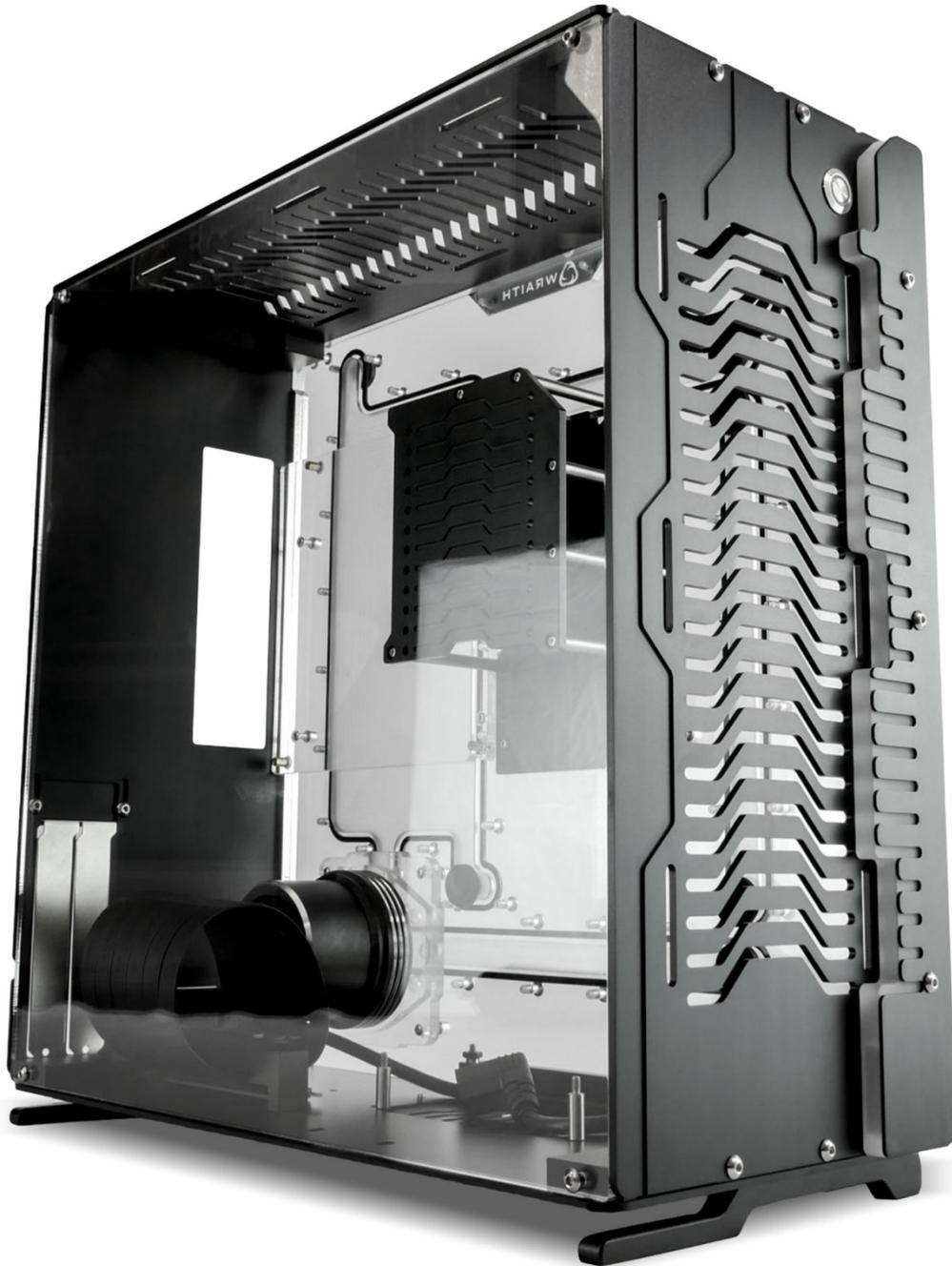




WRAITH



MANUAL

Revision 1.95

Table of Contents

| | |
|--|----|
| Introducing Wraith..... | 3 |
| Features..... | 4 |
| Specifications..... | 5 |
| Wraith Liquid Cooling System Layout | 6 |
| Table of Panels, Accessories & Fasteners | 7 |
| Tools Required | 8 |
| Step 1 - Attach Corner Pieces to Top Panel | 9 |
| Step 2: Attach Corner Pieces and Feet to Bottom Panel | 9 |
| Step 3: Attach LED Diffusor and LED Shroud to Front Panel..... | 10 |
| Step 4: Attach Rear I/O Block to Rear Panel..... | 11 |
| Step 5: Assemble Wraith Outer Panels | 11 |
| Step 6 - Install Wraith Manifold | 12 |
| Step 7 - Assemble Cable Shroud/Drive Cage and attach it to the case..... | 13 |
| Step 8 - Side Panel Window Installation | 15 |
| Additional Steps for Case Version 1.87..... | 15 |
| Filling & Draining The Loop | 15 |

IMPORTANT: Wraith Warranty

Wraith has a limited 2-year warranty.

Welcome to Singularity Computers and your new Wraith! We look forward to seeing what you create.

1: The Integrated Liquid Cooling System is pressure tested at the factory, so there is no need to adjust the fasteners on the manifold. Take care not to over tighten any fasteners on the acrylic. As soon as you feel any significant feedback or tension go no more than 1/4th of a turn past it. On the metal parts you can tighten normally. We are not responsible for damage caused by over-tightening the fasteners.

2: Any thread stripping, cross threading or thread damage of any kind will not be covered under our warranty. All threads are pre-tested. We use stainless steel fasteners which are extremely tough.

3: All acrylic is carefully checked for scratches, marks or particles as the manifold is assembled. We are not responsible for mistreatment of the acrylic. Only clean with a microfiber cloth and use nothing except distilled or deionized water for cleaning, or Novus Plastic Cleaner. Damage caused by cleaning agents (particularly alcohols or solvents) is not covered under warranty.

4: Acrylic Surface Guarantee: Marks on acrylic which cannot be wiped away with a microfiber cloth will only be covered under warranty under the following conditions: That they did not occur after the item was shipped from the Singularity Computers Factory or Retailer. If there are more than 10 marks which are beyond 5mm in length and visible when facing perpendicular to the surface. Evidence of this must be photographed in detail and photographs must be taken perpendicular to the surface. Marks must be easily visible in photographs; subtle marks will not be covered.

5: For the latest coolant recommendations please visit <http://bit.ly/sc-important-info>. We are not responsible for staining of the acrylic, but it has never been an issue with our products. Most staining will be easy to remove by flushing out the loop with distilled water for 24hrs or using Mayhems Blitz. If you are concerned about staining then we suggest Mayhems Non-Stain Dyes.

6: Any damage which occurs after the item leaves the Singularity Computers Factory or our Retailers is not covered under warranty. We are not responsible for shipping damage or mishandling.

Introducing Wraith

From the people who brought you the first ever PC Chassis with liquid cooling integration, we now bring you Wraith. In development for the past 2 years since the release of Spectre, Wraith has all of the features of Spectre but in a smaller ITX form factor. Now you can fit the most extreme components on the market into a very small space and have the ultimate in liquid cooling. Integrated cooling components include the Reservoir, D5 Pump Top, D5 Pump Cover, Fill Port, Drain Port and over half of the cooling loop. Integration and compatibility do not have to work against each other when you have more than a decade of experience building extreme liquid cooled systems. From a combination of statistics and experience we have created a port layout which will not inhibit compatibility or your creativity. Wraith has a cable cover so that stock cables can be used in a clean configuration, custom cables are not necessary. Despite its compact size Wraith can fit full sized GPUs, 2x 240mm radiators, 13x 2.5" drives and even a 3.5" drive and more. The case is designed to be modified and every component can be completely disassembled. As always, we look forward to seeing your creativity with our design.

Manufacturing Process

Created with a manufacturing process used in industries such as aerospace. All components are carved from a solid block of material with extreme precision. 6061 aluminum, cast acrylic and stainless steel. Manifold technology developed for Spectre 2.0 with gaskets, stainless steel fasteners and thread inserts. Every case is carefully assembled and tested by a team of experts.

Lighting

Wraith has the best lighting features of any case in the industry. There are two integrated 30cm (11.81") LED Strip positions. Even one LED strip will make the entire case glow. With UV lighting and UV reactive coolant you can make your coolant glow. There are endless lighting possibilities to experiment with.

Features

- Singularity Computers Liquid Cooling Integration.
- Integrated Reservoir, D5 Pump Top, D5 Pump Cover, Fill Port, Drain Port and half of the cooling loop.
- The second commercially available case with an integrated manifold, designed exclusively for liquid cooling, Spectre being the first.
- Significant cost savings due to liquid cooling component integration.
- Designed so that the integration does not restrict compatibility.
- All components CNC machined from a solid block of material.
- Built from 6061 Anodized Aluminum, Cast Acrylic and Stainless Steel.
- Aluminum is Anodized for the most durable and resistant finish.
- All stainless-steel fasteners.
- Uses gaskets instead of O-rings for increase durability.
- Supports 2x 240mm 30mm thick radiators.
- Adjustable radiator mounts to align the radiator ports to the integrated liquid cooling ports.
- The Reservoir is designed for easy filling and air removal.
- The Drain Port is at the lowest point for effective and easy draining of the loop.
- External fill port for easy access, internal drain port so that drain valve does not protrude from the case.
- 13x 2.5" and 1x 3.5" drive capacity.
- Two mounting configurations for the 2.5" drives, one for aesthetics and the other for maximum capacity.
- Vertical GPU Mount.
- The entire manifold glows with the addition of a single LED Strip.
- Front lighting feature.
- Cable shroud means custom cables are not necessary.
- Modder friendly, no rivets, low component count, easy to assemble and disassemble.
- Fits full length and ultra-wide GPUs.

Specifications

| | |
|----------------------------------|---|
| Motherboard Form Factor | Mini-ITX, Mini-DTX |
| Case Dimensions | 407mm x 407mm x 170mm (Including legs) |
| Package Dimensions | 450mm x 450mm x 230mm |
| Case Weight | 7 kg |
| Case Packaged Weight | 8 kg |
| Expansion Slots | 2x |
| Storage | 2.5" x13 3.5" x1 |
| PSU Compatibility | SFX, SFX-L |
| Radiator Top | 240mm x 30mm |
| Radiator Front | 240mm x 30mm |
| Maximum GPU Length | 300mm |
| Maximum GPU Thickness | 2 slots |
| Maximum GPU Width | Fits the widest GPUs |
| Maximum PSU Length | 170mm |
| Maximum CPU Cooler Height | 130mm |
| Front Panel I/O | Vandal Switch 16mm |
| Fittings Compatibility | G1/4" BSPP Standard |
| Fittings | Click here for more details |
| Pump Compatibility | All D5 pumps (Pump not included) |
| Vertical GPU Mount | 1x (High quality ribbon cable included) |
| Materials | 6061 Alloy, Acrylic, Stainless Steel |
| Manufacturing Process | CNC Router, CNC Mill, CNC Lathe |

Wraith Liquid Cooling System Layout

Note

- Dimensions are in millimetres.

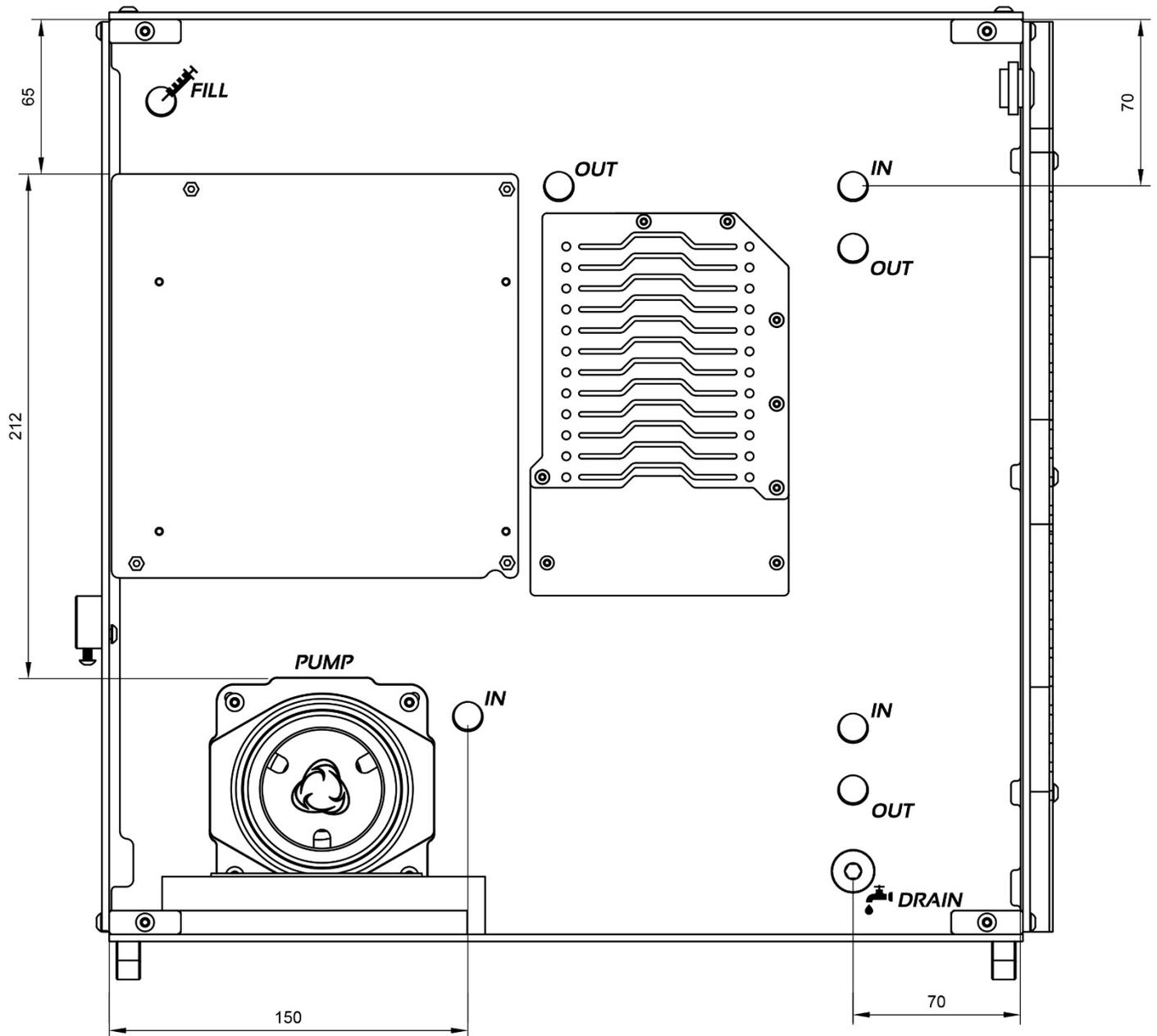


Table of Panels, Accessories & Fasteners

Panels

| | Name | Quantity | Page Reference |
|---|-------------------|----------|----------------|
| A | Top Panel | 1 | 9 |
| B | Bottom Panel | 1 | 9 |
| C | Front Panel | 1 | 10 |
| D | Rear Panel | 1 | 11, 15 |
| E | Corner Pieces | 4 | 9 |
| F | Feet | 2 | 9 |
| G | LED Diffusor | 1 | 10 |
| H | LED Shroud | 1 | 10 |
| I | Manifold | 1 | 12 |
| J | Drive Mount | 1 | 11 |
| K | Cable Shroud | 1 | 13 |
| L | Side Panel Window | 1 | 15 |
| | Rear I/O Block | 1 | |
| | Struts | 6 | 13 |
| Case Version 1.87 also includes: | | | |
| | PSU Struts | | |
| | PSU Shroud | | |
| | PSU Cover | | |

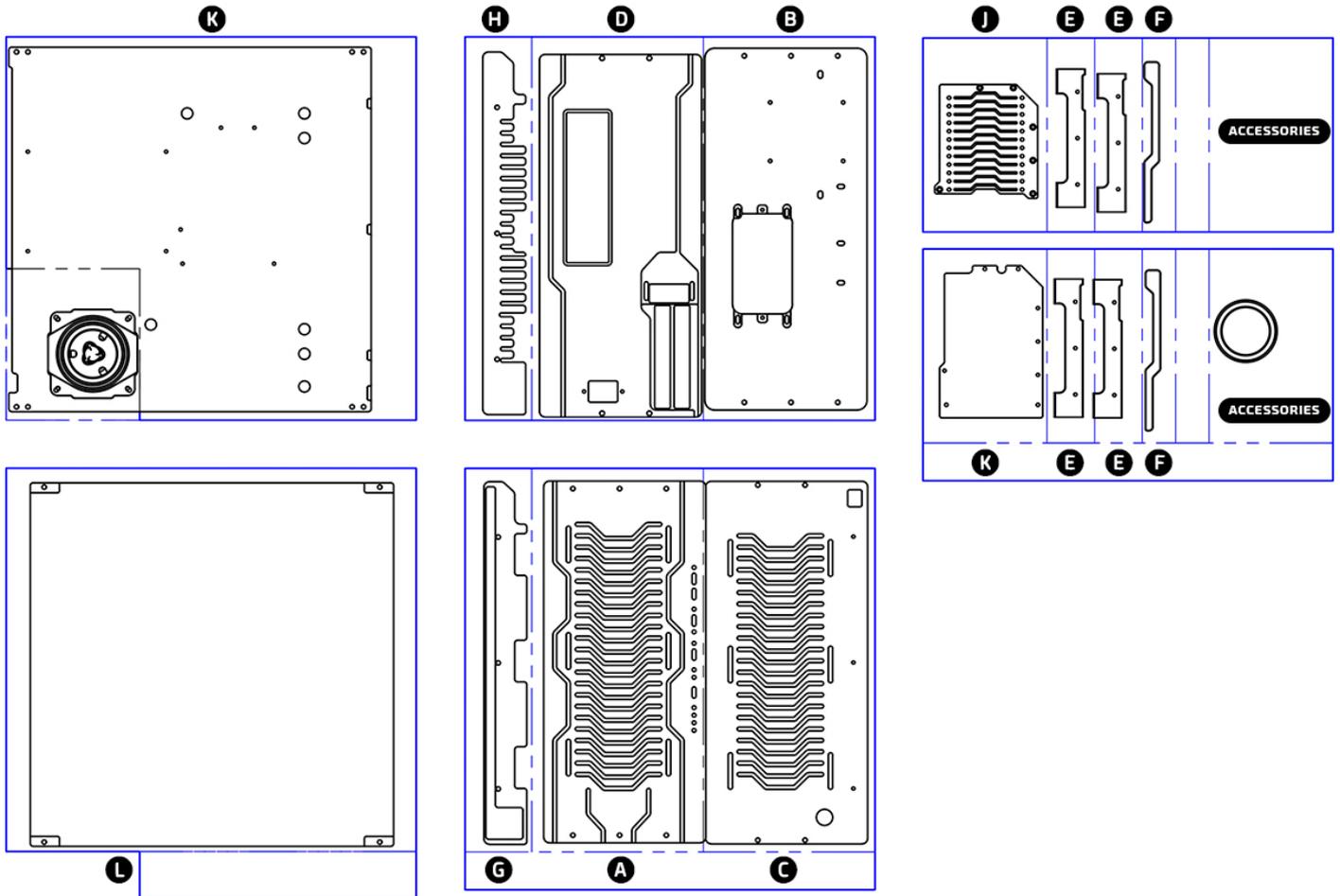
Accessories

| Name | Quantity |
|----------------------|----------|
| Vertical GPU Mount | 1 |
| 30cm DRGB LED Strips | 2 |
| D5 O-Ring | 1 |
| Power Button | 1 |
| Power Cable | 4 |

Fasteners

| Type | Quantity |
|---|----------|
| M3 x 6mm Phillips Head | 6 |
| M3 x 6mm | 23 |
| M3 x 20mm | 5 |
| M4 x 8mm | 2 |
| M4 x 10mm | 18 |
| M4 x 12mm | 4 |
| M4 x 14mm | 7 |
| M4 x 25mm | 8 |
| 6-32 x 6mm | 4 |
| SC Nut | 2 |
| Case Version 1.87 also includes: | |
| M3 x 8mm | 2 |
| M3 Nut | 2 |
| M4 x 6mm | 2 |

Turn to next page for **Panels Layout Diagram**.



Assembly Tolerances & Alignment

Wraith uses CNC machining and very thick materials. This means it is manufactured with extreme precision and there is no flex or play in any of the materials. Due to this we have built in tolerances to most mounting holes to allow for the looser tolerances on the components being installed. If a component does not align then loosen the related fasteners and you will be able to align it. All of the outer panels have a tolerance built in so that they can be used for alignment also.

Tools Required

- M4 Allen Key
- M3 Allen Key
- 6-32 Hex Key
- Phillips Head Screw Driver
- Fill & Drain Tubes

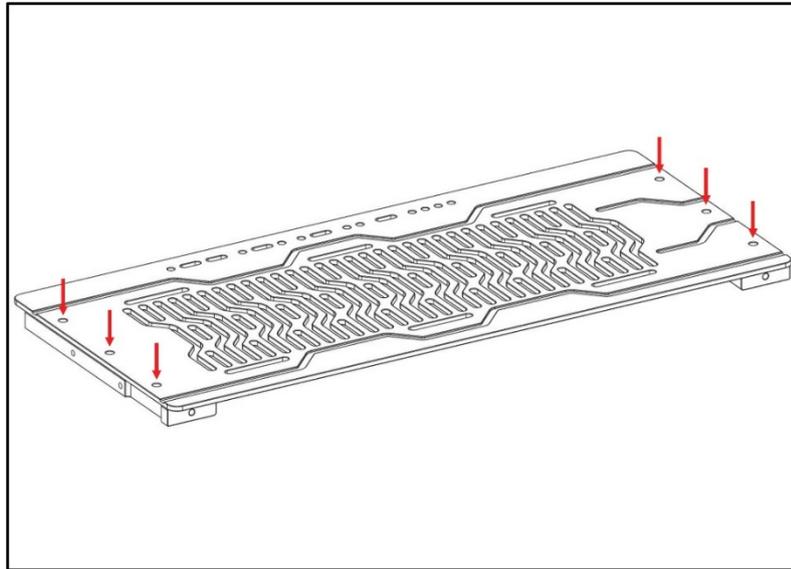
Note: Tools listed are not included, unless otherwise specified.

Step 1 - Attach Corner Pieces to Top Panel

Parts Involved

- **A** Top Panel x1
- **E** Corner Pieces x2
- M4 x 10mm Button Head Fasteners x6

Attach the corner pieces to the top panel using x6 M4 10mm Button Head Fasteners.

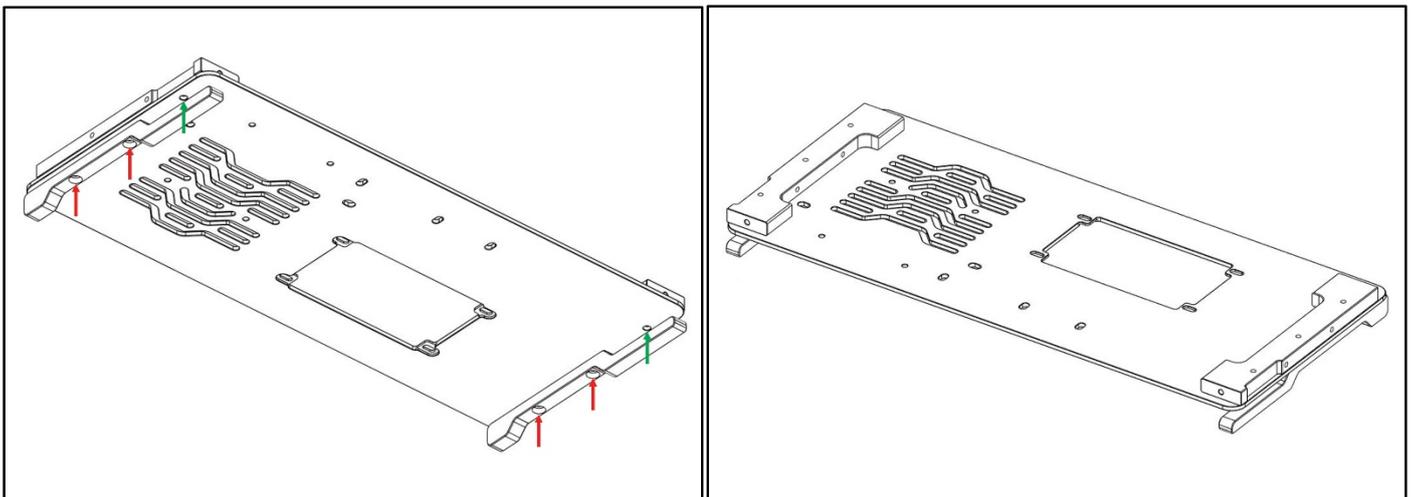


Step 2: Attach Corner Pieces and Feet to Bottom Panel

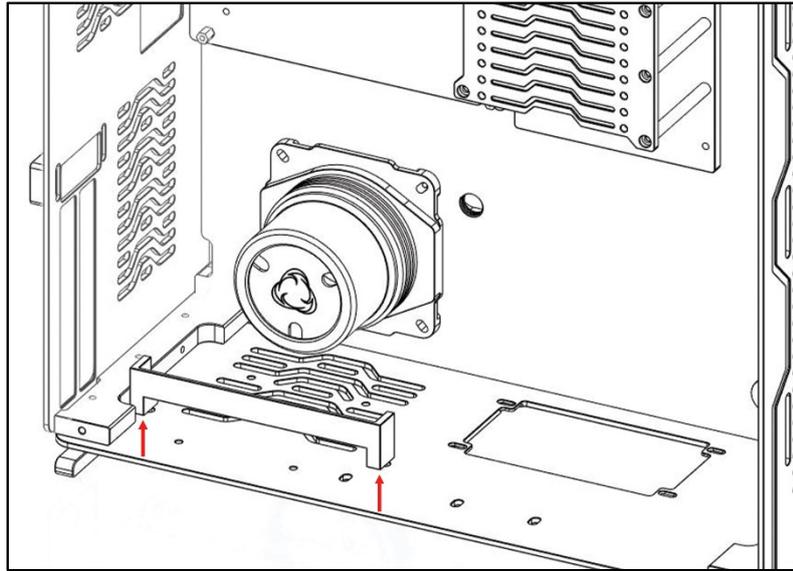
Parts Involved

- **B** Bottom Panel x1
- **E** Corner Pieces x2
- **F** Feet x2
- Vertical GPU Mount
- M4 x 10mm Fasteners x4
- M4 x 14mm Fasteners x4

Attach the Corner Pieces to the Bottom Panel using x2 M4 10mm Fasteners in the holes marked with green arrows.



Attach the Vertical GPU Mount to the bottom panel in the position marked in diagram below using x2 M4 10mm Fasteners.



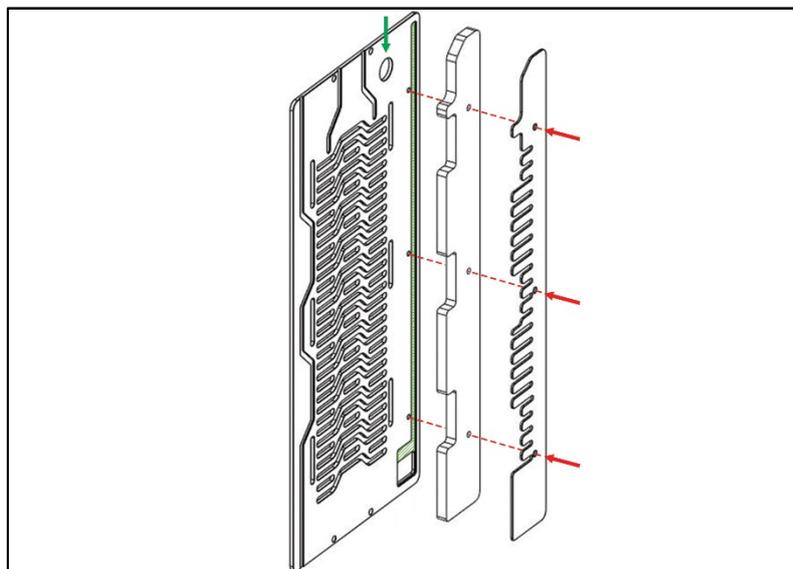
Step 3: Attach LED Diffusor and LED Shroud to Front Panel

Parts Involved

- **C** Front Panel x1
- **G** LED Diffusor x1
- **H** LED Shroud x1
- 30cm LED Strip x1
- Power Button x1
- M4 x 14mm Fasteners x3

Remove the adhesive backing from the LED strip and attach it to the LED strip position marked in green in the diagram below. Route the cable through the cable routing hole at the bottom of the front panel. Attach the LED Diffusor and LED Shroud at the same time using x3 M4 14mm Fasteners. Do not over tighten fasteners on acrylic.

Install the Power Button into the hole marked with the green arrow. Use the included O-ring on the inside of the panel and tighten the retention ring onto it.

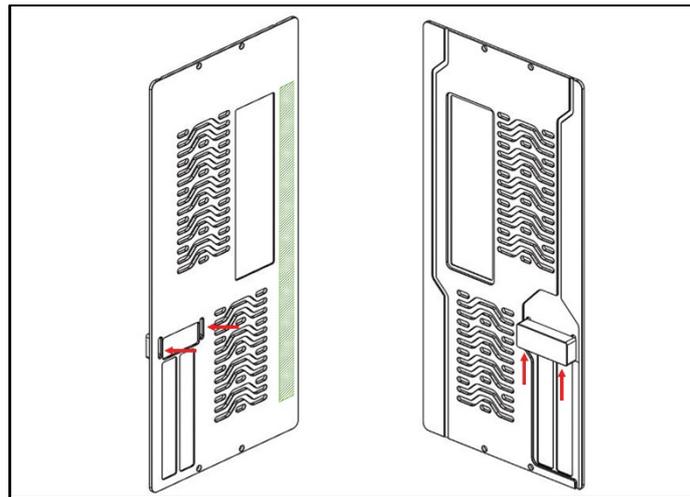


Step 4: Attach Rear I/O Block to Rear Panel

Parts Involved

- **J** Rear I/O Block x1
- **D** Rear Panel x1
- 30cm LED Strip x1
- M4 x 8mm Fasteners x2
- M3 x 8mm Fasteners x2

Attach the Rear I/O Block to the Rear Panel using x2 M3 8mm Fasteners. The Rear I/O Block is adjustable so that you can fit your GPU into position. Use x2 M3 8mm Fasteners to attach your GPU to the Rear I/O Block during building the system. Remove the adhesive backing from the LED strip and attach it to the LED strip position marked in green in the diagram below.

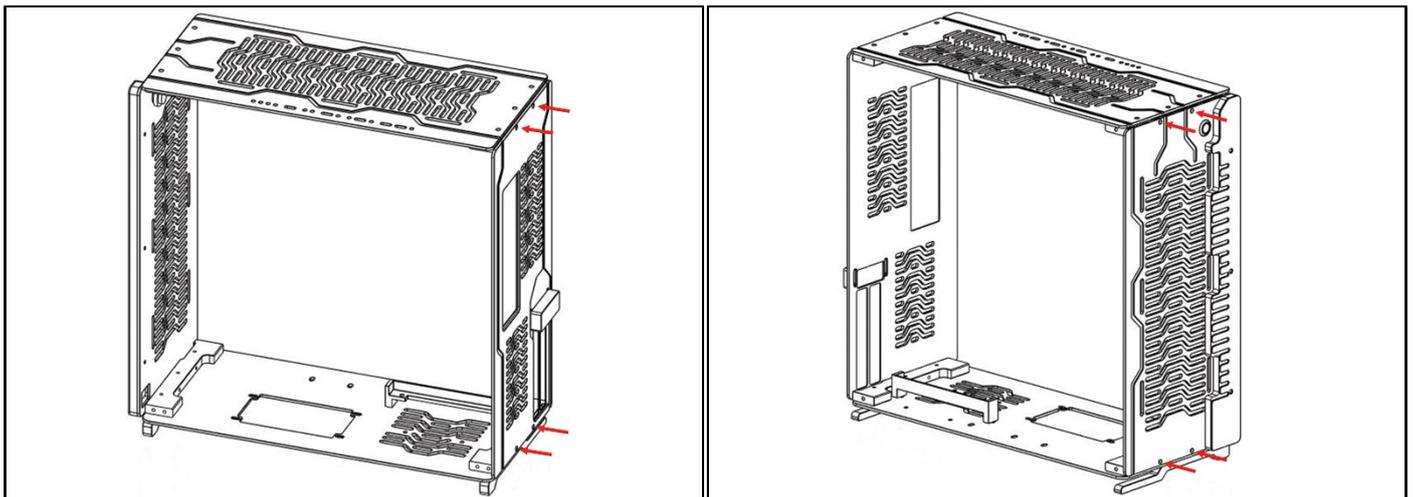


Step 5: Assemble Wraith Outer Panels

Parts Involved

- Front Panel Assembly x1
- Top Panel Assembly x1
- Bottom Panel Assembly x1
- Rear Panel Assembly x1
- M4 x 10mm Fasteners x8

Attach Front, Rear, Bottom and Top Panel assemblies to each other via the Corner pieces (which should already be installed) using x8 M4 10mm Fasteners.

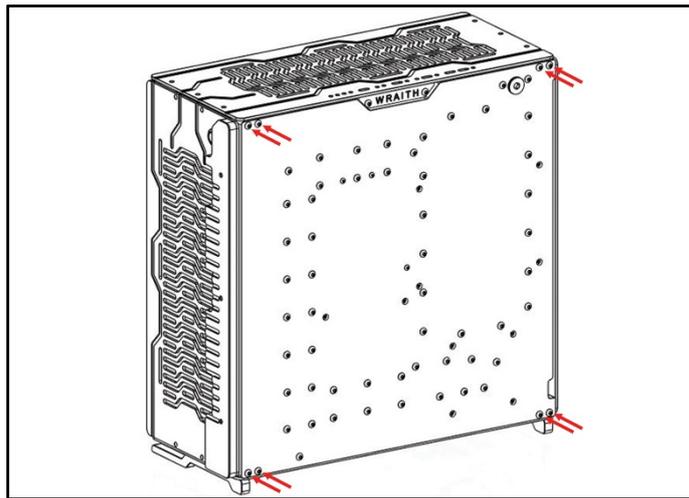


Step 6 - Install Wraith Manifold

Parts Involved

- Wraith Metal Parts Assembly x1
- M4 x 25mm Fasteners x8
- ❶ Wraith Manifold x1

Put the Wraith Metal Parts Assembly onto its side so that it is horizontal with the Corner Pieces facing so that the side with the two holes is facing upwards. Install the Wraith Manifold into the Wraith Metal Parts Assembly. If the Manifold does not fit then loosen off some of the fasteners holding the outer panels onto the Corner Pieces. Use x8 25mm M4 Fasteners to attach the Wraith Manifold to the Corner Pieces. Do not over tighten fasteners on acrylic.



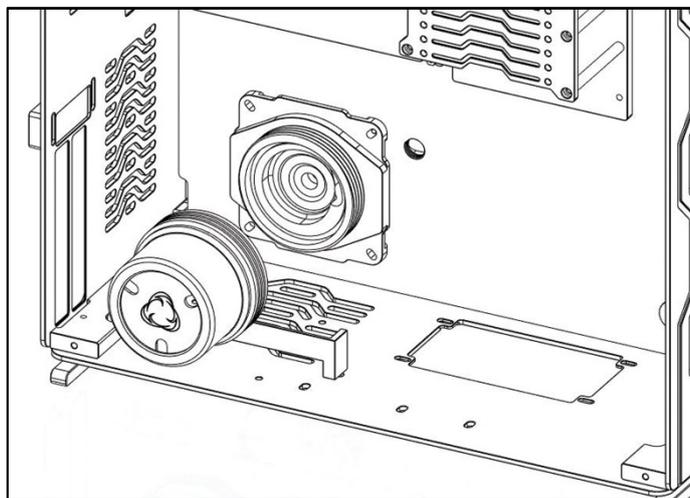
D5 Pump Installation

Install your D5 Pump into the included pump cover (D5 pump not included). Make sure to fit the included O-Ring into the Wraith D5 Pump Top before installing the pump. Check that the O-Ring is properly placed inside of the O-Ring groove, it may be best to do this while the case is laying on the manifold side so that the pump top is horizontal. Then tighten the pump cover onto the pump firmly.

Pressure Testing

We strongly recommend pressure testing with an air pressure tester prior to filling your loop.

For pressure testing we recommend up to 8.7 PSI (0.6 bar).



Step 7 - Assemble Cable Shroud/Drive Cage and attach it to the case

Parts Involved

- Struts x6
- **J** Drive Mount x1
- **K** Cable Shroud x1
- M3 x 20mm Fasteners x5
- M3 x 8mm Fasteners x9
- M3 Thread Insert x4

Attach the Struts to the Drive Mount using 6x M3 8mm Fasteners with red arrows in diagram 1. Then attach the Cable Shroud to the Struts using x3 8mm M3 Fasteners in the holes marked with red arrows in diagram 2.

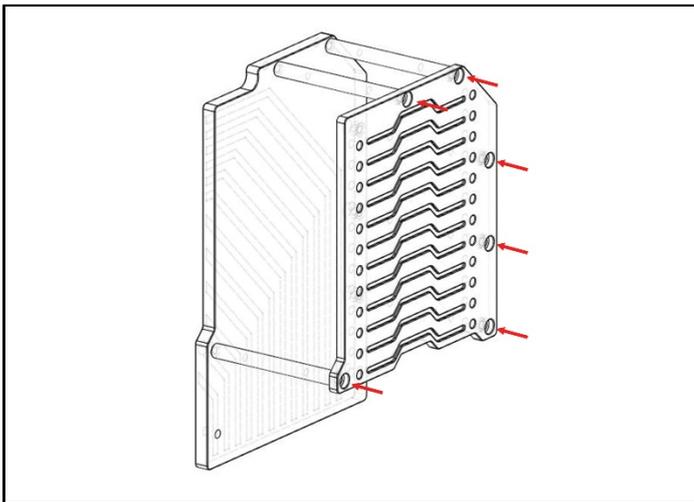


Diagram 1

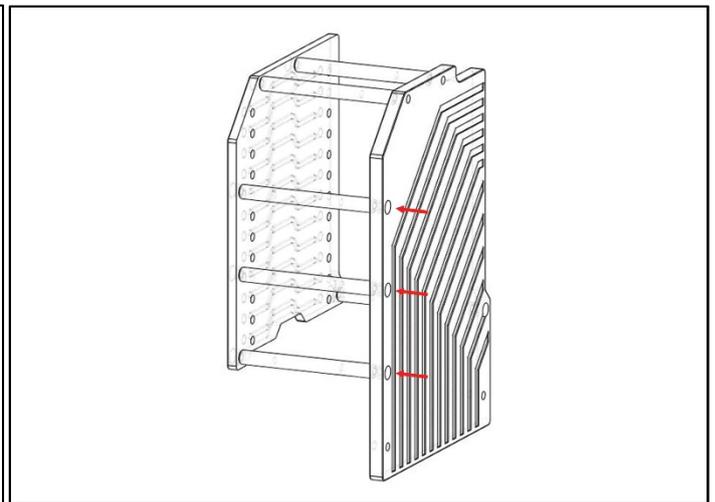


Diagram 2

Then attach the Cable Shroud/Drive Cage assembly to the case first using x3 M3 25mm Fasteners in the holes marked with red arrows in diagram 3. In the holes marked with green arrows in diagram 3 use 2x 25mm M3 Fasteners and 2x M3 Thread Inserts to hold them from the other side.

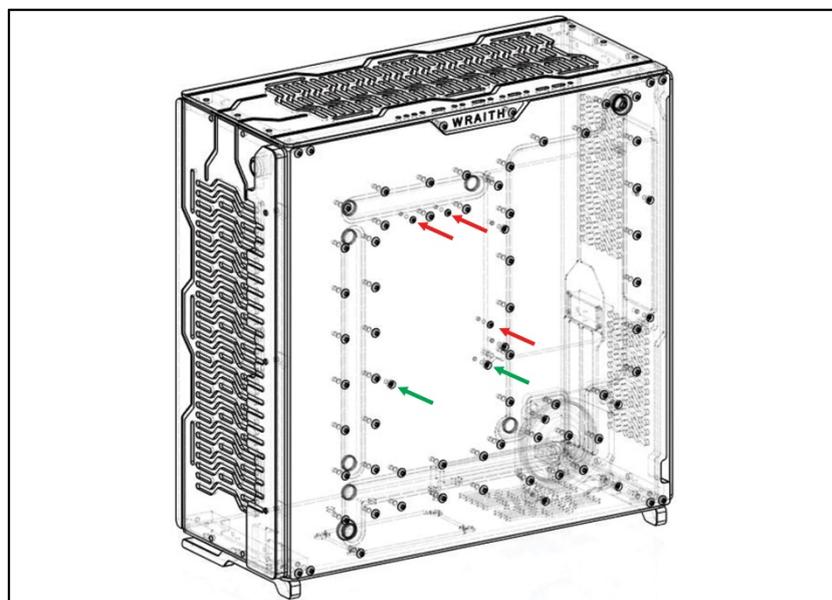
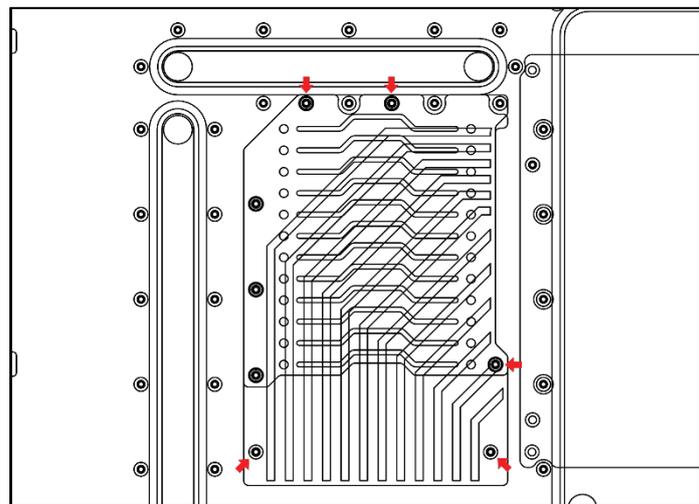


Diagram 3

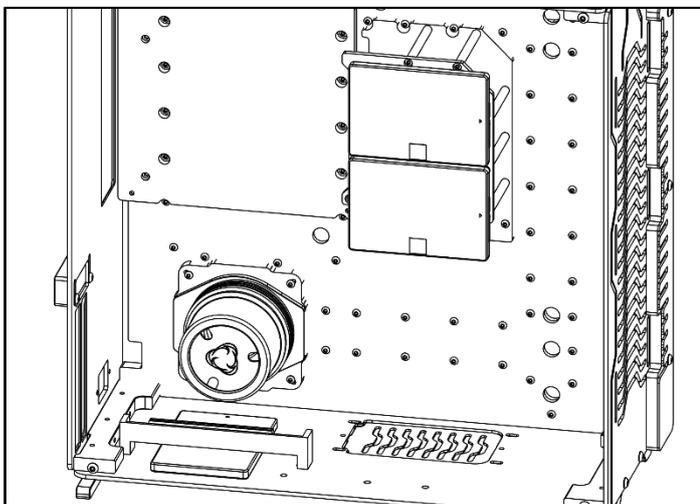
Drive Installation

There are 13 mounting positions for 2.5" drives, 12 on the Front Cable Cover and one more on the Bottom Panel under the Vertical GPU Mount. To install drives onto the Front Cable Cover you may not need to remove it because you can reach around the back. If you need to remove it then you will need to undo it from the manifold not from the front. Undo the 5 fasteners from the back of the manifold and remove the entire Cable Cover assembly together with the Stand Offs. Then you can easily access the rear of the Front Cable Cover to install your drives. There are two mounting orientations for 2.5" drives on the Front Cable Cover, one is for aesthetics and the other is for maximum drive capacity. For the aesthetics configuration you can lay two drives flat. The lower drive will only need 3 screws to attach it while the top one will need 4. For the maximum capacity configuration install the drives on their edge.

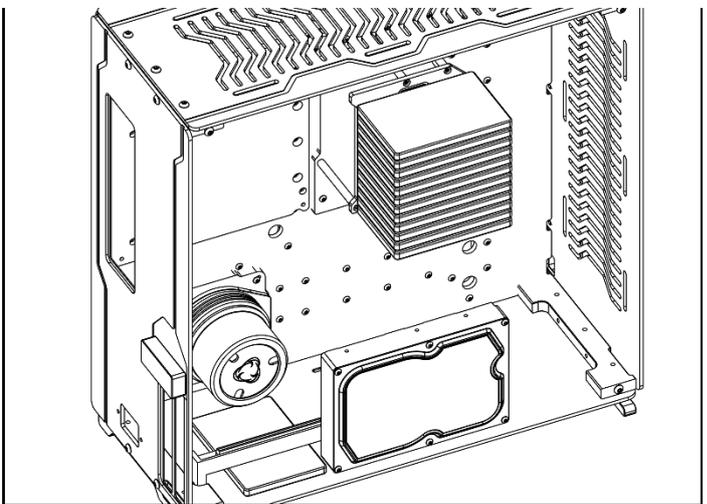
Wraith also has one 3.5" drive position in-front of the GPU for a side mounted 3.5" drive.



Front Cover removal (Looking from the back)



Drive Configuration 1



Drive Configuration 2

Step 8 - Side Panel Window Installation

Parts Involved

- **L** Side Panel Window x1
- M4 x 12mm Button Head Fasteners x4

Attach the Side Panel Window to the Corner Pieces using the x4 M4 12mm Fasteners.

Additional Steps for Case Version 1.87

Attach Power Cable to Rear Panel

Parts Involved

- **D** Rear Panel x1
- M3 x 8mm Fasteners x2
- Power Cable x1
- M3 Nuts x2

Attach the power cable to the Rear Panel using 2x M3 8mm Fasteners and 2x M3 Nuts.

Install PSU

Parts Involved

- PSU Struts
- PSU Shroud
- PSU Cover
- PSU
- 6-32 x 6mm fasteners x4
- M4 x 6mm fasteners x2

Install the PSU Struts onto the PSU mounting threads. Slide the PSU Shroud onto the PSU Struts and put the PSU into position on the Bottom Panel of the case. Use the x4 6-32 6mm Fasteners to attach the PSU via the PSU struts. Then install the PSU Cover using the x2 6mm M4 Fasteners.

Filling & Draining The Loop



Recommended Items

- Air Pressure Tester
- Long Fill Tube
- External Power Supply for D5 Pump

Filling the Loop

We recommend air pressure testing before filling any loop. Air pressure should not surpass 0.6 bar.

To fill the loop, we strongly recommend a long fill tube. We use a 90-degree fitting with a barb fitting and a 200mm length of soft tube. This prevents spilling and helps to remove the air faster. Use an external PSU for your pump or jump start your PSU. Do not boot your system to fill the loop.

Fill the reservoir 100% and run the pump until the reservoir is almost empty (do not run the pump dry). Keep repeating until you have full circulation. Give some time for the final air to come out, it can take 30min to 48hrs depending on your build. Keep the fill tube on until all the air is out and then seal up the reservoir with a stop fitting.

Draining the Loop

There are various options for drain valves. No drainage system will ever drain a loop 100%. The only way trapped coolant can be removed is the hard way in any build, dismantling the loop and individually draining each section.

For more information about Singularity Computers and our products, please visit/scan the following links:

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PRODUCTS

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SUPPORT

<http://bit.ly/sc-contact-us>
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