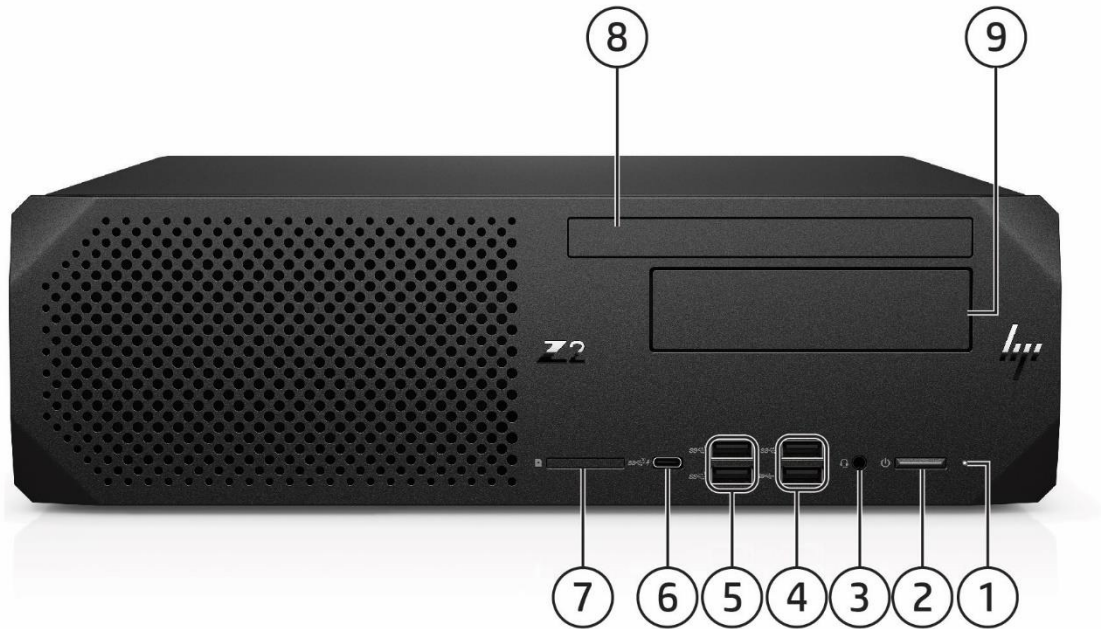## Overview

HP Z2 Small Form Factor G8 Workstation

Front View

1. HDD Activity LED

2. Power button

3. Universal audio jack (with CTIA & OMTP headset support)

4. (2) Type-A SuperSpeed USB 5Gbps signaling rate port (1 charge port supports up to 5V/2.1A)

5. (2) Type-A SuperSpeed USB 10Gbps signaling rate port

6. (1) Type-C® SuperSpeed USB 20Gbps signaling rate port (charge supports up to 5V/3A)

7. Media Card Reader 4.0 (optional)

8. Slim ODD bay

9. External/internal shared 3.5" bay

Overview
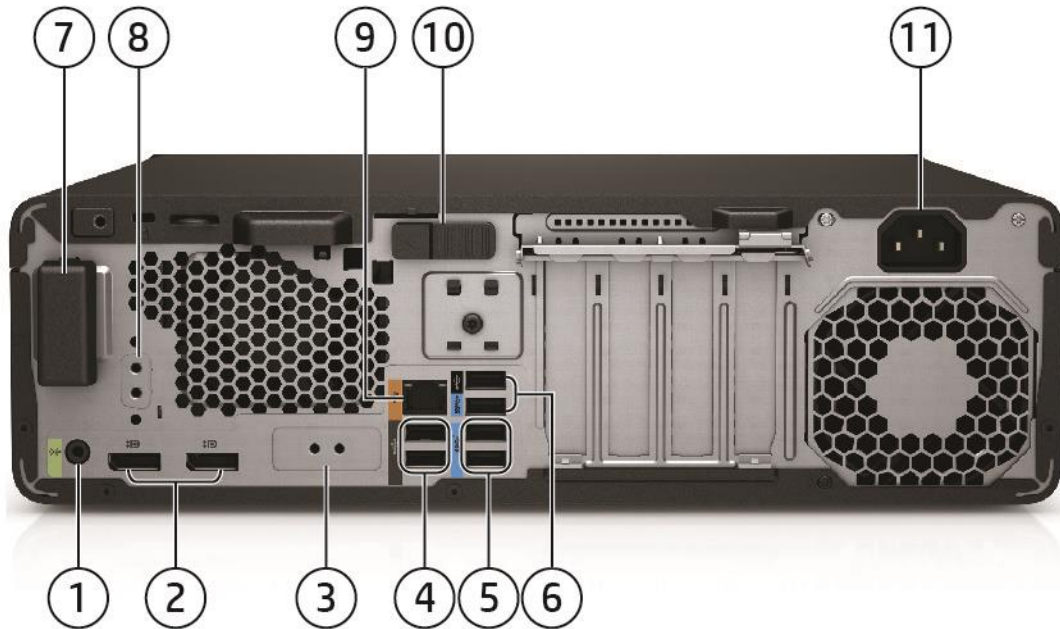
Rear view

1.   Audio line out
2.   (2) DisplayPort 1.4
3.   Flex I/O module: choose one from the following:
     (1) DisplayPort 1.4, (1) HDMI 2.0b, (1) VGA, (1) Dual Type-A SuperSpeed USB 5Gbps signaling rate, (1) Type-C®
     SuperSpeed USB 10Gbps signaling rate (Power Delivery 15W, Alt Mode DisplayPort), (1) 2nd GbE LAN, (1) Thunderbolt 3
     with Type-C® SuperSpeed USB4 40Gbps signaling rate* (cabled to PCIe AIC)
4.   (2) Hi-Speed USB 480Mbps signaling rate port
5.   (2) Type-A SuperSpeed USB 10Gbps signaling rate port
6.   (1) Type-A SuperSpeed USB 5Gbps signaling rate port
     (1) Hi-Speed USB 480Mbps signaling rate port
7.   WLAN Antenna (optional)
8.   2nd serial port (optional)
9.   RJ-45
10. Release latch
11. Power connector

*Maximum speed requires DisplayPort™ and PCIe aggregation.
NOTE: All onboard Display support DP1.4/HBR2 when video output is via Intel Graphics.
Note: Flex I/O module Display support DP1.4/HBR3, resolution support up to 5120x3200 24bpp @60Hz
NOTE: TBT 3 will be available in Q3, 2021

QuickSpecs

Supported Components

Form Factor	Small Form Factor
Operating Systems	Preinstalled:

- Windows 10 Pro 64[1]
- Windows 10 Pro 64 High End[1]
- Windows 10 Pro 64 Workstation Plus[1]
- Windows 10 Home 64 Plus[1]
- Windows 10 Home 64 Advanced[1]
- Linux®-ready[2]
- Ubuntu Linux 20.04 LTS[3]
- Red Hat® Enterprise Linux® (RHEL) Workstation – paper license (1yr) only (not preinstalled)
-

Web-supported only:
- Windows 10 Enterprise 64[1]

Supported Version:
- HP tested Windows 10, versions 1909, 2004, and 20H2 on this platform. For testing information on newer versions of Windows 10, please see: https://support.hp.com/document/c05195282.

[1] 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 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See http://www.windows.com. **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
[2] For detailed Linux® OS/hardware information, see:
http://www.hp.com/support/linux_hardware_matrix
[3] Ubuntu Linux 20.04 LTS available Q3, 2021

Available Processors

Name	Cores	Clock Speed (GHz)	Intel® Turbo Boost Technology[3]	Cache (MB)	Memory Speed (MT/s)	Hyper-Threading	Integrated Graphics	Featuring Intel® vPro® Technology[4]	16GB Intel® Optane™ memory[2]	TDP (W)
Intel® Core™ i9 11900K Processor	8	3.5	5.2	16	3200	Y	Intel® UHD Graphics 750	Y	Y	125
Intel® Core™ i9 11900F Processor	8	2.5	5.1	16	3200	Y	N/A	N/A	Y	65
Intel® Core™ i9 11900 Processor	8	2.5	5.1	16	3200	Y	Intel® UHD Graphics 750	Y	Y	65
Intel® Core™ i7 11700K Processor	8	3.6	5	16	3200	Y	Intel® UHD Graphics 750	Y	Y	125
Intel® Core™ i7 11700 processor	8	2.5	4.9	16	3200	Y	Intel® UHD Graphics 750	Y	Y	65
Intel® Core™ i5 11600K processor	6	3.9	4.9	12	3200	Y	Intel® UHD Graphics 750	Y	Y	125
Intel® Core™ i5 11600 processor	6	2.8	4.8	12	3200	Y	Intel® UHD Graphics 750	Y	Y	65

QuickSpecs

Supported Components

Intel® Core™ i5 11500 processor	6	2.7	4.6	12	3200	Y	Intel® UHD Graphics 750	Y	Y	65
Intel® Core™ i5 11400F processor	6	2.6	4.4	12	3200	Y	N/A	N/A	Y	65
Intel® Core™ i5 11400 processor	6	2.6	4.4	12	3200	Y	Intel® UHD Graphics 730	N/A	Y	65
Intel® Xeon® W-1390P processor	8	3.5	5.2	16	3200	Y	Intel® UHD Graphics P750	Y	Y	125
Intel® Xeon® W-1390 processor	8	2.8	5.1	16	3200	Y	Intel® UHD Graphics P750	Y	Y	80
Intel® Xeon® W-1370P processor	8	3.6	5.2	16	3200	Y	Intel® UHD Graphics P750	Y	Y	125
Intel® Xeon® W-1370 processor	8	2.9	5.1	16	3200	Y	Intel® UHD Graphics P750	Y	Y	80
Intel® Xeon® W-1350P processor	6	4	5.1	12	3200	Y	Intel® UHD Graphics P750	Y	Y	125
Intel® Xeon® W-1350 processor	6	3.3	5	12	3200	Y	Intel® UHD Graphics P750	Y	Y	80

1. 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.

2. Intel® Optane™ memory is sold separately. Intel® Optane™ memory system acceleration does not replace or increase the DRAM in your system. Available for HP commercial desktops and notebooks and for select HP workstations (HP Z240 Tower/SFF, Z2 Mini, ZBook Studio, 15 and 17 G5) and requires a SATA HDD, 7th Gen or higher Intel® Core™ processor or Intel ® Xeon® processor E3-1200 V6 product family or higher, BIOS version with Intel® Optane™ supported, Windows 10 version 1703 or higher, M.2 type 2280-S1-B-M connector on a PCH Remapped PCIe Controller and Lanes in a x2 or x4 configuration with B-M keys that meet NVMeTM Spec 1.1, and an Intel® Rapid Storage Technology (Intel® RST) 15.5 driver.

3. The specifications shown in the Intel® Turbo Boost Technology column represent the maximum turbo frequency with one core active. Turbo boost stepping occurs in 100MHz increments. Processors that do not have turbo functionality are denoted as N/A. Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. See http://www.intel.com/technology/turboboost for more information

4. For full Intel® vPro® functionality, Windows 10 Pro 64 bit, a vPro supported processor, vPro enabled chipset, vPro enabled wired LAN and/or WLAN card and TPM 2.0 are required. Some functionality requires additional 3rd party software in order to run. See http://intel.com/vpro

Color	Black
Convertibility	The Z2G8 SFF can either be placed flat on the desktop or made to stand on the desk with the optional tower stand.
Expansion Slots (see system board section for more details)	Slot 1: PCIe Gen4 x16
	Slot 2: PCIe Gen3 x1
	Slot 3: PCIe Gen3 x4 - with x4 Connector

Supported Components

	Slot 4: PCIe Gen3 x4 - with x16 Connector
Expansion Bays (see storage section for more details)	(1) Shared internal/external 3.5" bay (1) Internal 3.5" bay (1) Internal 2.5" bay (for SSD only) (1) Dedicated 9.5mm slim optical disk drive bay
Front I/O	(2) Type-A SuperSpeed USB 5Gbps signaling rate port (1 charge port supports up to 5V/2.1A), (2) Type-A SuperSpeed USB 10Gbps signaling rate port, (1) Type-C® SuperSpeed USB 20Gbps signaling rate port (charge supports up to 5V/3A) , (1) SD card reader (optional), 1 universal audio jack
Internal I/O	(1) Hi-Speed USB 480Mbps signaling rate port (1) serial port
Rear I/O	(2) DisplayPort 1.4*, (1) Audio Line out, 1 RJ-45, (3) Hi-Speed USB 480Mbps signaling rate port, (2) Type-A SuperSpeed USB 10Gbps signaling rate port, (1) Type-A SuperSpeed USB 5Gbps signaling rate port, (1) serial (optional), (1)Flex I/O port*** (VGA, HDMI 2.0b, DisplayPort 1.4, Type-C® SuperSpeed USB 10Gbps signaling rate port (Power Delivery 15W, Alt Mode DisplayPort), Dual Type-A SuperSpeed USB 5Gbps signaling rate port, 2nd 1GbE LAN, Thunderbolt 3** with Type-C® SuperSpeed USB4 40Gbps signaling rate**** (cabled to PCIe AIC)) *All onboard Display support DP1.4/HBR2 when video output is via Intel Graphics. **TBT 3 will be available in Q3, 2021 *** Flex I/O module Display support DP1.4/HBR3, resolution support up to 5120x3200 24bpp @60Hz ****Maximum speed requires DisplayPort™ and PCIe aggregation.
Interfaces Supported	SD card reader (optional)
On-board RAID Support	RAID 0 RAID 1
Chassis Dimensions (H x W x D)	H: 3.95" [100mm] W: 13.3" [338mm] D: 12.1" [308mm] (Standard desktop orientation)
Packaged Dimensions	H: 8.98" (228mm) W: 15.71" (399mm) D: 19.65" (499mm)
Rack Dimensions	5U
Weight	Exact weights depend upon configuration (System weight only). Starting at 5.4kg (11.9lbs.)
Temperature	Operating: 5° to 35° C (40° to 95° 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 Non-operating: -40° to 60° C (-40° to 140° F) Maximum rate of change: 10°C/hr
Humidity	Operating: 10% to 85% RH, non-condensing, 35° C maximum wet bulb Non-operating: 10% to 90% RH, non-condensing, 35° C maximum wet bulb
Maximum Altitude (non-pressurized)	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 (40,000 feet) Maximum operating temperature is reduced as altitude increases. See Temperature for details.
Power Supply	450W wide-ranging, active Power Factor Correction, 90% Efficiency. 260W wide-ranging, active Power Factor Correction, 92% Efficiency. NOTE: The Power Supply Efficiency Report for the 450W 90% Efficiency and 260W 92% Efficiency Power Supply may be found at the following links:

Supported Components

	450W PSU: https://www.plugloadsolutions.com/80PlusPowerSuppliesDetail.aspx?id=0&type=2 260W PSU: https://www.plugloadsolutions.com/80PlusPowerSuppliesDetail.aspx?id=0&type=2
Backup Devices	For a complete listing of compatible DAT tape drives, LTO tape drives and RDX Removable Disk Backup System offerings, please visit http://www.hp.com/go/connect
Chipset	Intel® W580 chipset
Memory	4 DIMM slots, supporting up to 128GB ECC/non-ECC, and up to DDR4 3200 MT/s speeds

Processors	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
11th Generation Intel® Core Processors*				
Intel® Core™ i9 11900K Processor	Y	N		
Intel® Core™ i9 11900F Processor	Y	N		1
Intel® Core™ i9 11900 Processor	Y	N		
Intel® Core™ i7 11700K Processor	Y	N		
Intel® Core™ i7 11700 processor	Y	N		
Intel® Core™ i5 11600K processor	Y	N		
Intel® Core™ i5 11600 processor	Y	N		
Intel® Core™ i5 11500 processor	Y	N		
Intel® Core™ i5 11400F processor	Y	N		1
Intel® Core™ i5 11400 processor	Y	N		
Intel® Xeon® W Processors				
Intel® Xeon® W-1390P processor	Y	N		
Intel® Xeon® W-1390 processor	Y	N		
Intel® Xeon® W-1370P processor	Y	N		
Intel® Xeon® W-1370 processor	Y	N		
Intel® Xeon® W-1350P processor	Y	N		
Intel® Xeon® W-1350 processor	Y	N		

* These processors support only non-ECC memory
NOTE 1: No iGfx. A discrete graphics card must be purchased at the same time.

SATA Hard Drives	Factory Configured	Option Kit	Option Kit Part Number
500GB SATA 7200 rpm 6Gb/s 3.5" HDD	Y	Y	LQ036AA
1TB SATA 7200 rpm 6Gb/s 3.5" HDD	Y	Y	LQ037AA
2TB SATA 7200 rpm 6Gb/s 3.5" HDD	Y		TBD
1TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	Y	Y	W0R10AA
2TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	Y	Y	2Z274AA
4TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	Y	Y	K4T76AA
8TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	Y	Y	2Z273AA
500GB SATA 7.2K SED SFF HDD	Y	Y	D8N29AA

Supported Components

PCIe Solid State Drives	Factory Configured	Option Kit	Option Kit Part Number
HP ZTurbo PCIE-4X4 1TB TLC Z2 G8 TWR/SFF SSDKit	Y	Y	201F5AA/AT
HP ZTurbo PCIE-4X4 256GB SED Z2 G8 TWR/SFF SSDKit	Y	Y	201F6AA
HP ZTurbo PCIE-4X4 256GB TLC Z2 G8 TWR/SFF SSDKit	Y	Y	201F7AA/AT
HP ZTurbo PCIE-4X4 2TB TLC Z2 G8 TWR/SFF SSDKit	Y	Y	201F8AA
HP ZTurbo PCIE-4X4 512GB SED Z2 G8 TWR/SFF SSDKit	Y	Y	201F9AA
HP ZTurbo PCIE-4X4 512GB TLC Z2 G8 TWR/SFF SSDKit	Y	Y	201G0AA/AT
Z Turbo 1TB 2280 PCIe-Gen4x4 Self Encrypted OPAL2 TLC M.2 Z2 SSD	Y	Y	223A3AA/AT
Z Turbo 2TB 2280 PCIe-Gen4x4 Self Encrypted OPAL2 TLC M.2 Z2 SSD	Y	Y	223A4AA/AT

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

Hard Drive Controllers	Factory Configured	Option Kit
Integrated SATA Controller (Z2 G8)		
Integrated SATA Controller, RAID 0,1 supported: 4x 6 Gb/s ports	Y	
Factory integrated RAID on motherboard for SATA drives		
RAID 0 Data Configuration	Y	
RAID 1 Data Configuration	Y	
Factory integrated RAID on motherboard for Z Turbo Drive		
RAID 0 Data Configuration	Y	
RAID 1 Data Configuration	Y	

NOTE: SATA hardware RAID is not supported on Linux® systems. The Linux® kernel, with built-in software RAID, provides excellent functionality and performance. It is a good alternative to hardware-based RAID. All drives must be identical in type and capacity. Boot volume/RAID array must be less than 2 TB
NOTE: Requires identical drives (speeds, capacity, and interface).
NOTE: The HP Z2 Tower G8 Workstation is capable of configuring up to 2 Z Turbo Drives. By default, the Z Turbo Drive configured will be installed in the M.2 storage slot on the system's motherboard.
NOTE: For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36GB (for Windows 10) of system disk is reserved for system recovery software.

QuickSpecs

Supported Components

Graphics		Factory Configured	Option Kit	Option Kit Part Number	Supported # of cards
Graphics Cable Adapters	HP DisplayPort To HDMI True 4k Adapter	Y	Y	2JA63AA	
	HP Single miniDP-to-DP Adapter Cable	Y	Y	2MY05AA	
	HP DisplayPort To DVI-D Adapter	Y	Y	FH973AA	
	HP DisplayPort To VGA Adapter	Y	Y	AS615AA	
	HP USB-C to DisplayPort Adapter	Y	Y	4SH08AA	
	HP USB-C to HDMI Adapter	Y	Y	4SH07AA	
	HP USB-C to VGA Adapter	Y	Y	4SH06AA	
Entry 3D	NVIDIA® Quadro® P400 2GB Graphics	Y	Y	1ME43AA/AT	2
	NVIDIA® T400 2 GB GDDR6 LP Blower Fan 3mDP PCIe x16 Graphics	Y	Y	340K8AA	2
	NVIDIA® T600 4 GB GDDR6 LP Blower Fan 4mDP PCIe x16 Graphics	Y	Y	340K9AA	2
Mid-range 3D	AMD Radeon™ Pro WX 3200 4GB Graphics	Y	Y	6YT68AA/AT	1
	NVIDIA® T1000 4GB Graphics	Y	Y	20X22AA/AT	1
	NVIDIA RTX A2000 6 GB GDDR6 Blower Fan 4mDP PCIe x16 Graphics	Y	Y	340L0AA	1
Ultra High-End 3D	NVIDIA® Quadro® RTX 3000 6GB Graphics	Y		TBD	1

Memory		Factory Configured	Option Kit	Option Kit Part Number	Support Notes
	HP 4GB (1x4GB) DDR4-3200 nECC UDIMM	Y	Y	141J1AA/AT	2,4
	HP 8GB (2x4GB) DDR4-3200 nECC UDIMM	Y	N		
	HP 8GB (1x8GB) DDR4-3200 nECC UDIMM	Y	Y	141J4AA/AT	2,4
	HP 8GB (1x8GB) DDR4-3200 ECC UDIMM	Y	Y	141J3AA/AT	1,2,4
	HP 16GB (2x8GB) DDR4-3200 nECC UDIMM	Y	N		
	HP 16GB (2x8GB) DDR4-3200 ECC UDIMM	Y	N		1
	HP 16GB (1x16GB) DDR4-3200 nECC UDIMM	Y	Y	141H3AA/AT	2,4
	HP 16GB (1x16GB) DDR4-3200 ECC UDIMM	Y	Y	141H2AA/AT	1,2,4
	HP 24GB (3x8GB) DDR4-3200 nECC UDIMM	Y	N		
	HP 24GB (3x8GB) DDR4-3200 ECC UDIMM	Y	N		1
	HP 32GB (4x8GB) DDR4-3200 nECC UDIMM	Y	N		3
	HP 32GB (4x8GB) DDR4-3200 ECC UDIMM	Y	N		1, 3
	HP 32GB (2x16GB) DDR4-3200 nECC UDIMM	Y	N		
	HP 32GB (2x16GB) DDR4-3200 ECC UDIMM	Y	N		1
	HP 32GB (1x32GB) DDR4-3200 nECC UDIMM	Y	N		2
	HP 32GB (1x32GB) DDR4-3200 ECC UDIMM	Y	N		1, 2
	HP 64GB (4x16GB) DDR4-3200 nECC UDIMM	Y	N		3
	HP 64GB (4x16GB) DDR4-3200 ECC UDIMM	Y	N		1, 3
	HP 64GB (2x32GB) DDR4-3200 nECC UDIMM	Y	N		3

Supported Components

HP 64GB (2x32GB) DDR4-3200 ECC UDIMM	Y	N		1, 3
HP 128GB (4x32GB) DDR4-3200 nECC UDIMM	Y	N		3
HP 128GB (4x32GB) DDR4-3200 ECC UDIMM	Y	N		1,3

NOTES:

1. Intel® Xeon® can support either ECC or non-ECC memory; Intel® Core™ i5/i7/i9 processors only support non-ECC memory.
2. Two channels of DDR4 memory are supported. To realize full performance at least one DIMM must be inserted into each channel.
3. The maximum speed supported by Intel on this configuration is 2933 MT/s
4. For Option Kits, only 2666Mhz can be guaranteed.

Note: When more than one memory slot is populated, symmetric configurations are required for 2 DIMMs per channel. Mix of different part numbers or mix of single and dual ranks within a channel is not allowed.

Optical and Removable Storage	Factory Configured	Option Kit	Option Kit Part Number
HP SD card reader Z2 SFF	Y	Y	16U37AA/AT
HP 9.5mm Slim DVD Writer	Y	Y	4L5J9AA
HP DP25 Removable 2.5" HDD Frame/Carrier	Y	Y	W3J84AA
HP 9.5mm Slim DVD-ROM Drive	Y	Y	4L5J8AA
HP QX310 3.5in Frame/Carrier	Y	Y	4D9X2AA

NOTE: With Blu-ray, 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.

Networking and Communications	Factory Configured	Option Kit	Option Kit Part Number
Integrated Intel® I219LM PCIe GbE Controller (Intel® vPro® with Intel® AMT 15.0)	Y	N	
HP 1GbE LAN Flex Port 2020	Y	Y	141J6AA/AT
Aquantia AQN108 1-Port 5GbE NIC	Y	Y	1PM63AA
Intel Ethernet I350-T4 4-Port 1Gb NIC	N	Y	W8X25AA
Intel X550 10GBASE-T Dual Port NIC	Y	Y	1QL46AA
Intel Ethernet Network Adapter I225-T1*	Y	Y	406L9AA
Intel Ethernet I350-T2 2-Port 1Gb NIC	Y	Y	V4A91AA
Intel Wi-Fi 6 AX201 BT5 M.2 non-vPro	Y	N	

*Planned to be available in Q3,2021
NOTE: The integrated network connection is required to support Intel® vPro® Technology.
NOTE: If AMT is provisioned, then network teaming with the integrated LAN port is not possible.
NOTE: "Gigabit" Ethernet indicates compliance with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/sec. For high speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

Input Devices	Factory Configured	Option Kit	Option Kit Part Number

QuickSpecs

Supported Components

HP Premium Wireless Keyboard	Y	Y	Z9N41AA/AT
HP USB 320K Keyboard	Y	Y	9SR37AA
HP USB Business Slim Wired SmartCard CCID Keyboard	Y	N	
HP PS/2 Business Slim Keyboard	N	Y	N3R86AA
HP USB Premium Wired Keyboard PROMO	Y	Y	Z9N40AT
HP 320M Wired Mouse	Y	Y	9VA80AA
HP USB Premium Mouse	Y	Y	1JR32AA
HP Wireless Premium Mouse	Y	Y	1JR31AA
HP Promo PS/2 Mouse	N	Y	QY775AT
HP Wired Desktop 320MK Mouse and Keyboard	N	Y	9SR36AA

Other Hardware

	Factory Configured	Option Kit	Option Kit Part Number
HP Single TBT3 Type C and USB4 PCIe x4 Card[1]	Y	Y	3N3C1AA
HP Z2 Internal Serial Port and PS/2 Port	Y	Y	141K9AA/AT
HP Z2 Power Cord Kit	Y	Y	1N1D5AA
HP Z2 2nd serial port adapter	Y	Y	141K9AA/AT
HP Z2 SFF Dust Filter	Y	Y	141L0AA/AT
HP Z2 SFF Dust Filter and bezel	Y	Y	141L1AA/AT
HP Z2 Internal Serial Port and PS/2 Port	Y	Y	141K9AA/AT
HP PCIe x1 Parallel Port Card	Y	Y	N1M40AA
HP DP Flex Port 2020	Y	Y	141J7AA/AT
HP Dual USB-A 3.2 Gen1 Flex 2020	Y	Y	141J8AA/AT
HP Front Type-C SuperSpeed USB 20Gbps port	Y	Y	201F4AA/AT
HP HDMI Flex Port 2020	Y	Y	141K1AA/AT
HP USB-C 3.2 Gen2 Alt Flex Port 2020	Y	Y	141K6AA/AT
HP VGA Flex Port 2020	Y	Y	141K7AA/AT

[1]Available in Q3, 2021

Software

	Factory Configured	Option Kit	Support Notes
HP Performance Advisor	Y	N	1
HP PC Hardware Diagnostics UEFI (Windows OS only)	Y	N	2
HP PC Hardware Diagnostics Windows	Y	N	
ZCentral Remote Boost	Y	N	
HP Sure Sense	Y	N	
HP Notifications	Y	N	
HP Desktop Support Utility	Y	N	
HP Documentation	Y	N	
HP Image Assistant	N	N	
HP Support Assistant	N	N	
HP QuickDrop	Y	N	
myHP	Y	N	

Supported Components

Operating Systems	Windows 10 Pro 64
	Windows 10 Pro 64 High End
	Windows 10 Pro 64 Workstation Plus
	Windows 10 Home 64 Plus
	Windows 10 Home 64 Advanced
	Linux®-ready
	Ubuntu Linux 20.04 LTS
	Red Hat® Enterprise Linux® (RHEL) Workstation – paper license (1 yr) only (not preinstalled)

NOTE: For detailed OS/hardware information for Linux, see:
http://www.hp.com/support/linux_hardware_matrix

HP BIOS

Key features of the HP BIOS include:

- Deployment and manageability – HP BIOS provides several technologies that help integrate the HP Z2 G8 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.
- 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.

Supported Components

- 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 Start

- 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

NOTE: HP Sure Start Gen7 is available on HP Workstation products equipped with Intel® 11th generation processors.

Supported Components

SOFTWARE COMPONENTS AND APPLICATIONS WITH WINDOWS

BIOS
HP BIOSphere Gen6[1]
BIOS Update via Network
HP Secure Erase[2]
Absolute Persistence Module[3]
Pre-boot Authentication
HP Wake on WLAN
HP DriveLock & Automatic DriveLock

Software
HP Support Assistant
HP Image Assistant
HP Desktop Support Utility
HP Documentation
HP Notifications
HP PC Hardware Diagnostics UEFI
HP PC Hardware Diagnostics Windows
HP Performance Advisor[4]
ZCentral Remote Boost[5]
My HP
HP QuickDrop

Manageability Features
HP Driver Packs[6]
HP System Software Manager (SSM)
HP BIOS Config Utility (BCU)
HP Manageability Integration Kit Gen4[7]
HP Smart Support[16]

Client Security Software
HP Client Security Manager Gen7[8] including:
(including Credential Manager, HP Password Manager[9], HP Spare Key)
HP Power On Authentication
Microsoft Defender[10]

Security Management
HP Sure Click[11]
HP Sure Start Gen7[12]
HP Sure Run Gen4[13]
HP Sure Sense[14]
HP Sure Recover Gen4[15]
HP Pro Wolf Security

[1] HP BIOSphere Features may vary depending on the platform and configurations.
[2] HP 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™.
[3] 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

Supported Components

must first sign a Pre-Authorization Agreement and either obtain a PIN or purchase one or more RSA SecurID tokens from Absolute Software.

[4] HP Performance Advisor Software - HP Performance Advisor is ready and waiting to help you get the most out of your HP Workstation from day one—and every day after. Learn more or download at:
https://www8.hp.com/us/en/workstations/performance-advisor.html

[5] HP Z Central Remote Boost Software does not come preinstalled on Z Workstations but can be downloaded and run on all Z desktop and laptops without license purchase. With non-Z sender devices, purchase of perpetual individual license or perpetual floating license per simultaneously executing versions and purchase of ZCentral Remote Boost Software Support is required. Zcentral Remote Boost requires Windows, RHEL (7 or 8), UBUNTU 18.04 LTS, or HP ThinPro 7 operating systems. MacOS (10.13 or newer) operating system is only supported on the receiver side. Requires network access. The software is available for download at hp.com/ZCentralRemoteBoost.

[6] HP Driver Packs not preinstalled, however available for download at http://www.hp.com/go/clientmanagement.

[7] HP Manageability Integration Kit can be downloaded from
http://www8.hp.com/us/en/ads/clientmanagement/overview.html

[8] HP Client Security Manager Gen6 requires Windows and is available on the select HP Elite and Pro PCs.

[10] Microsoft Defender Opt in and internet connection required for updates.

[11] HP Sure Click requires Windows 10 Pro or Enterprise. See https://bit.ly/2PrLT6A_SureClick for complete details.

[12] HP Sure Start is available on select HP PCs and requires Windows 10.

[13] HP Sure Run is available on HP Workstation products equipped with 8th generation Intel® or AMD® processors.

[14] HP Sure Sense requires Windows 10 Pro or Enterprise. See product specifications for availability.

[15] HP Sure Recover is available on select HP PCs and requires an open network connection. You must back up important files, data, photos, videos, etc. before using HP Sure Recover to avoid loss of data.

[16] HP Smart Support is available to commercial customers through your HP Service Representative and HP Factory Configuration Services; or it can be downloaded at: http://www.hp.com/smart-support. HP Smart Support automatically collects the telemetry necessary upon initial boot of the product to deliver device-level configuration data and health insights.

QuickSpecs

System Technical Specifications

System Board

System Board Form Factor	Customized PCB 30.124 x 24.38 mm (11.86 x 9.6 inches)
Processor Socket	Single LGA-1200
CPU Bus Speed	DMI
Chipset	Intel® PCH W580
Super I/O Controller	Nuvoton SIO18
Memory Expansion Slots	4 DDR4 memory slots
Memory Type Supported	DDR4, UDIMM (Unbuffered), ECC& non-ECC
Memory Modes	Non-Interleaved for single channel. Interleaved when both channels are populated.
Memory Speed Supported	Up to 3200MT/s DDR4
Memory Protection	ECC available on data
Maximum Memory	128GB[1]
Memory Configuration (Supported)	4GB, 8GB, 16GB and 32GB non-ECC/8GB, 16GB and 32GB ECC unbuffered DIMMs are supported. ECC and non-ECC memory DIMMs cannot be mixed in the same system
PCI Express Connectors[2]	(1) PCI Express Gen4 slot x16 mechanical/ x16 electrical (full height, full length) (1) PCI Express Gen3 slot x1 mechanical/ x1 electrical (full height, full length, open-ended) (1) PCI Express Gen3 slot x4 mechanical/ x4 electrical (full height, full length, open-ended) (1) PCI Express Gen3 slot x16 mechanical/ x4 electrical (full height, full length) (1) M.2 2280 Storage (PCIe Gen4 x4) [2] (1) M.2 2280 Storage (PCIe Gen3 x4) [2] (1) M.2 2230 WLAN (PCIe Gen3 x1+ Intel CNVi) [2] NOTE: The PCIe Gen 4 x16 slot is meant for HP qualified cards, configured or after market. HP does not provide warranty support for 3rd party cards.

Supported Drive Interfaces	**SATA**	Integrated (4) Serial ATA interfaces (6Gb/s SATA).
	Integrated Graphics	Intel® UHD Graphics 730 (on Core i5-11400 processors);Intel® UHD Graphics 750 (on Core i5/i7/i9 processors); Intel® Integrated Graphics P750 for Xeon processors Based on Unified Memory Architecture (UMA) - a region of system memory is reserved and dedicated to the graphics display. Support for Microsoft DirectX 12, OpenGL 4.6 and OpenCL 3.0 on Intel® UHD Graphics 730/750; Based on Unified Memory Architecture (UMA) - a region of system memory is reserved and dedicated to the graphics display. Support for Microsoft DirectX 12, OpenGL 4.6 and OpenCL 3.0 on Intel® UHD Graphics P750; 2 DP 1.4 graphics ports integrated in motherboard; Supports up to three simultaneous displays across DisplayPort*/HDMI*/DVI outputs. Max. resolution supported on onboard DP 1.4/HBR2 ports: 4096x2304 @ 60Hz, 24bpp Max. resolution supported on FlexIO DP 1.4/HBR3 port: 5120x3200 @60Hz, 24bpp
	Network Controller	Integrated Ethernet PHY Connection I219LM. Management capabilities: WOL, PXE 2.1 and AMT 15
	Serial	Yes- requires optional Serial Port Adapter Kit
	2nd Serial	Yes- requires optional Serial Port Adapter Kit

System Technical Specifications

USB Connector(s)	Front	2 Type-A SuperSpeed USB 5Gbps signaling rate port (1 charge port supports up to 5V/2.1A); 2 Type-A SuperSpeed USB 10Gbps signaling rate port; 1 Type-C® SuperSpeed USB 20Gbps signaling rate port (charge supports up to 5V/3A)
	Rear	3 High-speed USB 480Mbps signaling rate port; 1 Type-A SuperSpeed USB 5Gbps signaling rate port; 2 Type-A SuperSpeed USB 10Gbps signaling rate port; Flex I/O option: 1 Type-C® SuperSpeed USB 10Gbps signaling rate (Power Delivery 15W, Alt Mode DisplayPort); 1 Dual Type-A SuperSpeed USB 5Gbps signaling rate
	Internal	1 Hi-Speed USB 480Mbps signaling rate port
HD Integrated Audio	Realtek ALC3205	
Flash ROM	Yes	
CPU Fan Header	Yes	
Memory Fan Header	None	
Chassis Fan Header	1 Rear System Chassis Fan Header, 1 Graphic chassis Fan Header.	
Front PCI Fan Header	None	
Front Control Panel/Speaker Header	Yes	
CMOS Battery Holder – Lithium	Yes	
Integrated Trusted Platform Module	Integrated TPM 2.0 (Infineon SLB9670) Convertible to FIPS 140-2 Certified mode through firmware v7.85 The TPM module disabled where restricted by law, i.e. Russia.	
Power Supply Headers	Yes	
Power Switch, Power LED & Hard Drive LED Header	Yes	
Clear Password Jumper	None	
Keyboard/Mouse	USB or PS/2 (option)	
Power Supply	260W EPA92 and 450W EPA90	

[1]Maximum memory capacities assume 64-bit operating systems, such as Genuine Windows® 10 Professional 64 bit, Red Hat Linux 64-bit. 32-bit Windows Operating Systems support up to 4 GB.
[2]M.2 storage supports compatible devices up to 80mm

System Configurations

Z2G8 SFF Configuration #1	Processor Info	Intel Core i5- 11400 2.60GHz 6C65W					
	Memory Info	8GB (1x 8GB) 3200 MHz DDR4 non-ECC					
	Graphics Info	Intel® UHD Integrated Graphics 730					
	Disks/Optical/Floppy	1x SATA 1TB 7.2k rpm / 1x 9.5mm Slim ODD					
	PSU	260W					
	Other						
Energy Consumption (Watts)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows long Idle (S0)	15.842		15.996		15.63	
	Windows short Idle (S0)	16.668		16.738		16.437	

System Technical Specifications

		115 VAC		230 VAC		100 VAC	
	Windows Busy Typ (S0)	96.264		95.623		94.155	
	Windows Busy Max (S0)	94.286		94.628		93.582	
	Sleep (S3)	0.849	0.804	0.862	0.813	0.883	0.842
	Off (S5)	0.518	0.466	0.566	0.473	0.575	0.54
	Zero Power Mode (EuP)	0.218		0.257		0.223	
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)	54.052904		54.578352		53.32956	
	Windows short Idle (S0)	56.871216		57.110056		56.083044	
	Windows Busy Typ (S0)	328.452768		326.265676		321.25686	
	Windows Busy Max (S0)	321.703832		322.870736		319.301784	
	Sleep (S3)	2.896788	2.743248	2.941144	2.773956	3.012796	2.872904
	Off (S5)	1.767416	1.589992	1.931192	1.613876	1.9619	1.84248
	Zero Power Mode (EuP)	0.743816		0.876884		0.760876	

Z2G8 SFF Configuration #2 ENERGY STAR® CERTIFIED		
	Processor Info	Intel Core i7- 11700 2.50GHz 8C65W
	Memory Info	16GB (2x 8GB) 3200MHz DDR4 non-ECC
	Graphics Info	NVIDIA Quadro P400 2GB
	Disks/Optical/Floppy	1x SATA 256GB SSD / 1x9.5mm Slim ODD
	PSU	450W
	Other	

Energy Consumption (Watts)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows long Idle (S0)	20.619		20.622		20.129	
	Windows short Idle (S0)	21.298		21.456		21.232	
	Windows Busy Typ (S0)	138.407		141.28		144.091	
	Windows Busy Max (S0)	135.898		138.426		140.117	
	Sleep (S3)	0.829	0.781	0.881	0.832	0.979	0.941
	Off (S5)	0.621	0.568	0.648	0.574	0.693	0.656
	Zero Power Mode (EuP)	0.211		0.232		0.229	
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)	70.352028		70.362264		68.680148	
	Windows short Idle (S0)	72.668776		73.207872		72.443584	
	Windows Busy Typ (S0)	472.244684		482.04736		491.638492	
	Windows Busy Max (S0)	463.683976		472.309512		478.079204	
	Sleep (S3)	2.828548	2.664772	3.005972	2.838784	3.340348	3.210692
	Off (S5)	2.118852	1.938016	2.210976	1.958488	2.364516	2.238272
	Zero Power Mode (EuP)	0.719932		0.791584		0.781348	

System Technical Specifications

Z2G8 SFF Configuration #3	Processor Info	Intel Core i9- 11900K 3.50GHz 8C125W
	Memory Info	64GB (2x 32GB) 3200MHz DDR4 ECC
	Graphics Info	NVIDIA Quadro T1000 4 GB
	Disks/Optical/Floppy	1x SATA 512GB SSD
	PSU	450W
	Other	

Energy Consumption (Watts)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows long Idle (S0)	23.504		23.537		23.095	
	Windows short Idle (S0)	24.304		24.682		24.298	
	Windows Busy Typ (S0)	224.139		225.56		227.168	
	Windows Busy Max (S0)	213.511		222.54		216.214	
	Sleep (S3)	1.152	1.1	1.141	0.862	1.123	1.076
	Off (S5)	0.628	0.593	0.652	0.538	0.553	0.504
	Zero Power Mode (EuP)	0.199		0.232		*0.211*	
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)	80.195648		80.308244		78.80014	
	Windows short Idle (S0)	82.925248		84.214984		82.904776	
	Windows Busy Typ (S0)	764.762268		769.61072		775.097216	
	Windows Busy Max (S0)	728.499532		759.30648		737.722168	
	Sleep (S3)	3.930624	3.7532	3.893092	2.941144	3.831676	3.671312
	Off (S5)	2.142736	2.023316	2.224624	1.835656	1.886836	1.719648
	Zero Power Mode (EuP)	0.678988		0.791584		0.719932	

Z2G8 SFF Configuration #4 ENERGY STAR® CERTIFIED	Processor Info	Intel Xeon W- 1370P 3.60G 8C125W
	Memory Info	64GB (2x32GB) 3200MHz DDR4 ECC
	Graphics Info	AMD Radeon Pro WX 3200 4GB
	Disks/Optical/Floppy	1x SATA 1TB SSD Z Turbo
	PSU	450W
	Other	

Energy Consumption (Watts)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows long Idle (S0)	16.807		17.025		16.742	
	Windows short Idle (S0)	23.574		23.645		23.392	
	Windows Busy Typ (S0)	234.147		236.01		238.48	
	Windows Busy Max (S0)	228.984		232.11		231.252	
	Sleep (S3)	1.241	1.206	1.156	0.873	1.254	1.196

System Technical Specifications

		115 VAC		230 VAC		100 VAC	
	Off (S5)	0.733	0.68	*0.646*	0.559	0.579	0.537
	Zero Power Mode (EuP)	*0.221*		*0.243*		*0.219*	
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)	57.345484		58.0893		57.123704	
	Windows short Idle (S0)	80.434488		80.67674		79.813504	
	Windows Busy Typ (S0)	798.909564		805.26612		813.69376	
	Windows Busy Max (S0)	781.293408		791.95932		789.031824	
	Sleep (S3)	4.234292	4.114872	3.944272	2.978676	4.278648	4.080752
	Off (S5)	2.500996	2.32016	2.204152	1.907308	1.975548	1.832244
	Zero Power Mode (EuP)	0.754052		0.829116		*0.747228*	

Z2G8 SFF Configuration #5	**Processor Info**	Intel Xeon W- 1350 3.30GHz 6C80W
	Memory Info	16GB (2x8GB) 3200 MHz DDR4 ECC
	Graphics Info	NVIDIA Quadro RTX 3000 6 GB
	Disks/Optical/Floppy	1x SATA 1TB SSD Z Turbo
	PSU	450W
	Other	

		115 VAC		230 VAC		100 VAC	
Energy Consumption (Watts)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows long Idle (S0)	23.509		23.611		23.415	
	Windows short Idle (S0)	24.519		24.808		24.47	
	Windows Busy Typ (S0)	188.034		186.01		184.387	
	Windows Busy Max (S0)	170.716		168.03		165.495	
	Sleep (S3)	1.014	0.981	1.014	0.826	0.956	0.896
	Off (S5)	0.591	0.558	0.654	0.573	0.567	0.517
	Zero Power Mode (EuP)	0.216		0.241		*0.196*	
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)	80.212708		80.560732		79.89198	
	Windows short Idle (S0)	83.658828		84.644896		83.49164	
	Windows Busy Typ (S0)	641.572008		634.66612		629.128444	
	Windows Busy Max (S0)	582.482992		573.31836		564.66894	
	Sleep (S3)	3.459768	3.347172	3.459768	2.818312	3.261872	3.057152
	Off (S5)	2.016492	1.903896	2.231448	1.955076	1.934604	1.764004
	Zero Power Mode (EuP)	0.736992		0.822292		0.668752	

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

Operating Voltage Range	90-269 VAC
Rated Voltage Range	100-240 VAC
Rated Line Frequency	50-60 Hz
Operating Line Frequency Range	47-66 Hz
Rated Input Current	6A @ 100-240V
Heat Dissipation	Typical: 444 btu/hr (112 kcal/hr) Maximum: 1484 btu/hr (374 kcal/hr)
ENERGY STAR® certified (Config Dependent)	Yes
CECP Compliant @ 220V	Yes
FEMP Standby Power Compliant	Yes, with Wake-on-LAN disabled: <2W in S4/S5- Power Off
Built-in Self Test (BIST) LED	Yes
Surge Tolerant Full Ranging Power Supply (withstands power surges up to 2000V)	Yes
Hood Lock Header	Yes
ErP Lot 6- Tier 1 Compliance @ 230V (<1W in S4/S5- Power Off)	Yes
ErP Lot 6- Tier 2 Compliance @ 230V (<0.5W in S4/S5- Power Off)	Yes

Declared Noise Emissions (Entry-level, Mid-level, and High-end configurations; tested on floor)		
System Configuration (Entry level)	**Processor Info**	Intel® Core™ i9-11900 2.5 GHz 8C CPU
	Memory Info	64GB DDR4-3200 nECC (4x16GB) RAM
	Graphics Info	NVIDIA® T1000 4GB
	Disks/Optical	1 TB SATA 6Gb/s SSD / No Optical /
	Power Supply	450W PSU

Declared Noise Emissions		**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	2.98	11.31
	Hard drive Operating (random reads)	3.08	16.4

System Configuration (Mid-level)	**Processor Info**	Intel® Xeon® processor W-1390 2.8 GHz 8C CPU
	Memory Info	64GB DDR4-3200 nECC (4x16GB) RAM
	Graphics Info	NVIDIA® T1000 4GB
	Disks/Optical	2 x 2TB SATA 7200 rpm 6Gb/s / No Optical
	Power Supply	450W PSU

Declared Noise Emissions		**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	3.44	26.3

System Technical Specifications

	Hard drive Operating (random reads)	3.62	27.1
System Configuration (High-end)	**Processor Info**	Intel® CoreTM i9-11900K 3.5GHz 8C CPU	
	Memory Info	64GB DDR4-3200 nECC (4x16GB) RAM	
	Graphics Info	NVIDIA® T1000 4GB	
	Disks/Optical	1x 2TB SATA 7200 rpm 6Gb/s / No Optical	
	Power Supply	450W PSU	
Declared Noise Emissions		**Sound Power** (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)
	Idle	3.41	25.5
	Hard drive Operating (random reads)	3.57	26.6

System Technical Specifications

Environmental Requirements	Temperature	Operating: 5° to 35° C (40° to 95° F) Non-operating: -40° to 60° C (-40° to 140° F) Maximum rate of change: 10°C/hr
	Humidity	Operating: 10% to 85% RH, non-condensing, 35° C maximum wet bulb Non-operating: 10% to 90% RH, non-condensing, 35° C maximum wet bulb
	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 (40,000 feet) Maximum operating temperature is reduced as altitude increases. See Cooling for details.
	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 Vibration Operating random: 0.5g (rms), 5-300 Hz, up to $0.0025g^2$/Hz Non-operating random: 2.0g (rms), 5-500 Hz, up to $0.0150 g^2$/Hz
	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)

Physical Security and Serviceability

Access Panel	Tool-less Includes system board and memory information
Optical Drive	Tool-less, except for Screw-In carrier
Hard Drives	Tool-less, except for internal/external and 2.5" bay
Expansion Cards	Tool-less
Processor Socket	Tool-less, except for the processor heatsink
Blue User Touch Points	Yes, on tool-less internal chassis mechanisms
Color-coordinated Cables and Connectors	Yes
Memory	Tool-less
System Board	Screw-In
Padlock Support	Yes (optional): Locks side cover and secures chassis from theft 0.22-in diameter padlock loop at rear of system
Cable Lock Support	Yes, Kensington Cable Lock (optional): Locks side cover and secures chassis from theft 3 mm x 7 mm slot at rear of system
Universal Chassis Clamp Lock Support	Yes (optional): Locks side cover and locks cables to chassis. Secures chassis from theft and allows multiple units to be chained together when used with optional cable Threaded feature at rear of system
Solenoid Lock and Hood Sensor	Yes (optional) The Solenoid Hood Lock eliminates the need for a physical key by making the chassis lockable through software and a password. You can also lock and unlock the chassis remotely over the network. The Sensor Kit detects when the access panel has been removed.
Keyboard/Mouse/Video Cable Lock	Yes, locks rear IO cables to prevent cable theft

System Technical Specifications

CPUs and Heatsinks	A T-15 Torx or flat blade screwdriver is needed to remove the CPU heatsink before the CPU can be removed. CPU removal is tool-less
Internal Speaker	Yes
Power Supply Fans	70mm x 70mm x 25mm 4-wire PWM (non-serviceable)
Access Panel Key Lock	No
Integrated Chassis Handles	No
Power Supply	Requires T15 Torx or flat blade screwdriver
PCI Card Retention	Yes, rear (all), middle (none), front (none)

Service, Support, and Warranty

On-site Warranty and Service[1]: Three-years, limited warranty and service offering delivers on-site, next business-day[2] service for parts and labor and includes free telephone support[3] 8am - 5pm. Global coverage[2] 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.

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

System Technical Specifications

BIOS

BIOS 32-bit Services	BIOS supports 64-bit Operating systems only.
PCI 3.0 Support	Full BIOS support for PCI Express through industry standard interfaces.
ATAPI	ATAPI Removable Media Device BIOS Specification Version 1.0.
BBS	BIOS Boot Specification v1.01.
WMI Support	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.
BIOS Boot Spec 1.01+	Provides more control over how and from what devices the workstation will boot.
BIOS Power On	Users can define a specific date and time for the system to power on.
ROM Based Computer Setup Utility (F10)	Review and customize system configuration settings controlled by the BIOS.
System/Emergency ROM Flash Recovery with Video	Recovers system BIOS in corrupted Flash ROM.
Replicated Setup	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).
SMBIOS	System Management BIOS 3.2, for system management information.
Boot Control	Disables the ability to boot from removable media on supported devices.
Memory Change Alert	Alerts management console if memory is removed or changed.
Thermal Alert	Monitors the temperature state within the chassis. Three modes: • NORMAL - normal temperature ranges. • ALERTED - excessive temperatures are detected. Raises a flag so action can be taken to avoid shutdown or provide for a smoother system shutdown. • SHUTDOWN - excessive temperatures are encountered. Automatically shuts down the computer without warning before hardware component damage occurs.
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console.
ACPI (Advanced Configuration and Power Management Interface)	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.
Ownership Tag	A user-defined string stored in non-volatile memory that is displayed in the BIOS splash screen.
Remote Wakeup/Remote Shutdown	System administrators can power on, restart, and power off a client computer from a remote location.
Instantly Available PC (Suspend to RAM - ACPI sleep state S3)	Allows for very low power consumption with quick resume time.
Remote System Installation via F12 (PXE 2.1) (Remote Boot from Server)	Allows a new or existing system to boot over the network and download software, including the operating system.
ROM revision levels	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.
System board revision level	Allows management SW to read revision level of the system board. Revision level is digitally encoded into the HW and cannot be modified.
Start-up Diagnostics (Power-on Self-Test)	Assesses system health at boot time with selectable levels of testing.
Auto Setup when new hardware installed	System automatically detects addition of new hardware.
Keyboard-less Operation	The system can be booted without a keyboard.

System Technical Specifications

Localized ROM Setup	Common BIOS image supports System Configuration Utility (F10 Setup) menus in 14 languages with local keyboard mappings.
Asset Tag	The user or MIS to set a unique tag string in non-volatile memory.
Per-slot Control	Allows I/O slot parameters (option ROM enable/disable, bus latency) to be configured individually.
Adaptive Cooling	Control parameters are set according to detected hardware configuration for optimal acoustics.
Pre-boot Diagnostics	(Pre-video) critical errors are reported via beeps and blinks on the power LED.
UEFI Specification Revision	2.7
ACPI	Advanced Configuration and Power Management Interface, Version 6.0
ATA (IDE)	AT Attachment 6 with Packet Interface (ATA/ATAPI-6), Revision 3b
CD Boot	"El Torito" Bootable CD-ROM Format Specification Version 1.0
EDD	Enhanced Disk Drive Specification Version 1.1 BIOS Enhanced Disk Drive Specification Version 3.0
EHCI	Enhanced Host Controller Interface for Universal Serial Bus, Revision 1.0
PCI	PCI Local Bus Specification, Revision 2.3 PCI Power Management Specification, Revision 1.1 PCI Firmware Specification, Revision 3.0, Draft .7
PCI Express	PCI Express Base Specification, Revision 2.0 PCI Express Base Specification, Revision 3.0 PCI Express Base Specification, Revision 4.0
PMM	POST Memory Manager Specification, Version 1.01
SATA	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
SPD	PC SDRAM Serial Presence Detect (SPD) Specification, Revision 1.2B
TPM	Trusted Computing Group TPM Specification Version 2.0 (Infineon SLB 9670). Common Criteria EAL4+ certified. FIPS 140-2 Certification TCG TPM Certified products list: http://www.trustedcomputinggroup.org/certification/tpm-certified-products/
UHCI	Universal Host Controller Interface Design Guide, Revision 1.1
USB	Universal Serial Bus Revision 1.1 Specification Universal Serial Bus Revision 2.0 Specification Universal Serial Bus Revision 3.1 Specification
SMBIOS	System Management BIOS Reference Specification, Version 3.2 External BIOS simulator found at: http://csrsml.itcs.hp.com/

Social and Environmental Responsibility

Eco-Label Certifications & Declarations	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 registered in the United States. See http://www.epeat.net for registration status in your country. • TCO Certified • China Energy Conservation Program (CECP) • China State Environmental Protection Administration (SEPA)

System Technical Specifications

- Taiwan Green Mark
- Korea Eco-label
- Japan PC Green label*

Sustainable Impact Specifications
- 45% post-consumer recycled plastic
- External Power Supply 90% Efficiency
- Low halogen
- Outside Box and corrugated cushions are 100% sustainably sourced and recyclable
- Molded Paper Pulp Cushion inside box is 100% sustainably sourced and recyclable

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)	40.30 W	40.88 W	38.25 W
Normal Operation (Long idle)	38.70 W	38.89 W	38.7 W
Sleep	2.56 W	2.77 W	2.75 W
Off	0.81 W	0.81 W	0.81 W

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)	140 BTU/hr	140 BTU/hr	140 BTU/hr
Normal Operation (Long idle)	132 BTU/hr	135 BTU/hr	132 BTU/hr
Sleep	9 BTU/hr	9 BTU/hr	9 BTU/hr
Off	3 BTU/hr	3 BTU/hr	3 BTU/hr

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

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)

	Sound Power (L_{WAd}, bels)	Sound Pressure (L_{pAm}, decibels)
Typically Configured – Idle	3.42	24.5
Fixed Disk – Random writes	3.59	25.4
Optical Drive – Sequential reads	4.15	32.7

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

QuickSpecs

System Technical Specifications

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
- Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.
- This product is 94.2% recycle-able when properly disposed of at end of life.

Packaging Materials

External:	PAPER/Corrugated	1158 g
Internal:	PAPER/Molded pulp	390 g
	PLASTIC/Polyethylene low density	28 g

The plastic packaging material contains at least 80% recycled content.

The corrugated paper packaging materials contains at least 100% 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— 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):

- 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

QuickSpecs

System Technical Specifications

- 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.

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

- 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.

System Technical Specifications

- Fiber cushions made from 100% recycled wood fiber and organic materials.
- Plastic cushions are made from >90% recycled plastic.

Name	Cores	Clock Speed (GHz)	Intel® Turbo Boost Technology[3]	Cache (MB)	Memory Speed (MT/s)	Hyper-Threading	Integrated Graphics	Featuring Intel® vPro® Technology[4]	16GB Intel® Optane™ memory[2]	TDP (W)
Intel® Core™ i9 11900K Processor	8	3.5	5.2	16	3200	Y	Intel® UHD Graphics 750	Y	Y	125
Intel® Core™ i9 11900F Processor	8	2.5	5.1	16	3200	Y	N/A	N/A	Y	65
Intel® Core™ i9 11900 Processor	8	2.5	5.1	16	3200	Y	Intel® UHD Graphics 750	Y	Y	65
Intel® Core™ i7 11700K Processor	8	3.6	5	16	3200	Y	Intel® UHD Graphics 750	Y	Y	125
Intel® Core™ i7 11700 processor	8	2.5	4.9	16	3200	Y	Intel® UHD Graphics 750	Y	Y	65
Intel® Core™ i5 11600K processor	6	3.9	4.9	12	3200	Y	Intel® UHD Graphics 750	Y	Y	125
Intel® Core™ i5 11600 processor	6	2.8	4.8	12	3200	Y	Intel® UHD Graphics 750	Y	Y	65
Intel® Core™ i5 11500 processor	6	2.7	4.6	12	3200	Y	Intel® UHD Graphics 750	Y	Y	65
Intel® Core™ i5 11400F processor	6	2.6	4.4	12	3200	Y	N/A	N/A	Y	65
Intel® Core™ i5 11400 processor	6	2.6	4.4	12	3200	Y	Intel® UHD Graphics 730	N/A	Y	65
Intel® Xeon® W-1390P processor	8	3.5	5.2	16	3200	Y	Intel® UHD Graphics P750	Y	Y	125
Intel® Xeon® W-1390 processor	8	2.8	5.1	16	3200	Y	Intel® UHD Graphics P750	Y	Y	80
Intel® Xeon® W-1370P processor	8	3.6	5.2	16	3200	Y	Intel® UHD Graphics P750	Y	Y	125
Intel® Xeon® W-1370 processor	8	2.9	5.1	16	3200	Y	Intel® UHD Graphics P750	Y	Y	80
Intel® Xeon® W-1350P processor	6	4	5.1	12	3200	Y	Intel® UHD Graphics P750	Y	Y	125
Intel® Xeon® W-1350 processor	6	3.3	5	12	3200	Y	Intel® UHD Graphics P750	Y	Y	80

1. 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.

2. Intel® Optane™ memory is sold separately. Intel® Optane™ memory system acceleration does not replace or increase the DRAM in your system. Available for HP commercial desktops and notebooks and for select HP workstations (HP Z240 Tower/SFF, Z2 Mini, ZBook Studio, 15 and 17 G5) and requires a SATA HDD, 7th Gen or higher Intel® Core™ processor or Intel ® Xeon® processor E3-

System Technical Specifications

1200 V6 product family or higher, BIOS version with Intel® Optane™ supported, Windows 10 version 1703 or higher, M.2 type 2280-S1-B-M connector on a PCH Remapped PCIe Controller and Lanes in a x2 or x4 configuration with B-M keys that meet NVMeTM Spec 1.1, and an Intel® Rapid Storage Technology (Intel® RST) 15.5 driver.

3. The specifications shown in the Intel® Turbo Boost Technology column represent the maximum turbo frequency with one core active. Turbo boost stepping occurs in 100MHz increments. Processors that do not have turbo functionality are denoted as N/A. Intel® Turbo Boost performance varies depending on hardware, software and overall system configuration. See http://www.intel.com/technology/turboboost for more information

4. For full Intel® vPro® functionality, Windows 10 Pro 64 bit, a vPro supported processor, vPro enabled chipset, vPro enabled wired LAN and/or WLAN card and TPM 2.0 are required. Some functionality requires additional 3rd party software in order to run. See http://intel.com/vpro

QuickSpecs

Technical Specifications - Hard Drives

SATA Hard Drives for HP Workstations	500GB SATA 7200 rpm 6Gb/s 3.5" HDD			
		Capacity	500GB	
		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)	
		Synchronous Transfer Rate (Maximum)	Up to 600MB/s *	
		Buffer	32MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2 ms *
			Average	11 ms*
			Full Stroke	21 ms *
		Rotational Speed	7,200 rpm	
		Logical Blocks	976,773,168	
		Operating Temperature	41° to 131° F (5° to 55° C)	

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

	1TB SATA 7200 rpm 6Gb/s 3.5" HDD			
		Capacity	1 Terabyte (1000 GB)	
		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 600 MB/s *	
		Buffer	64MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2 ms *
			Average	11 ms *
			Full Stroke	21 ms *
		Rotational Speed	7,200 rpm	
		Logical Blocks	1,953,525,168	
		Operating Temperature	41° to 131° F (5° to 55° C)	

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

	2TB SATA 7200 rpm 6Gb/s 3.5" HDD			
		Capacity	2TB	
		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 (6.0 Gb/s), NCQ Enabled	

Technical Specifications - Hard Drives

Synchronous Transfer Rate (Maximum)	Up to 600MB/s *	
Buffer	64MB	
Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2.0 ms *
	Average	11 ms *
	Full Stroke	21 ms *
Rotational Speed	7,200 rpm	
Logical Blocks	3,907,029,168	
Operating Temperature	41° to 131° F (5° to 55° C)	

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

1TB SATA 7200 rpm 6GB/s 3.5" HDD (Enterprise Class)	**Capacity**	1TB
	Protocol	SATA
	Form Factor	3.5"
	Controller	AHCI
	Reliability (MTBF)	2.0M hours
	Rated Power On Hours	8760/yr
	Annualized Failure Rate (based on Rated POH)	<0.62%
	Rated for 24/7/365 Operation	YES
	Physical Size (Height)	1 in; 2.54 cm
	Physical Size (Width)	4 in; 10.17 cm
	Media Diameter	3.5 in; 8.9 cm
	Interface	Serial ATA (6Gb/s), NCQ enabled
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s*
	Buffer	128MB
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track** 0.32ms*
		Average 7.45ms*
		Full Stroke 14.2ms*
	Operating Temperature	41° to 140° F (5° to 60° C)
	Performance	**Sequential Read** up to 226MB/s*
		Sequential Write up to 226MB/s*
	Enterprise Class Features	High Reliability

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Technical Specifications - Hard Drives

2TB SATA 7200 rpm 6GB/s 3.5" HDD (Enterprise Class)

Capacity	2TB	
Protocol	SATA	
Form Factor	3.5"	
Controller	AHCI	
Reliability (MTBF)	2.0M hours	
Rated Power On Hours	8760/yr	
Annualized Failure Rate (based on Rated POH)	<0.62%	
Physical Size (Height)	1 in; 2.54 cm	
Physical Size (Width)	4 in; 10.17 cm	
Media Diameter	3.5 in; 8.9 cm	
Interface	Serial ATA (6Gb/s), NCQ enabled	
Synchronous Transfer Rate (Maximum)	Up to 600MB/s*	
Buffer	128MB	
Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.7ms*
	Average	8.5ms*
	Full Stroke	15.7ms*
Operating Temperature	41° to 131° F (5° to 55° C)	
Performance	Sequential Read	up to 226MB/s*
	Sequential Write	up to 226MB/s*
Enterprise Class Features	High Reliability	

Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

4TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)

Capacity	4TB
Protocol	SATA
Form Factor	3.5"
Controller	AHCI
Reliability (MTBF)	2.0M hours
Rated Power On Hours	8760/yr
Annualized Failure Rate (based on Rated POH)	<0.62%
Rated for 24/7/365 Operation	YES
Physical Size (Height)	1 in; 2.54 cm
Physical Size (Width)	4 in; 10.17 cm
Media Diameter	3.5 in; 8.9 cm
Interface	Serial ATA (6Gb/s), NCQ enabled
Synchronous Transfer Rate (Maximum)	Up to 600MB/s*

Technical Specifications - Hard Drives

Buffer	128MB	
Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.7ms*
	Average	8.5ms*
	Full Stroke	15.7ms*
Operating Temperature	41° to 131° F (5° to 55° C)	
Performance	**Sequential Read**	up to 226MB/s*
	Sequential Write	up to 226MB/s*
Enterprise Class Features	High Reliability	

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

8TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)		
Capacity	8TB	
Protocol	SATA	
Form Factor	3.5"	
Controller	AHCI	
Reliability (MTBF)	2.0M hours	
Physical Size (Width)	4 in; 10.17 cm	
Media Diameter	3.5 in; 8.9 cm	
Interface	Serial ATA (6Gb/s), NCQ enabled	
Synchronous Transfer Rate (Maximum)	Up to 600MB/s*	
Buffer	256MB	
Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.7ms*
	Average	8.5ms*
	Full Stroke	15.7ms*
Operating Temperature	41° to 140° F (5° to 60°C)	
Performance	**Sequential Read**	up to 226MB/s*
	Sequential Write	up to 226MB/s*
Enterprise Class Features	High Reliability	

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

500GB SATA 7.2K SED SFF HDD	
Capacity	500GB
Protocol	SATA
Form Factor	2.5"
Height	0.275 in; 0.7 cm
Physical Size (Width)	2.75 in; 6.99 cm
Media Diameter	2.5 in; 6.36 cm
Interface	Serial ATA (6Gb/s), NCQ enabled
Synchronous Transfer Rate (Maximum)	Up to 600MB/s*
Buffer	64MB

Technical Specifications - Hard Drives

	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	1ms*
		Average	4.2ms*
		Full Stroke	25ms (Typical)*
	Operating Temperature	32° to 131° F (0° to 60° C)	
	Self-Encrypting Drive Support	Yes	

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

HP Z Turbo Drv PCIE-4X4 256GB TLC PCIe SSD (Z2G8)	**Capacity**	256GB	
	Protocol	PCIe	
	Form Factor	M.2 in native Slot on motherboard	
	Controller	NVMe	
	NAND Type	3D TLC	
	Endurance	75TBW (TB Written)	
	Reliability	1.5M Hours	
	Interface	PCI Express 4.0 x4 electrical	
	Operating Temperature	32° to 178° F (0° to 81° C)	
	Performance	**Sequential Read**	5500MB/s*
		Sequential Write	2300MB/s*
		Random Read	400K IOPS*
		Random Write	400K IOPS*

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

HP Z Turbo Drv PCIE-4X4 512GB TLC PCIe SSD (Z2G8)	**Capacity**	512GB	
	Protocol	PCIe	
	Form Factor	M.2 in native Slot on motherboard	
	Controller	NVMe	
	NAND Type	3D TLC	
	Endurance	150TBW (TB Written)	
	Reliability	1.5M Hours	
	Interface	PCI Express 4.0 x4 electrical	
	Operating Temperature	32° to 178° F (0° to 81° C)	
	Performance	**Sequential Read**	6400MB/s*
		Sequential Write	3400MB/s*
		Random Read	600K IOPS*
		Random Write	600K IOPS*

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Technical Specifications - Hard Drives

HP Z Turbo Drv PCIE-4X4 1TB TLC PCIe SSD (Z2G8)

Capacity	1TB
Protocol	PCIe
Form Factor	M.2 in native Slot on motherboard
Controller	NVMe
NAND Type	3D TLC
Endurance	300TBW (TB Written)
Reliability	1.5M Hours
Interface	PCI Express 4.0 x4 electrical
Operating Temperature	32° to 178° F (0° to 81° C)

Performance	**Sequential Read**	6500MB/s*
	Sequential Write	5000MB/s*
	Random Read	800K IOPS*
	Random Write	800K IOPS*

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

HP Z Turbo Drv PCIE-4X4 2TB TLC PCIe SSD (Z2G8)

Capacity	2TB
Protocol	PCIe
Form Factor	M.2 in native Slot on motherboard
Controller	NVMe
NAND Type	3D TLC
Endurance	600TBW (TB Written)
Reliability	1.5M Hours
Interface	PCI Express 4.0 x4 electrical
Operating Temperature	32° to 178° F (0° to 81° C)

Performance	**Sequential Read**	6500MB/s*
	Sequential Write	5000MB/s*
	Random Read	800K IOPS*
	Random Write	800K IOPS*

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

HP Z Turbo Drv 256GB TLC PCIe SED OPAL2 (Z2G5)

Capacity	256GB
Protocol	PCIe
Form Factor	M.2 in native Slot on motherboard
Controller	NVMe
NAND Type	3D TLC
Endurance	75TBW (TB Written)
Reliability	1.5M Hours
Interface	PCI Express 4.0 x4 electrical
Operating Temperature	32° to 178° F (0° to 81° C)

Performance	**Sequential Read**	5500MB/s*

Technical Specifications - Hard Drives

	Sequential Write	2300MB/s*
	Random Read	400K IOPS*
	Random Write	400K IOPS*
Self-Encrypting Drive Support	OPAL2	

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

HP Z Turbo Drv 512GB TLC PCIe SED OPAL2 (Z2G5)		
Capacity	512GB	
Protocol	PCIe	
Form Factor	M.2 in native Slot on motherboard	
Controller	NVMe	
NAND Type	3D TLC	
Endurance	150TBW (TB Written)	
Reliability	1.5M Hours	
Interface	PCI Express 4.0 x4 electrical	
Operating Temperature	32° to 178° F (0° to 81° C)	
Performance	**Sequential Read**	6400MB/s*
	Sequential Write	3400MB/s*
	Random Read	600K IOPS*
	Random Write	600K IOPS*
Self-Encrypting Drive Support	OPAL2	

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

HP Z Turbo Drv 1TB TLC PCIe SED OPAL2 (Z2G5)		
Capacity	1TB	
Protocol	PCIe	
Form Factor	M.2 in native Slot on motherboard	
Controller	NVMe	
NAND Type	3D TLC	
Endurance	300TBW (TB Written)	
Reliability	1.5M Hours	
Interface	PCI Express 4.0 x4 electrical	
Operating Temperature	32° to 178° F (0° to 81° C)	
Performance	**Sequential Read**	6500MB/s*
	Sequential Write	5000MB/s*
	Random Read	800K IOPS*
	Random Write	800K IOPS*
Self-Encrypting Drive Support	OPAL2	

*Actual performance may vary.

Technical Specifications - Hard Drives

NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

HP Z Turbo Drv 2TB TLC PCIe SED OPAL2 (Z2G5)

Capacity	2TB	
Protocol	PCIe	
Form Factor	M.2 in native Slot on motherboard	
Controller	NVMe	
NAND Type	3D TLC	
Endurance	600TBW (TB Written)	
Interface	PCI Express 4.0 x4 electrical	
Operating Temperature	32° to 178° F (0° to 81° C)	
Performance	Sequential Read	6500MB/s*
	Sequential Write	5000MB/s*
	Random Read	800K IOPS*
	Random Write	800K IOPS*
Self-Encrypting Drive Support	OPAL2	

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

256GB M.2 2280 PCIE TLC SSD (Z2G8)

Capacity	256GB	
Protocol	PCIe	
Form Factor	M.2 in native Slot on motherboard	
Controller	NVMe	
NAND Type	3D TLC	
Endurance	200TBW (TB Written)	
Reliability	1.5M Hours	
Interface	PCI Express 3.0 x4 electrical	
Operating Temperature	32° to 158° F (0° to 70° C)	
Performance	Sequential Read	3100MB/s*
	Sequential Write	1400MB/s*
	Random Read	200K IOPS*
	Random Write	400K IOPS*

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

512GB M.2 2280 PCIE TLC SSD (Z2G8)

Capacity	512GB
Protocol	PCIe
Form Factor	M.2 in native Slot on motherboard
Controller	NVMe
NAND Type	3D TLC
Endurance	300TBW (TB Written)

Technical Specifications - Hard Drives

Reliability	1.5M Hours	
Interface	PCI Express 3.0 x4 electrical	
Operating Temperature	32° to 158° F (0° to 70° C)	
Performance	**Sequential Read**	3400MB/s*
	Sequential Write	2500MB/s*
	Random Read	380K IOPS*
	Random Write	430K IOPS*

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

1TB M.2 2280 PCIE TLC SSD (Z2G8)		
Capacity	1TB	
Protocol	PCIe	
Form Factor	M.2 in native Slot on motherboard	
Controller	NVMe	
NAND Type	3D TLC	
Endurance	400TBW (TB Written)	
Reliability	1.5M Hours	
Interface	PCI Express 4.0 x4 electrical	
Operating Temperature	32° to 158° F (0° to 70° C)	
Performance	**Sequential Read**	3400MB/s*
	Sequential Write	2500MB/s*
	Random Read	500K IOPS*
	Random Write	440K IOPS*

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

2TB M.2 2280 PCIE TLC SSD (Z2G8)		
Capacity	2TB	
Protocol	PCIe	
Form Factor	M.2 in native Slot on motherboard	
Controller	NVMe	
NAND Type	3D TLC	
Endurance	600TBW (TB Written)	
Reliability	1.5M Hours	
Interface	PCI Express 3.0 x4 electrical	
Operating Temperature	32° to 158° F (0° to 70° C)	
Performance	**Sequential Read**	3400MB/s*
	Sequential Write	2500MB/s*
	Random Read	430K IOPS*
	Random Write	500K IOPS*

*Actual performance may vary.
NOTE: For hard drives and solid state drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 36 GB (for Windows 10) of system disk is reserved for the system recovery software.

Technical Specifications - Hard Drives

QuickSpecs

Technical Specifications - Graphics

Integrated Intel® UHD Graphics (Z2 G8)	Form Factor	Integrated in select Intel® Xeon® , Intel® Core™ i9/ i7, and Intel® Core™ i5 processors.
		Check specific platform specifications for selections.
	Graphics Controller	Intel® UHD Graphics
	Memory	Unified Memory Architecture (UMA) frame buffer. Graphics memory is shared with system memory. Size selectable between 64 MB to 1024 MB via BIOS setting. Default size is 64 MB. Additional memory is allocated for graphics as needed using Intel's Dynamic Video Memory Technology (Intel® DVMT 5.0), to provide an optimal balance between graphics and system memory use.
	Connectors	Check system platform specifications where Intel® UHD Graphics are available.
	Maximum Resolution	Display Port: 4096 x 2160 (5120x3200 could be achieved if output from FlexIO ports - DP/USB-C/TBT) HDMI: 4096 x 2160 DVI: 1920x1200 VGA: 2048x1536
		NOTE: For HDMI, DVI and VGA outputs, separate adapters may be required.
	Shading Architecture	Shader Model 6 compiler support
	Supported Graphics APIs	OpenGL 4.6 DirectX 12
	Available Graphics Drivers	Windows 10

AMD Radeon™ Pro WX 3200 4GB Graphics	Form Factor	Low-Profile Single Slot (2.75 "H x 6.6" L)
	Graphics Controller	Radeon™ Pro WX 3200 Power: 56 Watts Cooling Solution: Active fan heatsink
	Memory	4GB GDDR5 memory
	Maximum Resolution	DisplayPort™ 1.4: - up to 4x 4096 x 2160 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Shading Architecture	Full Microsoft DirectX 12 Shader Model 5.1
	Display Outputs	4 mDP (Mini DisplayPort™) 1.4 Connectors
	Shading Architecture	Full Microsoft DirectX 12 Shader Model 5.1
	Supported Graphics APIs	DirectX®12 OpenGL® 4.5 OpenCL™ 2.0 Vulkan™ 1.0
	Available Graphics Drivers	Windows 10 (Windows® 7 64-bit available from AMD) Linux® 64-bit (selected Enterprise distributions) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html

Technical Specifications - Graphics

Notes		1. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.
		2. WX 3200 only has mini-DisplayPort™ (mDP) video ports. Two mDP-to-DP Adapters are included in the WX 3200 AMO kit. If more mDP-to-DP Adapters are needed, Adapters can be ordered separately:
		• 2MY05AA HP Single miniDP-to-DP Adapter Cable

NVIDIA® T1000 4GB Graphics	**Form Factor**	Low-Profile Single Slot (6.13" Length)
	Graphics Controller	NVIDIA® T1000 4GB Graphics Power: 50 Watts Cooling: Active Fan Heatsink
	Memory	4GB GDDR6 memory
	Maximum Resolution	DisplayPort™ 1.4a: - up to 4x 5210 x 3200 x 24 bpp @ 60Hz, uncompressed - 7680 x 4320 x 36 bpp @ 60Hz, compressed - supports Multi-Stream Transport (MST)
	Display Output	4 mDP (Mini DisplayPort™) 1.4 Connectors
	Shading Architecture	Shader Model 5.1
	Supported Graphics APIs	DirectX®12 OpenGL® 4.6 OpenCL™ 1.2 Vulkan™ 1.2
	Available Graphics Drivers	Windows 10 64-bit Linux® 64-bit (selected Enterprise distributions) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html
	Notes	

NVIDIA® Quadro® RTX 3000 6GB Graphics	**Form Factor**	Low-Profile Dual Slot (6.6" Length)
	Graphics Controller	NVIDIA Quadro RTX 3000 6GB Graphics Power: 60 Watts Cooling: Active Fan Heatsink
	Bus Type	PCI Express 3.0 x16
	Memory	6GB GDDR6 memory
	Connectors	4x Mini DisplayPort™1.4 – HDR ready connectors with HBR3 and MST support.
	Maximum Resolution	DisplayPort™1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Display Output	4x Mini DisplayPort™1.4 – HDR ready connectors
	GPU Architecture	Turing

Technical Specifications - Graphics

	Shading Architecture	Shader Model 6.5
	Supported Graphics APIs	DirectX®12 OpenGL® 4.6 OpenCL™ 2.1 Vulkan™ 1.2
	Available Graphics Drivers	Windows 10 64-bit Linux® 64-bit (selected Enterprise distributions) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html
	Notes	

NVIDIA® Quadro® P400 2GB Graphics	**Form Factor**	Single Slot, Low Profile (2.713" H x 5.7" L)
	Graphics Controller	NVIDIA® Quadro® P400 Graphics Card Max Power: 30 Watts Cooling Solution: Active fan heatsink
	Bus Type	PCI Express 3.0 x16
	Memory	Size: 2GB DDR5
	Maximum Resolution	DisplayPort™ 1.4: - up to 3x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Display Output	3 mDP (Mini DisplayPort™) 1.4 Connectors
	Shading Architecture	Full Microsoft DirectX 12 Shader Model 5.1
	Supported Graphics APIs	OpenGL 4.5 DirectX 12 Vulkan 1.0 API support includes: CUDA, OpenCL 1.x
	Available Graphics Drivers	Windows 10 64-bit Linux® 64-bit (selected Enterprise distributions) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html

	Notes	*P400 only have mini-DisplayPort™ (mDP) video ports.
		Note : AMO kits for P400 Adapters
		  • Two mDP-to-DP Adapters are included in the P400 AMO kits.
		  • If more mDP-to-DP Adapters are needed, Adapters can be ordered separately:
		    - 2MY05AA - HP Single miniDP-to-DP Adapter Cable

NVIDIA® T400 2GB Graphics	**Form Factor**	Dimensions: 2.713" H x 6.137" L Single Slot, Low Profile Weight: 124g
	Graphics Controller	NVIDIA® T400 Graphics Card GPU: 384 CUDA cores Power: 30 Watts

Technical Specifications - Graphics

		Cooling: Active
	Bus Type	PCI Express 3.0 x16
	Memory	Size: 2 GB GDDR6 Memory Interface: 64-bit Memory Bandwidth: 80 GB/s
	Connectors	3x mDP
	Maximum Resolution	3x 5120 x 2880 x 24 bpp @ 60Hz
	Supported Graphics APIs	OpenGL 4.5 DirectX 12 Vulkan 1.0 API support includes: CUDA, OpenCL 1.x
	Available Graphics Drivers	Windows 10 Linux HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html
NVIDIA® T600 4GB Graphics	**Form Factor**	Dimensions: 2.713" H x 5.7" L Single Slot, Low Profile
	Graphics Controller	NVIDIA® T600 Graphics Card GPU: 640 CUDA cores Power: 40 Watts Cooling: Active
	Bus Type	PCI Express 3.0 x16
	Memory	Size: 4 GB GDDR6 Memory Interface: 128-bit Memory Bandwidth: 160 GB/s
	Connectors	4x mDP
	Maximum Resolution	7680 x 432- @ 60Hz
	Display Output	4x mDP
	Supported Graphics APIs	OpenGL 4.5 DirectX 12 Vulkan 1.0 API support includes: CUDA C, CUDA C++, DirectCompute , OpenCL
	Available Graphics Drivers	Windows 10 Linux HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html

Technical Specifications - Optical and Removable Storage

HP 9.5mm Slim DVD Writer

Description	9.5mm height, tray-load	
Mounting Orientation	Either horizontal or vertical	
Interface Type	SATA/ATAPI	
Dimensions (WxHxD)	128 x 9.5 x 127mm	
Supported Media Types	DVD+R DVD+RW DVD+R DL DVD-R DL DVD-R DVD-RW CD-R CD-RW	
Disc Capacity	**DVD-ROM**	8.5 GB DL or 4.7 GB standard
Access Times	**Full Stroke DVD**	< 200ms (seek)
	Full Stroke CD	< 200ms (seek)
Maximum Data Transfer Rates	**CD ROM Read**	CD-ROM, CD-R Up to 24X CD-RW Up to 24X
	DVD ROM Read	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
Power	**Source**	SATA DC power receptacle
	DC Power Requirements	5 VDC ± 5%-100 mV ripple p-p
	DC Current	5 VDC – < 800 mA typical, < 1600 mA maximum
Operating Environmental (all conditions non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)
	Relative Humidity	10% to 80%
	Maximum Wet Bulb Temperature	84° F (29° C)
Operating Systems Supported	Windows 10, Windows 7 Professional 32-bit and 64-bit, Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*. Linux® No driver is required for this device. Native support is provided by the operating system.	
Kit Contents	HP SATA DVD Writer drive, installation guide.	
Approvals	USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.3, FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUVT	

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

Technical Specifications - Optical and Removable Storage

single layer discs. However, double-layer discs burned with this drive may not be compatible with many existing single-layer DVD drives and players.

HP 9.5mm Slim DVD-ROM Drive	Description	9.5mm height, tray-load	
	Mounting Orientation	Either horizontal or vertical	
	Interface Type	SATA / ATAPI	
	Dimensions (WxHxD)	128 x 9.5 x 127mm	
	Disc Capacity	DVD-ROM	Single layer: Up to 4.7 GB Double layer: Up to 8.5 GB
	Access Times	DVD-ROM Single Layer	< 110 ms (typical)
		CD-ROM Mode 1	< 110 ms (typical)
		Full Stroke DVD	< 230 ms (typical)
		Full Stroke CD	< 220 ms (typical)
	Power	Source	SATA DC power receptacle
		DC Power Requirements	5 VDC ± 5%-100 mV ripple p-p
		DC Current	5 VDC – <800mA typical, < 1600 mA maximum
	Operating Environmental (all conditions non-condensing)	Temperature	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 80%
		Maximum Wet Bulb Temperature	84° F (29° C)
	Operating Systems Supported	Windows 8.1, Windows 8 32-bit and 64-bit, Windows 7 Professional 32-bit and 64-bit, Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*. Linux® No driver is required for this device. Native support is provided by the operating system.	
	Kit Contents	9.5mm Slim DVD-ROM Drive, 5.25" ODD Bay adapter/carrier, slim SATA data/power cable, installation guide	
	Approvals	USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.3, FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUVT	

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.

QuickSpecs

HP Z2 Small Form Factor G8 Workstation

Technical Specifications - Controller Cards

HP Thunderbolt™ 3/USB4 PCIe 3 Single-port I/O Card	Data Transfer Rate	Supports up to 40 Gb/s* 40,000 Mb/s)
	Devices Supported	Thunderbolt™ certified devices
	Bus Type	PCIe card, Low-Profile PCIe slot
	Ports	One USB4 Type-C® connector (Rear)
	Internal Connectors	Two wire-to-board connectors
	System Requirements	Windows 10 64-bit, Intel® i5 series or higher processor, available on PCIe slot4.
	Temperature - Operating	50° to 131° F (10° to 55° C)
	Temperature - Storage	-22° to 140° F (-30° to 60° C)
	Relative Humidity - Operating	20% to 80%
	Compliances	FCC Part 15B, cULus 62368, CE Mark EN55032B/EN55024, Taiwan BSMI, Korea KCC
	Operating Systems Supported	Windows 10 64-bit.
	Kit Contents	HP Thunderbolt™ 3/USB4 PCIe 3 Single-port I/O Card, Flex IO wire-to-board module, One full height and One Low-Profile brackets, One power cable, One DisplayPort™ and GPIO (General-Purpose Input/Output) cable, Installation documentation and warranty card.

*Maximum speed requires DisplayPort™ and PCIe aggregation.

Technical Specifications - Networking and Communications

Integrated Intel® I219LM PCIe GbE Controller (Intel® vPro® with Intel® AMT 15.0)		
	Connector	RJ-45
	Cabling	Twin Axial Cabling up to 10m
	Controller	Intel® I219LM GbE platform LAN connect networking controller
	Memory	3 KB Tx and 3KB Rx FIFO packet buffer memory
	Data Rates Supported	10/100/1000 Mbps
	Compliance	802.1as/1588, 802.1p, 802.1Q, 802.3, 802.3ab, 802.3az, 802.3i, 802.3u, 802.3z
	Bus Architecture	PCI Express and SMBus
	Data Transfer Mode	PCIe-based interface for active state operation (S0 state) and SMBus for host and management traffic (Sx low power state)
	Power Requirement	Requires 3.3V (integrated regulators for core Vdc)
	Boot ROM Support	Yes
	Network Transfer Mode	Full-duplex; Half-duplex (not supported for the 1000BASE-T transceiver)
	Network Transfer Rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 10 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 100 Mbps 1000BASE-T (full-duplex) 1000 Mbps
	Management Capabilities	vPro®, WOL, auto MDI crossover, PXE, Muti-port teaming, RSS, ACPI, Advanced cable diagnostic, loopback modes, AMT 15.0 support, Circuit Breaker, VLAN, Multicast Listener Discovery (MLD)

HP 1-Port 1GbE Flex IO NIC		
	Connector	RJ-45
	Cabling	1GbE over Category 5e (or better) up to 100m
	Controller	Realtek RTL8153
	Data Rates Supported	10/100/1000 Mbps
	Compliance	802.3 (LAN) 802.3u (100BASE-TX) 802.3ab (1000BASE-T) 802.3x (Ethernet Flow Control) 802.1Q (Virtual LAN) 802.3az (Energy Efficient Ethernet)
	Bus Architecture	USB
	Power Requirement	Requires 3.3V (integrated regulators for core Vdc)
	Boot ROM Support	Yes
	Network Transfer Mode	Full-duplex; Half-duplex
	Network Transfer Rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 100 Mbps 1000BASE-T (full-duplex) 1000 Mbps
	Operating Temperature	32° to 131° F (0° to 55° C)
	Dimensions (HxW)	1.5 in x 1.5 in. x 0.75 in (3.81 cm x 3.81 cm x 1.9 cm)

QuickSpecs

Technical Specifications - Networking and Communications

	Operating System Driver Support	Windows 10 64-bit Linux®
HP 10GbE SFP+ SR Transceiver	**Operating Temperature**	32°F to 113°F (0°C to 45°C)
	Operating Humidity	0% to 85%, noncondensing
	Dimensions (HxWxD)	0.47 x 0.54 x 2.19 inches
	Kit Contents	HP 10GbE SFP+ SR Transceiver
Intel® X550-T2 2-Port 10GbE NIC	**Connector**	2 RJ-45
	Cabling	10GbE: Cat6a (or better) up to 100m 5GbE and below: Cat5e (or better) up to 100m
	Controller	Intel® Ethernet Controller X550
	Network Transfer Rates Supported	10GbE, 5GbE, 2.5GbE, 1GbE, 100MbE
	Data Path Width	PCIe Gen3x4
	Power Requirement	11.2W (typical)
	Operating Temperature	32° to 131° F (0° to 55° C)
	Dimensions (HxW)	5.1 x 2.7 in (without brackets)
	Operating System Driver Support	Windows 10 Linux®
	Kit Contents	• Intel® X550-T2 2-Port 10GbE NIC with standard height bracket attached • Low-profile bracket • Product Literature
Aquantia® AQN-108 1-Port 5GbE NIC	**Connector**	1 RJ-45
	Cabling	Cat5e (or better) up to 100m
	Controller	Aquantia® AQC108
	Network Transfer Rates Supported	5Gbe, 2.5GbE, 1GbE, 100MbE
	Data Path Width	PCIe Gen3x1
	Power Requirement	3.5W (typical)
	Operating Temperature	32° to 131° F (0° to 55° C)
	Dimensions (HxW)	3.72 x 3.18 inches (without brackets)
	Operating System Driver Support	Windows 10 Linux®
	Kit Contents	• Aquantia AQN-108 1-Port 5GbE NIC with standard height bracket attached • Low-profile bracket • Product Literature
Intel® I350-T2 2-Port 1GbE NIC	**Connector**	2 RJ-45
	Cabling	Cat5e (or better) up to 100m
	Controller	Intel® Ethernet I350 Controller

QuickSpecs

HP Z2 Small Form Factor G8 Workstation

Technical Specifications - Networking and Communications

	Network Transfer Rates Supported	1GbE, 100MbE, 10MbE
	Data Path Width	PCIe Gen2.1x4
	Power Requirement	4.4W (typical)
	Operating Temperature	32° to 131° F (0° to 55° C)
	Dimensions (HxW)	2.75 x 5.5 inches (without brackets)
	Operating System Driver Support	Windows 10 Linux®
	Kit Contents	• Intel® I350-T2 2-Port 1GbE NIC with standard height bracket attached • Low-profile bracket • Product Literature
Intel® I350-T4 4-Port 1GbE NIC	**Connector**	4 RJ-45
	Cabling	Cat5e (or better) up to 100m
	Controller	Intel® Ethernet I350 Controller
	Network Transfer Rates Supported	1GbE, 100MbE, 10MbE
	Data Path Width	PCIe Gen2.1x4
	Power Requirement	5W (typical)
	Operating Temperature	32° to 131° F (0° to 55° C)
	Dimensions (HxW)	2.75 x 5.5 inches (without brackets)
	Operating System Driver Support	Windows 10 Linux®
	Kit Contents	• Intel® I350-T4 4-Port 1GbE NIC with standard height bracket attached • Low-profile bracket • Product Literature
Intel® Wi-Fi 6 AX201 802.11ax, BT 5.1, M.2	**WLAN Standards**	802.11-2016 and select amendments (selected feature coverage) 802.11 a,b,d,e,g,h,i,k,n,r,u,v,w,ac,ax; Fine Measuermant based on 802.11-2016
	Antenna	2x2 Dual-Band
	Bluetooth Standards	5.1
	Operating Temperature	32° to 176° F (0° to 80° C)
	Interface	M.2 CNVio2
	Dimensions	M.2 2230
	Kit Contents	Not Available
	NOTE: Wireless access point and internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 5 (802.11 ax) is backwards compatible with prior 802.11 specs.	
Intel® I225-T1 1-Port 2.5GbE NIC *Planned to be available in Q3,2021	**Connector**	1 RJ-45
	Cabling	Cat5e (or better) up to 85m
	Controller	Intel® Ethernet I225 Controller
	Network Transfer Rates Supported	2.5GbE, 1GbE, 100MbE, 10MbE

Technical Specifications - Networking and Communications

Data Path Width	PCIe Gen3.1x1
Power Requirement	2W (typical)
Operating Temperature	32° to 158° F (0°C to 70°C)
Operating System Driver Support	Windows 10 64-bit Linux®
Kit Contents	• Intel® I225-T1 1-Port 2.5GbE NIC with standard height bracket attached • Low-profile bracket • Product Literature

---

Z2 G8 SFF Bezel w/ Dust Filter option

Part Number		141L1AA
Overview		Workstations are deployed in a variety of different ways and in different environments, from under a desk to manufacturing floors. HP Workstations designed a dust filter option to further protect the system against the ingress of dust and other particles over the life of the system. Test have shown a reduction of dust ingress of up to 32% for the HP Z2 Tower G8 Workstation platform and is cleanable and serviceable by customers. There is also a BIOS setting that will warn customer when it is time to check and clean their filters.

Cleaning and servicing the dust filter

1. After removing the filter from the system bezel (dust filter can be removed without the use of tools from the front bezel), either blow it with and wash with water or use a delicate duster (feather duster)to brush off the filter then rinse it with water.
2. Allow the filter half a day to dry at room temperature (25C at 30%-50% humidity)
3. Temperature of water can be 0-70C, due to the dust filter meeting the SQTM 70C humidity test. Suggested water temperature for best user experience is 0-50C.
4. Normal tap water (and most other types of water) can be used to rinse the filter. Any type of corrosive liquid is restricted.

Enabling the Check Filter warning in the BIOS:

1. Customers must enable the BIOS setting once they receive their filter.
2. To enable, do the following once you see the boot screen for your system: F10 > Advanced > Built-In Device Options > Dust Filter
3. Select to enable the Dust Filter replacement reminder, which can be set for 15, 30, 60, 90, 120, or 180 days. The Reminder will show during POST after the reminder timer has expired.
4.

NOTE: customers who anticipate more dust ingress in their environments should set the reminder for a shorter window. Customers anticipating longer ingress can set the reminder for a longer window.

BIOS Warnings

Large enterprise customers deploying multiple systems can centrally enable/control the BIOS warning using the WMI/BCU tool remotely to set the options below:

Dust Filter
- Disable*
- Enable

Dust Filter Reminder (Days)
15, 30, 60*, 90, 120, and 180

Technical Specifications - Networking and Communications

Z2 G8 SFF Dust Filter (Filter Only) **Part Number**   141L0AA

This is intended to be a replacement filter for the HP Z2 Tower G8 Workstation in the event that the original filter would need to be replaced.

QuickSpecs

Technical Specifications – Miscellaneous Features

MISCELLANEOUS FEATURES

Management Features

- Advanced Configuration and Power Management Interface (ACPI). Allows the system to wake from a low power mode. 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.
- Intel® Wired for Management support; industry wide initiative to make Intel® architecture based PCs, servers and mobile computers more inherently manageable out-of-the-box and over the network
- Dual State Power Button; acts as both an on/off button and a suspend-to-sleep button

Serviceability Features

- Dual colored power LED on front of computer to indicate either normal or fault condition
- Diagnostic LED Explanation Table:
  - Power LED will blink red 2 to 5 times, then blink white 2 or more times, then repeat (with beep tones for each blink initially):
    - 2 red + 2 white   User must provide file for BIOS recovery (USB storage typically)
    - 2 red + 3 white   User must enter a key sequence to proceed with recovery by policy
    - 2 red + 4 white   BIOS recovery is in progress
    - 3 red + 2 white   Memory could not be initialized
    - 3 red + 3 white   Graphics adaptor could not be found
    - 3 red + 4 white   Power supply failure / not connected
    - 3 red + 5 white   Processor not installed
    - 3 red + 6 white   Current processor does not support an enabled feature
    - 3 red + 7 white   Computer cover has been removed since last system startup
    - 4 red + 2 white   Processor has exceeded its temperature threshold / system thermal shutdown
    - 4 red + 3 white   System internal temperature has exceeded its threshold
    - 5 red + 2 white   System controller firmware is not valid
    - 5 red + 3 white   System controller detected BIOS is not executing
    - 5 red + 4 white   BIOS could not complete initialization / PCA failure
    - 5 red + 5 white   System controller rebooted the system after a health or recovery timer triggered
- HP PC Hardware Diagnostics UEFI:
  - This utility 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
- System/Emergency ROM
- Flash ROM
- CMOS Battery Holder for easy replacement
- Flash Recovery with Video Configuration Record Software5 Aux Power LED on System PCA
- Processor ZIF Socket for easy Upgrade
- Over-Temp Warning on Screen (Requires IM Agents)
- DIMM Connectors for easy Upgrade
- Clear CMOS Button
- NIC LEDs (integrated) (Green & Amber)
- Color coordinated cables and connectors
- Tool-less Hood Removal
- Front power switch
- System memory can be upgraded without removing the system board or any internal components
- Tool-less Hard Drive, CD & Diskette Removal
- Blue Pull Tabs, and Quick Release Latches for easy Identification

QuickSpecs

Summary of Changes

Date of change:	Version History:		Description of change:
May 13, 2021	From v1 to v2	Added	Intel Xeon W-1300 series
May 26, 2021	From v2 to v3	Changed	SOFTWARE COMPONENTS AND APPLICATIONS WITH WINDOWS and Social and Environmental Responsibility sections
June 11, 2021	From v3 to v4	Changed	Hard Drive Controllers section
July 15, 2021	From v4 to v5	Changed	Memory section
August 1, 2021	From v5 to v6	Changed	Graphics section
August 11, 2021	From v6 to v7	Changed	Social and Environmental Responsibility section
September 1, 2021	From v7 to v8	Changed	Memory, Optical and Removable Storage sections
October 1, 2021	From v8 to v9	Changed	Graphics section