

Power Configurator

Lenovo ThinkStation P4



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Overview

The Lenovo Mainstream Workstation portfolio has been dominated by Intel CPUs since the sunsetting of the P358. Due to increased demand for more diversity in this segment, we are delighted to introduce ThinkStation P4.

The purpose of this document is to provide ThinkStation P4 users with guidance over the optimum utilization within the available power budget for a given PSU while maintaining maximum TDP thresholds.

This document will also try to highlight key differentiators between the other systems within this segment so that customers can make an informed choice.

Section 1 – Key Architectural Design

The key new design improvements that boast the greatest rewards in P4 are,

- Liquid Cooling, meaning a higher TDP (~170W) is achievable within a ~29L chassis with less audible footprint.
- Motherboard layout design & optimization, enabling greater flexibility with multi-slot GPUs and add-in adapters.
- AMD Pro 675 chipset, unique to Lenovo at launch supporting AMDs Granite Ridge & Phoenix Ryzen™ CPUs.

ThinkStation P4 employs a standardized system power architecture. All onboard components and standard peripherals receive power via the system board's integrated power delivery. However, most high-performance, multi-slot GPUs require supplemental power delivered through a dedicated cable connected directly to the power supply unit (PSU).

Figures 1 to 3 illustrate the three PSU options available in P4 along with their respective connections to the system board and supported high-performance GPUs.

Figure 1 – P4 Power Supply 500W (TFX)

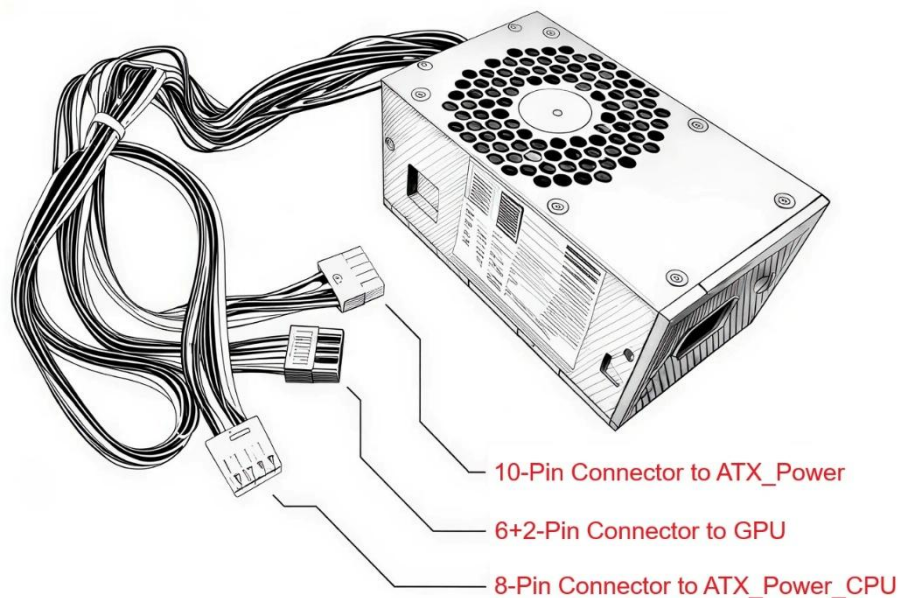


Figure 2 – P4 Power Supply 750W (ATX)

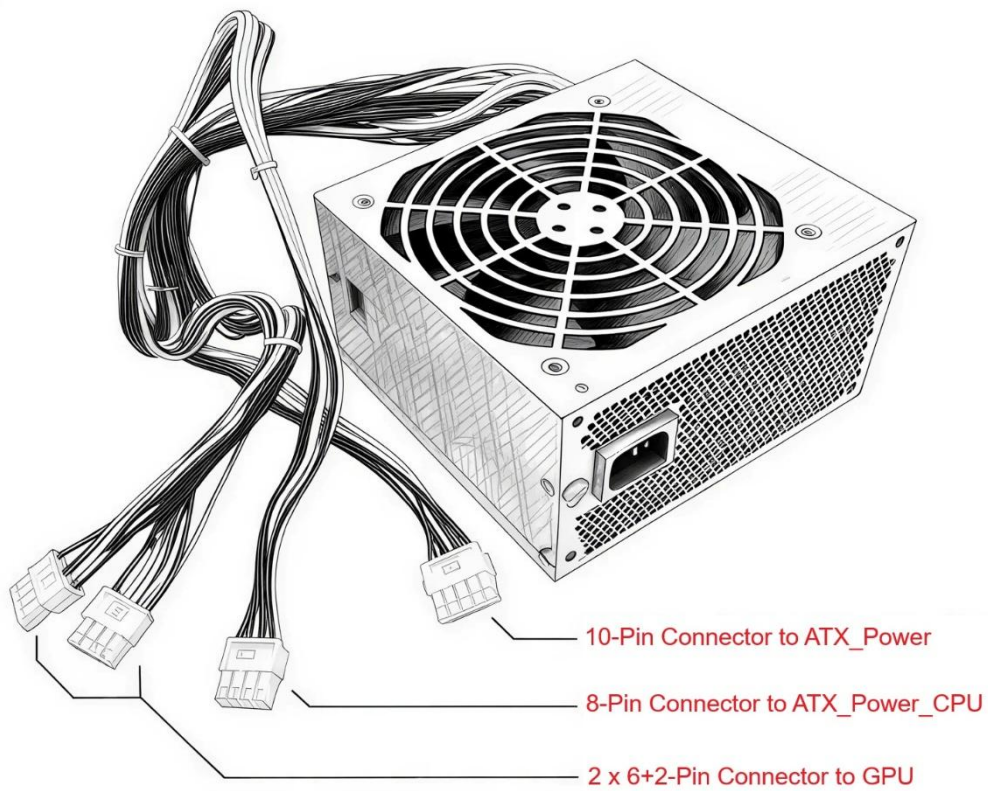
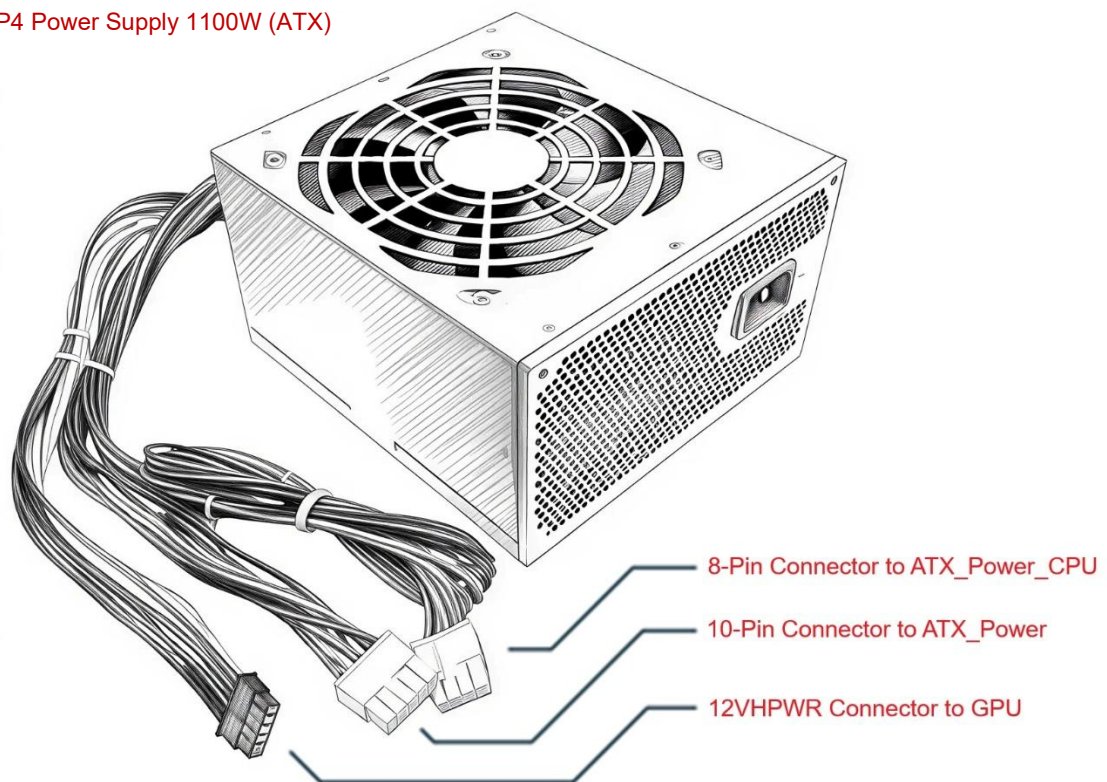
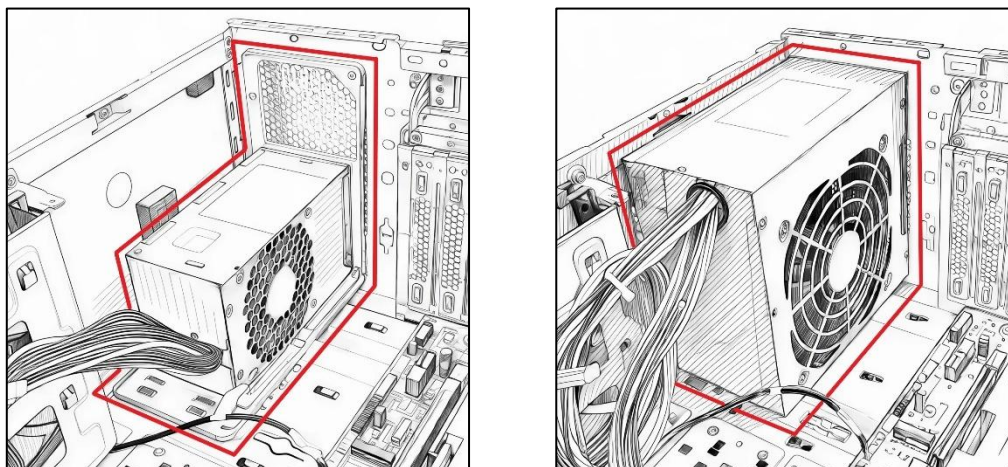


Figure 3 – P4 Power Supply 1100W (ATX)



The 500W TFX PSU (left) is smaller than the 750W or 1100W ATX PSU (right) and therefore requires a bracket when mounting in the P4 chassis.

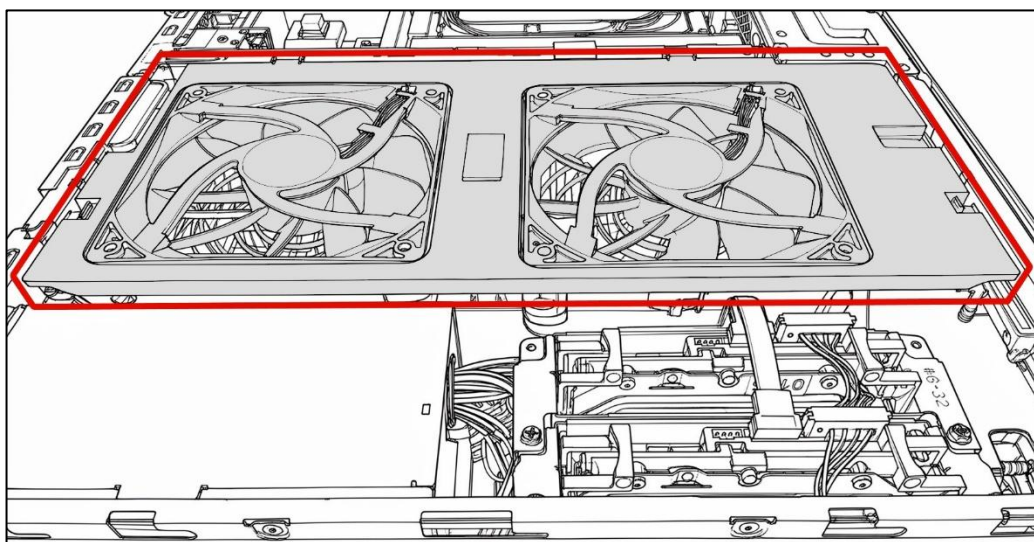
Figure 4 & 5 – P4 Power Supply TFX vs. ATX



A P4 configured with a 750W or 1100W PSUs will ship with a vented side panel. A system with a 500W PSU will ship with a non-vented (blank) side panel.

Additionally, a side fan assembly is included in every P4 equipped with a 750W or 1100W PSU to provide additional cooling to high-end cards supported in those models. In the 750W base configuration these fans are 120 x 25mm thick but in the 1100W base configuration these fans are 120 x 15mm thick to cater for larger higher wattage GPUs. A system configured with a 500W PSU will not have this fan assembly and as such can support the 4th SATA HDD bay.

Figure 6 – P4 Side Fan Assembly



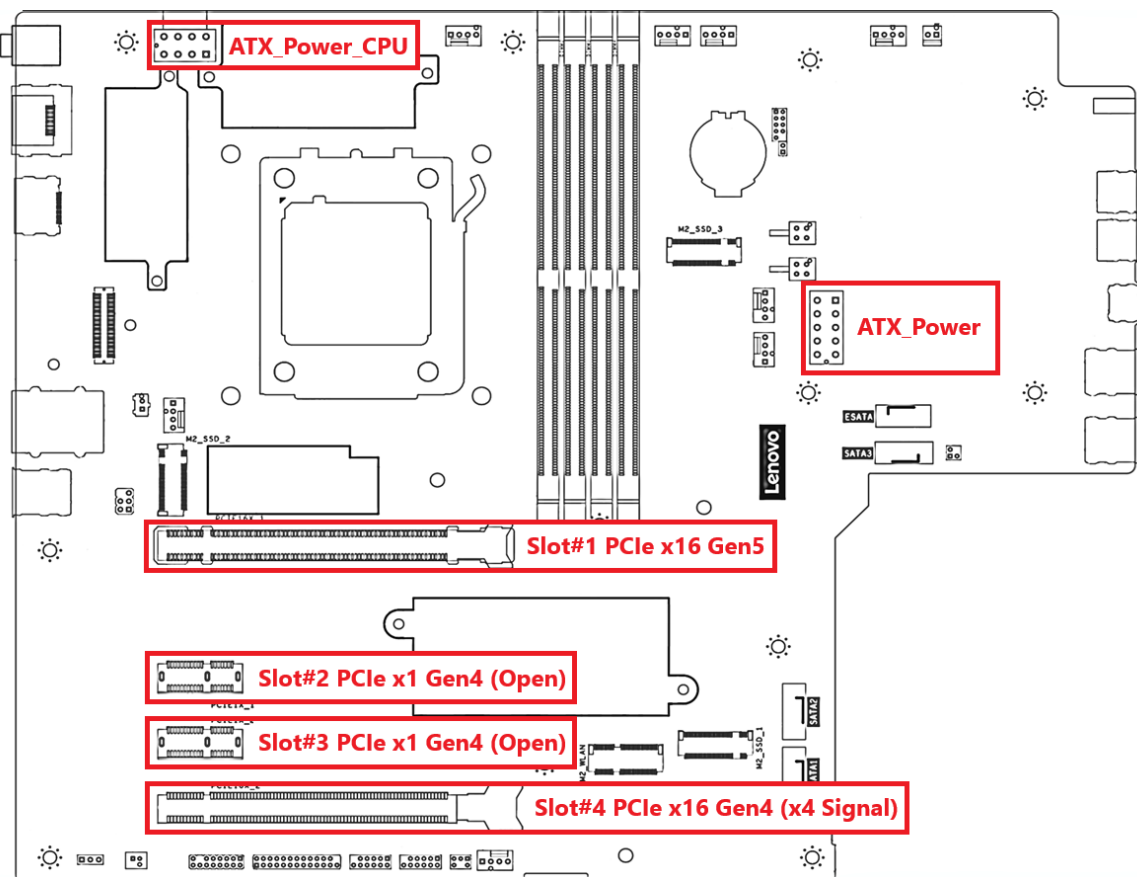
More part information can be found in the [Appendix](#).

Below is a diagram of the P4 motherboard, with callouts for the ATX power connections and PCIe slots.

Slot#1, which is PCIe x16 Gen5 mechanically and electrically, is the primary slot for a discreet GPU and the remaining Gen4 slots are primarily used for non-GPU PCIe devices.

Although the second x16 Gen4 slot (Slot#4) in P4 is electrically an x4 slot in common with other systems in this segment, it is the full 75W and has been relocated away from Slot#1, so it is not obstructed by large multi-slot GPUs.

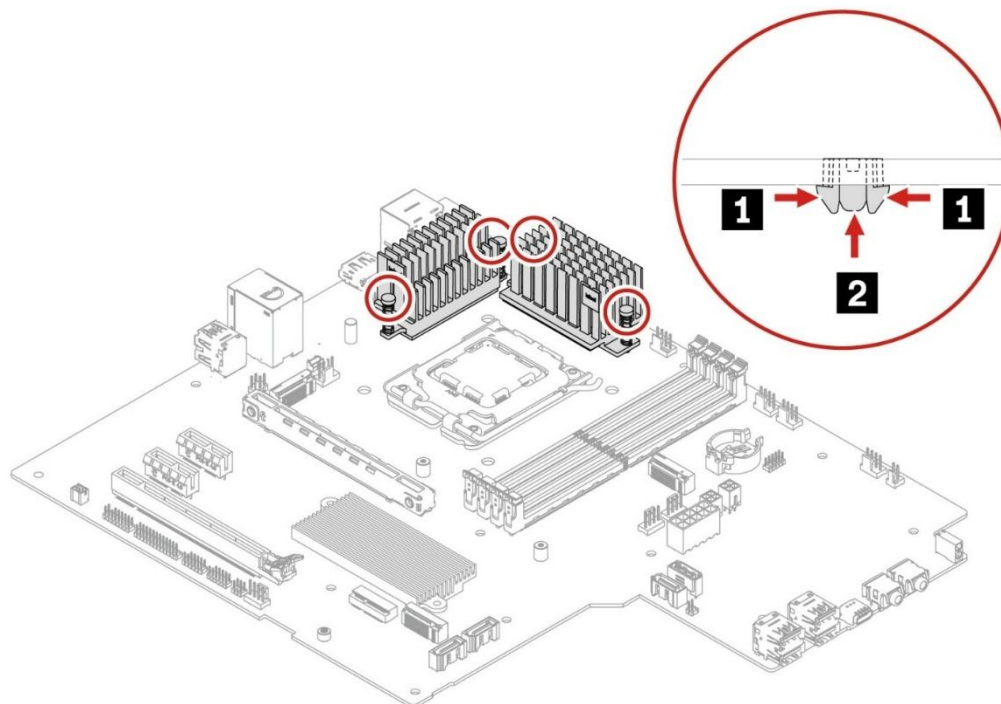
Figure 7 – P4 Motherboard



If either a 120W CPU or 170W CPU are installed in P4 VRM heatsinks are required.

VRM heatsink FRU Part Numbers: (FRU# [5H40U93273](#) & [5H40U93274](#))

Figure 8 – P4 VRM Heatsinks



Note: Removal of the VRM heatsink will require the motherboard to be removed from the chassis to access its retention clips.

Liquid Cooling:

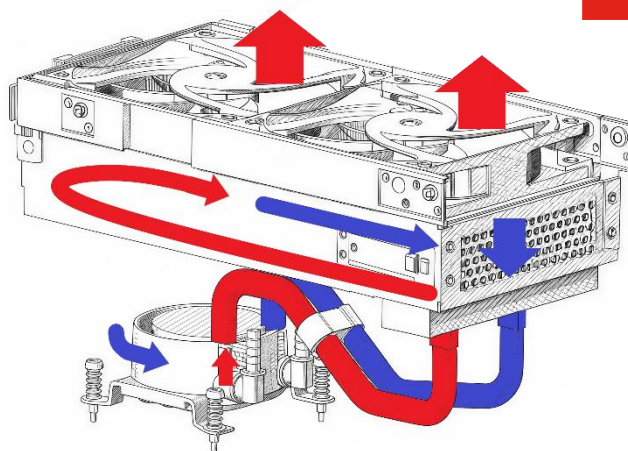
New to Lenovo Workstation and introduced here in P4 is Liquid Cooling for the CPU. This consists of a CPU water block & reservoir containing an impeller and a separate radiator with 2 x 120mm PWM fans.

A higher TDP with a reduction in audible footprint is achievable with this solution.

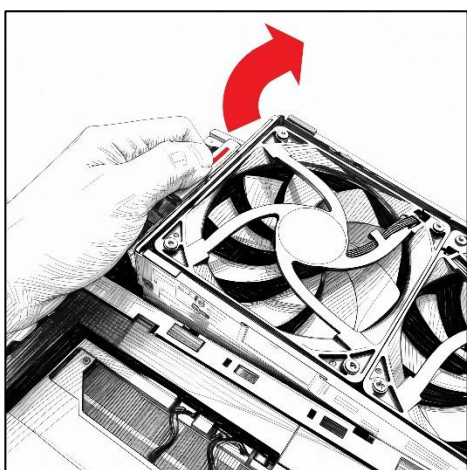
It is not new to Lenovo International and has been thoroughly tested through thousands of existing customer deployments.

The liquid cooler is only available on 120W & 170W CPUs, it is not necessary on 65W CPUs, details are covered further down in this document.

Note: CPU Cooler FRUs are listed in the [Appendix](#)



The radiator occupies the better half of the top of the P4 chassis. To gain access to the innards for upgrade or service of P4 first remove the vented side panel.



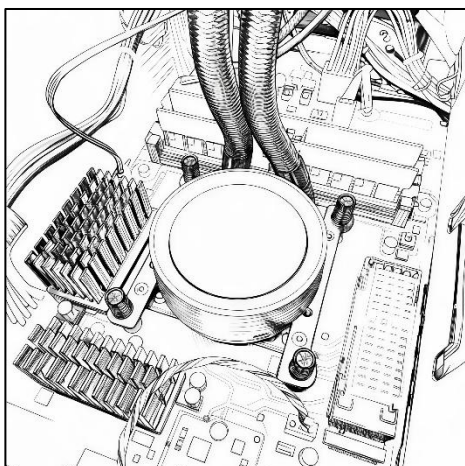
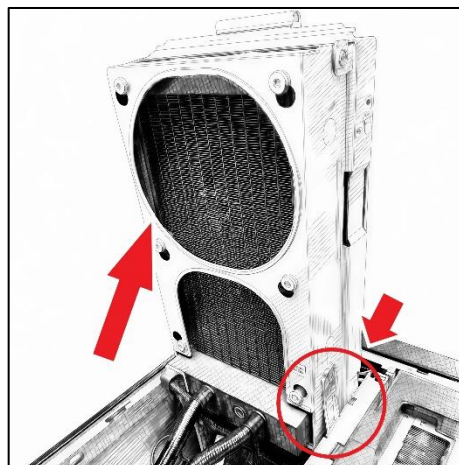
Then, with the system on its side, press in on the red radiator latch and gently lift.

You do not need to be concerned about dislodging the water cooler block or disconnecting the water pipes.

When the radiator is fully upright it will lock into place with the latch provided.

Do not push past 90 degrees (fully upright).

For safety, ensure the lock is **fully** engaged, an audible “clunk” will be heard.

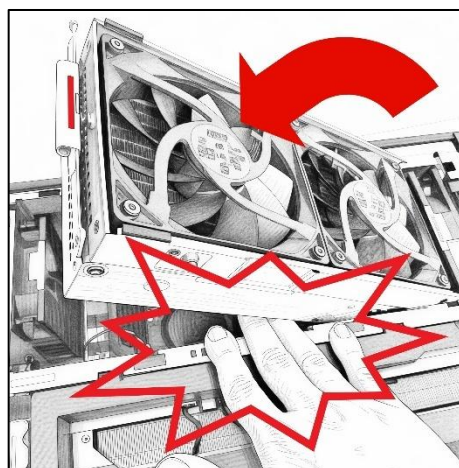


Take care not to bump or knock the radiator out of its locked position.

The CPU water block, DIMM sockets and Gen5 M.2 Slot#1 are now accessible.

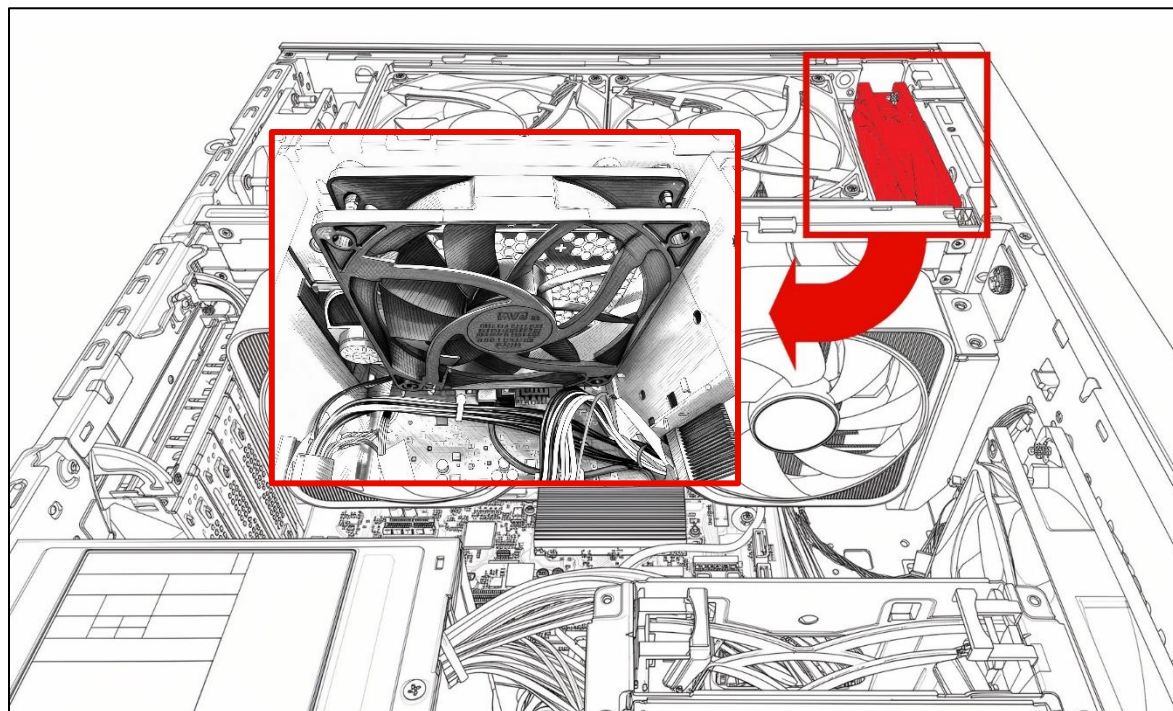
CAUTION!

When lowering the radiator, ensure your fingers are clear of the opening or personal injury may occur.



In addition to the Liquid Cooler there is a large 120mm inlet fan at the top front of the chassis.

This front system fan kit must be installed if a GPU of +200W is installed.



When a Liquid Cooling or the front system fan kit solution is installed in P4 the Optical Disk Drive, FASE and Flex-Bay HDD options will not be possible due to space constraints.

Section 2 – Power Ratings for Key System Components

To adequately understand the power capabilities of the ThinkStation P4 it is important to know the individual power ratings of the core system components.

Table 1 and 3 shows the power ratings for the various CPUs and GPUs supported on P4.

Table 1 – Supported AMD Granite Ridge & Phoenix CPUs

Granite Ridge	CPU Power	Additional CPU information
AMD Ryzen 9 PRO 9965X3D	170W	4.3GHz (16C/32T) 128M DDR5-5600
AMD Ryzen 9 PRO 9965	170W	4.3GHz (16C/32T) 64M DDR5-5600
AMD Ryzen 9 PRO 9955	120W	3.4GHz (12C/24T) 64M DDR5-5600
AMD Ryzen 7 PRO 9755X3D	120W	4.7GHz (8C/16T) 96M DDR5-5600
AMD Ryzen 7 PRO 9755	120W	3.8GHz (8C/16T) 32M DDR5-5600
AMD Ryzen 5 PRO 9655	120W	3.9GHz (6C/12T) 32M DDR5-5600
AMD Ryzen 7 PRO 9745	65W	3.8GHz (8C/16T) 32M DDR5-5600

Phoenix	CPU Power	Additional CPU information
AMD Ryzen 7 PRO 8700G	65W	4.2GHz (8C/16T) 16M DDR5-5200
AMD Ryzen 5 PRO 8600G	65W	4.35GHz (6C/12T) 16M DDR5-5200

CPU	CPU Power	Cooler Options			
		170W Liquid	120W Air	65W Air	VRM H/S
AMD Ryzen 9 PRO 9965X3D	170W	✓			✓
AMD Ryzen 9 PRO 9965	170W	✓			✓
AMD Ryzen 9 PRO 9955	120W	O	✓		✓
AMD Ryzen 7 PRO 9755X3D	120W	✓			✓
AMD Ryzen 7 PRO 9755	120W	O	✓		✓
AMD Ryzen 5 PRO 9655	120W	O	✓		✓
AMD Ryzen 7 PRO 9745	65W			✓	
AMD Ryzen 7 PRO 8700G	65W			✓	
AMD Ryzen 5 PRO 8600G	65W			✓	

'O' = Optional, should the customer wish to benefit from advanced thermals and quieter operation.

All 120W & 170W CPUs require a separate motherboard VRM heatsink kit. See [Section 1](#) for more info.

All CPUs supported on P4 have an integrated iGPU and can support up to 4 independent displays.

Table 2 – Supported Granite Ridge & Phoenix iGPU features.

Port	Granite Ridge		Phoenix	
DP1	4K@144Hz or 8K@60Hz	DP2.0	4K@120Hz or 8K@30Hz	DP2.0
DP2	4K@120Hz or 8K@30Hz	DP1.4	4K@120Hz or 8K@30Hz	DP1.4
HDMI	4K@100Hz or 8K@30Hz	HDMI2.1	4K@100Hz or 8K@30Hz	HDMI2.1

Note: 4th Video Port Available via Optional Flex I/O DP / HDMI / USB-C Option.

Table 3 lists the power ratings for the various add-in cards supported in P4.

Table 3 - Add-in Card Power Ratings

P/W Rating	Card Name	Width	Aux Power (if any)
600W	RTX PRO 6000 BW Workstation (96GB)*	Dual Slot	12VHPWR
575W	GeForce RTX 5090 (32GB)*	Quad Slot	12VHPWR
	GeForce RTX 5090Dv2 (24GB)*		
360W	GeForce RTX 5080 (16GB)*	Quad Slot	12VHPWR
300W	RTX PRO 6000 BW Max-Q Workstation (96GB)*	Dual Slot	12VHPWR
	RTX PRO 5000 BW (72GB)		
	RTX PRO 5000 BW (48GB)		
250W	GeForce RTX 5070 (12GB)*	Triple Slot	12VHPWR
200W	RTX PRO 4500 BW (32GB)	Dual Slot	12VHPWR
180W	GeForce RTX 5060Ti (8GB)*	Dual Slot	8-pin (PCIe)
145W	GeForce RTX 5060 (8GB)*		
	RTX PRO 4000 BW (24GB)	Single Slot	12VHPWR
75W max	RTX A400 (4GB)	Single Slot	None
	RTX A1000 (8GB)		
	RTX 2000 BW (16GB)	Dual Slot	None
	Other PCIe Cards	Single Slot	None

*Availability dependent on geographic region.

Note: All references to GeForce relate to Lenovo-branded GPUs. These are typically manufactured with custom coolers and long extenders to ensure maximum compatibility across Lenovo workstations. As a result, we are unable to advise on the suitability of third-party GeForce cards that have not been through Lenovo's qualification process.

Stated Power Rating of GPUs may vary from specifications given by vendors or other online sources.

Table 4 lists the power cable adapters required for the various GPU cards supported in the P4 based on PSU Selection.

For more detailed information refer to [Appendix](#).

Table 4 - GPU power cable adapter requirements

PSU + Required GPU Adapter Cables				
GPU	1100W (12VHPWR)	750W (2x PCIe 6+2)	500W (PCIe 6+2)	
RTX PRO 6000 BW (600W)	No Adapter Required	Not Supported		
GeForce RTX 5090				
GeForce RTX 5090Dv2				
GeForce RTX 5080		8-Pin to 12VHPWR	Not Supported	
RTX PRO 6000 BW Max-Q				
RTX PRO 5000 BW (Both)				
GeForce RTX 5070				
RTX PRO 4500 BW				
RTX PRO 4000 BW				
GeForce RTX 5060Ti	12VHPWR to Dual 8-Pin	No Adapter Required		
GeForce RTX 5060				
RTX PRO 2000 BW RTX A400 RTX A1000	No Adapter Required - (PCIe Slot Powered Only)			

Section 3 – P4 Power Configurations

P4 supports 500W, 750W, and 1100W power supply options, allowing customers to optimize their system configuration to meet the power requirements of the selected components. The following tables and accompanying notes illustrate the supported hardware configurations for systems using each of these power supplies.

Graphics cards should not be mixed in dual-GPU configurations. Some supported GPU configurations may require additional cabling (see the previous section).

Table 5 – P4 1100W PSU Config Table

P4 - 1100W PSU									
GPU	CPU Power Rating								
	170W		120W				65W		
	R9 PRO 9965X3D	R9 PRO 9965	R9 PRO 9955	R7 PRO 9755X3D	R7 PRO 9755	R5 PRO 9655	R7 PRO 9745	R7 PRO 8700G	R5 PRO 8600G
RTX PRO 6000 BW (600W)	1							Not Supported	
GeForce RTX 5090									
GeForce RTX 5090Dv2									
GeForce RTX 5080									
RTX PRO 6000 BW Max-Q									
RTX PRO 5000 BW (48G/72G)									
GeForce RTX 5070									
RTX PRO 4500 BW									
GeForce RTX 5060Ti									
RTX PRO 4000 BW									
GeForce RTX 5060									
RTX PRO 2000 BW									
Slot Powered	2*								

*Excludes Dual-Slot GPUs.

Table 6 – P4 750W PSU Config Table

P4 - 750W PSU									
GPU	CPU Power Rating								
	170W		120W				65W		
	R9 PRO 9965X3D	R9 PRO 9965	R9 PRO 9955	R7 PRO 9755X3D	R7 PRO 9755	R5 PRO 9655	R7 PRO 9745	R7 PRO 8700G	R5 PRO 8600G
RTX PRO 6000 BW (600W)	Not Supported 1								
GeForce RTX 5090									
GeForce RTX 5090Dv2									
GeForce RTX 5080									
RTX PRO 6000 BW Max-Q									
RTX PRO 5000 BW (48G/72G)									
GeForce RTX 5070									
RTX PRO 4500 BW									
GeForce RTX 5060Ti									
RTX PRO 4000 BW									
GeForce RTX 5060									
RTX PRO 2000 BW									
Slot Powered	2*								

*Excludes Dual-slot GPUs.

Table 7 – P4 500W PSU Config Table

P4 - 500W PSU									
GPU	CPU Power Rating								
	170W		120W				65W		
	R9 PRO 9965X3D	R9 PRO 9965	R9 PRO 9955	R7 PRO 9755X3D	R7 PRO 9755	R5 PRO 9655	R7 PRO 9745	R7 PRO 8700G	R5 PRO 8600G
RTX PRO 6000 BW (600W)	Not Supported								
GeForce RTX 5090									
GeForce RTX 5090Dv2									
GeForce RTX 5080									
RTX PRO 6000 BW Max-Q									
RTX PRO 5000 BW (48G/72G)									
GeForce RTX 5070									
RTX PRO 4500 BW									
GeForce RTX 5060Ti									
RTX PRO 4000 BW									
GeForce RTX 5060									
RTX PRO 2000 BW									
Slot Powered									
							1	2*	

*Excludes Dual-slot GPUs.

Important power configuration notes:

- All P4 systems provide a single dedicated 12V rail.
- Most supported GPUs require a custom extender bracket to help secure the card in the chassis and protect the PCIe slots from transit damage. Some also require a top retainer as well. For more info, see [Appendix](#).

Other configuration notes:

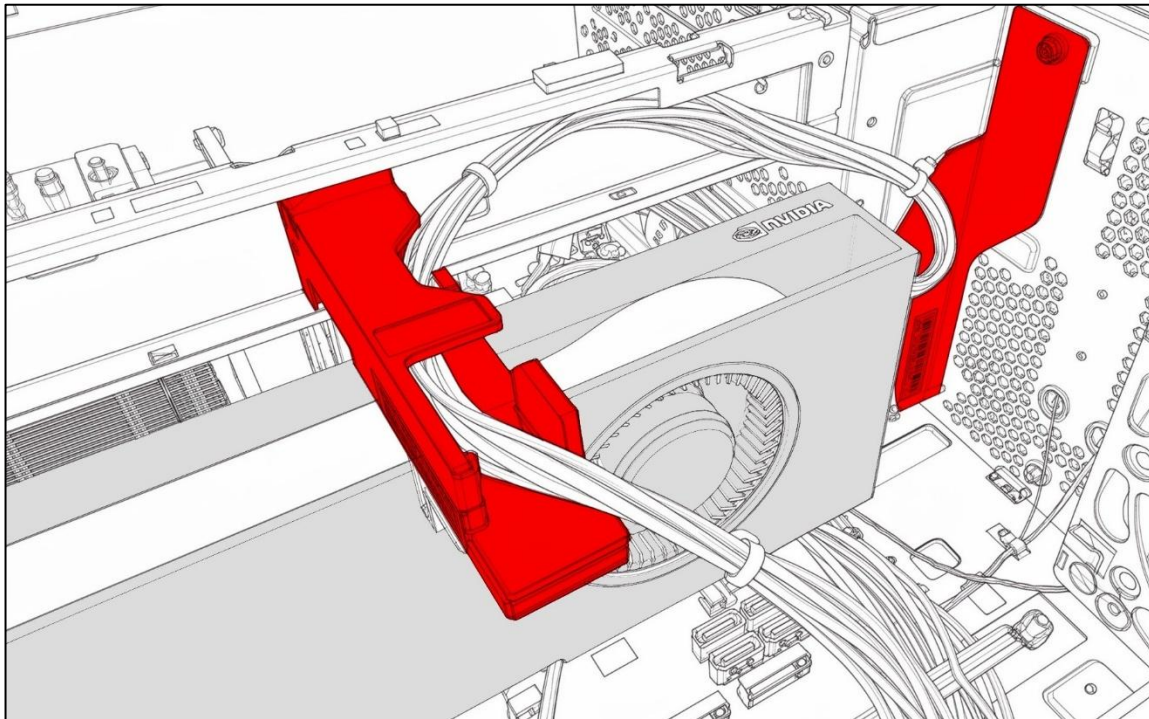
- Officially supported configurations could still be limited by additional factors not defined within this document.
- Some supported GPU/add-in-card configurations might require additional cabling to be supported. See [Appendix](#).

Note: For configurations that are not listed above but appear to be feasible, please work with the Technical Solutions Team to have the configuration vetted and validated.



Section 4 – GPU Chassis Considerations

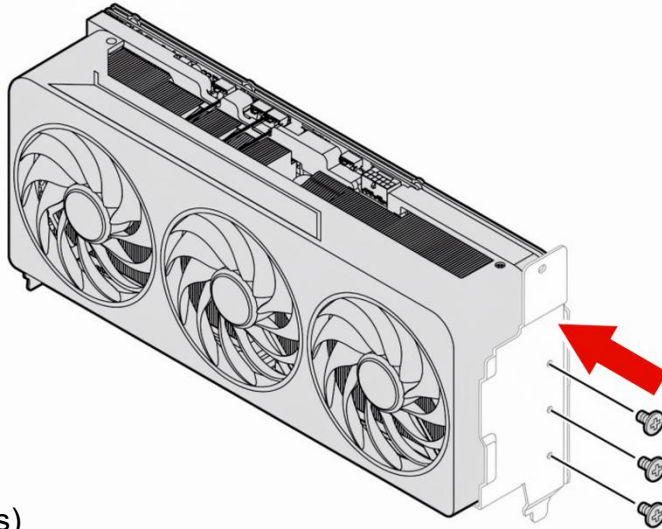
Most of the GPUs supported in P4 have additional hardware that is used to help support the GPU's weight and protect the PCIe slots from transit damage. Below is an example of such, with a top-side retainer and GPU extender bracket (highlighted in red) used to hold an RTX PRO 5000 during shipment *and* while the system is in use.



To adapt further to the largest high-end Nvidia GPUs, Lenovo has developed many modifications to provide extra support for selected GPUs.

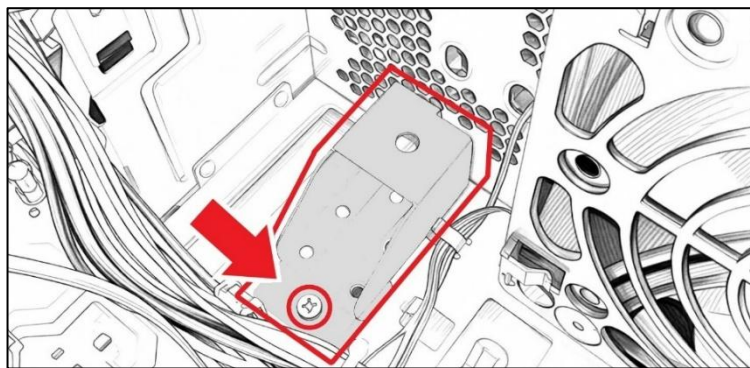
Requirements for RTX 5090 and RTX 5090Dv2:

To support the heavy weight of the Lenovo customized RTX 5090 / 5090Dv2 and mitigate transit damage to the PCIe slot attach the extender bracket to the GPU,

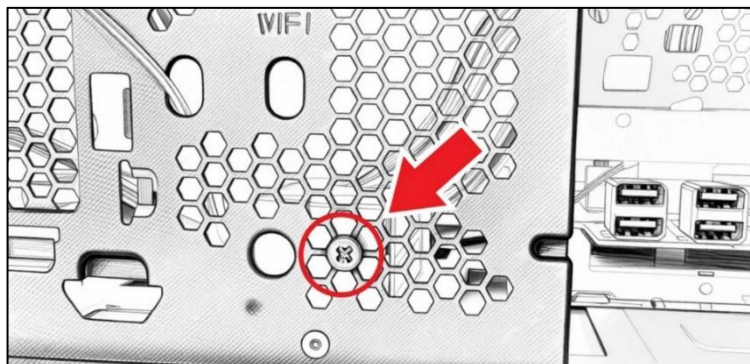


(See [Appendix](#) for required parts)

Then, an additional support bracket installs into a unique chassis punchout secured with one 6-32 screw internally,

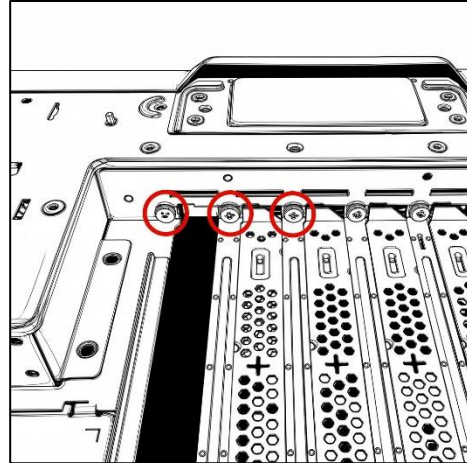


.. plus, a locking screw via the front grill on the outside.

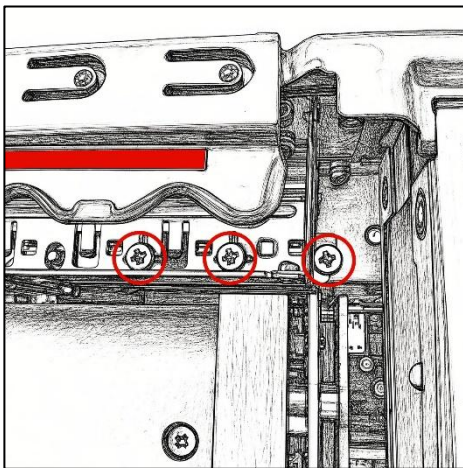


Lenovo

Once the GPU is physically installed, including its long-ender bracket, relocate the following three PCIe slot screws from the outside,



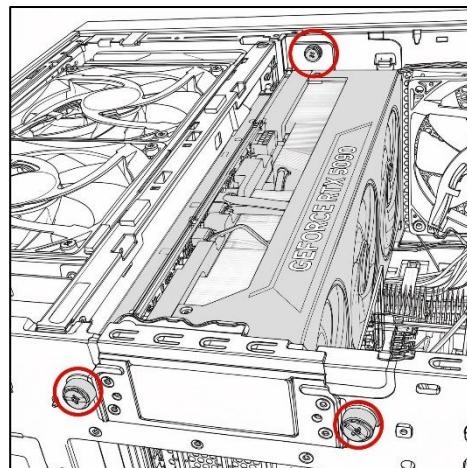
Lenovo™



... to the inside of the chassis, with the PCIe slot clamp **closed**. These screws are supplied as standard in all chassis.

Finally install the remaining three thumbscrews, two at the rear securing the PCIe slot clamp and one at the front securing the extender bracket, attached to the GPU previously.

Do not forget to attach the 12VHPWR power cable!

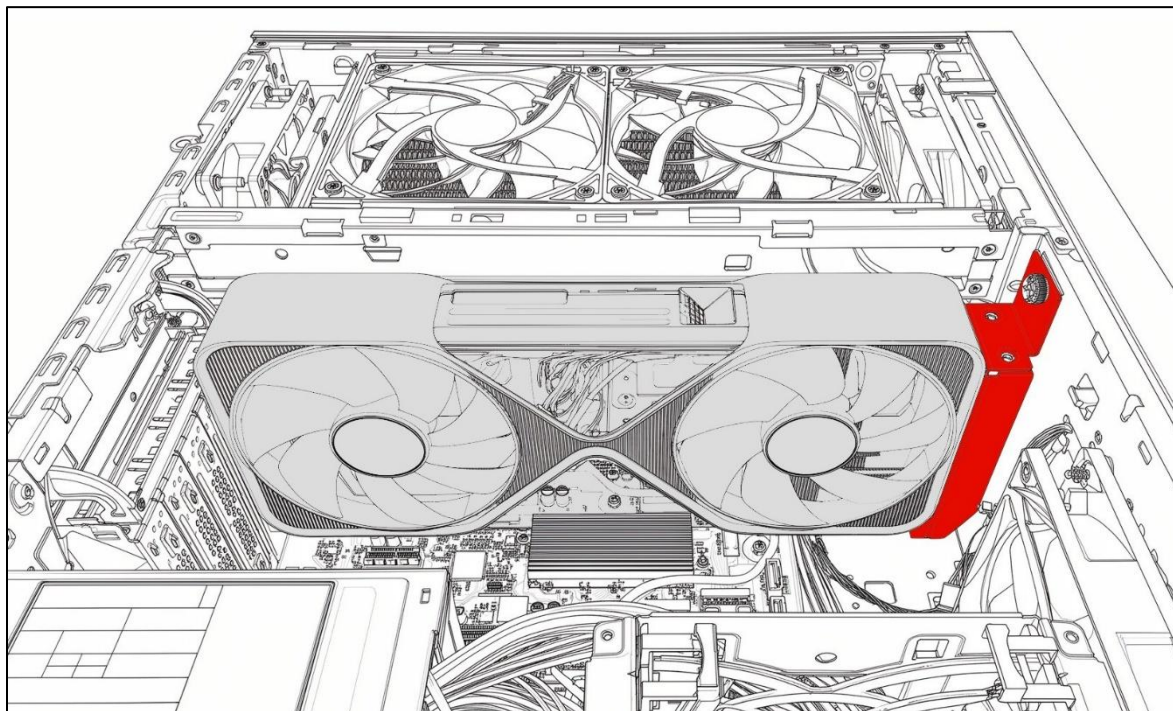


Note: Non-Lenovo (3rd Party) versions of these cards are not officially supported. The required support hardware may not fit or attach correctly to a non-Lenovo GPU. Without it, the largest GPUs may place excessive stress on the PCIe slot due to their weight, potentially causing damage.

Requirements for RTX PRO 6000 600W

For the RTX PRO 6000 600W GPU ([5V11M21425](#)) the side fan assembly mentioned in [Section 1](#) and supplied as standard in the 750W & 1100W chassis must be **removed**.

The PRO 6000 600W is physically taller than its lower wattage counterparts (e.g., PRO 6000 Max-Q). As with the other large GPUs, a dedicated extender bracket must be attached to mitigate transit damage to the PCIe slots. This bracket must remain in place when the system is in use.



See the [Appendix](#) for required mounting hardware.

BIOS Requirements:

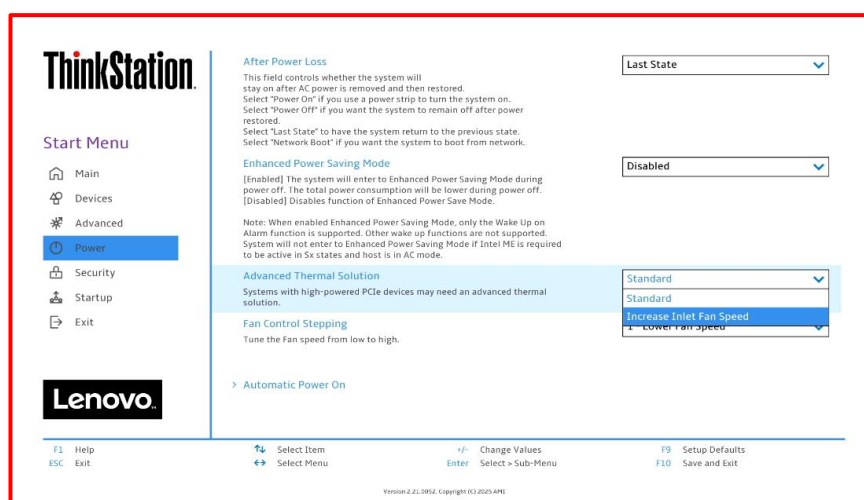
In the P4 BIOS, there is an option named “Advanced Thermal Solution” under the “Power” section. As the name suggests, this option adjusts the fan table to accommodate higher GPU thermal loads. This setting is required for the systems configured with the Lenovo PRO 6000 600W or Max-Q & RTX 5090/5090Dv2.

Lenovo recommends users always use the latest available BIOS and EC FW for their system.

1. To enable this option, start by pressing “**F1**” when the Lenovo splash screen appears while the system is booting to enter BIOS.



2. Once in BIOS, navigate to the “Power” section to find the “Advanced Thermal Solution” option. This is set to “Standard” by default.

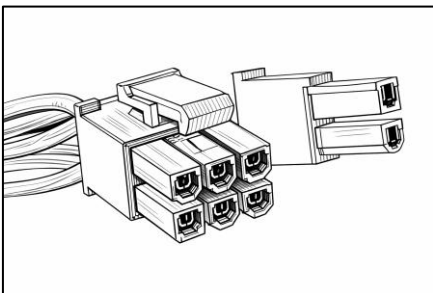


3. To save any changes to this setting, press “**F10**” on the keyboard to save & exit BIOS.

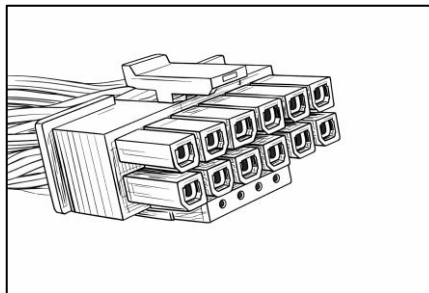
Section 5 – Appendix

This section contains additional useful information about the hardware and options used in P4.

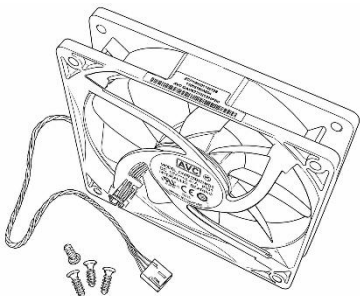
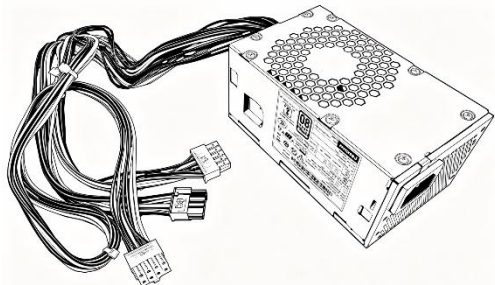
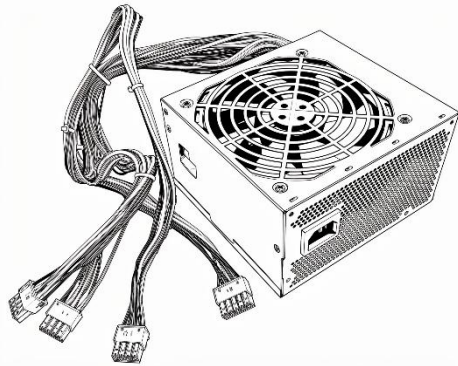
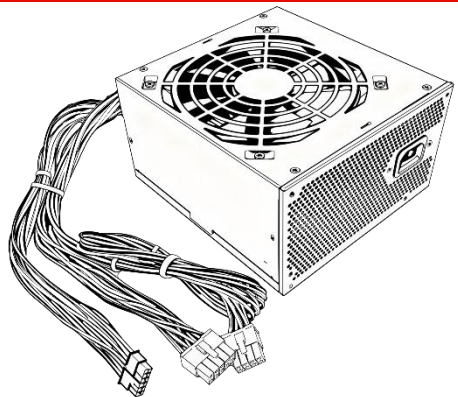
6+2 (8) pin PCIe Power Connector



12HPWR Power Connector

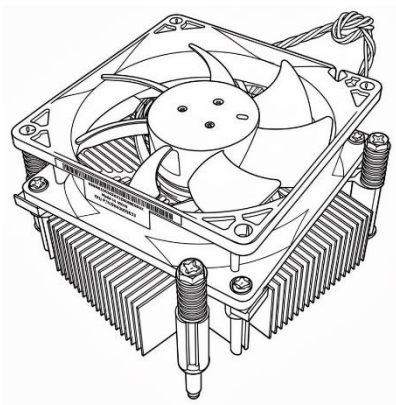


Parts	Picture
12VHPWR (female) to Dual 6+2-pin (male) Power Adapter Cabel FRU: 5C10U58750 Part of Option Kit: 4XF1M24241	
8-pin (female) to 12VHPWR (male) Power Adapter Cabel FRU: 5C10U58794	
170W AMD Liquid Cooler & Bracket 170W Liquid Cooler FRU: 5H40U93272 - Liquid Cooler Cage FRU: 5M11N44573 6 x 6-32 H9-7 STEP5-5 Screws & Gromit FRU: 5M20U51391 & 5M20U51392	

Parts	Picture
Top Front System Fan - Front System Fan (Top) FRU: 5F10U94127 4 x MBW-76 Fan Pin FRU: 5M11N44567 Part of Option Kit: 4XH1W59686	
500W TFX PSU & Adapter Bracket - TFX 500W PSU FRU: 5P51D77295 - TFX to ATX PSU Adapter Bracket FRU: 5M11N44157	
750W ATX PSU ATX 750W PSU FRU: 5P51D77300	
1100W ATX PSU ATX 1100W PSU FRU: 5P51D77374	

65W Cooler

- FRU: [5H40U93033](#)



120W Cooler

- FRU: [5H40U93282](#)

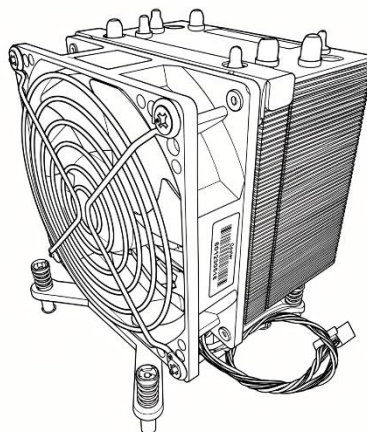


Table 9 – P4 GPU Bracket, Extender Parts & Screws

GPU	Extender FRU#	Retainer FRU#	Additional Screws	
RTX PRO 6000 BW (600W)	5M11N44572	N/A	2x 6-32	5M11N44576
			2x M3x8	5S10U51624
			3 x 6-32 (thumb)	5S10U51667
RTX PRO 6000 BW Max-Q RTX PRO 5000 BW (72GB) RTX PRO 5000 BW (48GB) RTX PRO 4500 BW	5M11H28663	5M11H28728	2x M3x8	5S10U51624
			1 x 6-32 (thumb)	5S10U51667
RTX PRO 4000 BW	5M11H28732	N/A	2x M3x8	5S10U51624
			1 x 6-32 (thumb)	5S10U51667
RTX PRO 2000 BW	5M11H28668	N/A	2x M3x8	5S10U51624
RTX 5090/5090Dv2	5M11N44570 5M11N44571	5M11N44677	5x 6-32	5M11N44576
			3 x 6-32 (thumb)	5S10U51667
			3x M3x5	SS10K40551
RTX 5080	Retainer + Bracket 5M11N44398		3 x 6-32 (thumb)	5S10U51667
			2x M3x5	SS10K40551
RTX 5070 RTX 5060Ti	5M11H28654 *	5M11H28663	1x 6-32	5M11N44576
			2x M3x8	5S10U51624 *
RTX 5060	N/A	5M11N44468	N/A	

* Not Required for 5060Ti

Revision History

Version	Date	Author	Changes/Updates
1.0	23/06/2026	Matthew R	Initial Release