5,000 m (16,404 feet)

Non-operating: 12,192 m (40,000ft)

Note: Above 1524 m (5,000 feet) altitude, maximum operating temperature is reduced by 1° C (1.8° F) per 305 m (1,000 feet) increase in elevation.

#### Power Supply

Choice of 80 Plus Gold (90% efficiency at 50% load) Power Supplies:

- Single 1125W @110V or 1450W @200V ([Delta Efficiency Report](#))
- Dual 1125W @110V or 1450W @200V ([Delta Efficiency Report](#)) (configurable in redundant mode or 2250W aggregate mode)

Note: not all configurations are supported on all power supplies. Configuration support depends on total system power budget and having sufficient number or type of PCIe supplemental power connectors. Confirm power supply and configuration support using configurator on [hp.com](http://hp.com).

- 1125W supports up to 600W of auxiliary graphics power (dependent on system configuration)
- 1450W supports up to 900W of auxiliary graphics power (dependent on system configuration)
- 2250W supports up to 1200W of auxiliary graphics power (dependent on system configuration)

Note: updating graphics after purchase may require additional power distribution cables and/or auxiliary graphics adapters to support the new graphics configuration.

#### Workstation ISV Certifications

See the latest list of certifications at

<http://www.hp.com/united-states/campaigns/workstations/partnerships.html>

#### Chipset

Intel® W790 chipset

#### Memory

16 DIMM slots, supporting 25 HP Wolf Pro Security Edition is available preloaded on select SKUs, and, depending on the HP product purchased, includes a license with a term length communicated to you at purchase and in your order confirmation email. The HP Wolf Pro Security Edition software is licensed under the license terms of the HP Wolf Security Software - End-User license Agreement (EULA) that can be found at: [https://support.hp.com/us-en/document/ish\\_3875769-3873014-16](https://support.hp.com/us-en/document/ish_3875769-3873014-16) as that EULA is modified by the following: 7. Term. Unless otherwise terminated earlier pursuant to the terms contained in this EULA, the license for the HP Wolf Pro Security Edition is effective upon 4 months after the date the HP Product was shipped by HP and will continue for the term communicated to you at purchase and in your order confirmation email ("Initial Term"). At the end of the Initial Term you may either (a) purchase a renewal license for the HP Wolf Pro Security Edition from HP.com, HP Sales or an HP Channel Partner, or (b) continue using the standard versions of HP Sure Click and HP Sure Sense at no additional cost with no future software updates or HP Support. Notwithstanding the foregoing, the license shall expire no later than one year after the fixed term of the subject license ends. up to 2TB RDIMMs, DDR5 4800 MT/s speed depending on the system configuration

### Supported Components

#### Processors

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
<b>Intel® Xeon® W-3400 processors</b>				
Intel® Xeon® W9-3595X	Y	N		
Intel® Xeon® W9-3575X	Y	N		
Intel® Xeon® W7-3565X	Y	N		
Intel® Xeon® W7-3555	Y	N		
Intel® Xeon® W7-3545	Y	N		
Intel® Xeon® W5-3535X	Y	N		
Intel® Xeon® W5-3525	Y	N		
Intel® Xeon® W5-3433	Y	N		
Intel® Xeon® W5-3425	Y	N		
Intel® Xeon® W5-3423	Y	N		

#### SATA Hard Drives

	Factory Configured	Option Kit	Option Kit Part Number
1TB 7200RPM SATA 3.5in Enterprise HDD	Y	Y	W0R10AA
2TB 7200RPM SATA 3.5in Enterprise HDD	Y	Y	2Z274AA
4TB 7200RPM SATA 3.5in Enterprise HDD	Y	Y	K4T76AA/AT
8TB 7200RPM SATA 3.5in Enterprise HDD	Y	Y	2Z273AA
12TB 7200RPM SATA-6G 3.5in Enterprise HDD	Y	Y	5S461AA
1TB 7200RPM SATA 3.5" Enterprise HDD (not-made-in-China)	Y	N	
2TB 7200RPM SATA 3.5in Enterprise HDD (not-made-in-China)	Y	N	

**NOTE:** Starting November 1, 2023, HP PCs with Windows require Windows to be installed on SSD. HDD can only be configured as additional data drives and not as the boot drive.

#### PCIe Solid State Drives

	Factory Configured	Option Kit	Option Kit Part Number
Z Turbo 512GB 2280 PCIe-4x4 TLC SSD <sup>4</sup>	Y	N	
Z Turbo 512GB 2280 PCIe-4x4 SED OPAL2 TLC M.2 SSD <sup>4</sup>	Y	N	
Z Turbo 512GB 2280 PCIe-4x4 TLC SSD (not-made-in-China)	Y	N	
Z Turbo 1TB 2280 PCIe-4x4 SED OPAL2 TLC M.2 SSD <sup>4</sup>	Y	Y	38T76AA
Z Turbo 1TB 2280 PCIe-4x4 TLC SSD <sup>4</sup>	Y	Y	38T77AA
Z Turbo 1TB 2280 PCIe-4x4 TLC SSD (not-made-in-China)	Y	N	
Z Turbo 1TB 2280 PCIe-4x4 TLC Z8 Kit SSD <sup>5</sup>	N	Y	360H5AA
HP 1TB 2280 PCIe-4x4 NVMe M.2 India Solid State Drive <sup>4</sup>	Y	Y	9A1X3AA
Z Turbo 2TB 2280 PCIe-4x4 SED OPAL2 TLC M.2 SSD <sup>4</sup>	Y	Y	38T79AA
Z Turbo 2TB 2280 PCIe-4x4 TLC SSD <sup>4</sup>	Y	Y	38T75AA
Z Turbo 2TB 2280 PCIe-4x4 SED OPAL2 TLC M.2 Z8 Kit SSD <sup>5</sup>	N	Y	360H1AA
HP 2TB 2280 PCIe-4x4 NVMe M.2 India Solid State Drive <sup>4</sup>	Y	Y	9A1X2AA
Z Turbo 4TB 2280 PCIe-4x4 TLC M.2 SSD <sup>4</sup>	Y	Y	5S496AA/AT



### Supported Components

Z Turbo 4TB 2280 PCIe-4x4 SED OPAL2 TLC M.2 SSD <sup>4</sup>	Y	Y	5S497AA/AT
Z Turbo 4TB 2280 PCIe-4x4 SED OPAL2 TLC M.2 Z8 Kit SSD <sup>5</sup>	Y	Y	5S4A0AA
HP Z Turbo 8TB PCIe-4x4 2280 NVMe M.2 SSD	Y	N	
<b>HP Z Turbo Drive Dual Pro</b>			
HP Z Turbo Drive Dual Pro PCIe-4x4 NVMe Carrier <sup>1</sup>	Y	Y	56Q86AA
HP Z Turbo Drive Dual Pro 512GB TLC SSD	Y	N	
HP Z Turbo Drive Dual Pro 1TB TLC SSD	Y	N	
HP Z Turbo Drive Dual Pro 2TB TLC SSD	Y	N	
HP Z Turbo Drive Dual Pro 4TB TLC SSD	Y	N	
<b>HP Z Turbo Drive Quad Pro</b>			
HP Z Turbo Drive Quad Pro PCIe-4x16 NVMe Carrier <sup>1</sup>	Y	Y	7H9Z3AA
HP Z Turbo Drive Quad Pro 512GB TLC SSD	Y	N	
HP Z Turbo Drive Quad Pro 1TB TLC SSD	Y	N	
HP Z Turbo Drive Quad Pro 2TB TLC SSD	Y	N	
HP Z Turbo Drive Quad Pro 4TB TLC SSD	Y	N	
<b>Intel® Virtual RAID on CPU (Intel® VROC) for NVMe</b>			
Intel VROC NVMe SSD Premium Ctlr Module <sup>3</sup>	N	Y	3FJ81AA
Intel VROC NVMe SSD Standard Ctlr Module <sup>2</sup>	Y	Y	3FJ80AA

**Note 1:** Kit includes carrier and heatsink. Requires separate purchase of Z Turbo PCIe 4x4 M.2 SSD modules.

**Note 2:** Enables RAID 0, 1 & 10

**Note 3:** Enables RAID 0, 1 & 10 plus RAID 5 with write hole closure options

**Note 4:** Does not include a heatsink.

**Note 5:** Includes a heatsink.

**NOTE:** Internal M.2 PCIe SSDs are installed using HP Personality Card (up to 2 Personality Cards per system). Each Personality Card can support two M.2 drives.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

Graphics		Factory Configured	Option Kit	Option Kit Part Number	Supported # of cards
<b>Graphics Cable Adapters</b>	HP DisplayPort to HDMI Adapter	Y	Y	2JA63AA	
	HP DisplayPort to VGA Adapter	N	Y	AS615AA	
	HP DisplayPort to VGA Adapter	N	Y	F7W97AA	
	HP miniDP-to-DP Adapter Cable (single)	Y	Y	2MY05AA	
	HP miniDP-to-DP Adapter Cable (2-pack)	Y	N		
	HP miniDP-to-DP Adapter Cable (4-pack)	Y	N		
	HP miniDP-to-DP Adapter Cable (8-pack)	Y	N		
	HP miniDP-to-DP Adapter Cable (Bulk 12)	N	Y	2KW87A6	
	HP Graphics Power Cable CPU-8p to CPU-8p <sup>1</sup>	N	Y	6J6H7AA	
	HP Graphics Power Cable CPU-8p to x2 PCIe 8p(6+2) <sup>1</sup>	N	Y	6J6H8AA	
	NVIDIA 3D Stereo Bracket	N	Y	K0A25AA	
	RTX PRO 6000 Z8 Fury G5 Retrofit Kit <sup>4</sup>	N	Y	CA0E3AA	
	NVIDIA® A800 40 GB Graphics <sup>3</sup>	Y	Y	8D6C0AA	3
<b>Compute</b>					

### Supported Components

<b>Ultra High-End Graphics</b>	NVIDIA® RTX PRO 6000 Blackwell 96GB <sup>4</sup>	Y	Y	B11F0AA	1
	NVIDIA® RTX PRO 6000 Max-Q Blackwell 96GB	Y	Y	B11E9AA	4
<b>High-End Graphics</b>	NVIDIA® RTX 6000 Ada 48GB	Y	Y	79C23AA	4
	NVIDIA RTX 5880 Ada 48 GB 4DP Graphics	Y	Y	9Z7P5AA	4
	NVIDIA® RTX PRO 5000 Blackwell 48GB	Y	Y	B11F1AA	4
	NVIDIA RTX 5000 Ada 32 GB 4DP Graphics	Y	Y	8D6B6AA	4
	NVIDIA® Quadro® Sync II	N	Y	1WT20AA	1
	NVIDIA® RTX PRO Sync Card <sup>3</sup>	N	Y	C08YVAA	1
	NVIDIA® RTX PRO 4500 Blackwell 32GB	Y	Y	B11F2AA	4
	NVIDIA® RTX 4500 Ada 24GB	Y	Y	8D6C1AA	4
	NVIDIA® RTX PRO 4000 Blackwell 24GB	Y	Y	B11F3AA	4
	NVIDIA® RTX 4000 Ada 20GB	Y	Y	8D6B7AA	4
<b>Midrange Graphics</b>	NVIDIA® RTX 2000 Ada 16 GB	Y	Y	8D6B8AA	2
	NVIDIA RTX 2000E Ada 16 GB 4mDP Graphics	Y	Y	C81TMAA	4
	AMD® Radeon™ Pro W7600 8GB	Y	Y	8D6B9AA	3
	AMD® Radeon™ Pro W7500 8GB	Y	Y	8D6C2AA	3
<b>Entry Graphics</b>	NVIDIA RTX A1000 8 GB 4mDP 4th Graphics	Y	Y	AV8J4AA	4
	NVIDIA T1000 4 GB LP Blower Fan 4mDP PCIe16 Graphics	Y	Y	20X22AA	4
	NVIDIA® Long-Life T1000E 8GB	Y	Y	6V9V4AA	6
	NVIDIA RTX A400 4 GB 4mDP Graphics	Y	Y	AV8J3AA	4
	NVIDIA® T400E 4 GB 4mDP Graphics	Y	Y	A4HP3AA	4
	AMD® Radeon™ RX 6400 4GB	Y	Y	6Q3U4AA	1
	Intel Arc Pro A40 6GB	Y	Y	6E3Y8AA	1

**Note 1:** Required for select graphics configurations.

**Note 2:** The NVIDIA® A800 is meant for GPU compute and does not have video outputs. A graphics card must be configured in addition with the A800.

**Note 3:** The NVIDIA® RTX™ PRO Sync Card is the next generation of the NVIDIA® Quadro® Sync II, offering the same functionality and compatibility.

**Note 4:** Installation of the NVIDIA RTX™ PRO 6000 Blackwell (non-CTO/BTO configurations) requires an additional Retrofit Kit CA0E3AA.

### Memory

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
16GB (1x16GB) DDR5 4800 DIMM ECC REG Memory (not-made-in-China)	Y	N		
32GB (2x16GB) DDR5 4800 DIMM ECC REG Memory	Y	N		
32GB (2x16GB) DDR5 4800 DIMM ECC REG Memory (not-made-in-China)	Y	N		
64GB (4x16GB) DDR5 4800 DIMM ECC REG Memory	Y	N		
64GB (4x16GB) DDR5 4800 DIMM ECC REG Memory (not-made-in-China)	Y	N		
64GB (2x32GB) DDR5 4800 DIMM ECC REG Memory	Y	N		
96GB (6x16GB) DDR5 4800 DIMM ECC REG Memory	Y	N		
128GB (8x16GB) DDR5 4800 DIMM ECC REG Memory	Y	N		
128GB (4x32GB) DDR5 4800 DIMM ECC REG Memory	Y	N		

### Supported Components

192GB (6x32GB) DDR5 4800 DIMM ECC REG Memory	Y	N	
256GB (16x16GB) DDR5 4800 DIMM ECC REG Memory	Y	N	
256GB (8x32GB) DDR5 4800 DIMM ECC REG Memory	Y	N	
256GB (4x64GB) DDR5 4800 DIMM ECC REG Memory	Y	N	
256GB (2x128GB) DDR5 4800 DIMM ECC REG Memory	Y	N	
512GB (16x32GB) DDR5 4800 DIMM ECC REG Memory	Y	N	
512GB (8x64GB) DDR5 4800 DIMM ECC REG Memory	Y	N	
512GB (4x128GB) DDR5 4800 DIMM ECC REG Memory	Y	N	
1TB (16x64GB) DDR5 4800 DIMM ECC REG Memory	Y	N	
1TB (8x128GB) DDR5 4800 DIMM ECC REG Memory	Y	N	
2TB (16x128GB) DDR5 4800 DIMM ECC REG Memory	Y	N	
<b>After Market Options</b>			
16GB (1x16GB) DDR5 4800 DIMM ECC REG Memory	Y	Y	340K1AA
32GB DDR5 (1x32GB) 4800 DIMM ECC REG Memory	N	Y	340K2AA
32GB (1x32GB) DDR5 4800 DIMM ECC Registered India Memory	Y	Y	99T40AA
64GB DDR5 (1x64GB) 4800 DIMM ECC REG Memory	N	Y	340K3AA

**NOTE:** When configuring the system with 2 DIMMS per channel (DPC), max memory speed will decrease from 4800MHz to 4400MHz. The CPUs determine the speed at which the memory is clocked. For example, if a 4800MHz capable CPU is used in the system, the maximum speed the memory will run at is 4800MHz regardless of the specified speed of the memory.

### Supported Components

#### Multimedia and Audio Devices

	Factory Configured	Option Kit	Option Kit Part Number
Integrated Realtek ALC3205-CG Audio	Y	N	

#### Optical and Removable Storage

	Factory Configured	Option Kit	Option Kit Part Number
HP CRU QX448 Removable with 185mm Cable (Qty 2) Frame/Carrier <sup>1,4</sup>	Y	N	
HP CRU Secure High Performance Storage Module with 4TB M.2 SSD <sup>5</sup>	Y	N	-
HP DX175 Removable HDD Frame/Carrier <sup>2</sup>	Y	Y	1ZX71AA
HP CRU Secure High Performance Storage Module with 2TB M.2 SSD <sup>3</sup>	Y	Y	56Q87AA
HP CRU Secure High Performance Storage Module with 1TB M.2 SSD <sup>3</sup>	Y	Y	56Q88AA
HP CRU Secure High Performance Storage Module with 512GB M.2 SSD <sup>3</sup>	Y	Y	56Q89AA
HP 9.5mm Slim DVD-ROM Drive	Y	Y	K3R63AA
HP 9.5mm Slim BDXL Blu-Ray Writer Drive	Y	Y	K3R65AA
HP 9.5mm Slim SuperMulti DVD Writer	Y	Y	K3R64AA

**Note 1:** Optional separate purchase of HP CRU Secure High Performance Storage (SHIPS) Module(s).

**Note 2:** Only supports 4TB or lower capacity HDDs.

**Note 3:** HP CRU SHIPS Module Kit contains select M.2 SSD for install into a factory configured front removeable storage carrier (HP CRU QX448 Frame/Carrier).

**Note 4:** Front QX448 carrier supports hot-swap capability with front removable drives

**Note 5:** Some double-sided M.2 SSDs may throttle during heavy use, resulting in lower read and write speeds. This behavior is by design in order to protect the SSD from over-heating.

#### Networking and Communications

	Factory Configured	Option Kit	Option Kit Part Number
HP Dual Port 10GbE NIC G2 <sup>2</sup>	Y	Y	360K6AA
Intel® X550 10GBASE-T Dual Port NIC	Y	Y	1QL46AA
Intel® I225-T1 Single Port 2.5GbE PCIe NIC	Y	Y	406L9AA
Intel® Ethernet I350-T4 4-Port 1Gb NIC	N	Y	W8X25AA
Allied Telesis AT-2914SX/LC-901 1GB LC Fiber NIC	Y	Y	1C7Q2AA
Allied Telesis AT-2911T/2-901 Dual Port 1GbE NIC	Y	Y	6E3Y9AA/AT
NVIDIA® Mellanox® ConnectX-6 DX Dual Port 10/25GbE SFP28 NIC <sup>1</sup>	Y	Y	436M8AA
Intel E810-CQDA2 1x100GbE/2x50GbE QSFP28 PCIe Network Adapter <sup>1</sup>	Y	Y	D05X1AA
HP 10GbE SFP+ SR/SW LC Fiber Optic Transceiver	Y	Y	860T8AA
HP 25GbE SFP28 LC Fiber Optic Transceiver	Y	Y	860T9AA
Intel AX210 Wi-Fi 6E non-vPro + Bluetooth® 5.2 wireless card with External Antenna WLAN	Y	Y	340L7AA

**Note1:** Current HP transceiver offerings are rated for single speed only. The HP 25GbE SFP28 LC Fiber Optic Transceiver officially only supports 25Gbps. The HP 10GbE SFP+ SR/SW LC Fiber Optic Transceiver officially only supports 10G. Please select the appropriate transceiver to match the speed of the network or infrastructure that the system will be connected to.

### Supported Components

**Note 2:** available in Fall 2023

#### HP Remote System Controller

	Factory Configured	Option Kit	Option Kit Part Number
HP Remote System Controller	Y	Y	7K6D7AA
HP Remote System Controller Main Board Adapter	Y	Y	7K6D8AA
HP Integrated Remote System Controller	Y	Y	7K6D9AA
HP Remote System Controller for Universal KVM	N	Y	7K7N2AA

#### Racking and Physical Security

	Factory Configured	Option Kit	Option Kit Part Number
HP Z640/Z840/Z8 G4 Rail Rack Kit	N	Y	2FZ77AA/AT
HP Z8 Rack Rail Upgrade Kit	N	Y	2FZ76AA/AT

#### Input Devices

	Factory Configured	Option Kit	Option Kit Part Number
HP 320K Wired Keyboard	Y	Y	9SR37AA/ET/UT
HP 125 Wired Keyboard	Y	Y	266C9AA/ET/UT
HP 975 USB+BT Dual-Mode Wireless Keyboard	N	Y	3Z726AA/ET/UT
HP 455 Programmable Wireless Keyboard	N	Y	4R177AA/ET/UT/A6
HP Wired Desktop 320MK Mouse and Keyboard	N	Y	9SR36AA/ET/UT
HP 655 Wireless Keyboard and Mouse Combo	N	Y	4R009AA/ET/UT/A6
HP Wired 320M Mouse	Y	Y	9VA80AA/ET/UT
HP Creator 935 Black Wireless Mouse	N	Y	1D0K8AA/ET/UT
HP 128 LSR Wired Mouse	Y	Y	265D9AA/ET/UT
HP Business Slim Smartcard Keyboard	Y	Y	Z9H48AA/AT

**Note:** Keyboard and Mouse are optional or add on features.

#### Other Hardware

	Factory Configured	Option Kit	Option Kit Part Number
HP Dual Thunderbolt4 PCIe x4 Low Profile Card	Y	Y	340L1AA
HP Type-C SuperSpeed USB 20Gbps Front IO v2 Premium Module	Y	Y	38T92AA
1125/1450W Z8 Fury EPA90 Redundant Power Supply <sup>2</sup>	Y	Y	6E3Z5AA
HP Internal Serial+PS/2 Port	Y	Y	56Q78AA
HP USB 2.0 Type-A Port Adapter Kit <sup>4</sup>	Y	Y	79C24AA
HP SD Card Reader Zx G4	Y	N	
HP 2.5in HDD/SSD 2-in-1 Optical Bay Bracket	N	Y	K4T74AA
HP 2.5in to 3.5in HDD Adapter Kit	N	Y	J5T63AA/A6
HP Optical Bay HDD Mounting Bracket <sup>3</sup>	N	Y	NQ099AA
HP C13 1.83m Power Cord Kit (halogen-free)	Y	N	
HP C13 1.83m Power Cord Kit	Y	Y	6Z1T9AA

### Supported Components

C13-C14 2.0m 15A 100-127V Countries Straight Desktop Power Cord	Y	Y	8R881AA
C13-C14 2.0m 10A 200-240V Countries Straight Desktop Power Cord	Y	Y	8R882AA

**Note 2:** This kit should be used with a power cord from kit 6Z1T9AA. Separate purchase of 6Z1T9AA required.

**Note 3:** NQ099AA HP Optical Bay HDD Mounting Bracket is required as a separate purchase for HDD option kits installed into an external bay.

**Note 4:** The USB 2.0 Type-A Port Adapter Kit has a single USB 2.0 type A connector.

### Software

	Factory Configured	Option Kit	Support Notes
HP Anyware	Y	N	
HP Performance Advisor	Y	N	1
HP PC Hardware Diagnostics UEFI (Windows OS only)	Y	N	2
HP PC Hardware Diagnostics Windows	Y	N	
HP Wolf Security	Y	N	3
HP Notifications	Y	N	
HP Desktop Support Utility	Y	N	
HP Documentation	Y	N	
myHP	Y	N	
HP Easy Clean	Y	N	
Kingsoft WPS Office	Y	N	4
Z by HP Data Science Stack Manager	Y	N	5, 6
WSL2/Ubuntu Data Science Stack	Y	N	5
HP Image Assistant	N	N	
HP Support Assistant	N	N	
HP Smart Health	N	N	
Wolf Pro Security			7

**Note 1:** Supported with Windows only. Also available as a free download from <http://www.hp.com/go/performanceadvisor>

**Note 2:** Windows OS only

**Note 3:** Not available in Russia

**Note 4:** Not available in China

**Note 5:** Only available with NVIDIA® graphics

**Note 6:** Only available with Ubuntu

**Note 7:** HP Wolf Pro Security Edition is available preloaded on select SKUs, and, depending on the HP product purchased, includes a license with a term length communicated to you at purchase and in your order confirmation email. The HP Wolf Pro Security Edition software is licensed under the license terms of the HP Wolf Security Software - End-User license Agreement (EULA) that can be found at: [https://support.hp.com/us-en/document/ish\\_3875769-3873014-16](https://support.hp.com/us-en/document/ish_3875769-3873014-16) as that EULA is modified by the following: 7. Term. Unless otherwise terminated earlier pursuant to the terms contained in this EULA, the license for the HP Wolf Pro Security Edition is effective upon 4 months after the date the HP Product was shipped by HP and will continue for the term communicated to you at purchase and in your order confirmation email ("Initial Term"). At the end of the Initial Term you may either (a) purchase a renewal license for the HP Wolf Pro Security Edition from HP.com, HP Sales or an HP Channel Partner, or (b) continue using the standard versions of HP Sure Click and HP Sure Sense at no additional cost with no future software



### Supported Components

updates or HP Support. Notwithstanding the foregoing, the license shall expire no later than one year after the fixed term of the subject license ends.

---

#### Operating Systems Windows 11 Pro for Workstations<sup>1,2</sup>

Windows 11 Pro for Workstations (preinstalled with Windows 10 Pro for Workstations Downgrade)<sup>1,2,3</sup>

Ubuntu 22.04 LTS<sup>4</sup>

HP Linux®-ready

<sup>1</sup> Windows Enterprise sold separately and requires that customer have an enterprise license from Microsoft.

<sup>2</sup> Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows is automatically updated and enabled. High speed internet and Microsoft account required. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com>.

<sup>3</sup>This system is preinstalled with Windows 10 Pro software and also comes with a license for Windows 11 Pro software and provision for recovery software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.

<sup>4</sup> Not all features are available in all editions or versions of Ubuntu. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS to take full advantage of Ubuntu functionality. Ubuntu may be automatically updated. ISP fees may apply and additional requirements may apply over time for updates.

**NOTE:** Your product does not support Windows 8 or Windows 7. In accordance with Microsoft's support policy, HP does not support the Windows® 8 or Windows 7 operating system on products configured with Intel® and AMD® 7th generation and forward processors or provide any Windows® 8 or Windows 7 drivers on <http://www.support.hp.com>. A full list of HP products and the Windows 10 versions tested is available on the HP support website. <https://support.hp.com/us-en/document/c05195282>

### Supported Components

#### HP BIOS

Key features of the HP BIOS include:

- Deployment and manageability – HP BIOS provides several technologies that help integrate the HP Z8 Fury G5 Workstation into the enterprise, such as PXE, remote recovery, remote configuration, remote control, and BIOS (F10) Setup support for 15 languages.
- Network firmware updates – Update your BIOS via the cloud or standardize on a BIOS version hosted on an Enterprise network.
- Stability – HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification.
- Class 3 UEFI specification version 2.7
- Absolute Persistence agent – For tracking and tracing services, available in select countries, separate software and purchase of a subscription is required.
- Thermal and power management – The HP BIOS provides and enables thermal and power management technologies so component temperatures are managed for high reliability and to assist in operating the HP Workstation computer in any enterprise environment.
- Acoustic performance – Industry leading acoustic emissions across the range of operating conditions.
- Serviceability – HP BIOS provides diagnostic and detailed service information.
- Upgrades and recovery – HP BIOS provides numerous ways to upgrade HP Workstation computers, including BIOS updates from within Windows (HP Firmware Update and Recovery), Capsule update, HP Client Manager, and fail-safe recovery. In addition, the HP BIOS Configuration Utility enables replication of BIOS settings within Windows while the Replicated Setup feature provides the same capability within BIOS (F10) Setup. The BIOS Configuration Utility is available from the HP support website.
- HP BIOS uses PKI signing of the BIOS for trusted BIOS upgrades and recovery. Additional HP BIOS Features:
  - Power-On password – Helps prevent an unauthorized user from powering on the system.
  - Administrator password – Also known as the BIOS Setup password, this helps prevent unauthorized changes to the system configuration. If the administrator password is not known, the BIOS cannot be updated and changes cannot be made to BIOS settings using BIOS Setup or under the OS.
  - S4/S5 Maximum Power Savings setting supports EU Lot6 requirement and allows the computer to power down below 0.5W in S4/S5 (when turned off). When S4/S5 Maximum Power Savings feature is enabled below features are turned off:
    - Power to expansion connectors / slots
    - Most Wake events other than power buttons and WOL (Wake on LAN supported by embedded Lan controller under S4/S5 Maximum Power Saving Enabled)
    - USB charging ports

#### HP Sure Start Gen7

- BIOS Integrity checking – Sure Start protection ensures that only trusted BIOS code is executed and not rootkits, viruses and malware. Verification is done upon boot up, shutdown and while the system is on.
- Sure Start is set by default to automatically repair the BIOS if corrupted or compromised but is policy driven for better manageability. Start is set by default to automatically repair the BIOS if corrupted or compromised but is policy driven for better manageability.
- Protecting beyond BIOS – Integrity checking and repair is extended to other data that should be protected such as network configuration parameters, platform specific information (i.e. system IDs), secure boot credentials, and other code the system needs to boot.
- Audit enabled – System Audit via Sure Start Event Logs capture data such as incident, repair date and time for troubleshooting and investigating.

### Supported Components

## SOFTWARE COMPONENTS AND APPLICATIONS WITH WINDOWS

### BIOS

HP BIOSphere Gen6<sup>13</sup>  
HP DriveLock & Automatic DriveLock  
BIOS Update via Network  
Master Boot Record Security  
Power On Authentication  
Absolute Persistence Module<sup>23</sup>  
Pre-boot Authentication  
HP Wireless Wakeup

### Software

HP Desktop Support Utility  
HP Performance Advisor<sup>1</sup>  
HP Privacy Settings  
HP Notifications  
myHP  
HP Services Scan<sup>25</sup>

### Manageability Features

HP Driver Packs<sup>2</sup>  
HP System Software Manager (SSM)  
HP BIOS Config Utility (BCU)  
HP Client Catalog  
HP Manageability Integration Kit Gen6<sup>3</sup>

### Client Security Software

HP Wolf Security (Including HP Sure Click & HP Sure Sense)<sup>22</sup>  
HP Pro Wolf Security (Including Credential Manager)<sup>18</sup>  
HP Client Security Manager Gen 7<sup>4</sup>  
HP Sure Run<sup>9</sup>  
HP Sure Recover<sup>10</sup>  
HP Power On Authentication  
Microsoft Defender<sup>7</sup>

### Security Management

HP Security Update Service (SUS)  
Secure Erase<sup>16</sup>  
TPM 2.0 Embedded Security Chip(Common Criteria EAL4+ Certified)<sup>24</sup>  
SATA port disablement (viaBIOS)  
Serial, USB enable/disable (viaBIOS)  
Power-on password (viaBIOS)  
Setup password (viaBIOS)  
Support for chassis padlocks and cable lock devices  
Integrated hood sensor<sup>0</sup>  
HP Sure Start Gen4<sup>8</sup>

<sup>1</sup> HP Performance Advisor Software - HP Performance Advisor is ready to help you get the most out of your HP Workstation from day one—and every day after. Learn more or download at: <http://hp.com/PerformanceAdvisor>

<sup>2</sup> HP Driver Packs not preinstalled, however available for download at <http://www.hp.com/go/clientmanagement>.

<sup>3</sup> HP Manageability Integration Kit can be downloaded from <https://ftp.ext.hp.com/pub/caps-softpaq/cmit/HPMIK.html>

<sup>4</sup> HP Client Security Manager Gen7 requires Windows and is available on the select HP PCs.

### Supported Components

<sup>7</sup> Microsoft Defender Opt in and internet connection required for updates.

<sup>8</sup> HP Sure Start Gen 7 is available on select HP PCs and workstations. See product specifications for availability.

<sup>9</sup> HP Sure Run Gen5 is available on select Windows 11 based HP Pro, Elite and Workstation PCs with select Intel® or AMD processors

<sup>10</sup> HP Sure Recover Gen4 is available on select HP PCs and requires Windows 10 and an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data. Network based recovery using Wi-Fi is only available on PCs with Intel Wi-Fi Module

<sup>13</sup> HP BIOSphere Gen6 features may vary depending on the platform and configurations.

<sup>16</sup> Secure Erase - For the methods outlined in the National Institute of Standards and Technology Special Publication 800-88 "Clear" sanitation method. HP Secure Erase does not support platforms with Intel® Optane.

<sup>18</sup> HP Wolf Pro Security Edition is available preloaded on select SKUs, and, depending on the HP product purchased, includes a license with a term length communicated to you at purchase and in your order confirmation email. The HP Wolf Pro Security Edition software is licensed under the license terms of the HP Wolf Security Software - End-User license Agreement (EULA) that can be found at: [https://support.hp.com/us-en/document/ish\\_3875769-3873014-16](https://support.hp.com/us-en/document/ish_3875769-3873014-16) as that EULA is modified by the following: 7. Term. Unless otherwise terminated earlier pursuant to the terms contained in this EULA, the license for the HP Wolf Pro Security Edition is effective upon 4 months after the date the HP Product was shipped by HP and will continue for the term communicated to you at purchase and in your order confirmation email ("Initial Term"). At the end of the Initial Term you may either (a) purchase a renewal license for the HP Wolf Pro Security Edition from HP.com, HP Sales or an HP Channel Partner, or (b) continue using the standard versions of HP Sure Click and HP Sure Sense at no additional cost with no future software updates or HP Support. Notwithstanding the foregoing, the license shall expire no later than one year after the fixed term of the subject license ends.

<sup>22</sup> HP Wolf Security for Business requires Windows 10 or higher, includes various HP security features and is available on HP Pro, Elite, RPOS and Workstation products. See product details for included security features

<sup>23</sup> Absolute agent is shipped turned off, and will be activated when customers activate a purchased subscription. Subscriptions can be purchased for terms ranging multiple years. Service is limited, check with Absolute for availability outside the U.S. The Absolute Recovery Guarantee is a limited warranty. Certain conditions apply. For full details visit: <http://www.absolute.com/company/legal/agreements/computrace-agreement>. Data Delete is an optional service provided by Absolute Software. If utilized, the Recovery Guarantee is null and void. In order to use the Data Delete service, customers must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.

<sup>24</sup> Firmware TPM is version 15.21. Hardware TPM is v2.0.

<sup>25</sup> HP Services Scan is provided with Windows Update on select products and will check entitlement on each hardware device to determine if an HP TechPulse-enabled service has been purchased, and will download applicable software automatically. HP TechPulse is a telemetry and analytics platform that provides critical data around devices and applications. For full system requirements or to disable this feature, please visit <http://www.hpdaas.com/requirements> . Not applicable in China.

System Technical Specifications

System Board

System Board Form Factor	Approximately 416.56 x 373.38 mm (16.4 x 14.7 inches)
Processor Socket	Single LGA-4677
CPU Bus Speed	DMI Gen4 x 8 lanes
Chipset	Intel W790 Alder Lake – WS PCH
Super I/O Controller	Nuvoton SIO21
Memory Expansion Slots	16 DDR5 RDIMM memory slots
Memory Type Supported	DDR5, RDIMM (Registered) ECC, RDIMMs and 3DS RDIMMs
Memory Modes	Non-Interleaving for single channel. Interleaving when multiple channels are populated
Memory Speed Supported	4800MT/s for 1DPC and 4400MHz for 2DPC; DDR5
Memory Protection	ECC on data
Maximum Memory	2TB
Memory Configuration (Supported)	16GB, 32GB, 64GB RDIMMs and 128GB 3DS RDIMM. RDIMMs and 3DS RDIMMs cannot be mixed in the same system. 64GB RDIMMs cannot be mixed with any other module capacities in the same system.
NVDIMM Memory	No
PCI Express Connectors	Standard PCIe Slots <ul style="list-style-type: none"><li>• 2 PCI Express Gen5 slot x16 mechanical/ x16 electrical (full height, full length)</li><li>• 1 PCI Express Gen5 slot x4 mechanical/ x4 electrical (full height, full length)</li><li>• 2 PCI Express Gen4 slot x16 mechanical/ x16 electrical (full height, full length)</li><li>• 2 PCI Express Gen4 slot x4 mechanical/ x4 electrical (full height, full length)</li><li>• 1 PCI Express Gen3 slot x8 mechanical/ x8 electrical (full height, full length)</li></ul> <p>Personality Slots:</p> <ul style="list-style-type: none"><li>• 2 PCI Express Gen4 slot x8 mechanical/ x8 electrical (full height, half length) (supports two x4 M.2 devices per personality slot)</li></ul> <p>Other PCIe Connections</p> <ul style="list-style-type: none"><li>• 2 Front NVMe Storage (SlimSAS PCIe Gen4 x8) (each PCIe connection supports two x4 M.2 devices for a total system support of four x4 M.2 devices via QX448)</li><li>• 1 10GbE (PCIe Gen3 x4)</li></ul>

Supported Drive Interfaces

Integrated RAID

		RAID 0	RAID 1	RAID 5	RAID 10
Standard Factory Configuration	NVMe	On-Board Boot (Max 2)	On-Board Boot	-	On-Board Boot
	SATA	-	-	-	-
	Supported Operating Systems: Windows 11				
Factory Services	NVME	Boot & Data All Supported Locations	Boot & Data All Supported Locations	Boot & Data All Supported Locations	Boot & Data All Supported Locations
	SATA	Boot & Data All Supported Locations	Boot & Data All Supported Locations	Boot & Data All Supported Locations	Boot & Data All Supported Locations

### System Technical Specifications

Supported Operating Systems: Windows 11, RHEL 8.6 and later, SLE 15 SP4 and later, and Ubuntu 20.04 or later

**Note:** HP only supports VROC (Intel) and AMD-RAIDXpert2 (AMD) RAID configurations

**Note:** Customers may use the built-in Linux software RAID. See details at:

[www.hp.com/support/Linux\\_hardware\\_matrix](http://www.hp.com/support/Linux_hardware_matrix)

<b>SATA</b>	Number of SATA ports: 6 Intel® SATA controller: primary SATA
<b>Integrated Graphics</b>	No
<b>Network Controller</b>	Intel WGI210LAT and WGI219LM. WGI219LM LOM provides Management capabilities: WOL, PXE 2.1, DASH 1.1 and AMT
<b>External SATA (eSATA)</b>	No
<b>Serial</b>	1 internal header (requires optional Serial Port Adapter Kit)
<b>2nd Serial</b>	No
<b>HD Integrated Audio</b>	Yes
<b>USB Connector(s)</b>	<b>Front</b> Front I/O Entry: 4 USB 3.1 Gen1 Type-A (left-most port supports Battery Charging 1.2)  Front I/O Premium: 2x USB 3.2 Gen2x2 Type-C™ (Power Delivery 3.0) 2x USB 3.1 Gen1 Type-A (left-most port supports Battery Charging 1.2)  <ul style="list-style-type: none"> <li>• USB Type-C Ports provide 3 Amps @ 5 Volts</li> <li>• Charging USB Type-A port provides 1.5 Amps @ 5 Volts</li> <li>• Standard USB Type-A Ports provide 900mA @ 5 Volts</li> </ul>
	<b>Rear</b> 4x USB 3.1 Gen1 Type-A with USB hub and 2x USB 3.2 Gen 1 Type-A without hub.
	<b>Internal</b> 1 USB 3.2 Gen1 header, with a single 12-pin shrouded connector. This header supports a USB Media Card reader. 1 USB 2.0 single port header 1 USB 2.0 dual port header
<b>Flash ROM</b>	Yes
<b>CPU Fan Header</b>	Yes
<b>Memory Fan Header</b>	Yes (dual header)
<b>Chassis Fan Header</b>	3 front, one rear and one Aux Fan Header (dual)
<b>Front PCI Fan Header</b>	Yes (connects to AUX fan header)
<b>Front Control Panel/Speaker Header</b>	Yes
<b>CMOS Battery Holder - Lithium</b>	Yes
<b>Integrated Trusted Platform Module</b>	Integrated TPM 2.0. Convertible to FIPS 140-2 Certified Mode through firmware v15.21. The TPM module is disabled where restricted by law.
<b>Power Supply Headers</b>	Yes
<b>Power Switch, Power LED &amp; Hard Drive LED Header</b>	Yes



## System Technical Specifications

Clear Password Jumper	Yes
Keyboard/Mouse	USB and PS/2 (option)
<sup>1</sup> Maximum memory capacities assume 64-bit operating systems, such as Genuine Windows® 11 Professional 64 bit, Red Hat Linux 64-bit.	
<sup>2</sup> M.2 storage supports compatible devices up to 80mm	

### System Technical Specifications

System Configurations		
<b>Example Configuration #1</b>	<b>Processor Info</b>	Intel® Xeon® w5-3423 2.1GHz 12C 220W
	<b>Memory Info</b>	64GB DDR5 (4x16GB) RegRAM
	<b>Graphics Info</b>	1x NVIDIA® A2000
	<b>Disks/Optical/Floppy</b>	1x 4TB Internal M.2 SSD + 1x DVDRW SATA
	<b>PSU</b>	1x 1125W Full Height
	<b>Other</b>	N/A

<b>Energy Consumption (Watts)</b>		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	118.527	116.568	118.754	116.635	118.445	116.415
	Windows Busy Typ (S0)	315.78		310.87		313.42	
	Windows Busy Max (S0)	346.73		342.51		345.88	
	Sleep (S3)	5.196	5.193	5.201	5.195	5.192	5.187
	Off (S5)	1.591	1.578	1.593	1.579	1.587	1.575
	Zero Power Mode (EuP)	0.186		0.252		0.185	

<b>Heat Dissipation (Btu/hr)</b>		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	404.414	397.73	405.188	397.958	404.134	397.207
	Windows Busy Typ (S0)	1077.441		1060.688		1069.389	
	Windows Busy Max (S0)	1183.043		1168.644		1180.143	
	Sleep (S3)	17.728	17.718	17.745	17.725	17.715	17.698
	Off (S5)	5.428	5.384	5.453	5.387	5.414	5.373
	Zero Power Mode (EuP)	0.634		0.859		0.631	

<b>Example Configuration #2</b>	<b>Processor Info</b>	Intel® Xeon® w5-3435X 3.1GHz 16C 270W					
	<b>Memory Info</b>	64GB DDR5 (4x16GB) RegRAM					
	<b>Graphics Info</b>	1x NVIDIA® Quadro A4000					
	<b>Disks/Optical/Floppy</b>	1x 1TB Internal SATA HDD + 2x 4TB Internal M.2 SSD + 1x DVDRW SATA					
	<b>PSU</b>	1x 1125W Full Height					
	<b>Other</b>	N/A					

<b>Energy Consumption (Watts)</b>		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	123.644	121.267	123.845	121.486	123.241	120.891
	Windows Busy Typ (S0)	473.23		469.61		472.28	
	Windows Busy Max (S0)	495.31		488.24		491.81	
	Sleep (S3)	5.24	5.177	5.325	5.197	5.185	5.114
	Off (S5)	1.613	1.597	1.618	1.603	1.604	1.582
	Zero Power Mode (EuP)	0.186		0.259		0.186	

		115 VAC		230 VAC		100 VAC	
--	--	---------	--	---------	--	---------	--

## System Technical Specifications

Heat Dissipation (Btu/hr)		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	421.873		413.763		422.559	
	Windows Busy Typ (S0)	1614.661		1602.309		1611.4194	
	Windows Busy Max (S0)	1689.997		1665.875		1678.056	
	Sleep (S3)	17.879	17.664	18.168	17.732	17.691	17.448
	Off (S5)	5.503	5.448	5.521	5.469	5.473	5.397
	Zero Power Mode (EuP)	0.634		0.883		0.634	
	Example Configuration #3	Processor Info	Intel® Xeon® w7-3455 2.5GHz 24C 270W				
Memory Info		256GB DDR5 (16x16GB) RegRAM					
Graphics Info		2x NVIDIA® Quadro A4000					
Disks/Optical/Floppy		2x 1TB Internal SATA HDD + 2x 4TB Internal M.2 SSD + 1x DVDRW SATA					
PSU		2x 1125W Redundant					
Other		N/A					

Energy Consumption (Watts)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	161.93		158.45		162.05	
	Windows Busy Typ (S0)	547.49		538.57		543.44	
	Windows Busy Max (S0)	688.541		670.132		694.74	
	Sleep (S3)	7.231	7.013	7.235	7.018	7.224	7.009
	Off (S5)	2.622	2.285	2.635	2.289	2.587	2.267
	Zero Power Mode (EuP)	0.236		0.291		0.235	

Heat Dissipation (Btu/hr)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	552.506		540.631		552.915	
	Windows Busy Typ (S0)	1868.035		1837.601		1854.217	
	Windows Busy Max (S0)	2349.301		2286.491		2370.452	
	Sleep (S3)	24.672	23.928	24.685	23.945	24.648	23.914
	Off (S5)	8.946	7.796	8.991	7.810	8.827	7.735
	Zero Power Mode (EuP)	0.805		0.992		0.801	

<b>Example Configuration #4</b>	<b>Processor Info</b>	Intel Xeon w7-3465X 2.5GHz 28C 300W					
	<b>Memory Info</b>	512GB DDR5 (16x32GB) RegRAM					
	<b>Graphics Info</b>	2x NVIDIA® Quadro A6000					
	<b>Disks/Optical/Floppy</b>	4x 4TB Internal SATA HDD + 2x 4TB Internal M.2 SSD + 1x DVDRW SATA					
	<b>PSU</b>	2x 1125W Half Height (Aggregate)					
	<b>Other</b>	N/A					

Energy Consumption (Watts)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	185.683		182.315		186.023	

### System Technical Specifications

	Windows Busy Typ (S0)	802.106		792.69		800.97	
	Windows Busy Max (S0)	1093.001		1067.263		1092.547	
	Sleep (S3)	7.704	7.028	7.725	7.103	7.686	6.997
	Off (S5)	2.678	2.546	2.682	2.551	2.666	2.535
	Zero Power Mode (EuP)	0.233		0.290		0.231	

Heat Dissipation (Btu/hr)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	633.550		622.058		634.710	
	Windows Busy Typ (S0)	2736.786		2704.658		2732.909	
	Windows Busy Max (S0)	3729.319		3641.501		3727.77	
	Sleep (S3)	26.286	23.979	26.357	24.235	26.224	23.873
	Off (S5)	9.137	8.686	9.151	8.704	9096	8.649
	Zero Power Mode (EuP)	0.794		0.989		0.788	

<b>Example Configuration #5</b>	<b>Processor Info</b>	Intel Xeon w9-3495X 1.9GHz 56C 350W
	<b>Memory Info</b>	1024GB DDR5 (16x64GB) RegRAM
	<b>Graphics Info</b>	4x NVIDIA® Quadro A6000
	<b>Disks/Optical/Floppy</b>	4x 4TB Internal M.2 + 4x 4TB External M.2 + 1x DVDRW SATA
	<b>PSU</b>	2x 1125W Half Height (Aggregate)
	<b>Other</b>	N/A

Energy Consumption (Watts)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	398.352		390.385		399.87	
	Windows Busy Typ (S0)	932.35		918.74		933.412	
	Windows Busy Max (S0)	TBD		TBD		TBD	
	Sleep (S3)	18.478	18.354	18.641	18.335	18.335	18.284
	Off (S5)	2.261	2.156	2.312	2.174	2.268	2.155
	Zero Power Mode (EuP)	0.230		0.291		0.231	

Heat Dissipation (Btu/hr)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	1359.177		1331.993		1364.356	
	Windows Busy Typ (S0)	3181.178		3134.741		3184.801	
	Windows Busy Max (S0)	TBD		TBD		TBD	
	Sleep (S3)	63.047	62.624	63.603	62.559	62.559	62.385
	Off (S5)	7.714	7.356	7.888	7.417	7.738	7.352
	Zero Power Mode (EuP)	0.788		0.993		0.788	

**NOTE:** The numbers in this table are from actual measurements on a single system. There will be some variation from unit to unit.

**NOTE:** The busy power number and associated BTU/hr number for each configuration will be a strong function of the actual application software run on the system. There can be a great deal of variation in this number.

### System Technical Specifications

**NOTE:** The Power Supply Efficiency report may be found at the following links:

<https://www.plugloadsolutions.com/80PlusPowerSuppliesDetail.aspx?id=0&type=2>

### System Technical Specifications

<b>Operating Voltage Range</b>	90-269 VAC
<b>Rated Voltage Range</b>	100-240 VAC
<b>Rated Line Frequency</b>	50-60 Hz
<b>Operating Line Frequency Range</b>	47-66 Hz
<b>ENERGY STAR® certified</b> (Config Dependent)	Yes
<b>CECP Compliant @ 220V</b>	Yes
<b>FEMP Standby Power Compliant</b>	Yes, with Wake-on-LAN disabled: <1W in S5 - Power Off
<b>Built-in Self Test (BIST) LED</b>	Yes
<b>Surge Tolerant Full Ranging Power Supply</b> (withstands power surges up to 2000V)	Yes
<b>Hood Lock Header</b>	Yes
<b>ErP Lot 6- Tier 1 Compliance @ 230V</b> (<1W in S5 - Power Off)	Yes
<b>ErP Lot 6- Tier 2 Compliance @ 230V</b> (<0.5W in S5 - Power Off)	Yes

<b>Declared Noise Emissions</b> (Entry-level, Mid-level, and High-end configurations; tested on floor)			
<b>System Configuration (Entry level)</b>	<b>Processor Info</b>	Intel Sapphire Rapids 12C 220W	
	<b>Memory Info</b>	4 x 16GB DDR5-4800 RDIMM	
	<b>Graphics Info</b>	1 x NVIDIA RTX A2000	
	<b>Disks/Optical</b>	2 x 512GB SSD / Blu-ray DVD+/-RW	
	<b>Power Supply</b>	1125W Full Height	
<b>Declared Noise Emissions</b>		<b>Sound Power (LWAd, bels)</b>	<b>Deskside Sound Pressure (LpAm, decibels)</b>
	<b>Idle</b>	3.3	15
	<b>Hard drive Operating (Drive Random Seek)</b>	3.3	15
	<b>Active mode</b>	3.3	16
<b>System Configuration (Mid-level)</b>	<b>Processor Info</b>	Intel Sapphire Rapids 36C 300W	
	<b>Memory Info</b>	4 x 16GB DDR5-4800 RDIMM	
	<b>Graphics Info</b>	1 x NVIDIA RTX A4000	
	<b>Disks/Optical</b>	2 x 512GB SSD + 1TB HDD / Blu-ray DVD+/-RW	
	<b>Power Supply</b>	1125W Full Height	
<b>Declared Noise Emissions</b>		<b>Sound Power (LWAd, bels)</b>	<b>Deskside Sound Pressure (LpAm, decibels)</b>
	<b>Idle</b>	3.4	16
	<b>Hard drive Operating (Drive Random Seek)</b>	4.0	20



System Technical Specifications

	Active mode	3.7	18
System Configuration (High-end)	Processor Info	Intel Sapphire Rapids 56C 350W	
	Memory Info	16 x 64GB DDR5-4800 RDIMM	
	Graphics Info	4 x NVIDIA RTX A6000	
	Disks/Optical	4 x 4TB SSD + 4 x 8TB HDD / Blu-ray DVD+/-RW	
	Power Supply	2 x 1125W Half Height	
Declared Noise Emissions		Sound Power (LWAd, bels)	Deskside Sound Pressure (LpAm, decibels)
	Idle	4.3	28
	Hard drive Operating (Drive Random Seek)	4.5	29
	Active mode	4.4	28

Environmental Requirements	Temperature	Operating: 5° to 40°C (40° to 104°F) <sup>1</sup> Non-operating: -40° to 60°C (-40° to 140°F)
		<sup>1</sup> 40°C has been validated for configs up to a 300W CPU, 2x NVIDIA® RTX A4000 graphics cards, 8x64GB RAM, 4x 2TB M.2 storage, 2x 2TB HDD storage, and 1125W full-height PSU
	Humidity	Operating: 8% to 85% RH, non-condensing Non-operating: 8% to 90% RH, non-condensing
	Maximum Altitude	Operating (with Rotational Hard Drives): 3,048 m (10,000 feet) Operating (with only Solid-State Drives): 5,000 m (16,404 feet)
		Non-operating: 12,192 m (40,000ft) <a href="#">Note: Above 1524 m (5,000 feet) altitude, maximum operating temperature is reduced by 1° C (1.8° F) per 305 m (1,000 feet) increase in elevation.</a>
	Dynamic	Shock Operating: ½-sine: 40g, 2-3ms (~62 cm/sec) Non-operating: ½-sine: 160 cm/s, 2-3ms (~105g)* square: 422 cm/s, 20g
		<a href="#">*PCIe devices mass &lt;1.3kg</a> <a href="#">NOTE: Values represent individual shock events and do not indicate repetitive shock events</a>
		Vibration Operating random: 0.5g (rms), 5-300 Hz, up to 0.0025g²/Hz Non-operating random: 2.0g (rms), 5-500 Hz, up to 0.0150 g²/Hz
		<a href="#">NOTE: Values do not indicate continuous vibration.</a>
	Cooling	Above 1524 m (5,000 feet) altitude, the maximum operating temperature is reduced by 1° C (1.8° F) for every 305 m (1,000 feet) increase in elevation, up to 3048 m (10,000 feet)

### System Technical Specifications

#### Physical Security and Serviceability

<b>Access Panel</b>	Tool-less Includes system board and memory information
<b>Optical Drive</b>	Tool-less, 2nd Optical Drive requires a 5.25" bay carrier
<b>Hard Drives</b>	Tool-less
<b>Expansion Cards</b>	Tool-less
<b>Processor Socket</b>	Screw-in processor coolers
<b>Blue User Touch Points</b>	Yes, on tool-less internal chassis mechanisms
<b>Color-coordinated Cables and Connectors</b>	Yes
<b>Memory</b>	Tool-less
<b>System Board</b>	Tool-less, retained by Front Card Guide and Top Memory Fan Holder
<b>Power and HD LED on Front of Computer</b>	Yes
<b>Configuration Record SW</b>	Yes
<b>Over-Temp Warning on Screen</b>	Yes
<b>Dual Function Front Power Switch</b>	Yes, causes a fail-safe power off when held for 4 seconds
<b>Padlock Support</b>	No
<b>Cable Lock Support</b>	Yes, Kensington Cable Lock (optional): Prevents entire system theft only. 3mm x 7mm slot at rear of system
<b>Universal Chassis Clamp Lock Support</b>	No
<b>Chassis Interlock Sensor</b>	Yes Sensor detects when the access panel has been removed. The access panel must be installed for the system to power ON. Removal of the access panel during operation will power OFF the system.
<b>Solenoid Lock and Hood Sensor</b>	No
<b>Rear Port Control Cover</b>	No
<b>Serial, USB, Audio, Network, Enable/Disable Port Control</b>	Yes, enables or disables serial, USB, audio, and network ports
<b>Removable Media Write/Boot Control</b>	Yes, prevents ability to boot from removable media on supported devices (and can disable writes to media)
<b>Power-On Password</b>	Yes, prevents an unauthorized person from booting up the workstation
<b>Setup Password</b>	Yes, prevents an unauthorized person from changing the workstation configuration
<b>3.3V Aux Power LED on System PCA</b>	No
<b>NIC LEDs (integrated) (Green &amp; Amber)</b>	Yes
<b>CPUs and Heatsinks</b>	A torx driver (T30) is needed to remove the processor heatsink. CPU attached to heatsink via tool-less clip
<b>Power Supply Diagnostic LED</b>	Yes
<b>Front Power Button</b>	Yes
<b>Front Power LED</b>	Yes, white (normal), red (fault)

### System Technical Specifications

<b>Front Hard Drive Activity LED</b>	Yes, white
<b>Front ODD Activity LED</b>	Yes, on device
<b>Internal Speaker</b>	Yes
<b>System/Emergency ROM Flash Recovery</b>	Recovers corrupted system BIOS.
<b>Cooling Solutions</b>	Air cooled forced convection
<b>Power Supply Fans</b>	2x - Dual Side Inlet Blowers for each power supply
<b>CPU Heatsink Fan</b>	Base: 92 mm x 92 mm x 25 mm Performance: 108 mm x 108 mm x 25 mm
<b>Chassis Fan</b>	Rear: 120 mm x 38 mm Front Lower: 120 mm x 25.4 mm Front Middle: 92 mm x 25.4 mm Front Upper: 92 mm x 25 mm
<b>Memory Heatsink Fan</b>	Memory: 2x 80 mm x 25 mm
<b>HP PC Hardware Diagnostics UEFI</b>	HP PC Hardware Diagnostics (UEFI) enables hardware level testing outside the operating system on many components. The diagnostics can be invoked by pressing F2 at POST, and is available as a download from HP Support.
<b>Access Panel Key Lock</b>	Yes, left access panel
<b>ACPI-Ready Hardware</b>	Advanced Configuration and Power Management Interface (ACPI). <ul style="list-style-type: none"> <li>• Allows the system to wake from a low power mode.</li> <li>• Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system.</li> </ul>
<b>Integrated Chassis Handles</b>	Yes, front and rear
<b>Power Supply</b>	Tool-less, rear access direct-connect (blind-mate)
<b>PCI Card Retention</b>	Yes, rear (all), middle (full-height cards), front (cards with extender)
<b>Flash ROM</b>	Yes
<b>Diagnostic Power Switch LED on board</b>	Yes
<b>Clear Password Jumper</b>	Yes
<b>Clear CMOS Button</b>	Yes
<b>CMOS Battery Holder</b>	Yes
<b>DIMM Connectors</b>	Yes

### Service, Support, and Warranty

On-site Warranty and Service<sup>1</sup>: One-year, limited warranty and service offering delivers on-site, next business-day<sup>2</sup> service for parts and labor and includes free telephone support<sup>3</sup> 8am - 5pm. Global coverage<sup>2</sup> ensures that any product purchased in one country and transferred to another, non-restricted country will remain fully covered under the original warranty and service offering. 24/7 operation will not void the HP warranty. Storage devices are not covered under warranty for 24/7 operation except for Enterprise class HDDs.

**NOTE 1:** Terms and conditions may vary by country. Certain restrictions and exclusions apply.

**NOTE 2:** On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.

**NOTE 3:** Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24x7 support service may not be available in some countries.

HP Care Pack Services extend service contracts beyond the standard warranties. Service starts from date of hardware purchase. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at:

### System Technical Specifications

<http://www.hp.com/go/lookuptool>. Service levels and response times for HP Care Packs may vary depending on your geographic location.

#### Certification and Compliance

- USGv6 compliant for Windows OS ([USGv6 Compliance Report](#))
- Completed ISO/IEC 17025 accredited testing designed specifically for the USGv6 Test Program. USGv6 is a test program designated by NIST that provides a proof of compliance to IPv6 (Internet Protocol version 6) specifications outlined in current industry standards for common network products. It is meant as a strategic planning guide for USG (United States Government) IT acquisitions to help ensure the completeness, correctness, interoperability and security of early IPv6 product offerings so as to protect early USG investments in the technology. (source: UNH)

Environmental Sustainability questions concerning:

- Ecolabels (EPEAT, TCO, etc.)
- ENERGY STAR, California Energy Commission (CEC)
- Compliance with Environmental legislation (EU ErP, China CECP, EU RoHS and other countries)
- Supply Chain Social Environmental Responsibility (SER) (conflict minerals; human rights, etc.)
- Product specific environmental features (material content, packaging content, recycled content, etc.)
- China Energy Label (CEL)
- 

Please contact [sustainability@hp.com](mailto:sustainability@hp.com)

For country specific Regulatory Compliance approval documents or Regulatory and Safety questions concerning:

- Declarations of Conformity (for self-service, go to [https://www.hp.com/uk-en/certifications/technical/regulations-certificates.html?jumpid=ex\\_r135\\_uk/en/any/corp/hpuk-mu\\_chev/certificates](https://www.hp.com/uk-en/certifications/technical/regulations-certificates.html?jumpid=ex_r135_uk/en/any/corp/hpuk-mu_chev/certificates))
- GS Certificates
- Product Safety Certificates (UL, CB, BIS, etc.)
- EMC Certificates, Declarations of Conformity, or Certificates of Conformity (CE, FCC, ICES, etc.)
- CCC Certificates
- Ergonomics
- 

Please contact [techregshelp@hp.com](mailto:techregshelp@hp.com)

#### BIOS

<b>PCIe 5.0 Support</b>	Full BIOS support for PCI Express through industry standard interfaces. Supported speeds and slot information vary.
<b>ATA/ATAPI</b>	AT Attachment 6 with Packet Interface (ATA/ATAPI-6), Revision 3b
<b>WMI Support</b>	WMI is Microsoft's implementation of Web-Based Enterprise Management (WBEM) for Windows. WMI is fully compliant with the Distributed Management Task Force (DMTF) Common Information Model (CIM) and WBEM specifications.
<b>BIOS Power On</b>	Users can define a specific date and time for the system to power on.
<b>ROM Based Computer Setup Utility (F10)</b>	Review and customize system configuration settings controlled by the BIOS.
<b>System/Emergency ROM Flash Recovery with Video</b>	Recovers system BIOS in corrupted Flash ROM.
<b>Replicated Setup</b>	Saves BIOS settings to USB flash device in human readable file (HpSetup.txt). BiosConfigurationUtility.exe utility can then replicate these settings on machines being deployed without entering Computer Configuration Utility (F10 Setup).
<b>SMBIOS</b>	System Management BIOS Reference Specification, Version 3.2
<b>Boot Control</b>	Disables the ability to boot from removable media on supported devices.

### System Technical Specifications

<b>Memory Change Alert</b>	Alerts management console if memory is removed or changed.
<b>Thermal Alert</b>	Monitors the temperature state within the chassis. Three modes: <ul style="list-style-type: none"> <li>• NORMAL - normal temperature ranges.</li> <li>• ALERTED - excessive temperatures are detected. Raises a flag so action can be taken to avoid shutdown or provide for a smoother system shutdown.</li> <li>• SHUTDOWN - excessive temperatures are encountered. Automatically shuts down the computer without warning before hardware component damage occurs.</li> </ul>
<b>Remote ROM Flash</b>	Provides secure, fail-safe ROM image management from a central network console.
<b>ACPI (Advanced Configuration and Power Management Interface)</b>	Allows the system to enter and resume from low power modes (sleep states). Enables an operating system to control system power consumption based on the dynamic workload. Makes it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system. Supports ACPI 6.0 for full compatibility with 64-bit operating systems.
<b>Ownership Tag</b>	A user-defined string stored in non-volatile memory that is displayed in the BIOS splash screen.
<b>Remote Wakeup/Remote Shutdown</b>	System administrators can power on, restart, and power off a client computer from a remote location.
<b>Instantly Available PC (Suspend to RAM - ACPI sleep state S3)</b>	Allows for very low power consumption with quick resume time.
<b>Remote System Installation via F12 (PXE 2.1) (Remote Boot from Server)</b>	Allows a new or existing system to boot over the network and download software, including the operating system.
<b>ROM revision levels</b>	Reports the system BIOS revision level in Computer Configuration Utility (F10 Setup). Version is available through an industry standard interface (SMBIOS and WMI) so that management SW applications can use and report this information.
<b>System board revision level</b>	Allows management SW to read revision level of the system board. Revision level is digitally encoded into the HW and cannot be modified.
<b>Start-up Diagnostics (Power-on Self-Test)</b>	Assesses system health at boot time with selectable levels of testing.
<b>Auto Setup when new hardware installed</b>	System automatically detects addition of new hardware.
<b>Keyboard-less Operation</b>	The system can be booted without a keyboard.
<b>Localized ROM Setup</b>	Common BIOS image supports System Configuration Utility (F10 Setup) menus in 15 languages with local keyboard mappings.
<b>Asset Tag</b>	The user or MIS to set a unique tag string in non-volatile memory.
<b>Per-slot Control</b>	Allows I/O slot parameters (option ROM enable/disable, bifurcation, speed) to be configured individually.
<b>Adaptive Cooling</b>	Control parameters are set according to detected hardware configuration for optimal acoustics.
<b>Pre-boot Diagnostics</b>	(Pre-video) critical errors are reported via beeps and blinks on the power LED.
<b>UEFI Specification</b>	2.7
<b>Revision</b>	
<b>ACPI</b>	Advanced Configuration and Power Management Interface, Version 6.0
<b>CD Boot</b>	"El Torito" Bootable CD-ROM Format Specification Version 1.0
<b>EHCI</b>	Enhanced Host Controller Interface for Universal Serial Bus, Revision 1.0
<b>PCI Express</b>	PCI Express Base Specification, Revision 2.0 PCI Express Base Specification, Revision 3.0 PCI Express Base Specification, Revision 4.0 PCI Express Base Specification, Revision 5.0
<b>SATA</b>	Serial ATA Specification, Revision 1.0a Serial ATA 3 Gb/s: Serial ATA Specification, Revision 2.5 Serial ATA 6 Gb/s: Serial ATA Specification, Revision 3.0
<b>SPD</b>	JEDEC JESD300-5

### System Technical Specifications

<b>TPM</b>	Trusted Computing Group TPM Specification Version 2.0 (Infineon SLB 9672). Common Criteria EAL4+ certified. FIPS 140-2 Certification TCG TPM Certified products list: <a href="http://www.trustedcomputinggroup.org/certification/tpm-certified-products/">http://www.trustedcomputinggroup.org/certification/tpm-certified-products/</a>
<b>UHCI</b>	Universal Host Controller Interface Design Guide, Revision 1.1
<b>USB</b>	Universal Serial Bus Revision 1.1 Specification Universal Serial Bus Revision 2.0 Specification Universal Serial Bus Revision 3.1 Specification Universal Serial Bus Revision 3.2 Specification USB Battery Charging specification, Revision 1.2 USB Power Delivery specification Revision 3.0
<b>SMBIOS</b>	System Management BIOS Reference Specification, Version 3.2

### Social and Environmental Responsibility

#### Eco-Label Certifications & Declarations

This product is low halogen except for configurations that include HP Z Turbo Quad Pro PCIe TLC SSD, CRU QX448 removable storage frames, ConnectX-6 DX Amphenol 10 & 25 Gb Transceivers, Intel VROC M.2 RAID module, Broadcom 5720-2P NIC Card, power cords, cables, and peripherals. Service parts obtained after purchase may not be Low Halogen.

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- IT ECO declaration
- US ENERGY STAR®
- US Federal Energy Management Program (FEMP)
- EPEAT® Gold with Climate+ registered. See <http://www.epeat.net> for registration status and tier levels by country
- TCO Certified
- China Energy Conservation Program (CECP)
- China State Environmental Protection Administration (SEPA)
- Taiwan Green Mark
- Korea Eco-label
- Japan PC Green label\*

#### Sustainable Impact Specifications

- [Product Carbon Footprint \(hp.com\)](http://hp.com)
- Ocean-bound plastic in System fan, CPU fan
- 40% post-consumer recycled plastic
- 10% recycled metal
- Low halogen
- Outside Box and corrugated cushions are 100% sustainably sourced and recyclable
- Recycled Plastic cushions

#### System Configuration

The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a “Typically Configured Notebook”.

#### Energy Consumption (in accordance with US ENERGY STAR® test method)

	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Sort idle)	124.28 W	124.89 W	N/A
Normal Operation (Long idle)	122.88 W	123.22 W	N/A
Sleep	4.57 W	4.94 W	N/A



### System Technical Specifications

Off	1.62 W	1.65 W	N/A
-----	--------	--------	-----

**Note:**

Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family . HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.

Heat Dissipation*	115VAC, 60Hz	230VAC, 50Hz	100VAC, 50Hz
Normal Operation (Short idle)	425 BTU/hr	427 BTU/hr	N/A
Normal Operation (Long idle)	420 BTU/hr	421 BTU/hr	N/A
Sleep	16 BTU/hr	17 BTU/hr	N/A
Off	6 BTU/hr	6 BTU/hr	N/A

\*NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

**Longevity and Upgrading**

This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the

Spare parts are available throughout the warranty period and or for up to “5” years after the end of production.

**Additional Information**

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see [www.epeat.net](http://www.epeat.net)
- Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
- This product is 91.7% recycle-able when properly disposed of at end of life.

<b>Packaging Materials External:</b>	PAPER/Corrugated	2070 g
<b>Internal:</b>	PLASTIC/EPE (Expanded Polyethylene)	900 g
	PLASTIC/Polyethylene low density	46 g

The plastic packaging material contains at least 95.1% recycled content.

The corrugated paper packaging materials contains at least 35.0% recycled content.

**RoHS Compliance**

HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam.

We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—

### System Technical Specifications

including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products.

We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the scope of the commitment to include further restricted substances as regulations continue to evolve.

To obtain a copy of the HP RoHS Compliance Statement, see [HP RoHS position statement](#).

#### Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at [http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen\\_specifications.html](http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html)):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Bis(2-Ethylhexyl) phthalate (DEHP)
- Benzyl butyl phthalate (BBP)
- Dibutyl phthalate (DBP)
- Diisobutyl phthalate (DIBP)
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

#### Packaging Usage

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

### System Technical Specifications

#### End-of-life Management and Recycling

HP offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <http://www.hp.com/go/reuse-recycle> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/recyclers>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

#### HP, Inc. Corporate Environmental Information

For more information about HP's commitment to the environment:

Global Citizenship Report

<http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html>

Eco-label certifications

<http://www8.hp.com/us/en/hp-information/environment/ecolabels.html>

ISO 14001 certificates:

<http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842>

and

<http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf>

#### footnotes

- Percentage of ocean-bound plastic contained in each component varies by product
- Recycled plastic content percentage is based on the definition set in the IEEE 1680.1-2018 standard.
- External power supplies, WWAN modules, power cords, cables and peripherals excluded.
- 100% outer box packaging and corrugated cushions made from sustainably sourced certified and recycled fibers.
- Fiber cushions made from 100% recycled wood fiber and organic materials.
- Plastic cushions are made from >90% recycled plastic.
- Recycled metal is expressed as a percentage of the total weight of the metal according to ISO 14021 definitions for metal parts over 25 grams

## Manageability

### Industry Standard Specifications

### Intel® Active Management Technology (AMT)

This product meets the following industry standard specifications for manageability functionality:

- DASH 1.2 (via Intel® LAN on motherboard)
- Intel® Active Management Technology (AMT) 16.10

An advanced set of remote management features and functionality providing IT administrators the latest and most effective tools to remotely discover, heal, and protect networked client systems regardless of the system's health or power state. AMT 16.10 includes the following advanced management functions:

- Power Management (on, off, reset, graceful shutdown, sleep and hibernate)
  - Support in Max Power Savings (Shutdown and Hibernate Modes)
- Hardware Inventory (includes BIOS and firmware revisions)

### System Technical Specifications

- Hardware Alerting
- Agent Presence
- System Defense Filters
- Serial Over LAN (SOL)
- USB Redirect (Media Redirection)
- ME Wake-on-LAN (WOL), even with Maximum Power Savings Enabled
- DASH 1.2 compliance
- IPv6 Support
- Fast Call for Help - a client inside or outside the firewall may initiate a call for help via BIOS screen, periodic connections, or alert triggered connection
- Remote Scheduled Maintenance - pre-schedule when the system connects to the IT or service provider console for maintenance.
- Remote Alerts - automatically alert IT or service provider if issues arise
- Access Monitor - Provides oversight into Intel® AMT actions to support security requirements
- PC Alarm Clock
- Microsoft NAP Support
- Host Base set-up and configuration
- Management Engine (ME) firmware roll back
- Local Time Sync to UTC
- Remote Memory Dump Command – Creates memory dump for debug

**Intel® vPro™ Technology** Yes, when configured with an Intel® vPro™ supporting processor.

---

### Technical Specifications - Stable & Consistent Offerings

#### Stable & Consistent Offerings

##### Global Series SKUs

As part of its commitment to hardware, software, and solution innovation, HP is proud to introduce this breakthrough platform configuration stability to HP Workstation customers. HP Stable & Consistent Offerings are built on the foundation of a carefully chosen set of hardware and software designed and tested to work with all HP Z Workstation platforms through their end of life. These components and their corresponding HP Workstation platform compatibility are outlined in this section.

##### Stable & Consistent Offerings

HP Stable & Consistent Offerings are available worldwide to all HP Workstation customers-no special programs, no additional cost-no kidding. Simply select your hardware and software components when you customize your HP Workstation and be assured that you'll be able to buy that same configuration throughout the lifecycle of the product.

##### Processors

###### Product #

###### Offering

6M6F2AV

Intel Xeon W5-3425

6M6F4AV

Intel Xeon W5-3435X

##### Graphics

###### Product #

###### Offering

6W8P2AV

NVIDIA Long-Life T1000E

6W8N9AV

NVIDIA Long-Life RTX A2000E

6W8P0AV

NVIDIA Long-Life RTX A4000E

6B4F1AV

AMD Radeon RX 6400

3F5P0AV

AMD Radeon Pro 6600

##### Storage

###### Product #

###### Offering

3F5V2AV

Z Turbo 1TB PCIe-4x4 2280 TLC M.2 Solid State Drive

3F6V3AV

1TB 7200RPM SATA 3.5in Enterprise

### Technical Specifications - Storage Drives

#### STORAGE/HARD DRIVES

<b>Performance PCIe SSDs for HP Workstations</b>	<b>Z Turbo 512GB 2280 PCIe-4x4 TLC SSD</b>	<b>Capacity</b>	512GB
		<b>Protocol</b>	PCIe
		<b>Form Factor</b>	M.2
		<b>Controller</b>	NVMe
		<b>NAND Type</b>	3D TLC
		<b>Endurance</b>	300TBW (TB Written)
		<b>Reliability</b>	1.5M hours
		<b>Rated for 24/7/365 operation</b>	No
		<b>Interface</b>	PCI Express 4.0 x4 electrical
		<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
		<b>Performance</b>	<b>Sequential Read</b> up to 6400MB/s*
			<b>Sequential Write</b> up to 3400MB/s*
			<b>Random Read</b> up to 600K IOPS*
			<b>Random Write</b> up to 600K IOPS*

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

	<b>Z Turbo 512GB 2280 PCIe-4x4 SED OPAL2 TLC M.2 SSD</b>	<b>Capacity</b>	512GB
		<b>Protocol</b>	PCIe
		<b>Form Factor</b>	M.2
		<b>Controller</b>	NVMe
		<b>NAND Type</b>	3D TLC
		<b>Endurance</b>	300TBW (TB Written)
		<b>Reliability</b>	1.5M hours
		<b>Rated for 24/7/365 operation</b>	No
		<b>Interface</b>	PCI Express 4.0 x4 electrical
		<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
		<b>Performance</b>	<b>Sequential Read</b> up to 6400MB/s*
			<b>Sequential Write</b> up to 3400MB/s*
			<b>Random Read</b> up to 600K IOPS*
			<b>Random Write</b> up to 600K IOPS*
		<b>Self-Encrypting Drive Support</b>	OPAL 2

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

	<b>Z Turbo 1TB 2280 PCIe-4x4 SED OPAL2 TLC M.2 SSD</b>	<b>Capacity</b>	1TB
		<b>Protocol</b>	PCIe
		<b>Form Factor</b>	M.2
		<b>Controller</b>	NVMe
		<b>NAND Type</b>	3D TLC
		<b>Endurance</b>	400TBW (TB Written)
		<b>Reliability</b>	1.5M hours

### Technical Specifications - Storage Drives

<b>Rated for 24/7/365 operation</b>	No	
<b>Interface</b>	PCI Express 4.0 x4 electrical	
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
<b>Performance</b>	<b>Sequential Read</b>	up to 6500MB/s*
	<b>Sequential Write</b>	up to 5000MB/s*
	<b>Random Read</b>	up to 800K IOPS*
	<b>Random Write</b>	up to 800K IOPS*
<b>Self-Encrypting Drive Support</b>	OPAL 2	

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

<b>Z Turbo 1TB 2280 PCIe-4x4 TLC SSD</b>	<b>Capacity</b>	1TB	
	<b>Protocol</b>	PCIe	
	<b>Form Factor</b>	M.2	
	<b>Controller</b>	NVMe	
	<b>NAND Type</b>	3D TLC	
	<b>Endurance</b>	400TBW (TB Written)	
	<b>Reliability</b>	1.5M hours	
	<b>Rated for 24/7/365 operation</b>	No	
	<b>Interface</b>	PCI Express 4.0 x4 electrical	
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
	<b>Performance</b>	<b>Sequential Read</b>	up to 6500MB/s*
		<b>Sequential Write</b>	up to 5000MB/s*
<b>Random Read</b>		up to 800K IOPS*	
<b>Random Write</b>		up to 800K IOPS*	

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

<b>Z Turbo 1TB 2280 PCIe-4x4 TLC SSD</b>	<b>Capacity</b>	1TB	
	<b>Protocol</b>	PCIe	
	<b>Form Factor</b>	M.2	
	<b>Controller</b>	NVMe	
	<b>NAND Type</b>	3D TLC	
	<b>Endurance</b>	400TBW (TB Written)	
	<b>Reliability</b>	1.5M hours	
	<b>Rated for 24/7/365 operation</b>	No	
	<b>Interface</b>	PCI Express 4.0 x4 electrical	
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
	<b>Performance</b>	<b>Sequential Read</b>	up to 6500MB/s*
		<b>Sequential Write</b>	up to 5000MB/s*
		<b>Random Read</b>	up to 800K IOPS*
		<b>Random Write</b>	up to 800K IOPS*

### Technical Specifications - Storage Drives

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

<b>Z Turbo 2TB 2280 PCIe-4x4 SED OPAL2 TLC M.2 SSD</b>	<b>Capacity</b>	2TB
	<b>Protocol</b>	PCIe
	<b>Form Factor</b>	M.2
	<b>Controller</b>	NVMe
	<b>NAND Type</b>	3D TLC
	<b>Endurance</b>	500TBW (TB Written)
	<b>Reliability</b>	1.5M hours
	<b>Rated for 24/7/365 operation</b>	No
	<b>Interface</b>	PCI Express 4.0 x4 electrical
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Performance</b>	<b>Sequential Read</b> up to 6500MB/s*
		<b>Sequential Write</b> up to 5000MB/s*
		<b>Random Read</b> up to 800K IOPS*
		<b>Random Write</b> up to 800K IOPS*
	<b>Self-Encrypting Drive Support</b>	OPAL 2

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

<b>Z Turbo 2TB 2280 PCIe-4x4 TLC SSD</b>	<b>Capacity</b>	2TB
	<b>Protocol</b>	PCIe
	<b>Form Factor</b>	M.2
	<b>Controller</b>	NVMe
	<b>NAND Type</b>	3D TLC
	<b>Endurance</b>	500TBW (TB Written)
	<b>Reliability</b>	1.5M hours
	<b>Rated for 24/7/365 operation</b>	No
	<b>Interface</b>	PCI Express 4.0 x4 electrical
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Performance</b>	<b>Sequential Read</b> up to 6500MB/s*
		<b>Sequential Write</b> up to 5000MB/s*
		<b>Random Read</b> up to 800K IOPS*
		<b>Random Write</b> up to 800K IOPS*

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

<b>Z Turbo 4TB 2280 PCIe-4x4 TLC M.2 SSD</b>	<b>Capacity</b>	4TB
	<b>Protocol</b>	PCIe
	<b>Form Factor</b>	M.2
	<b>Controller</b>	NVMe
	<b>NAND Type</b>	3D TLC



### Technical Specifications - Storage Drives

<b>Endurance</b>	600TBW (TB Written)	
<b>Reliability</b>	1.5M hours	
<b>Rated for 24/7/365 operation</b>	No	
<b>Interface</b>	PCI Express 4.0 x4 electrical	
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
<b>Performance</b>	<b>Sequential Read</b>	up to 6500MB/s*
	<b>Sequential Write</b>	up to 5000MB/s*
	<b>Random Read</b>	up to 700K IOPS*
	<b>Random Write</b>	up to 700K IOPS*

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

<b>Z Turbo 4TB</b> <b>2280 PCIe-4x4 SED</b> <b>OPAL2 TLC M.2 SSD</b>	<b>Capacity</b>	4TB	
	<b>Protocol</b>	PCIe	
	<b>Form Factor</b>	M.2	
	<b>Controller</b>	NVMe	
	<b>NAND Type</b>	3D TLC	
	<b>Endurance</b>	600TBW (TB Written)	
	<b>Reliability</b>	1.5M hours	
	<b>Rated for 24/7/365 operation</b>	No	
	<b>Interface</b>	PCI Express 4.0 x4 electrical	
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
	<b>Performance</b>	<b>Sequential Read</b>	up to 6500MB/s*
		<b>Sequential Write</b>	up to 5000MB/s*
		<b>Random Read</b>	up to 700K IOPS*
		<b>Random Write</b>	up to 700K IOPS*
	<b>Self-Encrypting Drive Support</b>	OPAL 2	

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

<b>HP Z Turbo 8TB PCIe-4x4 2280 NVMe M.2 SSD</b>	<b>Capacity</b>	8TB	
	<b>Protocol</b>	PCIe	
	<b>Form Factor</b>	M.2	
	<b>Controller</b>	NVMe	
	<b>NAND Type</b>	3D TLC	
	<b>Endurance</b>	2400TBW (TB Written)	
	<b>Reliability</b>	1.5M hours	
	<b>Interface</b>	PCI Express 4.0 x4 electrical	
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
	<b>Performance</b>	<b>Sequential Read</b>	up to 6500MB/s*
		<b>Sequential Write</b>	up to 5000MB/s*
		<b>Random Read</b>	up to 800K IOPS*
		<b>Random Write</b>	up to 800K IOPS*

### Technical Specifications - Storage Drives

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

#### Performance PCIe SSDs for HP Dual Pro Carrier

#### HP Z Turbo Drive Dual Pro 512GB SSD

<b>Capacity</b>	512GB
<b>Protocol</b>	PCIe
<b>Form Factor</b>	M.2
<b>Controller</b>	NVMe
<b>NAND Type</b>	3D TLC
<b>Endurance</b>	300TBW (TB Written)
<b>Reliability</b>	1.5M hours
<b>Rated for 24/7/365 operation</b>	No
<b>Interface</b>	PCI Express 4.0 x4 electrical
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
<b>Performance</b>	<b>Sequential Read</b> up to 6400MB/s* <b>Sequential Write</b> up to 3400MB/s* <b>Random Read</b> up to 600K IOPS* <b>Random Write</b> up to 600K IOPS*

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

#### HP Z Turbo Drive Dual Pro 1TB SSD

<b>Capacity</b>	1TB
<b>Protocol</b>	PCIe
<b>Form Factor</b>	M.2
<b>Controller</b>	NVMe
<b>NAND Type</b>	3D TLC
<b>Endurance</b>	400TBW (TB Written)
<b>Reliability</b>	1.5M hours
<b>Rated for 24/7/365 operation</b>	No
<b>Interface</b>	PCI Express 4.0 x4 electrical
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
<b>Performance</b>	<b>Sequential Read</b> up to 6500MB/s* <b>Sequential Write</b> up to 5000MB/s* <b>Random Read</b> up to 800K IOPS* <b>Random Write</b> up to 800K IOPS*

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

#### HP Z Turbo Drive Dual Pro 2TB SSD

<b>Capacity</b>	2TB
<b>Protocol</b>	PCIe
<b>Form Factor</b>	M.2
<b>Controller</b>	NVMe
<b>NAND Type</b>	3D TLC
<b>Endurance</b>	500TBW (TB Written)
<b>Reliability</b>	1.5M hours

### Technical Specifications - Storage Drives

<b>Rated for 24/7/365 operation</b>	No	
<b>Interface</b>	PCI Express 4.0 x4 electrical	
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
<b>Performance</b>	<b>Sequential Read</b>	up to 6500MB/s*
	<b>Sequential Write</b>	up to 5000MB/s*
	<b>Random Read</b>	up to 800K IOPS*
	<b>Random Write</b>	up to 800K IOPS*

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

<b>HP Z Turbo Drive Dual Pro 4TB SSD</b>	<b>Capacity</b>	4TB	
	<b>Protocol</b>	PCIe	
	<b>Form Factor</b>	M.2	
	<b>Controller</b>	NVMe	
	<b>NAND Type</b>	3D TLC	
	<b>Endurance</b>	500TBW (TB Written)	
	<b>Reliability</b>	1.5M hours	
	<b>Rated for 24/7/365 operation</b>	No	
	<b>Interface</b>	PCI Express 4.0 x4 electrical	
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
	<b>Performance</b>	<b>Sequential Read</b>	up to 6500MB/s*
		<b>Sequential Write</b>	up to 5000MB/s*
		<b>Random Read</b>	up to 800K IOPS*
<b>Random Write</b>		up to 800K IOPS*	

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

Performance PCIe SSDs for HP Quad Pro Carrier	HP Z Turbo Drive Quad Pro 512GB SSD	Capacity	512GB	
		Protocol	PCIe	
		Form Factor	M.2	
		Controller	NVMe	
		NAND Type	3D TLC	
		Endurance	300TBW (TB Written)	
		Reliability	1.5M hours	
		Rated for 24/7/365 operation	No	
		Interface	PCI Express 4.0 x4 electrical	
		Operating Temperature	32° to 158° F (0° to 70° C)	
		Performance	Sequential Read	up to 6400MB/s*
			Sequential Write	up to 3400MB/s*
			Random Read	up to 600K IOPS*
			Random Write	up to 600K IOPS*

\*Actual performance may vary.

### Technical Specifications - Storage Drives

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

<b>HP Z Turbo Drive Quad Pro 1TB SSD</b>	<b>Capacity</b>	1TB
	<b>Protocol</b>	PCIe
	<b>Form Factor</b>	M.2
	<b>Controller</b>	NVMe
	<b>NAND Type</b>	3D TLC
	<b>Endurance</b>	400TBW (TB Written)
	<b>Reliability</b>	1.5M hours
	<b>Rated for 24/7/365 operation</b>	No
	<b>Interface</b>	PCI Express 4.0 x4 electrical
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Performance</b>	<b>Sequential Read</b> up to 6500MB/s*
		<b>Sequential Write</b> up to 5000MB/s*
		<b>Random Read</b> up to 800K IOPS*
		<b>Random Write</b> up to 800K IOPS*

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

<b>HP Z Turbo Drive Quad Pro 2TB SSD</b>	<b>Capacity</b>	2TB
	<b>Protocol</b>	PCIe
	<b>Form Factor</b>	M.2
	<b>Controller</b>	NVMe
	<b>NAND Type</b>	3D TLC
	<b>Endurance</b>	500TBW (TB Written)
	<b>Reliability</b>	1.5M hours
	<b>Rated for 24/7/365 operation</b>	No
	<b>Interface</b>	PCI Express 4.0 x4 electrical
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Performance</b>	<b>Sequential Read</b> up to 6500MB/s*
		<b>Sequential Write</b> up to 5000MB/s*
		<b>Random Read</b> up to 800K IOPS*
		<b>Random Write</b> up to 800K IOPS*

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

<b>HP Z Turbo Drive Quad Pro 4TB SSD</b>	<b>Capacity</b>	4TB
	<b>Protocol</b>	PCIe
	<b>Form Factor</b>	M.2
	<b>Controller</b>	NVMe
	<b>NAND Type</b>	3D TLC
	<b>Endurance</b>	500TBW (TB Written)
	<b>Reliability</b>	1.5M hours

### Technical Specifications - Storage Drives

<b>Rated for 24/7/365 operation</b>	No
<b>Interface</b>	PCI Express 4.0 x4 electrical
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
<b>Performance</b>	<b>Sequential Read</b> up to 6500MB/s* <b>Sequential Write</b> up to 5000MB/s* <b>Random Read</b> up to 800K IOPS* <b>Random Write</b> up to 800K IOPS*

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

#### SATA Hard Drives for HP Workstations

<b>1TB 7200RPM SATA 3.5in Enterprise HDD</b>	<b>Capacity</b> 1TB <b>Protocol</b> SATA <b>Form Factor</b> 3.5" <b>Controller</b> AHCI <b>Reliability</b> 2.0M hours <b>Rated Power On Hours</b> 8760/yr <b>Annualized Failure Rate (based on Rated POH)</b> <0.62% <b>Rated for 24/7/365 operation</b> YES <b>Height</b> 1 in; 2.54 cm <b>Width</b> <b>Media Diameter</b> 3.5 in; 8.9 cm <b>Physical Size</b> 4 in; 10.17 cm <b>Interface</b> Serial ATA (6.0Gb/s), NCQ enabled <b>Synchronous Transfer Rate (Maximum)</b> Up to 600MB/s * <b>Buffer</b> 128MB <b>Cache</b> Adaptive <b>Seek Time</b> (typical reads, includes controller overhead, including settling) <b>Single Track</b> 0.32 ms * <b>Average</b> 7.45 ms * <b>Full Stroke</b> 14.2 ms * <b>Rotational Speed</b> 7,200 rpm <b>Logical Blocks</b> 1,953,525,168 <b>Operating Temperature</b> 41° to 131° F (5° to 55° C) <b>Performance</b> <b>Sequential Read</b> up to 226MB/s* <b>Sequential Write</b> up to 226MB/s*
----------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

<b>2TB 7200RPM SATA 3.5in Enterprise HDD</b>	<b>Capacity</b> 2TB <b>Protocol</b> SATA <b>Form Factor</b> 3.5" <b>Controller</b> AHCI <b>Reliability</b> 2.0M hours <b>Rated Power On Hours</b> 8760/yr
----------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### Technical Specifications - Storage Drives

<b>Annualized Failure Rate (based on Rated POH)</b>	<0.62%	
<b>Rated for 24/7/365 operation</b>	YES	
<b>Height</b>	1 in; 2.54 cm	
<b>Width</b>	<b>Media Diameter</b>	3.5 in; 8.9 cm
	<b>Physical Size</b>	4 in; 10.17 cm
<b>Interface</b>	Serial ATA (6.0Gb/s), NCQ enabled	
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s *	
<b>Buffer</b>	128MB	
<b>Cache</b>	Adaptive	
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	0.7 ms *
	<b>Average</b>	8.5 ms *
	<b>Full Stroke</b>	15.7 ms *
<b>Rotational Speed</b>	7,200 rpm	
<b>Logical Blocks</b>	3,907,029,168	
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	
<b>Performance</b>	<b>Sequential Read</b>	up to 226MB/s*
	<b>Sequential Write</b>	up to 226MB/s*

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

<b>4TB 7200RPM SATA 3.5in Enterprise HDD</b>	<b>Capacity</b>	4TB	
	<b>Protocol</b>	SATA	
	<b>Form Factor</b>	3.5"	
	<b>Controller</b>	AHCI	
	<b>Reliability</b>	2.0M hours	
	<b>Rated Power On Hours</b>	8760/yr	
	<b>Annualized Failure Rate (based on Rated POH)</b>	<0.62%	
	<b>Rated for 24/7/365 operation</b>	YES	
	<b>Height</b>	1 in; 2.54 cm	
	<b>Width</b>	<b>Media Diameter</b>	3.5 in; 8.9 cm
		<b>Physical Size</b>	4 in; 10.17 cm
	<b>Interface</b>	Serial ATA (6.0Gb/s), NCQ enabled	
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s *	
	<b>Buffer</b>	256MB	
	<b>Cache</b>	Adaptive	
	<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	0.7 ms *
		<b>Average</b>	8.5 ms *
		<b>Full Stroke</b>	15.7 ms *
	<b>Rotational Speed</b>	7,200 rpm	

### Technical Specifications - Storage Drives

<b>Logical Blocks</b>	7,814,037,168
<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)
<b>Performance</b>	<b>Sequential Read</b> up to 226MB/s*
	<b>Sequential Write</b> up to 226MB/s*

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

<b>8TB 7200RPM SATA 3.5in Enterprise HDD</b>	<b>Capacity</b>	8TB	
	<b>Protocol</b>	SATA	
	<b>Form Factor</b>	3.5"	
	<b>Controller</b>	AHCI	
	<b>Reliability</b>	2.0M hours	
	<b>Rated Power On Hours</b>	8760/yr	
	<b>Annualized Failure Rate (based on Rated POH)</b>	<0.62%	
	<b>Rated for 24/7/365 operation</b>	YES	
	<b>Height</b>	1 in; 2.54 cm	
	<b>Width</b>		
		<b>Media Diameter</b>	3.5 in; 8.9 cm
		<b>Physical Size</b>	4 in; 10.17 cm
	<b>Interface</b>	Serial ATA (6.0Gb/s), NCQ enabled	
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s *	
	<b>Buffer</b>	256MB	
	<b>Cache</b>	Adaptive	
	<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	0.7 ms *
		<b>Average</b>	8.5 ms *
		<b>Full Stroke</b>	15.7 ms *
	<b>Rotational Speed</b>	7,200 rpm	
	<b>Logical Blocks</b>	15,628,053,168	
	<b>Operating Temperature</b>	41° to 140° F (5° to 60° C)	
	<b>Performance</b>	<b>Sequential Read</b>	up to 226MB/s*
		<b>Sequential Write</b>	up to 226MB/s*

\*Actual performance may vary.

**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.

<b>12TB 7200RPM SATA-6G 3.5in Enterprise HDD</b>	<b>Capacity</b>	12TB	
	<b>Protocol</b>	SATA	
	<b>Form Factor</b>	3.5"	
	<b>Controller</b>	AHCI	
	<b>Reliability</b>	2.0M hours	
	<b>Rated Power On Hours</b>	8760/yr	
	<b>Annualized Failure Rate (based on Rated POH)</b>	<0.62%	
	<b>Rated for 24/7/365 operation</b>	YES	

## Technical Specifications - Storage Drives

Height	1 in; 2.54 cm	
Width	Media Diameter	3.5 in; 8.9 cm
	Physical Size	4 in; 10.17 cm
Interface	Serial ATA (6.0Gb/s), NCQ enabled	
Synchronous Transfer Rate (Maximum)	Up to 600MB/s *	
Buffer	256MB	
Cache	Adaptive	
Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.7 ms *
	Average	8.5 ms *
	Full Stroke	15.7 ms *
Rotational Speed	7,200 rpm	
Logical Blocks	23,437,770,752	
Operating Temperature	41° to 140° F (5° to 60° C)	
Performance	Sequential Read	up to 226MB/s*
	Sequential Write	up to 226MB/s*

\*Actual performance may vary.  
**NOTE:** For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB of system disk (for Windows) is reserved for system recovery software.



### Technical Specifications - Graphics

#### GRAPHICS

<b>NVIDIA® A800 48GB</b>	<b>Form Factor</b>	Full-Height Dual Slot (4.4" Height x 10.5" Length)
	<b>Max Power Consumption</b>	240W
	<b>GPU Memory</b>	40GB HBM2 Memory Bandwidth: 1,555 GB/s Memory Width: 5,120-bit
	<b>Connectors</b>	NVLink Requires: 1x 16-pin CEM 5 power connector (adapter may be needed)
	<b>Maximum Resolution</b>	Not supported - No display out
	<b>Bus Type</b>	PCI Express 4.0 x16
	<b>Available Graphics Drivers</b>	Windows 10 Windows 11

<b>NVIDIA® RTX™ 6000 Ada 48GB</b>	<b>Form Factor</b>	Full-Height Dual Slot (4.4" Height x 10.5" Length) Weight: 1230 grams / 2.71 lbs (with extender)
	<b>Max Power Consumption</b>	Power: 300 Watts Cooling: Active
	<b>GPU Memory</b>	48GB GDDR6 memory ECC Memory Bandwidth: Up to 960 GB/s Memory Width: 384 bits
	<b>Connectors</b>	4x DisplayPort 1.4a Quadro Sync II connector Stereo Sync Requires CEM 5.0 16-pin auxiliary power adapter
	<b>Maximum Resolution</b>	7680x4320 @ 120Hz
	<b>Bus Type</b>	PCI Express 4.0 x16
	<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

<b>NVIDIA® RTX™ A6000 48GB</b>	<b>Form Factor</b>	Full-Height Dual Slot (4.4" Height x 10.5" Length) Weight: 1230 grams / 2.71 lbs (with extender)
	<b>Max Power Consumption</b>	Power: 300 Watts Cooling: Active
	<b>GPU Memory</b>	48GB GDDR6 memory ECC optional Memory Bandwidth: Up to 768 GB/s Memory Width: 384 bit
	<b>Connectors</b>	4x DisplayPort 1.4a Quadro Sync II connector NVLink® Stereo Sync Requires 8-pin auxiliary power cable (HP Graphics Power Cable CPU-8p to CPU-8p)
	<b>Maximum Resolution</b>	7680x4320 @ 120Hz
	<b>Bus Type</b>	PCI Express 4.0 x16

### Technical Specifications - Graphics

<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit
-----------------------------------	-------------------------------------------

<b>NVIDIA® RTX™ 5000 Ada 32GB</b>	<b>Form Factor</b>	Full-Height Dual Slot (4.4" Height x 13.85" Length) Weight: 1130 grams / 2.49 lbs (excluding extender)
	<b>Max Power Consumption</b>	Power: 250 Watts Cooling: Active
	<b>GPU Memory</b>	32GB GDDR6 memory ECC Memory Bandwidth: Up to 576 GB/s Memory Width: 256 bits
	<b>Connectors</b>	4x DisplayPort 1.4a Quadro Sync II connector Stereo Sync Requires CEM 5.0 16-pin auxiliary power adapter
	<b>Maximum Resolution</b>	7680x4320 @ 120Hz
	<b>Bus Type</b>	PCI Express 4.0 x16
	<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

<b>AMD® Radeon™ Pro W7900 48GB</b>	<b>Form Factor</b>	Full-Height Triple Slot (4.4" Height x 10.5" Length)
	<b>Max Power Consumption</b>	Power: 295W Cooling: Active
	<b>GPU Memory</b>	48GB GDDR6 memory Memory Bandwidth: Up to 864 GB/s Memory Width: 384 bit
	<b>Connectors</b>	3x DisplayPort 2.1 1x Enhanced Mini DisplayPort 2.1 Requires 2x 8-pin auxiliary power connectors
	<b>Maximum Resolution</b>	12288x6912 @ 120Hz
	<b>Bus Type</b>	PCI Express 4.0 x16
	<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

<b>NVIDIA® RTX™ A5000 24GB</b>	<b>Form Factor</b>	Full-Height Dual Slot (4.4" Height x 10.5" Length) Weight: 1049 grams + 80 grams extender
	<b>Max Power Consumption</b>	Power: 230W Cooling: Active
	<b>GPU Memory</b>	24GB GDDR6 memory ECC optional Memory Bandwidth: Up to 768 GB/s Memory Width: 384 bit
	<b>Connectors</b>	4x DisplayPort 1.4a Quadro Sync II connector

### Technical Specifications - Graphics

	NVLink® Stereo Sync Requires 8-pin auxiliary power
<b>Maximum Resolution</b>	7680x4320 @ 120Hz
<b>Bus Type</b>	PCI Express 4.0 x16
<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

#### NVIDIA® RTX 4500 Ada 24GB

<b>Form Factor</b>	Full-Height Dual Slot (4.4" Height x 10.5" Length)
<b>Max Power Consumption</b>	210W
<b>GPU Memory</b>	24GB GDDR6 Memory Bandwidth: 432 GB/s Memory Width: 192-bit
<b>Connectors</b>	4x DisplayPort 1.4a Requires: 1x 16-pin CEM 5 power connector (adapter may be needed)
<b>Maximum Resolution</b>	4x @ 4096 x 2160 @ 120Hz 4x @ 5120 x 2880 @ 60Hz 2x @ 7680 x 4320 @ 60Hz
<b>Bus Type</b>	PCI Express 4.0 x16
<b>Available Graphics Drivers</b>	Windows 10 Windows 11

#### NVIDIA® RTX™ A4500 20GB

<b>Form Factor</b>	Full-Height Dual Slot (4.4" Height x 10.5" Length) Weight: 1049 grams + 80 grams extender
<b>Max Power Consumption</b>	Power: 200W Cooling: Active
<b>GPU Memory</b>	20GB GDDR6 memory Memory Bandwidth: Up to 640 GB/s Memory Width: 320 bit
<b>Connectors</b>	4x DisplayPort 1.4a Quadro Sync II connector NVLink® Stereo Sync Requires 8-pin auxiliary power
<b>Maximum Resolution</b>	7680x4320 @ 120Hz
<b>Bus Type</b>	PCI Express 4.0 x16
<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

#### NVIDIA® RTX™ 4000 Ada 20GB

<b>Form Factor</b>	Full-Height Single Slot (4.4" Height x 9.5" Length)
--------------------	-----------------------------------------------------

### Technical Specifications - Graphics

<b>Max Power Consumption</b>	Power: 130W Cooling: Active
<b>GPU Memory</b>	20GB GDDR6 memory Memory Bandwidth: Up to 360 GB/s Memory Width: 256 bit
<b>Connectors</b>	4x DisplayPort 1.4a Requires 6-pin auxiliary power
<b>Maximum Resolution</b>	7680x4320 @ 120Hz
<b>Bus Type</b>	PCI Express 4.0 x16
<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

#### NVIDIA® RTX™ A4000 16GB

<b>Form Factor</b>	Full-Height Single Slot (4.4" Height x 9.5" Length) Weight: 500 grams
<b>Max Power Consumption</b>	Power: 140W Cooling: Active
<b>GPU Memory</b>	16GB GDDR6 memory Memory Bandwidth: Up to 448 GB/s Memory Width: 256 bit
<b>Connectors</b>	4x DisplayPort 1.4a Quadro Sync II connector Stereo Sync Requires 6-pin auxiliary power
<b>Maximum Resolution</b>	7680x4320 @ 120Hz
<b>Bus Type</b>	PCI Express 4.0 x16
<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

#### NVIDIA® Long-Life RTX™ A4000E 16GB

<b>Form Factor</b>	Full-Height Single Slot (4.4" Height x 9.5" Length) Weight: 500 grams
<b>Max Power Consumption</b>	Power: 140W Cooling: Active
<b>GPU Memory</b>	16GB GDDR6 memory Memory Bandwidth: Up to 448 GB/s Memory Width: 256 bit
<b>Connectors</b>	4x DisplayPort 1.4a Quadro Sync II connector Stereo Sync Requires 6-pin auxiliary power
<b>Maximum Resolution</b>	7680x4320 @ 120Hz
<b>Bus Type</b>	PCI Express 4.0 x16
<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

### Technical Specifications - Graphics

<b>NVIDIA® RTX™ 2000 Ada 16GB</b>	<b>Form Factor</b>	Half Height Dual Slot (2.7" Height x 6.7" Length)
	<b>Max Power Consumption</b>	70W
	<b>GPU Memory</b>	16GB GDDR6 Memory Bandwidth: 224 GB/s Memory Width: 128-bit
	<b>Connectors</b>	4x Mini DisplayPort 1.4a
	<b>Maximum Resolution</b>	4x 4096 x 2160 @ 120 Hz 4x 5120 x 2880 @ 60 Hz 2x 7680 x 4320 @ 60 Hz
	<b>Bus Type</b>	PCI Express 4.0 x8
	<b>Available Graphics Drivers</b>	Windows 10 Windows 11

<b>NVIDIA® RTX™ A2000 12GB</b>	<b>Form Factor</b>	Half-Height Dual Slot (2.713" Height x 6.6" Length) Weight: 306 grams
	<b>Max Power Consumption</b>	Power: 70W Cooling: Active
	<b>GPU Memory</b>	12GB GDDR6 memory Memory Bandwidth: Up to 288 GB/s Memory Width: 192 bit
	<b>Connectors</b>	4x mini-DisplayPort 1.4a
	<b>Maximum Resolution</b>	7680x4320 @ 120Hz
	<b>Bus Type</b>	PCI Express 4.0 x16
	<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

<b>NVIDIA® Long-Life RTX™ A2000E 12GB</b>	<b>Form Factor</b>	Half-Height Dual Slot (2.713" Height x 6.6" Length) Weight: 306 grams
	<b>Max Power Consumption</b>	Power: 70W Cooling: Active
	<b>GPU Memory</b>	12GB GDDR6 memory Memory Bandwidth: Up to 288 GB/s Memory Width: 192 bit
	<b>Connectors</b>	4x mini-DisplayPort 1.4a
	<b>Maximum Resolution</b>	7680x4320 @ 120Hz
	<b>Bus Type</b>	PCI Express 4.0 x16
	<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

<b>NVIDIA® T1000 8GB</b>	<b>Form Factor</b>	Half-Height Single Slot (2.713" Height x 6.137" Length) Weight: 132.6 grams
	<b>Max Power Consumption</b>	Power: 50W Cooling: Active

### Technical Specifications - Graphics

<b>GPU Memory</b>	8GB GDDR6 memory Memory Bandwidth: Up to 160 GB/s Memory Width: 128 bit
<b>Connectors</b>	4x mini-DisplayPort 1.4a
<b>Maximum Resolution</b>	7680x4320 @ 120Hz
<b>Bus Type</b>	PCI Express 3.0 x16
<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

#### NVIDIA® Long-Life T1000E 8GB

<b>Form Factor</b>	Half-Height Single Slot (2.713" Height x 6.137" Length) Weight: 132.6 grams
<b>Max Power Consumption</b>	Power: 50W Cooling: Active
<b>GPU Memory</b>	8GB GDDR6 memory Memory Bandwidth: Up to 160 GB/s Memory Width: 128 bit
<b>Connectors</b>	4x mini-DisplayPort 1.4a
<b>Maximum Resolution</b>	7680x4320 @ 120Hz
<b>Bus Type</b>	PCI Express 3.0 x16
<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

#### NVIDIA® T1000 4GB

<b>Form Factor</b>	Half-Height Single Slot (2.713" Height x 6.137" Length) Weight: 132.6 grams
<b>Max Power Consumption</b>	Power: 50W Cooling: Active
<b>GPU Memory</b>	4GB GDDR6 memory Memory Bandwidth: Up to 160 GB/s Memory Width: 128 bit
<b>Connectors</b>	4x mini-DisplayPort 1.4a
<b>Maximum Resolution</b>	7680x4320 @ 120Hz
<b>Bus Type</b>	PCI Express 3.0 x16
<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

#### NVIDIA® T400 4GB

<b>Form Factor</b>	Half-Height Single Slot (2.713" Height x 6.137" Length) Weight: 123.5 grams
<b>Max Power Consumption</b>	Power: 30W Cooling: Active
<b>GPU Memory</b>	4GB GDDR6 memory Memory Bandwidth: Up to 80 GB/s Memory Width: 64 bit
<b>Connectors</b>	3x mini-DisplayPort 1.4a
<b>Maximum Resolution</b>	7680x4320 @ 120Hz

### Technical Specifications - Graphics

<b>Bus Type</b>	PCI Express 3.0 x16
<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

#### AMD® Radeon™ Pro W6800 32GB

<b>Form Factor</b>	Full-Height Dual Slot (4.4" Height x 10.5" Length) Weight: 850 grams
<b>Max Power Consumption</b>	Power: 261W Cooling: Active
<b>GPU Memory</b>	32GB GDDR6 memory Memory Bandwidth: Up to 512 GB/s Memory Width: 256 bit
<b>Connectors</b>	6x mini-DisplayPort 1.4 Requires 8-pin+6-pin auxiliary power
<b>Maximum Resolution</b>	7680x4320 @ 60Hz
<b>Bus Type</b>	PCI Express 4.0 x16
<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

#### AMD® Radeon™ Pro W7600 8GB

<b>Form Factor</b>	Full-Height Single Slot (4.38" Height x 9.5" Length)
<b>Max Power Consumption</b>	130W
<b>GPU Memory</b>	8GB GDDR6 Memory Bandwidth: 288 GB/s Memory Width: 128-bit
<b>Connectors</b>	4x DP 2.1 Requires: 1x 6-pin PCIe Aux Power
<b>Maximum Resolution</b>	4x @ 3840x2160 (4K) 4x @ 5120x2880 (5K) 2x @ 7680x4320 (8K)
<b>Bus Type</b>	PCI Express 4.0 x8
<b>Available Graphics Drivers</b>	Windows 10 Windows 11

#### AMD® Radeon™ Pro W7500 8GB

<b>Form Factor</b>	Full-Height Single Slot (4.38" Height x 8.5" Length)
<b>Max Power Consumption</b>	70W
<b>GPU Memory</b>	8 GB GDDR6 Memory Bandwidth: 173 GB/s Memory Width: 128-bit
<b>Connectors</b>	4x DP 2.1
<b>Maximum Resolution</b>	4x @ 3840x2160 (4K) 4x @ 5120x2880 (5K) 2x @ 7680x4320 (8K)
<b>Bus Type</b>	PCI Express 4.0 x8
<b>Available Graphics Drivers</b>	Windows 10 Windows 11

### Technical Specifications - Graphics

<b>AMD® Radeon™ Pro W6600 8GB</b>	<b>Form Factor</b>	Full-Height Single Slot (4.38" Height x 9.50" Length) Weight: 132.6 grams
	<b>Max Power Consumption</b>	Power: 122W Cooling: Active
	<b>GPU Memory</b>	8GB GDDR6 memory Memory Bandwidth: Up to 224 GB/s Memory Width: 128 bit
	<b>Connectors</b>	4x DisplayPort 1.4 Requires 6-pin auxiliary power
	<b>Maximum Resolution</b>	7680x4320 @ 60Hz
	<b>Bus Type</b>	PCI Express 4.0 x16 (x8 electrical)
	<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

<b>AMD® Radeon™ RX 6400 4GB</b>	<b>Form Factor</b>	Half-Height Single Slot (4.4" Height x 10.5" Length) Weight: 155 grams
	<b>Max Power Consumption</b>	Power: 50W Cooling: Active
	<b>GPU Memory</b>	4GB GDDR6 memory Memory Bandwidth: Memory Width:
	<b>Connectors</b>	1x DisplayPort 1.4a 1x HDMI
	<b>Maximum Resolution</b>	7680x4320 @ 60Hz
	<b>Bus Type</b>	PCI Express 4.0 x4
	<b>Available Graphics Drivers</b>	Windows 11 Windows 10 Linux® 64-bit

<b>Intel® Arc Pro A40 6GB</b>	<b>Form Factor</b>	Half-Height Single Slot (2.7" Height x 6.6" Length) Weight: 220 grams
	<b>Max Power Consumption</b>	Power: 50W Cooling: Active
	<b>GPU Memory</b>	6GB GDDR6 memory Memory Bandwidth: 192GB Memory Width: 96 bit
	<b>Connectors</b>	4x mini- DisplayPort 1.4
	<b>Maximum Resolution</b>	7680x4320 @ 60Hz
	<b>Bus Type</b>	PCI Express 4.0 x8
	<b>Available Graphics Drivers</b>	Windows 11 Windows 10



### Technical Specifications - Graphics

Notes for all graphics cards:

- Some graphics and GPU compute cards can consume a great deal of power, thus combinations of cards with other components may exceed a particular power supply's output capability.
- Some graphics and GPU compute cards require supplemental power cables.
- Not all chassis/PSU configurations have enough supplemental power cables of the correct type for all graphics configurations.
- Refer to the Power Supply section within Overview for more information.

### OPTICAL AND REMOVABLE STORAGE

<b>HP 9.5mm Slim Blu-Ray Writer</b>	<b>Description</b>	9.5mm height, tray-load
	<b>Mounting Orientation</b>	Either horizontal or vertical
	<b>Interface Type</b>	SATA/ATAPI
	<b>Dimensions (WxHxD)</b>	128 x 9.5 x 127mm
	<b>Supported Media Types</b>	BD-ROM BD-R BD-RE DVD+R DVD+RW DVD+R DL DVD-R DL DVD-R DVD-RW CD-R CD-RW
	<b>Disc Capacity</b>	<b>DVD-ROM</b> 8.5 GB DL or 4.7 GB standard <b>Blu-ray</b> 25 GB (single-layer) 50 GB (dual-layer) 100/128 GB (BDXL)
		<b>Full Stroke DVD</b> < 230 ms (seek) <b>Full Stroke CD</b> < 220 ms (seek) <b>Blu-ray</b> < 230 ms (seek) (Full Stroke Blu-ray)
		<b>Startup Time</b> (Time to drive ready from tray loading) BD-ROM (SL/DL) 25S / 28S BD-R (SL/DL) 25S / 28S BD-RE (SL/DL) 25S / 28S DVD-ROM (SL/DL) 18S / 18S DVD-R (SL/DL) 25S / 25S DVD-RW 25S DVD+R (SL/DL) 25S / 25S DVD+RW 25S CD-ROM 15S
	<b>Maximum Data Transfer Rates</b>	<b>CD ROM Read</b> CD-ROM, CD-R Up to 24X CD-RW Up to 24X
		<b>DVD ROM Read</b> DVD+RW Up to 8X DVD-RW Up to 8X

### Technical Specifications - Graphics

		DVD+R DL Up to 8X DVD-R DL Up to 8X DVD-ROM Up to 8X DVD-ROM DL Up to 8X DVD+R Up to 8X DVD-R Up to 8X
	<b>Blu-ray</b>	BD-ROM Up to 6X BD-ROM DL Up to 6X BD-R Up to 6X BD-R DL Up to 6X BD-R Up to 6X BD-RE SL/DL Up to 6X
<b>Power</b>	<b>Source</b>	SATA DC power receptacle
	<b>DC Power Requirements</b>	5 VDC ± 5%-100 mV ripple p-p
	<b>DC Current</b>	5 VDC -900 mA typical, 2000mA maximum
<b>Operating Environmental</b> (all conditions non-condensing)	<b>Temperature</b>	41° to 122° F (5° to 50° C)
	<b>Relative Humidity</b>	10% to 80%
	<b>Maximum Wet Bulb Temperature</b>	84° F (29° C)
<b>Operating Systems Supported</b>	Windows 11, Windows 10, Windows 7 Professional 64-bit, Red Hat® Enterprise Linux® (RHEL) 8, 9 Desktop/Workstation SUSE Linux® Enterprise Desktop 15 Ubuntu 20.04, 22.04 LTS	
	No driver is required for this device. Native support is provided by the operating system.	
<b>Kit Contents</b>	9.5mm Slim BDXL Blu-Ray Writer, 5.25" ODD Bay adapter/carrier, slim SATA data/power cable, installation guide As Blu-ray is a new format containing new technologies, certain disc, digital connection, compatibility and/or performance issues may arise, and do not constitute defects in the product. Flawless playback on all systems is not guaranteed. In order for some Blu-ray titles to play, they may require a DVI or HDMI digital connection and your display may require HDCP support. HD-DVD movies cannot be played on this workstation.	
<b>NOTE:</b> HD-DVD disks cannot be played on the DVD-ROM drive. No support for DVD-RAM. Actual speeds may vary. Don't copy copyright-protected materials. Double Layer discs can store more data than single layer discs. Discs burned with this drive may not be compatible with many existing single-layer DVD drives and players. Flawless playback on all systems is not guaranteed.		

#### HP 9.5mm Slim DVD Writer

<b>Description</b>	9.5mm height, tray-load
<b>Mounting Orientation</b>	Either horizontal or vertical
<b>Interface Type</b>	SATA/ATAPI
<b>Dimensions (WxHxD)</b>	128 x 9.5 x 127mm
<b>Supported Media Types</b>	DVD+R DVD+RW DVD+R DL DVD-R DL

### Technical Specifications - Graphics

	DVD-R DVD-RW CD-R CD-RW	
<b>Disc Capacity</b>	<b>DVD-ROM</b>	8.5 GB DL or 4.7 GB standard
	<b>Full Stroke DVD</b>	< 200 ms (seek)
	<b>Full Stroke CD</b>	< 200 ms (seek)
<b>Maximum Data Transfer Rates</b>	<b>CD ROM Read</b>	CD-ROM, CD-R Up to 24X CD-RW Up to 24X
	<b>DVD ROM Read</b>	DVD+RW Up to 8X DVD-RW Up to 8X DVD+R DL Up to 8X DVD-R DL Up to 8X DVD-ROM Up to 8X DVD-ROM DL Up to 8X DVD+R Up to 8X DVD-R Up to 8X
<b>Power</b>	<b>Source</b>	SATA DC power receptacle
	<b>DC Power Requirements</b>	5 VDC $\pm$ 5%-100 mV ripple p-p
	<b>DC Current</b>	5 VDC -< 800 mA typical, <1600 mA maximum
<b>Operating Environmental</b> (all conditions non-condensing)	<b>Temperature</b>	41° to 122° F (5° to 50° C)
	<b>Relative Humidity</b>	10% to 80%
	<b>Maximum Wet Bulb Temperature</b>	84° F (29° C)
<b>Operating Systems Supported</b>	Windows 11, Windows 10, Windows 7 Professional 64-bit, Windows Vista Business 64*, Windows 2000. Red Hat® Enterprise Linux® (RHEL) 8, 9 Desktop/Workstation SUSE Linux® Enterprise Desktop 15 Ubuntu 20.04, 22.04 LTS	
	* No driver is required for this device. Native support is provided by the operating system	
<b>Kit Contents</b>	HP SATA DVD Writer drive, installation guide.	
	<b>NOTE:</b> Actual speeds may vary. No support for DVD-RAM (DVD Writer). Does not permit copying of commercially available DVD movies or other copyright protected materials. Intended for creation and storage of your original material and other lawful uses. Double Layer discs can store more data than single layer discs. However, double-layer discs burned with this drive may not be compatible with many existing single-layer DVD drives and players.	

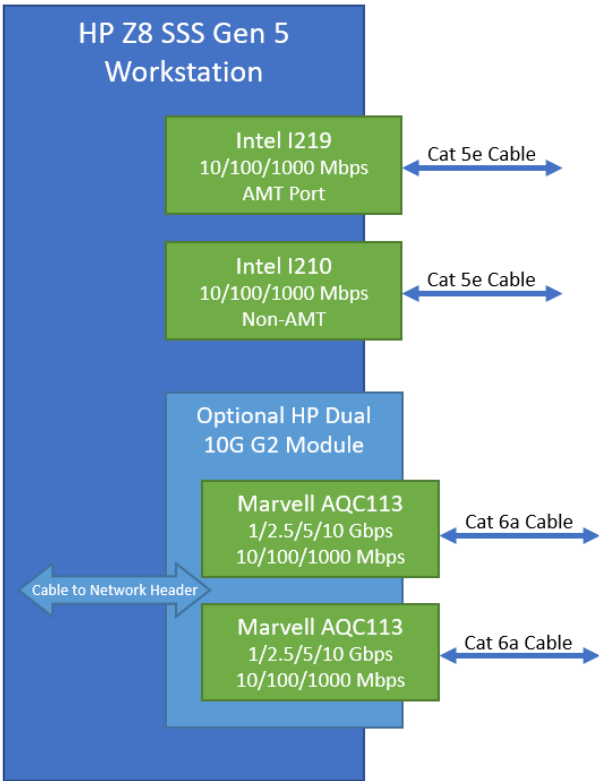
<b>HP 9.5mm Slim DVD-ROM</b>	<b>Description</b>	9.5mm height, tray-load
	<b>Mounting Orientation</b>	Either horizontal or vertical
	<b>Interface Type</b>	SATA/ATAPI
	<b>Dimensions (WxHxD)</b>	128 x 9.5 x 127mm
	<b>Disc Capacity</b>	<b>DVD-ROM</b> Single layer: Up to 4.7 GB Double layer: Up to 8.5 GB
	<b>Access Times</b>	<b>DVD-ROM Single Layer</b> < 110 ms (typical)

### Technical Specifications - Graphics

<b>Power</b>	<b>CD-ROM Mode 1</b>	< 110 ms (typical)
	<b>Full Stroke DVD</b>	< 230 ms (typical)
	<b>Full Stroke CD</b>	< 220 ms (typical)
	<b>Source</b>	SATA DC power receptacle
<b>Operating Environmental</b> (all conditions non-condensing)	<b>DC Power Requirements</b>	5 VDC ± 5%-100 mV ripple p-p
	<b>DC Current</b>	5 VDC -< 800 mA typical, <1600 mA maximum
	<b>Temperature</b>	41° to 122° F (5° to 50° C)
	<b>Relative Humidity</b>	10% to 80%
<b>Operating Systems Supported</b>	<b>Maximum Wet Bulb Temperature</b>	84° F (29° C)
	Windows 11, Windows 10, Windows 8.1, Windows 7 Professional 64-bit	
	Red Hat® Enterprise Linux® (RHEL) 8, 9 Desktop/Workstation	
	SUSE Linux® Enterprise Desktop 15	
<b>Kit Contents</b>	Ubuntu 20.04, 22.04 LTS	
	No driver is required for this device. Native support is provided by the operating system.	

**NOTE:** Actual speeds may vary. No support for DVD-RAM (DVD Writer). Does not permit copying of commercially available DVD movies or other copyright protected materials. Intended for creation and storage of your original material and other lawful uses. Double Layer discs can store more data than single layer discs. However, double-layer discs burned with this drive may not be compatible with many existing single-layer DVD drives and players.

NETWORKING AND COMMUNICATIONS



<b>Integrated Intel® I219LM PCIe GbE Controller (Intel® vPro® with Intel® AMT 16.01)</b>	<b>Connector</b>	RJ-45
	<b>Cabling</b>	Twisted pair up to 100m
	<b>Controller</b>	Intel® I219LM GbE platform LAN connect networking controller
	<b>Memory</b>	3 KB Tx and 3KB Rx FIFO packet buffer memory
	<b>Data Rates Supported</b>	10/100/1000Mbps
	<b>Compliance</b>	IEEE 802.3x, 802.3az, 802.1as/1588, 802.1p, 802.1Q, 802.3, 802.3ab, 802.3i, 802.3u, 802.3z
	<b>Bus Architecture</b>	PCI Express and SMBus
	<b>Data Transfer Mode</b>	PCIe-based interface for active state operation (S0 state) and SMBus for host and management traffic (Sx low power state)
	<b>Power Requirements</b>	0.5 Watts Max
	<b>Boot ROM Support</b>	Yes
	<b>Network Transfer Mode</b>	Full-duplex; Half-duplex
	<b>Network Transfer Rate</b>	0BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps
	<b>Management Capabilities</b>	vPro®, WOL, auto MDI crossover, PXE, Muti-port teaming, RSS, ACPI,

### Technical Specifications - Networking and Communications

Advanced cable diagnostic, loopback modes, AMT 16.0 support, Circuit Breaker, VLAN, Multicast Listener Discovery (MLD)

<sup>1</sup>Requires activation and a system with a corporate network connection, an Intel® AMT enabled chipset, and network hardware and software. For notebooks, Intel AMT may be unavailable or limited over a host OS-based VPN, when connecting wirelessly, on battery power, sleeping, hibernating, or powered off. Results dependent upon hardware, setup, and configuration. For more information, visit: <https://www.intel.com/content/www/us/en/architecture-and-technology/intel-active-managementtechnology.html>

#### I210 (integrated)

<b>Connector</b>	RJ-45
<b>Cabling</b>	Up to 100m with Cat 5e or better
<b>Controller</b>	Intel I210
<b>Memory</b>	N/A
<b>Data Rates Supported</b>	10/100/1000Mbps
<b>Compliance</b>	IEEE 802.3az, 802.3u, 802.3z, 802.3ab, 802.1AS/1588, 802.1Qav
<b>Bus Architecture</b>	PCIe
<b>Data Transfer Mode</b>	BASE-T
<b>Power Requirements</b>	N/A
<b>Network Transfer Mode</b>	BASE-T
<b>Network Transfer Rate</b>	10/100/1000Mbps
<b>Management Capabilities</b>	Wake-on-LAN, PXE, UEFI
<b>Kit Contents</b>	Integrated into system

#### NVIDIA® Mellanox® ConnectX-6 DX Dual Port 10/25GbE SFP28 NIC

<b>Connector</b>	2 x SFP28 Transceiver Cage (Dual Port)*
<b>Cabling</b>	Depends on transceiver pairing. Typically OM4 or higher MMF LC fiber optic cabling with LC SFP28 Transceivers.
<b>Controller</b>	ConnectX6-DX
<b>Memory</b>	256Mbit SPI Quad Flash Device
<b>Data Rates Supported</b>	1/10/25GbE
<b>Compliance</b>	<ul style="list-style-type: none"> <li>– IEEE 802.3by 25 Gigabit Ethernet</li> <li>– IEEE 802.3ae 10 Gigabit Ethernet</li> <li>– IEEE 802.3ap based auto-negotiation and KR startup</li> <li>– IEEE 802.3ad, 802.1AX Link Aggregation</li> <li>– IEEE 802.1Q, 802.1P VLAN tags and priority</li> <li>– IEEE 802.1Qau (QCN)</li> <li>– Congestion Notification</li> <li>– IEEE 802.1Qaz (ETS)</li> <li>– IEEE 802.1Qbb (PFC)</li> <li>– IEEE 802.1Qbg</li> <li>– IEEE 1588v2</li> <li>– Jumbo frame support (9.6KB)</li> <li>– Safety: CB/cTUVus/CE</li> <li>– EMC: CE/FCC/VCCI/RCM</li> <li>– RoHS Compliant</li> <li>– KCC</li> <li>– CAN ICES-3 (B)</li> <li>– NM EN 55035/55032 (Morocco)</li> </ul>

### Technical Specifications - Networking and Communications

<b>Bus Architecture</b>	– UKCA
<b>Data Transfer Mode</b>	PCIe Gen 4 x8
<b>Power Requirements</b>	11.5 Watts (typical)
<b>Network Transfer Rate</b>	1Gbps, 10Gbps, 25Gbps

[Note: Network Transfer Rate depends on transceiver model.\\*](#)

<b>Kit Contents</b>	NVIDIA® Mellanox® ConnectX-6 DX Dual Port 10/25GbE SFP28 NIC
---------------------	--------------------------------------------------------------

#### HP Dual Port 10GBase-T NIC Module G2

<b>Networking Interface</b>	2 RJ-45
<b>System Interface</b>	Cabled from Dedicated Rear I/O Slot
<b>Networking Speeds Supported</b>	10Gbps, 5Gbps, 2.5Gbps, 1Gbps, 100Mbps, 10Mbps
<b>Cabling (up to 100m)</b>	Cat5e (or higher) for 1Gbps Cat6a (or higher) for 10Gbps
<b>Power Consumption (active-typical)</b>	5.5W at 1Gbps 11.2W at 10Gbps
<b>Physical Dimensions</b>	0.875 in x 3 in x 2.75 in
<b>Connect Speed LED Indicators</b>	Link/Activity LED <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Blinking = Activity</li> </ul> Speed LED <ul style="list-style-type: none"> <li>• Amber = 1Gbps</li> <li>• Green = 10Gbps</li> </ul>
<b>Operating Temperature</b>	0 °C to 55 °C (32 °F to 131 °F)

#### Intel® X550 10GBASE-T Dual Port NIC

<b>Connector</b>	2 x RJ-45
<b>Cabling</b>	Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps, 2.5Gbps, or 5Gbps Cat6 (or higher) for 10Gbps up to 55m Cat6a (or higher) for 10Gbps up to 100m
<b>Controller</b>	Intel X550-AT2
<b>Memory</b>	Jumbo Frames up to 15.5KB, 64 Tx and 64Rx Queues per port, 160KB/port of programmable memory transmit buffers
<b>Data Rates Supported</b>	100Mbps (BASE-TX), 1Gbps (BASE-T), 2.5Gbps, 5Gbps, 10Gbps
<b>Compliance</b>	802.1q (VLAN), 802.1Qbb, 802.1p, 802.1Qaz
<b>Bus Architecture</b>	PCIe 3x4
<b>Data Transfer Mode</b>	PCIe Gen 3 x4 based interface
<b>Power Requirements</b>	3.9W at 100Mbps 5.5W at 1Gbps 11.2W at 10Gbps
<b>Boot ROM Support</b>	Yes
<b>Network Transfer Mode</b>	Auto negotiation between 1GbE, 2.5GbE, 5GbE and 10GbE



### Technical Specifications - Networking and Communications

**Management Capabilities** DMI 2.0 Support, Windows Management Instrumentation (WMI) and SNMP, PXE 2.0 through boot ROM, Multi-mode I/O Virtualization, VxLAN, VMDq, VLAN support with VLAN tag insertion

**Kit Contents** Intel® X550 10GBASE-T Dual Port NIC

<b>Intel® I225-T1 Single Port 2.5GbE PCIe NIC</b>	<b>Connector</b>	RJ-45 (Single Port)
	<b>Cabling</b>	Cat5e (or better) up to 100m
	<b>Controller</b>	Intel® Ethernet I225 Controller
	<b>Memory</b>	Jumbo Frames up to 9.5KB, 4 Tx and Rx Queues,
	<b>Data Rates Supported</b>	2.5GbE, 1GbE, 100MbE, 10MbE
	<b>Compliance</b>	IEEE 802.3 auto negotiation, 802.3x, 802.3z
	<b>Bus Architecture</b>	PCIe Gen 3.1x1
	<b>Data Transfer Mode</b>	PCIe-based interface for active state operation
	<b>Power Requirements</b>	1.9 Watts (typical)
	<b>Management Capabilities</b>	WOL, PXE 2.1, Power Management Protocol Offload (proxying), MAC Power Management, Active State Power Management,
	<b>Kit Contents</b>	Intel® I225-T1 1-Port 2.5GbE NIC with standard height bracket attached and Low-profile bracket included Product Literature

<b>Intel® Ethernet I350-T4V2 4-Port 1Gb NIC</b>	<b>Connector</b>	4x RJ-45 (Quad Port)
	<b>Cabling</b>	Cat3 (or higher) for 10Mbps Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps up to 100m
	<b>Controller</b>	Intel® I350
	<b>Memory</b>	Jumbo Frames up to 9.5KB, 8 Tx/Rx Queue pairs per port, Main Internal memory is Error Code Correcting
	<b>Data Rates Supported</b>	10Mbps, 100Mbps, 1Gbps
	<b>Compliance</b>	IEEE 802.3 auto negotiation, 802.3, 802.3u, 802.3ab, 802.3x, 802.3z, IEEE1588 protocol and 802.1AS implementation, 802.3az EEE
	<b>Bus Architecture</b>	PCI Express 2.1 x4
	<b>Data Transfer Mode</b>	PCIe-based interface for active state operation
	<b>Power Requirements</b>	5W
	<b>Network Transfer Mode</b>	Multi-speed, full, and half-duplex
	<b>Network Transfer Rate</b>	10BASE-T 100BASE-Tx 1000BASE-T
	<b>Management Capabilities</b>	WOL, PXE 2.1, UEFI, Power Management Protocol Offload (proxying), MAC Power Management, Active State Power Management, VLAN, ACPI
	<b>Kit Contents</b>	Intel® Ethernet I350-T4V2 4-Port 1Gb NIC with full-height bracket installed Low-profile bracket included

<b>Allied Telesis AT-2911T/2-901 Dual Port 1GbE NIC</b>	<b>Connector</b>	2 x RJ-45 (Dual Port)
	<b>Cabling</b>	Cat3 (or higher) for 10Mbps Cat5 (or higher) for 100Mbps

### Technical Specifications - Networking and Communications

<b>Memory</b>	Cat5e (or higher) for 1Gbps up to 100m
<b>Data Rates Supported</b>	17 Rx and 16 Tx queues
<b>Compliance</b>	10/100/1000 Mbps IEEE 802.1p (Quality of Service), IEEE 802.1Q (VLANs), IEEE 802.2 (LLC), IEEE 802.3ac (MAC), IEEE 802.3x (Flow control auto-negotiation), IEEE 802.3z (1000 Base-X), IEEE 802.3ad (Link aggregation), IEEE 802.3ab (10/100/1000T) RoHS, UL, FCC/EN55022 Class A, TUV, EN55024, CE, C-TICK, VCCI
<b>Bus Architecture</b>	PCIe 2x1
<b>Data Transfer Mode</b>	PCIe-based interface
<b>Power Requirements</b>	2.4 Watts (typical)
<b>Management Capabilities</b>	VLAN support, Link aggregation LACP, Link aggregation smart switch, Failover, Smart Load Balancing (SLB), iSCSI boot support, Windows Management Instrumentation (WMI), PXE 2.1, SNMP
<b>Kit Contents</b>	Allied Telesis AT-2911T/2-901 Dual Port 1GbE NIC with low-profile bracket attached and standard bracket included

<b>Allied Telesis AT-2914SX/LC 1GbE LC Fiber NIC</b>	<b>Connector</b>	LC Fiber (Single Port)
	<b>Cabling</b>	50/125 µm (core/cladding) multimode fiber optic cable up to 500m 62.5/125 µm (core/cladding) multimode fiber optic cable up to 220m
	<b>Memory</b>	Jumbo Frames up to 9.6KB
	<b>Data Rates Supported</b>	1000SX (1GbE Fiber at 850nm Wavelength)
	<b>Compliance</b>	IEEE 802.1p (Quality of Service), IEEE 802.1Q (VLANs), IEEE 802.2 (LLC), IEEE 802.3ac (MAC), IEEE 802.3x (Flow control auto-negotiation), IEEE 802.3z (1000 Base-X), IEEE 802.3ad (Link aggregation) RoHS, UL, FCC/EN55022 Class A, TUV, EN55024, CE, C-TICK, VCCI
	<b>Bus Architecture</b>	PCIe x1
	<b>Data Transfer Mode</b>	PCIe-based interface
	<b>Power Requirements</b>	1.5 Watts (typical)
	<b>Network Transfer Rate</b>	1000SX only (1GbE Fiber at 850nm Wavelength)
	<b>Management Capabilities</b>	UEFI, Smart Load Balancing and failover, Link aggregation (IEEE802.3ad), Generic trunking (FEC/GEC) / IEEE 802.3ad-draft static, VLAN Support
	<b>Kit Contents</b>	Allied Telesis AT-2914SX/LC 1GB LC Fiber NIC with low-profile bracket attached and standard height bracket included

<b>Intel® AX210 Wi-Fi 6E non-vPro + Bluetooth® 5.2 wireless card with External Antenna WLAN</b>	<b>Connector</b>	Wireless
	<b>Cabling</b>	N/A
	<b>Controller</b>	Intel® AX210
	<b>Data Rates Supported</b>	Wi-Fi 6e (2.4GHz/5GHz/6GHz)
	<b>Compliance</b>	Wi-Fi Alliance* Wi-Fi Alliance CERTIFIED 6, WiFi CERTIFIED a/b/g/n/ac, WMM, WMM-Power Save, WPA2, WPA3, Wi-Fi Direct, and Wi-Fi Agile Multiband IEEE WLAN Standard 802.11-2016, 802.11a, b, d, e, g, h, l, k, n, r, u, v, w, ac, and ax, Bluetooth® 5.2
	<b>Bus Architecture</b>	PCIe G3x1 for WLAN, USB3.1G1 for BT
	<b>Management Capabilities</b>	Authentication Protocols: 802.1X EAP-TLS, EAP-TTLS/MSCHAPv2, PEAPv0 - MSCHAPv2 (EAP-SIM, EAP-AKA, EAP-AKA') Encryption: 128-bit AES-CCMP, 256-bit AES-GCMP

### Technical Specifications - Networking and Communications

#### Kit Contents

#### UEFI

Intel® AX210 Wi-Fi 6 + Bluetooth® 5.2 PCIe NIC

External Dipole Antenna

Installation Instructions

\*Wi-Fi 6E requires a Wi-Fi 6E router, sold separately to function in the 6GHz band. Availability of public wireless access points limited. Wi-Fi 6E is backwards compatible with prior 802.11 specs. And available in countries where Wi-Fi 6E is supported.

Date of change:	Version History:		Description of change:
March 1, 2023	From v1 to v2	Change	Optical and Removable Storage, Networking and Communications sections and changed Format
March 30, 2023	From v2 to v3	Change	Image page 1
April 1, 2023	From v3 to v4	Change	Format
May 1, 2023	From v4 to v5	Change	Power Supply section
May 2, 2023	From v5 to v6	Change	Social and Environmental Responsibility section
June 1, 2023	From v6 to v7	Change	Graphics, Storage, Networking and Communications, Social and Environmental Responsibility, Overview sections
July 1, 2023	From v7 to v8	Addition	HP Anyware Remote System Controller section
		Change	Optical and Removable Storage, Networking and Communications sections
August 1, 2023	From v8 to v9	Change	Storage Drives, Social and Environmental Responsibility sections
August 1, 2023	From v9 to v10	Change	ENVIRONMENTAL DATA section
August 11, 2023	From v10 to v11	Change	Optical and Removable Storage section
September 1, 2023	From v11 to v12	Change	Overview, NETWORKING AND COMMUNICATIONS, GRAPHICS sections
September 25, 2023	From v12 to v13	Change	SOFTWARE AND SECURITY section
October 1, 2023	From v13 to v14	Change	Graphics, Input Devices sections
November 1, 2023	From v14 to v15	Change	PCIe Solid State Drives, Memory, Multimedia and Audio Devices, Input Devices, Social and Environmental Responsibility sections
December 1, 2023	From v15 to v16	Change	Graphics, Other Hardware, Social and Environmental Responsibility sections
January 1, 2024	From v16 to v17	Change	PCIe Solid State Drives, Graphics sections
February 1, 2024	From v17 to v18	Change	STORAGE/HARD DRIVES, Graphics, Social and Environmental Responsibility sections
March 1, 2024	From v18 to v19	Change	Graphics section
April 1, 2024	From v19 to v20	Change	HP Remote System Controller, Certification and Compliance sections
April 24, 2024	From v20 to v21	Change	Processors section
May 1, 2024	From v21 to v22	Change	Graphics, Social and Environmental Responsibility sections
June 1, 2024	From v22 to v23	Change	Storage section
June 12, 2024	From v23 to v24	Change	Software section
August 1, 2024	From v24 to v25	Change	Graphics, Memory sections
September 2, 2024	From v25 to v26	Change	Processors, NETWORKING AND COMMUNICATIONS sections
September 26, 2024	From v26 to v27	Change	Maximum Altitude section
June 9, 2025	From v27 to v28	Change	Operating Systems, Optical and Removable Storage sections
June 20, 2025	From v28 to v29	Change	Supported Drive Interfaces section
August 1, 2025	From v29 to v30	Change	Other Hardware section
September 1, 2025	From v30 to v31	Change	Storage, Graphics, Memory, Optical and Removable Storage, Networking and Communications, Racking and Physical Security, Input Devices, Other Hardware sections
September 4, 2025	From v31 to v32	Change	Environmental Requirements section

Technical Specifications - Networking and Communications

November 17, 2025	From v32 to v33	Change	Networking and Communications, STORAGE/HARD DRIVES sections
January 16, 2026	From v33 to v34	Update	Graphics section updated
January 29, 2026	From v34 to v35	Correction	C20MMAA corrected to D0SX1AA

© 2026 HP Development Company, L.P. The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein. Intel, Intel Core, Xeon, Pentium, Thunderbolt and vPro are trademarks of Intel Corporation in the U.S. and other countries. Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. AMD is a trademark of Advanced Micro Devices, Inc. ENERGY STAR® is a registered trademark owned by the U.S. government. Linux® is the registered trademark of Linus Torvalds in the U.S. and other countries. NVIDIA, NVS and Quadro and the NVIDIA logo are trademarks and/or registered trademarks of NVIDIA Corporation in the U.S. and other countries. Red Hat® is a registered trademark of Red Hat, Inc. in the United States and other countries. SD is a trademark or registered trademark of SD-3C in the United States, other countries or both. Bluetooth is a trademark of its proprietor used by HP Inc. under license.