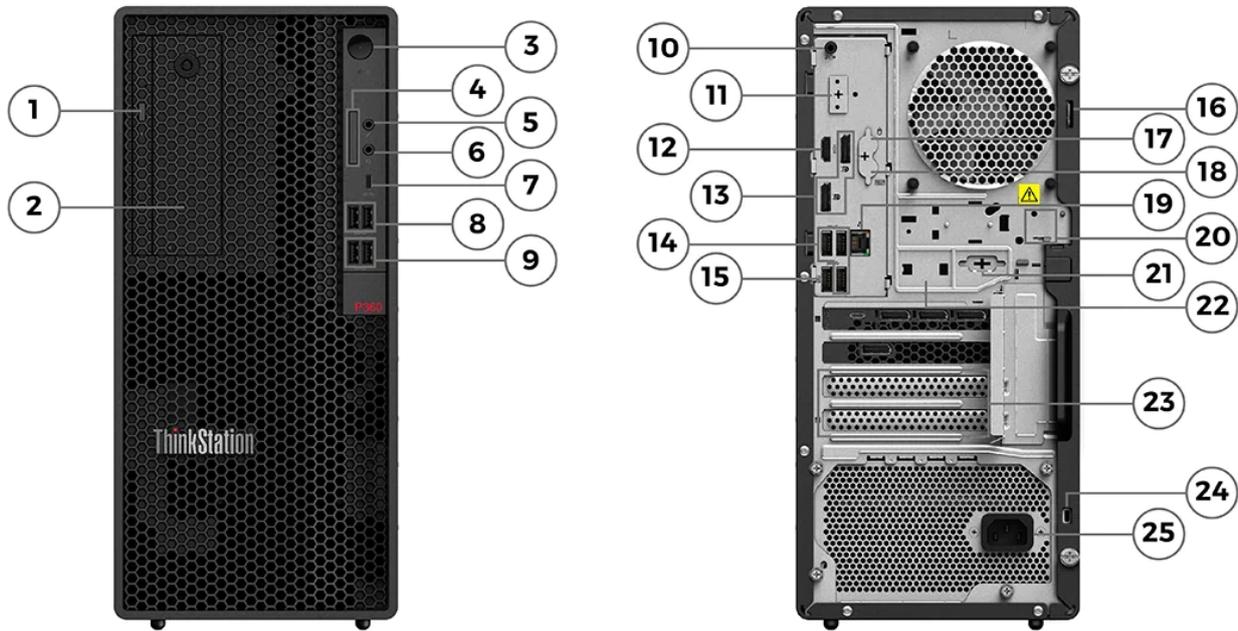


## OVERVIEW



1. Optical drive *	14. 3x USB-A (USB 5Gbps)
2. Flex bay *	15. USB-A (USB 5Gbps), with Smart Power On
3. Power button	16. Padlock loop *
4. Card reader *	17. PS/2 port (mouse) *
5. Microphone jack (3.5mm)	18. PS/2 port (keyboard) *
6. Headphone / microphone combo jack (3.5mm)	19. Ethernet (RJ-45)
7. USB-C (USB 10Gbps), data transfer only	20. E-lock slot *
8. 2x USB-A (USB 5Gbps)	21. Serial (9-pin) *
9. 2x USB-A (USB 10Gbps)	22. Smart cable clip slots *
10. Line-out (3.5mm)	23. Optional ports on expansion cards *
11. Flex IO *	24. Kensington Security Slot
12. HDMI	25. Power connector
13. 2x DisplayPort	

Notes:

- Items with \* are only available on selected models

## PERFORMANCE

### Processor

#### Processor Family

12th Generation Intel® Core™ i3 / i5 / i7 / i9 Processor

#### Processor\*\*<sup>[1]</sup>

Processor Name	Cores	Threads	Base Frequency	Max Frequency	Cache	Memory Support	Processor Graphics
Core i3-12100	4 (4 P-core + 0 E-core)	8	P-core 3.3GHz	P-core 4.3GHz	12MB	DDR5-4800	Intel® UHD Graphics 730
Core i3-12300	4 (4 P-core + 0 E-core)	8	P-core 3.5GHz	P-core 4.4GHz	12MB	DDR5-4800	Intel® UHD Graphics 730
Core i5-12400	6 (6 P-core + 0 E-core)	12	P-core 2.5GHz	P-core 4.4GHz	18MB	DDR5-4800	Intel® UHD Graphics 730
Core i5-12500	6 (6 P-core + 0 E-core)	12	P-core 3.0GHz	P-core 4.6GHz	18MB	DDR5-4800	Intel® UHD Graphics 770
Core i5-12600	6 (6 P-core + 0 E-core)	12	P-core 3.3GHz	P-core 4.8GHz	18MB	DDR5-4800	Intel® UHD Graphics 770
Core i5-12600K	10 (6 P-core + 4 E-core)	16	P-core 3.7GHz / E-core 2.8GHz	P-core 4.9GHz / E-core 3.6GHz	20MB	DDR5-4800	Intel® UHD Graphics 770
Core i7-12700	12 (8 P-core + 4 E-core)	20	P-core 2.1GHz / E-core 1.6GHz	Max Turbo up to 4.9GHz / P-core 4.8GHz / E-core 3.6GHz	25MB	DDR5-4800	Intel® UHD Graphics 770
Core i7-12700K	12 (8 P-core + 4 E-core)	20	P-core 3.6GHz / E-core 2.7GHz	Max Turbo up to 5.0GHz / P-core 4.9GHz / E-core 3.8GHz	25MB	DDR5-4800	Intel® UHD Graphics 770
Core i9-12900	16 (8 P-core + 8 E-core)	24	P-core 2.4GHz / E-core 1.8GHz	Max Turbo up to 5.1GHz / P-core 5.0GHz / E-core 3.8GHz	30MB	DDR5-4800	Intel® UHD Graphics 770
Core i9-12900K	16 (8 P-core + 8 E-core)	24	P-core 3.2GHz / E-core 2.4GHz	Max Turbo up to 5.2GHz / P-core 5.1GHz / E-core 3.9GHz	30MB	DDR5-4800	Intel® UHD Graphics 770

#### Processor Sockets

1x FCLGA1700

Notes:

[1] Intel® Max Turbo frequency will vary depending on application workload and the hardware and software configurations, see

<http://www.intel.com/technology/turboboost/> for more information.

### Operating System

#### Operating System\*\*

- Windows® 11 Pro
- Windows® 11 Home
- Windows® 11 Home Single Language
- Windows® 11 DG Windows® 10 Pro 64
- Ubuntu Linux LTS
- Red Hat Enterprise Linux 8.7 (certified only, for detailed and latest information, please visit [Red Hat Certified Hardware](#))
- No preload operating system

### Graphics

#### Integrated Graphics\*\*

- Intel® UHD Graphics 730
- Intel® UHD Graphics 770

#### Discrete Graphics Support<sup>[1]</sup>

Supports up to one NVIDIA® RTX A5000 or NVIDIA® GeForce RTX™ 3080

**Discrete Graphics Offering\*\*\***

Graphics	Memory	Power	Connector	Form Factor	SLI / NVLink
NVIDIA® T600	4GB GDDR6	40W	4x miniDP 1.4	Single slot	None
NVIDIA® T400 4GB	4GB GDDR6	40W	3x miniDP 1.4	Single slot	None
NVIDIA® T400	2GB GDDR6	40W	3x miniDP 1.4	Single slot	None
NVIDIA® T1000 8GB	8GB GDDR6	50W	4x miniDP 1.4	Single slot	None
NVIDIA® T1000	4GB GDDR6	50W	4x miniDP 1.4	Single slot	None
NVIDIA® RTX A5000	24GB GDDR6 with ECC	230W	4x DP 1.4a	Dual slot	None
NVIDIA® RTX A4500	20GB GDDR6 with ECC	200W	4x DP 1.4	Dual slot	None
NVIDIA® RTX A4000	16GB GDDR6 with ECC	140W	4x DP 1.4a	Single slot	None
NVIDIA® RTX A2000 12GB	12GB GDDR6	70W	4x miniDP 1.4a	Dual slot	None
NVIDIA® RTX A2000	6GB GDDR6	70W	4x miniDP 1.4a	Dual slot	None
NVIDIA® GeForce RTX™ 3080	10GB GDDR6	320W	3x DP 1.4a, 1x HDMI® 2.1 FRL	Triple slot	None
NVIDIA® GeForce RTX™ 3070 Ti	8GB GDDR6	290W	3x DP 1.4a, 1x HDMI® 2.1 FRL	Triple slot	None
NVIDIA® GeForce RTX™ 3060	12GB GDDR6	170W	3x DP 1.4a, 1x HDMI® 2.1 FRL	Dual slot	None

Notes:

[1] Discrete graphics support may vary by configurations such as processor selection or power supply wattage.

**Monitor Support**

**Monitor Support**

Onboard graphics supports up to 4 independent displays via onboard two DP, one HDMI® and one optional USB-C®; the number of maximum monitors also depends on the discrete graphic card in use

**Chipset**

**Chipset**

Intel® W680 chipset

**Memory**

**Max Memory<sup>[1]</sup>**

Up to 128GB (4x 32GB DDR5 UDIMM)

**Memory Type\*\*<sup>[2]</sup>**

- DDR5-4400 UDIMM ECC, maximum transfer speeds of up to 4400 MT/s
- DDR5-4400 UDIMM non-ECC, maximum transfer speeds of up to 4400 MT/s

**Memory Slots**

Four DDR5 UDIMM slots, dual-channel capable

**Memory Protection**

ECC on models with ECC DIMMs and ECC capable processor

Notes:

[1] The max memory is based on the test results with current Lenovo® memory offerings.

[2] 4400 MT/s is maximum operating speed, memory operating speed varies depending on memory configuration:

1x 8GB / 2x 8GB / 1x 16GB / 2x 16GB / 2x 32GB configurations run at 4400 MT/s;

4x 8GB / 4x 16GB configurations run at 4000 MT/s;

4x 32GB configuration runs at 3600 MT/s.

**Storage**

**Storage Support<sup>[1]</sup>**

Up to 2x 3.5" SATA HDD or 4x 2.5" SATA HDD; also supports up to 3x M.2 SSD (2 by onboard, 1 by M.2 to PCIe® adapter )

- 3.5" HDD up to 4TB each
- 2.5" HDD up to 1TB each

- Onboard M.2 SSD up to 4TB each
- M.2 SSD by M.2 to PCIe® adapter up to 2TB

**Storage Type**<sup>\*\*\*[2]</sup>

Disk Type	Interface	RPM	Offering	Security
2.5" SATA HDD	SATA 6Gb/s	7.2K	1TB / 1TB FIPS	-
3.5" SATA HDD	SATA 6Gb/s	7.2K	1TB / 2TB / 4TB	-
M.2 2280 SSD	PCIe® NVMe®, PCIe® 4.0 x4	-	256GB	Opal 2.0
M.2 2280 SSD for Onboard M.2 slots	PCIe® NVMe®, PCIe® 4.0 x4 Performance	-	512GB / 1TB / 2TB / 4TB	Opal 2.0

**Storage Controllers**<sup>[3]</sup>

Storage Controller	Type	Interface	RAID	Cache
Integrated NVMe® controller	Standard	PCIe® NVMe®	0/1	None
Integrated SATA controller	Standard	SATA 6.0Gb/s	0/1/10/5	None

Notes:

- [1] The storage capacity supported is based on the test results with current Lenovo® storage offerings.
- [2] When using M.2 to PCIe® adapter, M.2 SSD works at PCIe® Gen 3. 4TB M.2 SSD is pending availability.
- [3] NVMe® RAID is supported on onboard M.2 slots. SATA RAID 5 and 10 are supported on 2.5" HDD.

**Removable Storage**

**Optical Support**

Optional one 9.0mm optical drive, DVD-ROM, DVD±RW, and Blu-ray

**Card Reader**

- SD card reader
- No card reader

**Multi-Media**

**Audio Chip**

High Definition (HD) Audio, Realtek® ALC897Q-CG codec

**Speakers**

Single speaker, 2W x1

**Power Supply**

**Power Supply**<sup>\*\*</sup>

Power	Type	Efficiency	Key Features
500W	Fixed	92%	Autosensing, 80 PLUS Platinum qualified
750W	Fixed	92%	Autosensing, 80 PLUS Platinum qualified

**DESIGN**

**Mechanical**

**Form Factor**

Tower (17L)

**Dimensions (WxDxH)**<sup>[1]</sup>

170 x 315.4 x 376 mm (6.7 x 12.4 x 14.8 inches)

**Weight**<sup>[2]</sup>

9.67 kg (21.32 lbs, maximum configuration)

**Bays**

- 1x 3.5" disk bay (standard)
- 1x 3.5" disk bay (optional)

- 2x 2.5" disk bay (optional)

#### M.2 Slots

- Up to 3x M.2 SSD:
  - 2 via onboard M.2 PCIe® Gen 4 slots
  - 1 via Single M.2 to PCIe® adapter, PCIe® Gen 3
- One M.2 slot for WiFi

#### Expansion Slots

Supports four PCIe® slots with two PCIe® 4.0 x16 and two PCIe® 3.0 x1.

- Slot 1: PCIe® 4.0 x16, full height, full length, 75W, double-width
- Slot 2: PCIe® 3.0 x1, full height, half length, 25W
- Slot 3: PCIe® 4.0 x16 (x4 lanes), full height, half length, 25W
- Slot 4: PCIe® 3.0 x1, full height, half length, 25W

#### Notes:

[1] The system dimensions may vary depending on configurations.

[2] The system weight is approximate and based on results in Lenovo® lab, which varies depending on the source of component, variance of the distribution of each component, and manufacturing process. It may not be the exact weight for each specific model.

## CONNECTIVITY

### Network

#### WLAN + Bluetooth®\*\*

- Intel® Wi-Fi® 6 AX201, 802.11ax 2x2 Wi-Fi® + Bluetooth® 5.1 (Bluetooth® 5.2 hardware ready), Intel® vPro® technology support
- Intel® Wi-Fi® 6E AX211, 802.11ax 2x2 Wi-Fi® + Bluetooth® 5.1 (Bluetooth® 5.3 hardware ready), Intel® vPro® technology support<sup>[1]</sup>
- No WLAN and Bluetooth®

#### Onboard Ethernet

Gigabit Ethernet, Intel® Ethernet Connection I219-LM, 1x RJ-45, supports Wake-on-LAN

#### Optional Ethernet

Up to two additional PCIe® x1 Ethernet adapters or one PCIe® x4 Ethernet adapter support, up to one additional 10 GbE ports

- Gigabit Ethernet, Intel® I210-T1, 1x RJ-45, PCIe® x1
- Gigabit Ethernet, Intel® I350-T2, 2x RJ-45, PCIe® x4
- Gigabit Ethernet, Broadcom BCM5719, 4x RJ-45, PCIe® x4
- Gigabit Ethernet, Broadcom BCM5720, 2x RJ-45, PCIe® x1
- Gigabit Ethernet, Realtek® RTL8168H, 1x RJ-45, PCIe® x1
- 2.5 Gigabit Ethernet, Realtek® RTL8125BGS, 1x RJ-45, PCIe® x1
- 10 Gigabit Ethernet, Marvell AQtion AQN-107, 1x RJ-45, PCIe® x4

#### Notes:

[1] Bluetooth® 5.3 is hardware ready but may run at a lower version due to OS limitations. Wi-Fi® 6E is only enabled on Windows® 11 and operates as Wi-Fi® 6 with Windows® 10.

### Ports<sup>[1]</sup>

#### Front Ports

- 1x USB-C® (USB 10Gbps / USB 3.2 Gen 2), data transfer only
- 2x USB-A (USB 5Gbps / USB 3.2 Gen 1)
- 2x USB-A (USB 10Gbps / USB 3.2 Gen 2)
- 1x headphone / microphone combo jack (3.5mm)
- 1x microphone (3.5mm)

#### Rear Ports<sup>[2]</sup>

- 4x USB-A (USB 5Gbps / USB 3.2 Gen 1), one supports Smart Power On
- 1x HDMI® 2.1 TMDS
- 2x DisplayPort™ 1.4
- 1x Ethernet (RJ-45)
- 1x line-out (3.5mm)

**Optional Rear Ports<sup>[3]</sup>**

- 1x USB-C® (USB 5Gbps / USB 3.2 Gen 1), with DisplayPort™ function (Flex IO)
- 1x HDMI® 2.1 TMDS (Flex IO)
- 1x DP 1.2 (Flex IO)
- 1x VGA (Flex IO)
- 1x parallel (via cable and PCIe® bracket)
- 1x Thunderbolt™ 4 (via additional PCIe® adapter)
- 1x USB-C® (USB 20Gbps / USB 3.2 Gen 2x2), support data transfer, via PCIe® x4 card
- 2x USB-A (Hi-Speed USB / USB 2.0), via cable and PCIe® bracket
- 2x USB-A (USB 5Gbps / USB 3.2 Gen 1), via additional PCIe® x1 adapter
- 1x serial (via cable)
- 4x serial (via 4-port serial expansion card, PCIe® x1)
- 2x PS/2 (via cable)

**Notes:**

[1] The transfer speed of the ports will vary and, depending on many factors, such as the processing speed of the host device, file attributes, and other factors related to system configuration and your operating environment, will be slower than the theoretical speed.

[2] For video ports on discrete graphics, please see graphics section.

[3] 2x USB 2.0 and 1x parallel can not be chosen simultaneously. USB 2.0 and parallel occupy a PCIe® slot.

## SECURITY & PRIVACY

### Security

**Security Chip**

Discrete TPM 2.0, TCG certified, FIPS 140-2 certified

**Physical Locks**

- (Optional) Cable lock
- (Optional) E-lock
- Kensington® Security Slot™, 3 x 7 mm
- Padlock Loop

**Chassis Intrusion Switch**

- Chassis intrusion switch
- No chassis intrusion switch

**BIOS Security**

- Administrator password
- Power-on password

## MANAGEABILITY

### System Management

**System Management<sup>[1]</sup>**

- Intel® vPro® Enterprise with Intel® AMT 16
- Non-vPro®

**Notes:**

[1] Intel® vPro® offers a superset of DASH's defined capabilities.

## SERVICE

### Warranty<sup>[1]</sup>

**Base Warranty\*\***

- 1-year limited onsite service
- 2-year limited onsite service
- 3-year limited onsite service
- No base warranty

## Notes:

[1] The warranty upgrades may be bundled with some models, please check the "Included upgrade" column in the specific model's configurations. For more service extensions, please go to <https://smartfind.lenovo.com/>. To learn more details of warranty policy, please access <https://support.lenovo.com/warrantylookup/warrantypolicy>.

## OPERATING REQUIREMENTS

### Operating Environment

#### Temperature

- Operating: 10°C (50°F) to 35°C (95°F)
- Storage: -40°C (-40°F) to 60°C (140°F)

#### Altitude

- Operating: 0 m (0 ft) to 3048 m (10,000 ft)
- Storage: 0 m (0 ft) to 12192 m (40,000 ft)

#### Relative Humidity

- Operating: 20% to 80%
- Storage: 10% to 90%

## CERTIFICATIONS

### Green Certifications<sup>[1]</sup>

#### Green Certifications

- (Optional) ENERGY STAR® 8.0
- (Optional) EPEAT™ Gold Registered<sup>[2]</sup>
- ErP Lot 3
- RoHS compliant
- TCO Certified 9.0

## Notes:

[1] The items listed under the "Green Certifications" section may not only refer to certification but also registration or self-declaration. For ESG & regulatory compliance documents, please visit <https://compliance.lenovo.com>.

[2] EPEAT™ is registered where applicable, please visit [epeat.net](http://epeat.net) for registration status by country.

### Other Certifications

#### Mil-Spec Test

MIL-STD-810H military test passed

### ISV Certifications

#### ISV Certifications

Please visit [ISV certifications for Lenovo® Workstations](#)

- Feature with \*\* means that only one option listed under the feature can be configured on selected models. Please refer to the model configuration for specific information.
- Feature with \*\*\* means that one or more options listed under the feature can be configured on selected models. Please refer to the model configuration for specific information.
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