## OVERVIEW

<p>| | |</p>
<table>
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<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power button</td>
</tr>
<tr>
<td>2</td>
<td>Optical drive *</td>
</tr>
<tr>
<td>3</td>
<td>Card reader</td>
</tr>
<tr>
<td>4</td>
<td>Microphone (3.5mm)</td>
</tr>
<tr>
<td>5</td>
<td>Headphone / microphone combo jack (3.5mm)</td>
</tr>
<tr>
<td>6</td>
<td>USB-C 3.2 Gen 1</td>
</tr>
<tr>
<td>7</td>
<td>2x USB 3.2 Gen 1</td>
</tr>
<tr>
<td>8</td>
<td>2x USB 3.2 Gen 2</td>
</tr>
<tr>
<td>9</td>
<td>Serial</td>
</tr>
<tr>
<td>10</td>
<td>Line-out (3.5mm)</td>
</tr>
<tr>
<td>11</td>
<td>2x DisplayPort</td>
</tr>
<tr>
<td>12</td>
<td>2x PS/2 ports (keyboard / mouse) *</td>
</tr>
<tr>
<td>13</td>
<td>Video port (DisplayPort, HDMI, or USB-C) *</td>
</tr>
<tr>
<td>14</td>
<td>Ethernet (RJ-45)</td>
</tr>
<tr>
<td>15</td>
<td>2x USB 2.0</td>
</tr>
<tr>
<td>16</td>
<td>2x USB 3.2 Gen 1</td>
</tr>
<tr>
<td>17</td>
<td>Optional ports on expansion cards *</td>
</tr>
</tbody>
</table>

Notes:
- Ports with * are only available on selected models
PERFORMANCE

Processor

Processor Family
Up to one Intel® Core™ i3 / i5 / i7 / i9 or Intel Xeon® Processor

<table>
<thead>
<tr>
<th>Processor Name</th>
<th>Cores</th>
<th>Threads</th>
<th>Base Frequency</th>
<th>Max Frequency</th>
<th>Cache</th>
<th>Memory Support</th>
<th>Processor Graphics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core i3-10100</td>
<td>4</td>
<td>8</td>
<td>3.6GHz</td>
<td>4.3GHz</td>
<td>6MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
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<tr>
<td>Core i3-10300</td>
<td>4</td>
<td>8</td>
<td>3.7GHz</td>
<td>4.4GHz</td>
<td>8MB</td>
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<tr>
<td>Core i3-10320</td>
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<tr>
<td>Core i5-10400</td>
<td>6</td>
<td>12</td>
<td>2.9GHz</td>
<td>4.3GHz</td>
<td>12MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
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<tr>
<td>Core i5-10500</td>
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<td>12</td>
<td>3.1GHz</td>
<td>4.5GHz</td>
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<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
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<tr>
<td>Core i5-10600</td>
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<td>12</td>
<td>3.3GHz</td>
<td>4.8GHz</td>
<td>12MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>Core i5-10600K</td>
<td>6</td>
<td>12</td>
<td>4.1GHz</td>
<td>4.8GHz</td>
<td>12MB</td>
<td>DDR4-2666</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>Core i7-10700</td>
<td>8</td>
<td>16</td>
<td>2.9GHz</td>
<td>4.8GHz</td>
<td>16MB</td>
<td>DDR4-2933</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>Core i7-10700K</td>
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<td>16</td>
<td>3.8GHz</td>
<td>5.1GHz</td>
<td>16MB</td>
<td>DDR4-2933</td>
<td>Intel UHD Graphics 630</td>
</tr>
<tr>
<td>Core i9-10900</td>
<td>10</td>
<td>20</td>
<td>2.8GHz</td>
<td>5.2GHz</td>
<td>20MB</td>
<td>DDR4-2933</td>
<td>Intel UHD Graphics 630</td>
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<td>Core i9-10900K</td>
<td>10</td>
<td>20</td>
<td>3.7GHz</td>
<td>5.3GHz</td>
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<td>Intel UHD Graphics 630</td>
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<tr>
<td>Xeon W-1250</td>
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<tr>
<td>Xeon W-1250P</td>
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<td>4.8GHz</td>
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<td>Xeon W-1270</td>
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<tr>
<td>Xeon W-1270P</td>
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<td>3.8GHz</td>
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<td>DDR4-2933</td>
<td>Intel UHD Graphics P630</td>
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<tr>
<td>Xeon W-1290</td>
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<td>20</td>
<td>3.2GHz</td>
<td>5.2GHz</td>
<td>20MB</td>
<td>DDR4-2933</td>
<td>Intel UHD Graphics P630</td>
</tr>
<tr>
<td>Xeon W-1290P</td>
<td>10</td>
<td>20</td>
<td>3.7GHz</td>
<td>5.3GHz</td>
<td>20MB</td>
<td>DDR4-2933</td>
<td>Intel UHD Graphics P630</td>
</tr>
</tbody>
</table>

Processor Sockets
1x FCLGA1200

Operating System

Operating System**
- Windows® 10 Pro 64
- Windows 10 Pro 64 for Workstations
- Ubuntu Linux LTS
- No operating system

Graphics

Integrated Graphics**
- Intel UHD Graphics 630
- Intel UHD Graphics P630

Discrete Graphics Support
Supports up to one NVIDIA® Quadro® RTX 5000 or two NVIDIA Quadro P2200, 500W PSU is needed

Discrete Graphics Offering**(1)

<table>
<thead>
<tr>
<th>Graphics</th>
<th>Memory</th>
<th>Power</th>
<th>Connector</th>
<th>SLI / NVlink</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quadro P400</td>
<td>2GB GDDR5</td>
<td>30W</td>
<td>3x miniDP 1.4</td>
<td>None</td>
</tr>
<tr>
<td>Quadro P620</td>
<td>2GB GDDR5</td>
<td>40W</td>
<td>4x miniDP 1.4</td>
<td>None</td>
</tr>
<tr>
<td>Quadro P1000</td>
<td>4GB GDDR5</td>
<td>50W</td>
<td>4x miniDP 1.4</td>
<td>None</td>
</tr>
<tr>
<td>Quadro P2000</td>
<td>5GB GDDR5</td>
<td>75W</td>
<td>4x DP</td>
<td>None</td>
</tr>
<tr>
<td>Quadro P2200</td>
<td>5GB GDDR5</td>
<td>75W</td>
<td>4x DP 1.4</td>
<td>None</td>
</tr>
</tbody>
</table>
Quadro RTX 4000 8GB GDDR6 160W 3x DP 1.4, 1x VirtualLink None
Quadro RTX 5000 16GB GDDR6 265W 4x DP 1.4, 1x VirtualLink None
NVIDIA RTX A2000 6GB GDDR6 70W 4x miniDP 1.4a None

Notes:
1. NVIDIA Quadro RTX 5000 supports manufacture configure only, none standalone option is available

Monitor Support

Monitor Support
Supports multiple displays via onboard video ports and discrete graphics, the number of maximum monitors supported depends on the graphic card in use

Chipset

Chipset
Intel W480 chipset

Memory

Max Memory
Up to 128GB DDR4-2933

Memory Type
- DDR4-2933 UDIMM ECC
- DDR4-2933 UDIMM non-ECC

Memory Slots
Four DDR4 UDIMM slots, dual-channel capable

Memory Protection
ECC on models with ECC DIMMs and Xeon processor

Notes:
1. The max memory is based on the test results with current Lenovo® memory offerings. The system may support more memory as the technology develops.

Storage

Storage Support
Up to 2x 3.5" SATA HDD / 4x 2.5" SATA HDD / SSD + 4x M.2 PCIe® SSD
- 3.5" HDD up to 4TB each
- 2.5" SATA HDD up to 1TB each
- 2.5" SATA SSD up to 1TB each
- M.2 PCIe SSD up to 2TB each
- Optional Intel Optane™ Memory

Storage Type

<table>
<thead>
<tr>
<th>Disk Type</th>
<th>Interface</th>
<th>RPM</th>
<th>Offering</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5&quot; SATA SSD</td>
<td>SATA 6Gb/s</td>
<td>-</td>
<td>512GB / 1TB</td>
</tr>
<tr>
<td>2.5&quot; SATA HDD</td>
<td>SATA 6Gb/s</td>
<td>7.2K</td>
<td>1TB FIPS</td>
</tr>
<tr>
<td>3.5&quot; SATA HDD</td>
<td>SATA 6Gb/s</td>
<td>7.2K</td>
<td>1TB / 2TB / 4TB</td>
</tr>
<tr>
<td>M.2 PCIe SSD</td>
<td>PCIe NVMe*</td>
<td>-</td>
<td>256GB / 512GB / 1TB / 2TB</td>
</tr>
<tr>
<td>Intel Optane Memory</td>
<td>PCIe NVMe</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Storage Controllers

<table>
<thead>
<tr>
<th>Storage Controller</th>
<th>Type</th>
<th>Interface</th>
<th>RAID</th>
<th>Cache</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onboard Intel RSTe SATA RAID</td>
<td>Standard</td>
<td>SATA 6.0Gb/s</td>
<td>0/1/10/5</td>
<td>None</td>
</tr>
<tr>
<td>Onboard Intel RST PCIe RAID</td>
<td>Standard</td>
<td>PCIe NVMe</td>
<td>0/1</td>
<td>None</td>
</tr>
</tbody>
</table>

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® ALC623 codec

Power Supply

<table>
<thead>
<tr>
<th>Power</th>
<th>Type</th>
<th>Efficiency</th>
<th>Key Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>300W</td>
<td>Fixed</td>
<td>90%</td>
<td>100V - 240V, 80 PLUS Gold qualified</td>
</tr>
<tr>
<td>500W</td>
<td>Fixed</td>
<td>92%</td>
<td>100V - 240V, 80 PLUS Platinum qualified</td>
</tr>
</tbody>
</table>

DESIGN

Mechanical
Form Factor
Tower (17L)

Dimensions (WxDxH)

<table>
<thead>
<tr>
<th>Models</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>All models</td>
<td>170 x 315.35 x 376 mm (6.7 x 12.4 x 14.8 inches)</td>
</tr>
</tbody>
</table>

Weight

<table>
<thead>
<tr>
<th>Models</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>All models</td>
<td>9.38 kg (20.68 lbs, maximum configuration)</td>
</tr>
</tbody>
</table>

Bays
• 1x 3.5” disk bay (standard)
• 2x 2.5” disk bay (optional, comes with disk or optional upgrade kit)
• 1x 3.5” disk bay (optional, via flex bay)

M.2 Slots
Up to 4x M.2 SSD:
• 2 via onboard slots
• 2 via Single M.2 to PCIe adapter

Expansion Slots
• One PCIe 3.0 x16
• One PCIe 3.0 x16 (x4 lanes)
• One PCIe 3.0 x1

Expansion Slots Offering
Slot 1: PCIe 3.0 x16, full height, full length, links to CPU
Slot 2: PCIe 3.0 x1, full height, full length, links to PCH
Slot 3: PCIe 3.0 x16 (negotiable link width x4), full height, full length, links to PCH

CONNECTIVITY

Network
Onboard Ethernet
Gigabit Ethernet, Intel Ethernet Connection I219-LM, 1x RJ45, supports Wake-on-LAN

Optional Ethernet
Additional Ethernet options via PCIe adapter
WLAN + Bluetooth®

- Mediatek Wi-Fi® 6 MT7921, 802.11ax 2x2 Wi-Fi + Bluetooth 5.2, M.2 Card
- Intel Wi-Fi 6 AX201, 802.11ax 2x2 Wi-Fi + Bluetooth 5.1, M.2 Card
- No WLAN and Bluetooth

Ports

Front Ports
- 2x USB 3.2 Gen 1
- 2x USB 3.2 Gen 2
- 1x USB-C 3.2 Gen 1
- 1x headphone / microphone combo jack (3.5mm)
- 1x microphone (3.5mm)

Rear Ports
- 2x USB 2.0
- 2x USB 3.2 Gen 1
- 2x DisplayPort™
- 1x serial (9-pin)
- 1x Ethernet (RJ-45)
- 1x line-out (3.5mm)

Optional Rear Ports
- 2x USB 2.0
- 2x USB 3.2 Gen 1 (via 2-port USB expansion card, PCIe x1)
- 2x USB-C 3.2 Gen 2 (via 2-port USB-C expansion card)
- 1x Thunderbolt™
- 1x video (DisplayPort, HDMI®, or USB-C)
- 1x serial
- 4x serial (via 4-port serial expansion card, PCIe x1)
- 1x parallel
- 2x PS/2

Notes:
1. The transfer speed of following 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 theoretical speed.
   - USB 2.0: 480 Mbit/s;
   - USB 3.2 Gen 1 (SuperSpeed USB 5Gbps, formerly USB 3.0 / USB 3.1 Gen 1): 5 Gbit/s;
   - USB 3.2 Gen 2 (SuperSpeed USB 10Gbps, formerly USB 3.1 Gen 2): 10 Gbit/s;
   - USB 3.2 Gen 2x2 (SuperSpeed USB 20Gbps): 20 Gbit/s;
   - Thunderbolt 3: 40 Gbit/s;
   - FireWire 400: 400 Mbit/s;
   - FireWire 800: 800 Mbit/s
2. For video ports on discrete graphics, please see graphics section

SECURITY & PRIVACY

Security

Security Chip
Discrete TPM 2.0, TCG certified

Physical Locks
- (Optional) Cable lock
- (Optional) E-lock
- Kensington® Security Slot
- Padlock Loop

Chassis Intrusion Switch
- Chassis intrusion switch
- No chassis intrusion switch

BIOS Security
- Administrator password
- Power-on password

MANAGEABILITY
System Management

**System Management**
- Intel vPro with Intel AMT 14.0 (vPro-enable processor and WiFi needed)
- Standard Manageability

Diagnostic

**Diagnostic**
Lenovo UEFI Bootable Diagnostics

SERVICE

Warranty

**Base Warranty**
- 1-year limited onsite service
- 2-year limited onsite service
- 3-year limited onsite service with 9x5 NBD (for most models)

ENVIRONMENTAL

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)

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

CERTIFICATIONS

Green Certifications

**Green Certifications**
- (Optional) EPEAT™ Gold
- (Optional) EPEAT Silver
- ENERGY STAR® 8.0
- RoHS compliant

ISV Certifications

**ISV Certifications**
Please visit www.thinkworkstations.com/isv-certifications/

- Feature with ** means that only one offering listed under the feature is configured on selected models.
- Feature with *** means that one or more offerings listed under the feature could be configured on selected models.
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