Ossila
enabling science

LAMINAR FLOW HOOD

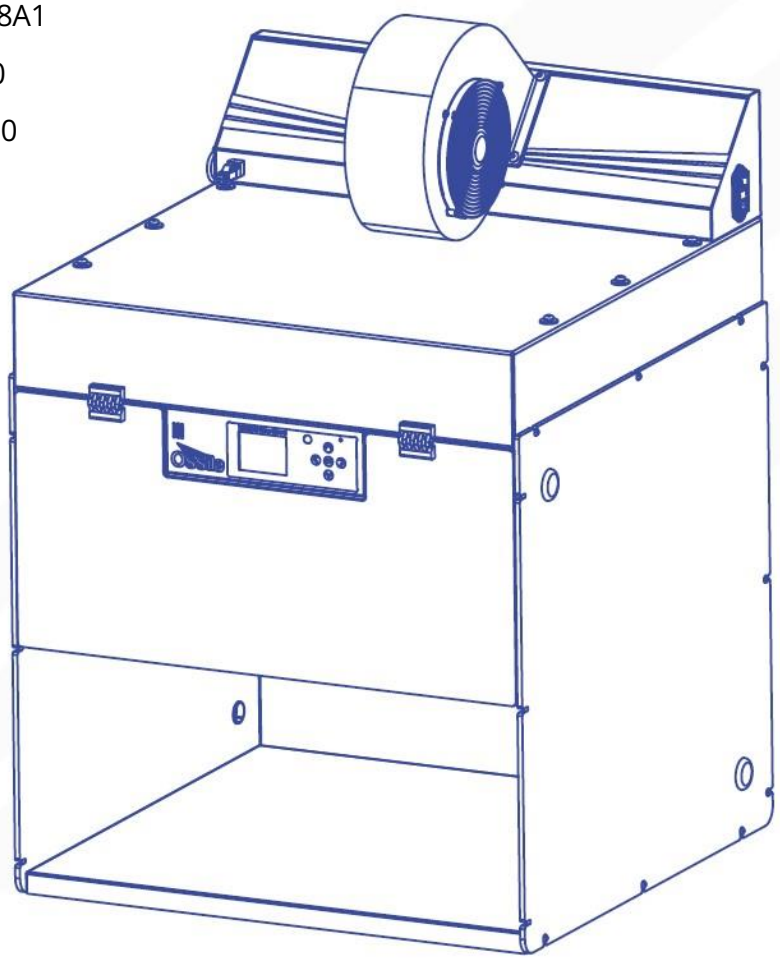
USER MANUAL

Manual Version: 1.0.A

Product code: L2008A1

Product Version: 1.0

Software Version: 1.0



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1. Overview

The Laminar Flow Hood is designed to provide a working space that meets a certain level of cleanliness for critical applications such as nanofabrication, or microbiological applications. These working spaces are often defined as a controlled environment or clean zone rather than a cleanroom. Typically, the cleanliness of the system is defined in one of two ways, via ISO 14644 Cleanrooms and Associated Control Environments or the FED STD 209E Airborne Particulate Cleanliness in Cleanrooms and Cleanzones. Although the FED STD 209E standard has been withdrawn and superseded by the ISO standards it is still often used within the wider community and so is still referenced in the instrument and documentation.

The use of controlled environments allows users to prepare samples or perform experiments inside an environment with a specific minimum level of control. In the case of the laminar flow hood, this is a certain level of cleanliness defined as particulate counts. In both standards particles are defined by their size and are grouped into bins with decreasing particle size and increasing maximum particle density count. **Table 1** shows the comparison between the two standards and the maximum particle count per bin.

ISO Class	Maximum Particles per m^3						FED STD 209E
	≥0.1µM	≥0.2µM	≥0.3µM	≥0.5µM	≥1µM	≥5µM	
ISO 1	10^1						
ISO 2	10^2	2.4×10^1	10^1				
ISO 3	10^3	$2.4\ 10^2$	10^2	3.5×10^1			Class 1
ISO 4	10^4	2.4×10^3	10^3	3.5×10^2	8.3×10^1		Class 10
ISO 5	10^5	2.4×10^4	10^4	3.5×10^3	8.3×10^2		Class 100
ISO 6	10^6	2.4×10^5	10^5	3.5×10^4	8.3×10^3	2.93×10^2	Class 1,00
ISO 7				3.5×10^5	8.3×10^4	2.93×10^3	Class 10,000
ISO 8				3.5×10^6	8.3×10^5	2.93×10^4	Class 100,000
ISO 9				3.5×10^7	8.3×10^6	2.93×10^5	Room Air

Table 1. ISO 14644 vs FED STD 209E particle count guidelines

The Ossila Laminar Flow Hood operate at ISO Class 5 cleanliness, this cleanliness is defined by the design of the system and the filtration used. For most ISO Class 5 systems HEPA filters are used typically of class H13 but some use H14 for a finer filtration. Higher degrees of classification can be reached using ULPA filtration, using either U15 or U16 filters.

It is these filters that allow the system to operate and generate a clean environment. The general principal behind the laminar flow hood is that air is passed through a filter which remove particulates from the air. This air is then passed over a surface at a speed which ensure air flow is unidirectional and laminar, rather than turbulent. This allows dirty air to be flushed out of the environment and creates a curtain of clean air that stops infiltration of particulate from the external environment. Operating in the laminar flow region also ensures that pockets of recirculating air are not formed which could trap particulates within it.

2. EU Declaration of Conformity (DoC)

We

Company Name: Ossila BV

Postal Address: Biopartner 3 building, Galileiweg 8

Postcode: 2333 BD Leiden

Country: The Netherlands

Telephone number: +31 (0)71 3322992

Email Address: info@ossila.com

declare that the DoC is issued under our sole responsibility and belongs to the following product:

Product: Laminar Flow Hood **(L2008A1)**

Serial number: L2008A1-xxxx

Object of declaration:

Laminar Flow Hood **(L2008A1)**

The object of declaration described above is in conformity with the relevant Union harmonisation legislation:

Low Voltage Directive 2014/35/EU

EMC Directive 2014/30/EU

RoHS Directive 2011/65/EU

The following harmonised standards and technical specifications have been applied:

BS EN 61010-1:2010/A1:2019 Safety requirements for electrical equipment for measurement, control, and laboratory use.

Signed:

Name: Dr James Kingsley
Place: Leiden
Date: 01/08/2023

Декларация **за съответствие на ЕС**
Производител: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.
Декларира с цялата си отговорност, че посоченото оборудване съответства на приложимото законодателство на ЕС за хармонизиране, посочено на предходната(-ите) страница(-и) на настоящия документ.

[Čeština] **Prohlášení o shodě EU**
Výrobce: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.
Prohlašujeme na vlastní odpovědnost, že uvedené zařízeni je v souladu s příslušnými harmonizačními předpisy EU uvedenými na předchozích stranách tohoto dokumentu.

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Erklærer herved, at vi alene er ansvarlige for, at det nævnte udstyr er i overensstemmelse med den relevante EU-harmoniseringslovgivning, der er anført på den/de foregående side(r) i dette dokument.

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Kinnitame oma ainuvastutusel, et loetletud seadmed on kooskõlas antud dokumendi eelmisel lehelküljel / eelmistel lehekülgedel ära toodud asjaomaste ELi ühtlustamise õigusaktidega.

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[Español] **Declaración de conformidad UE**
Fabricante: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.
Declaramos bajo nuestra única responsabilidad que el siguiente producto se ajusta a la pertinente legislación de armonización de la UE enumerada en las páginas anteriores de este documento.

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Si dichiara sotto la propria personale responsabilità che l'apparecchiatura in elenco è conforme alla normativa di armonizzazione UE rilevante indicata nelle pagine precedenti del presente documento.

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Ar pilnu atbilclību paziņojam, ka uzskaitītais aprīkojums atbilst attiecīgajiem ES saskaņošanas tiesību aktiem, kas minēti iepriekšējās šī dokumenta lapās.

[Lietuvių k.] **ES atitikties deklaracija**
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atsakingai pareiškia, kad išvardinta įranga atitinka aktualius ES harmonizavimo teisės aktus, nurodytus ankstesniuose šio dokumento

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3. Safety

3.1Warning

- **Only use the power cord (and transformer) supplied with the unit.**
- **Mains inlet rated for 110-230V ± 10%. For 110V mains supplies, use provided transformer.**
- **The unit must be connected to an earthed power outlet.**
- **The equipment should not be disassembled by users beyond the state it is shipped.**
- **Two people should be present when moving or assembling the laminar flow hood.**

3.2 Use of Equipment

The Laminar Flow Hood is designed to be used as instructed. It is intended to be operated in a laboratory environment and is designed to be used in the following environmental conditions:

- Indoors in a laboratory environment (pollution degree 2)
- Altitudes up to 2500 m
- Temperatures of 5°C to 40°C; maximum relative humidity of 80% up to 31°C.

The equipment is supplied with a power cord (and if necessary, an additional power transformer) for the country of purchase, in accordance with European Commission regulations and British Standards. Use of any other electrical power cables, adaptors, or transformers is not recommended.

3.3 Hazard Icons

The symbols shown in **Table 3.1** can be found at points throughout the manual. Note each warning before attempting any associated operations.

Table 3.1 Hazard warning labels used in this manual.

Symbol	Associated Hazard
	General warning or caution, which accompanying text will explain
	Electrical shock
	Severe injury or death by electrical shock
	Explosion
	High speed rotating fan
	UV light source
	Fire Hazard

3.4 General Hazards

Before installing or operating the Laminar Flow Hood, there are several health and safety precautions which must be followed and executed to ensure safe installation and operation.

WARNING: Improper handling when operating or servicing this equipment can result in serious injury. Read this manual before operating or servicing this equipment.

I. **DANGER:** DO NOT use the Laminar Flow Hood in the presence of an explosive atmosphere.

II. **WARNING:** To avoid electrical shock or injury, do not disassemble the baffle or electronics case or try to access any internal parts of the baffle. Servicing should only be carried out by a trained professional. Before servicing, disconnect the power cord and wait 10 minutes (high voltage may persist in capacitors for some time after removal of power).

III. **CAUTION:** The Laminar Flow Hood uses a ground-type power plug, which must be connected to an earthed outlet to prevent electrical shock. The Laminar Flow Hood will be supplied with an earthed plug appropriate for the country of purchase.

IV. **CAUTION:** The Laminar Flow Hood has a high voltage source. Do not attempt to open the unit.

V. **CAUTION:** The Laminar Flow Hood is heavy, movement and assembly should be done with two people.

3.5 Power Cord Safety

I. Emergency power disconnect options: Use the power cord as a disconnecting method and remove it from the power source. To facilitate disconnect, make sure the power outlet for this cord is readily accessible to the operator.

II. Only use the power cord supplied with the Laminar Flow Hood. Using an unearthed plug may result in serious injury or death.

3.6 Servicing

I. Routine replacement of the filters is recommended to ensure efficient running of the Laminar Flow Hood. Filters act as accumulators and appropriate PPE should be used when removing old filters to minimise exposure to any potential hazardous materials collected by the filters.

If servicing is required beyond routine servicing, please return the unit to Ossila Ltd The warranty will be invalidated if:

- Modification or service has taken place by anyone other than an Ossila engineer.
- The Unit has been subjected to chemical damage through improper use.
- The Unit has been operated outside the usage parameters stated in the user documentation associated with the Unit.
- The Unit has been rendered inoperable through accident, misuse, contamination, improper maintenance, modification, or other external causes.

3.7 Health and Safety – Installation

I. The final assembled Laminar Flow Hood is heavy, two or more people should be used to move the system into place.

II. The baffle should remain disconnected from the mains electrics until the Laminar Flow Hood is fully assembled. Doing so before complete assembly may result in serious injury or death.

3.8 Health and Safety – Operation

I. UV radiation can cause severe burns to the eyes and skin. An integrated passive infrared sensor detects when users are nearby and pauses the operation of the UV light. Acrylic side panels act as absorbers of emitted UV however radiation can escape through the front opening. As a precaution, never look directly into the Laminar Flow Hood when the UV light is on.

II. When using the Laminar Flow Hood only non-hazardous activities should be undertaken within the hood. Airflow of the unit is designed to move air from the experimental area to the user. This will not provide protection to users from activities within the hood.

III. The Laminar Flow Hood baffle has a high voltage source. Do not attempt to open the unit.

IV. Do not use any open flames within the laminar flow hood.

3.9 Health and Safety – Servicing

I. Service or installation work that includes integrating electrical components should only be performed by an Ossila engineer. Never alter the wiring of any purchased equipment. If changes are made, such alterations may damage the equipment, cause injury, or even death. At the very least, such alterations will void your warranty.

II. If the fuses located in the fuse drawer at the back of the unit need changing, the unit must be placed in a safe mode by switching the unit off and disconnecting the power cord from the power socket.

4. Unpacking

4.1 Packing List

The standard items included with the Laminar Flow Hood are:

- Baffle Assembly
- Electronic Case Assembly

- Two Acrylic Side Panels
- One Acrylic Front Window Sash
- Stainless Steel Tray
- Back Panel
- Assembly Kit and Instructions
- Power Supply Cord

In addition to these items, customers who live in countries where the voltage of the mains power is 110 V will have a step-up transformer which can be used to increase the voltage supplied to the system to 220 V.

4.2 Damage Inspection

Examine the components for evidence of shipping damage. If damage has occurred, please contact Ossila directly for further action.

5. Specifications

The Laminar Flow Hood specifications are shown in **Table 5.1**

Table 5.1. Laminar Flow Hood specifications

Motor Specification	
Motor Type	Single speed AC Blower
Maximum Flow Rate	510 $m^3.hour^{-1}$
Noise	75 dB
Dimensions and Weight	
Working Area	590 mm x 630 mm
Working Height	625 mm
Weight	24 Kg
Outer Dimensions (Vertical)	Width: 660 mm Height: 908 mm Depth: 660 mm
Outer Dimensions (Horizontal)	Width: 660 mm Height: 850 mm Depth: 660 mm
Materials and Finish	
Plenum, Back Panel, and Electronics Case	Material: 1.2 mm Aluminium Finish: Textured Black Powder Coating
Side Panels and Sash	Material: 5 mm Acrylic Finish: Transparent with Polished Edges
Tray	Material: 1.2 mm Stainless Steel Finish: #4 Brushed Finish
Filtration	
Filter Grade (Pre-Filter)	95% (F9) Particle Filter
Filter Grade	99.995% (H13) HEPA Particle Filter
Pore Size	0.3 µm
Depth	50 mm

Particulate Sensor	
Sensor Type	Light Scattering Discrete Airborne Particulate Counter
Count Range	0 – 100,000 particles.cm^3
Count Accuracy	±10%
Particle Bins Sizes	0.3 µm - 1 µm 1 µm - 2.5 µm 2.5 µm - 5 µm 5 µm - 10 µm
Pressure Sensor	
Sensor Type	MEMS Barometric Pressure Sensor
Pressure Range	30,000 Pa – 120,000 Pa
Accuracy	±6 Pa
Resolution	0.2 Pa
Visible Lighting	
Type	High Efficiency LED Array
Colour	6500K Daylight
Brightness	300 Lumens
UV Lighting	
Type	High Efficiency UV LED
Wavelength	280nm (UVC)
Intensity	45 mW
User Interface	
Display Type	24-bit Colour TFT LCD Display
Display Resolution	480 x 272 px
Display Size	4.3”
Interface	Tactile Keypad
Power Supply	
Connector Type	IEC C13 Power Cable
Voltage Range	220V – 240V
Fuse	2x 1A Slow Blow
Rated Power	185 VA

6. System Components

The Laminar Flow Hood comprises of several components that fit together to form the assembly, **Figure 6.1** shows the complete assembly.

Figure 6.1 Laminar Flow Hood Complete Assembly

7. Installation

7.1 Vertical Laminar Flow Hood

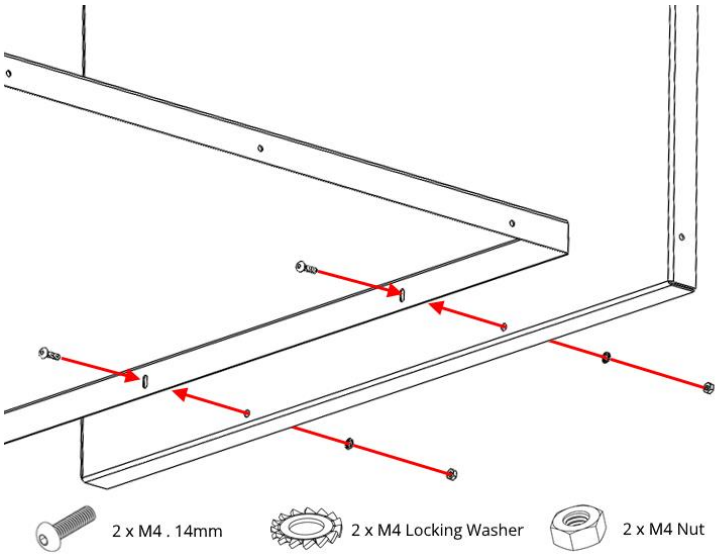


Figure 7.1.1. Attach the steel tray to the back panel through the slots and holes shown.

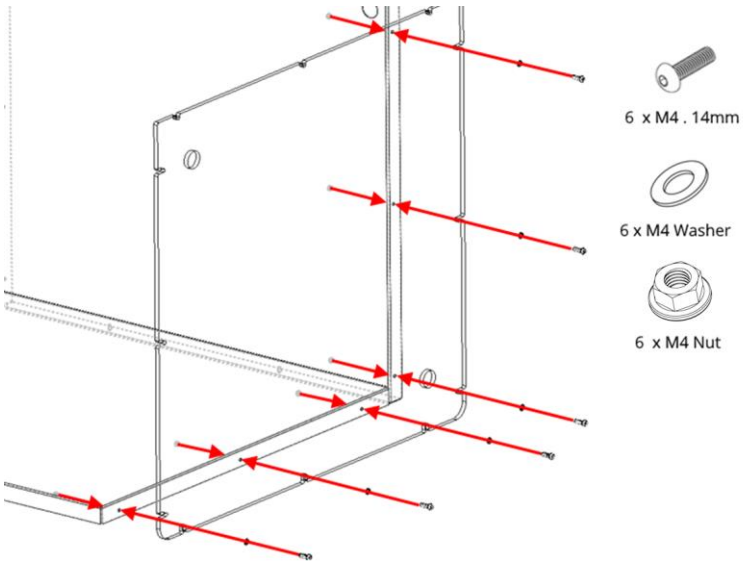


Figure 7.1.2. Attach one of the acrylic side panels using M4 x 14mm screws, M4 flat washers, and M4 flanged nuts.

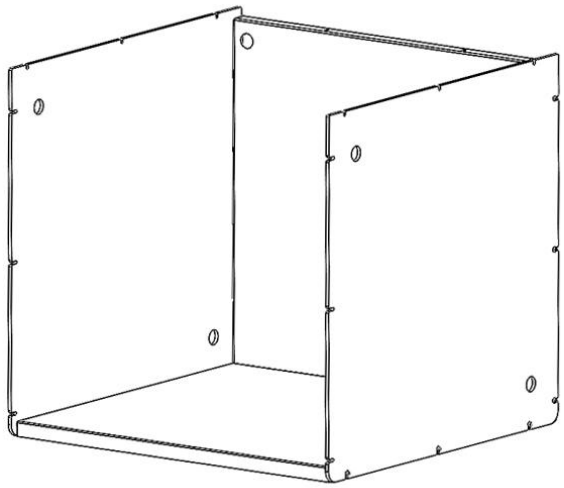


Figure 7.1.3. Repeat with the second acrylic side panel on the other side to complete the hood section.

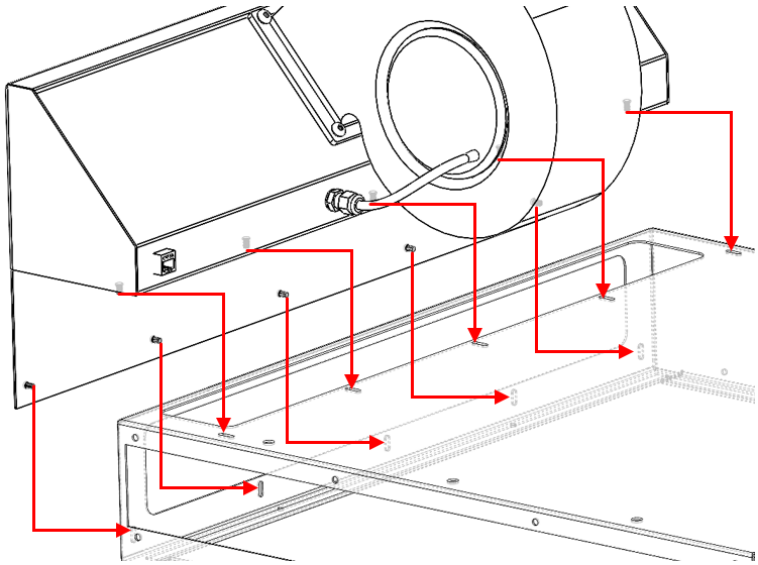


Figure 7.1.4. Place the baffle onto the plenum as shown ensuring the threaded studs enter the corresponding slots on the plenum.

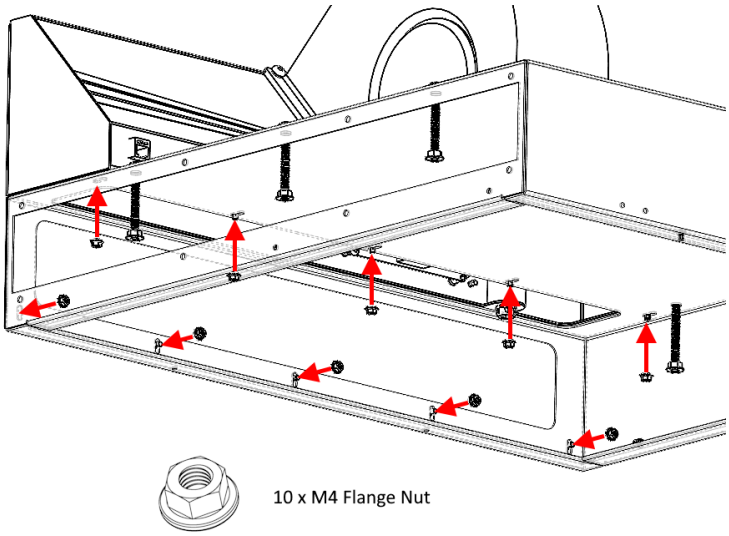


Figure 7.1.5. Place locking washers and nuts on all the studs, tightening the nuts so that even pressure is applied to the mating surface.

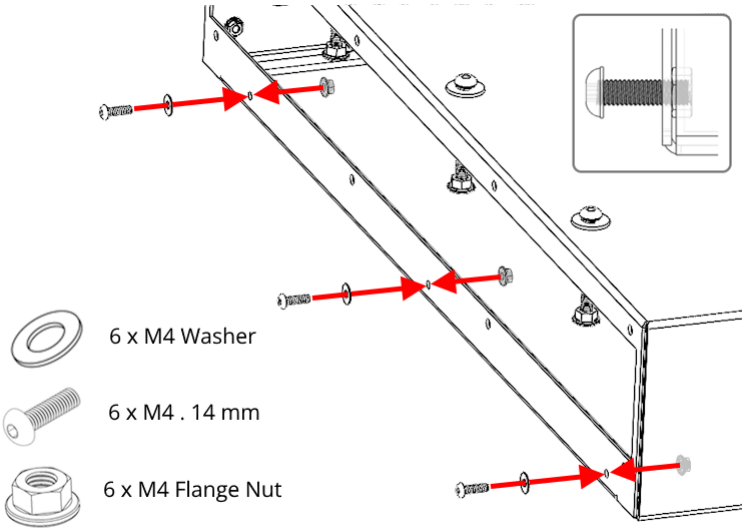


Figure 7.1.6. Attach the screws and flat washer to the outside of the sides of the plenum using a nut. Ensure that the screw protrudes out of the case as shown in the inset image. Repeat for the other side of the plenum.

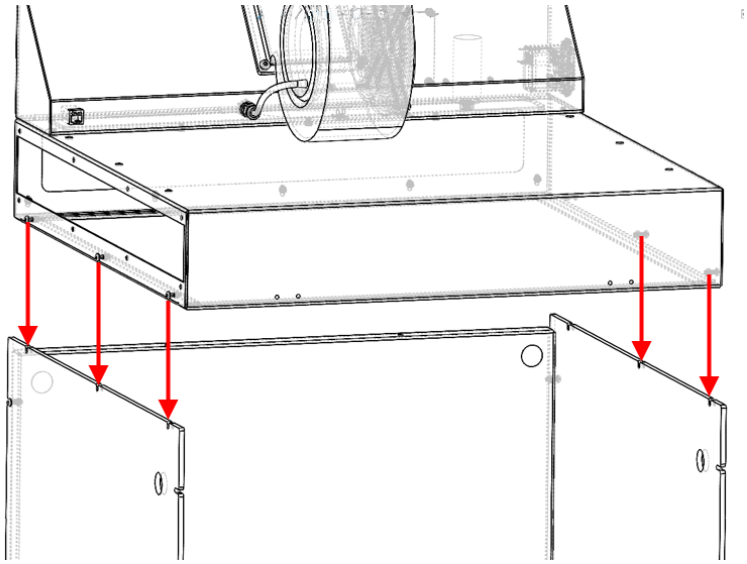


Figure 7.1.7. Lower the plenum onto the assembled hood, ensuring that the protruding screws fall into the slots on the top of the acrylic windows. Tighten the screws to secure the plenum to the hood.

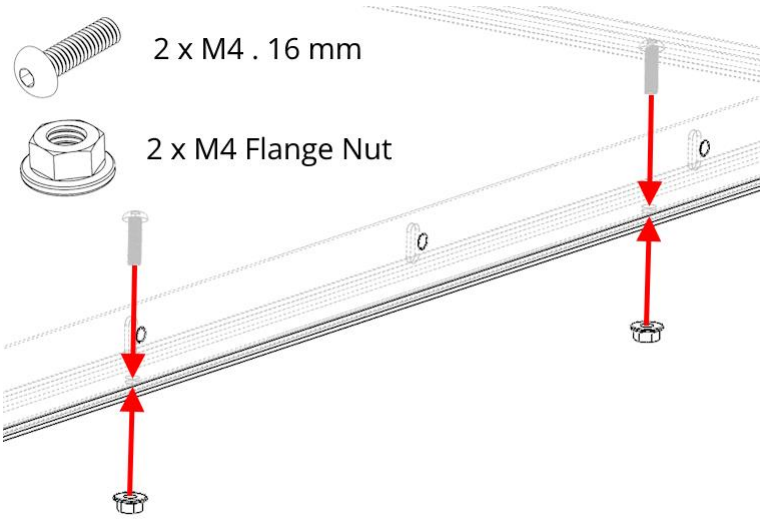


Figure 7.1.8. Connect the rear panel to the plenum using the slots and holes at the rear.

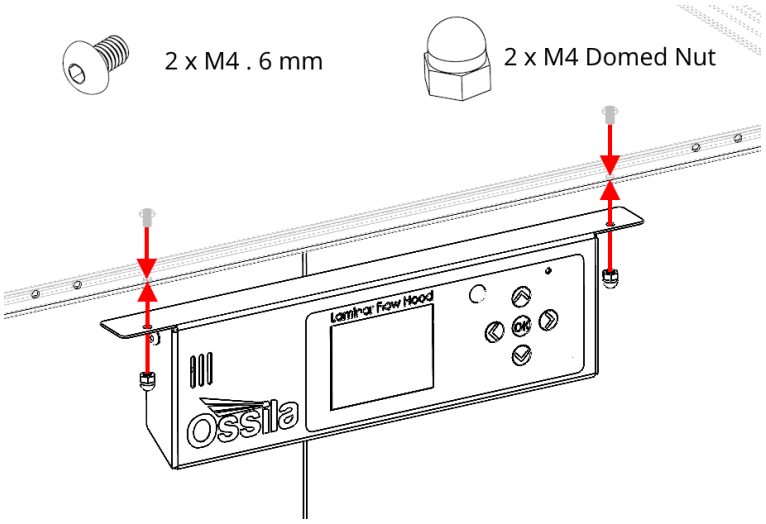


Figure 7.1.9. Attach the electronics case to the front of the plenum.

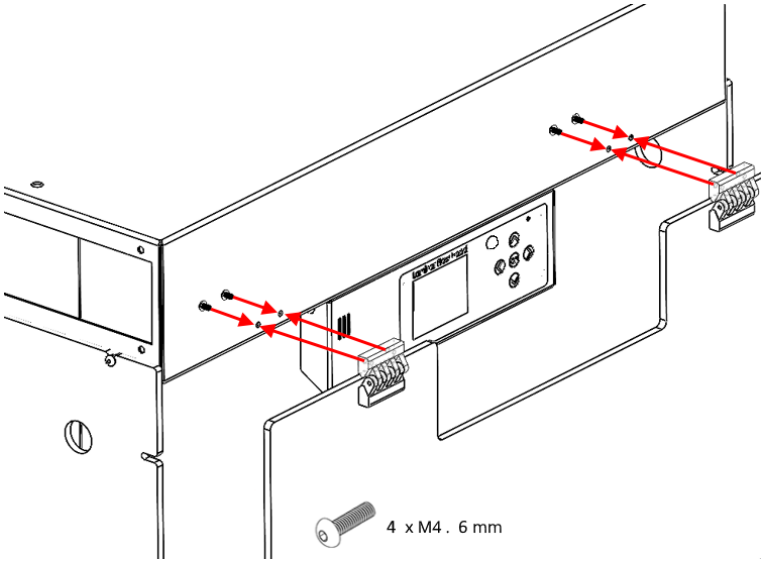


Figure 7.1.10. Attach the sash to the front of the plenum.

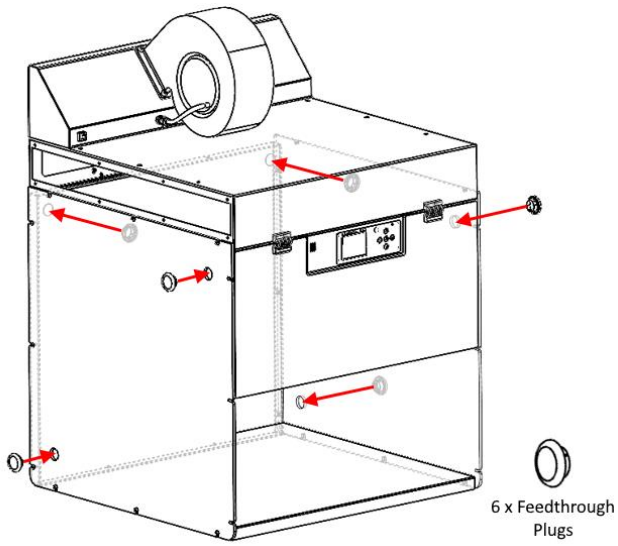


Figure 7.1.11. Insert the feedthrough plugs into the side panels and the rear panel.

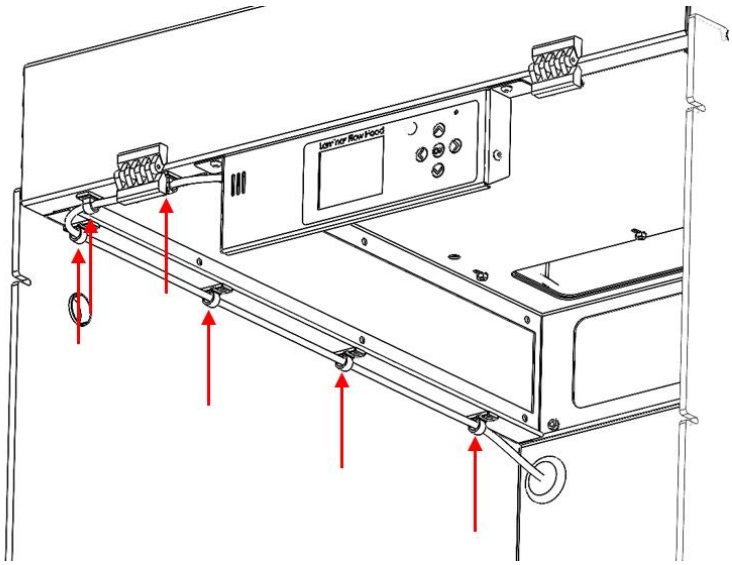


Figure 7.1.12. Connect the ethernet cable to the rear of the electronics case. Using the adhesive cable clips trunk, the cable to the rear of the hood. Make a small hole in the rear feedthrough plug and pass the cable through.

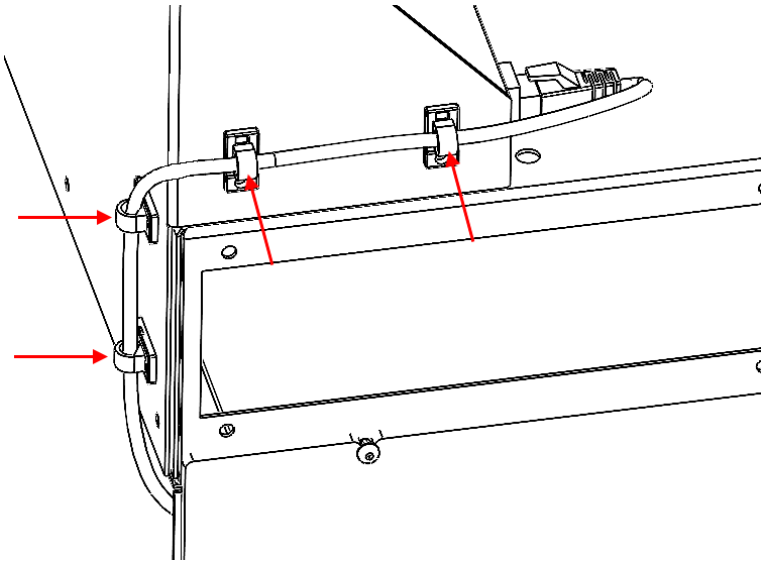


Figure 7.1.12. Continue trunking the ethernet cable up the back and around the side of the baffle and then connect the cable into the ethernet port.

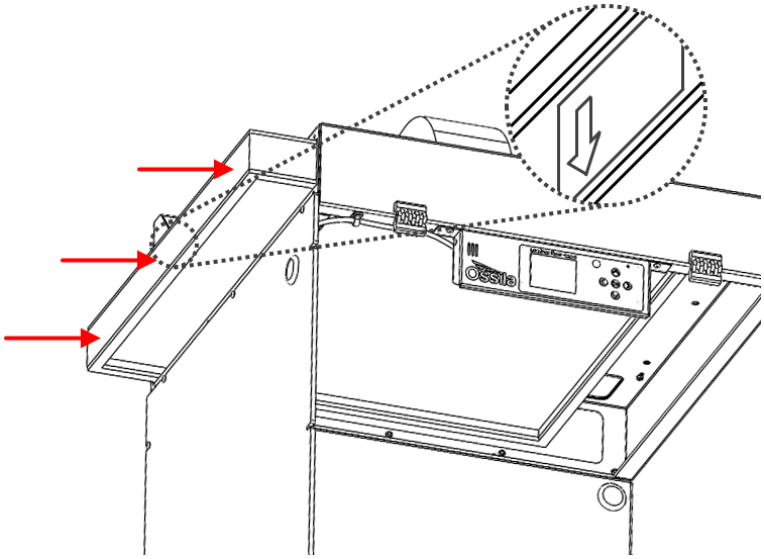


Figure 7.1.13. Slide the filter back in through the access panel cut out ensuring the arrow on the filter points towards the hood.

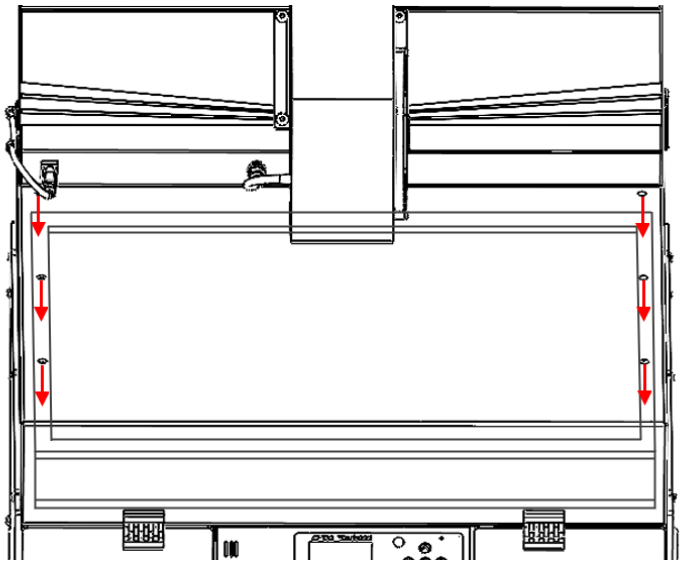


Figure 7.1.14. Align the filter so that the gasket lined frame is positioned directly below the clamp screw cut outs.

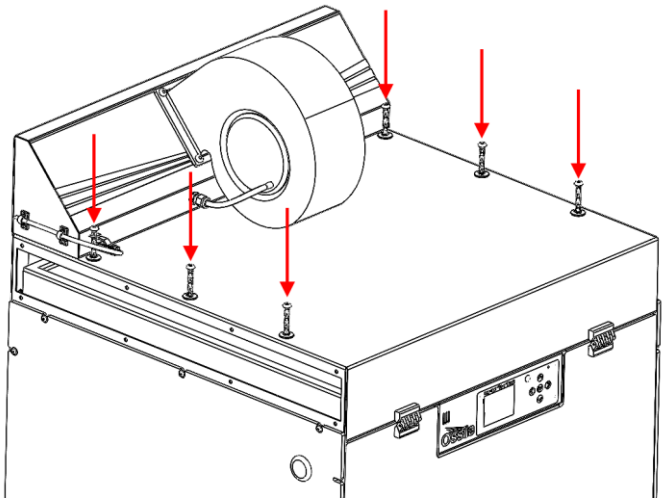


Figure 7.1.15. Screw the filter clamp screws into the plenum.

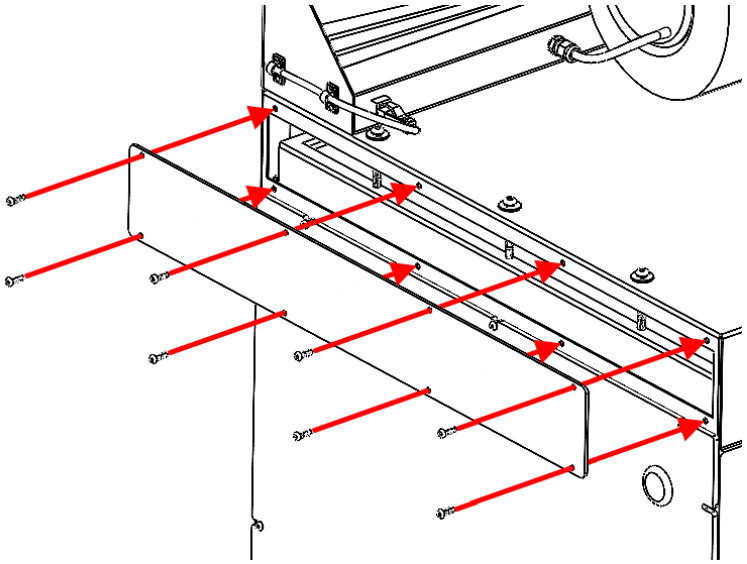


Figure 7.1.16. Screw the filter access panel in place.

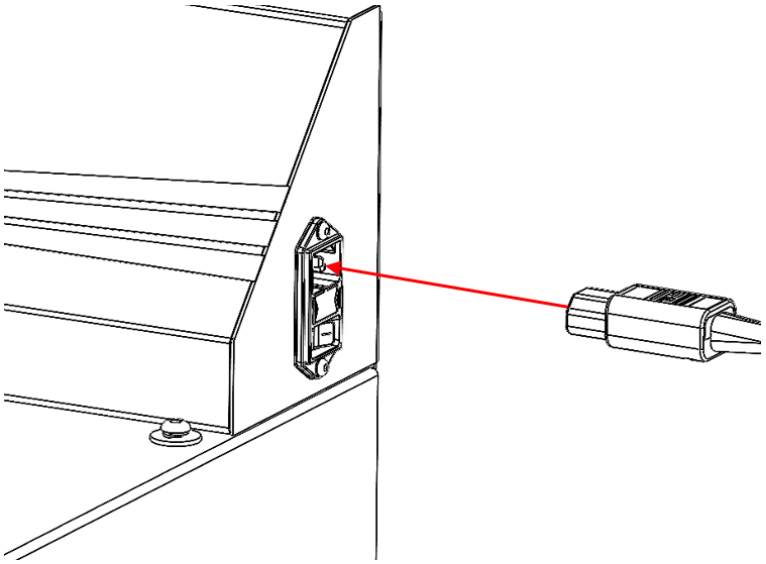


Figure 7.1.17. Insert the power cable into the system and power up.

7.2 Horizontal Laminar Flow Hood

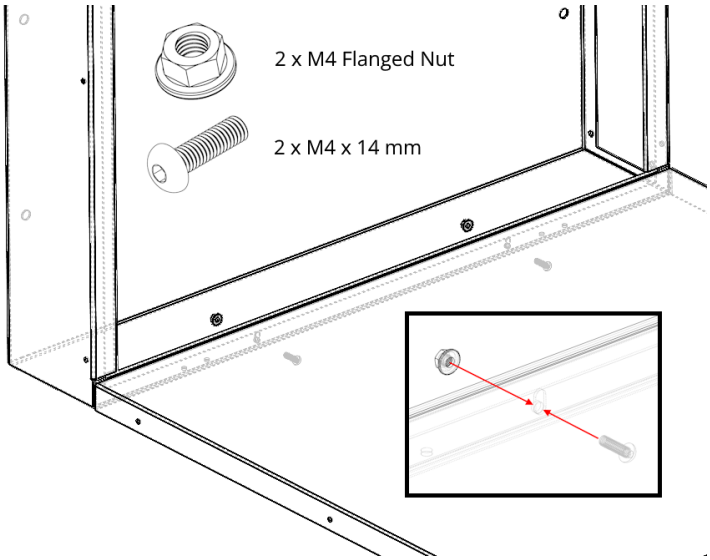


Figure 7.2.1 Connect the tray to the plenum.

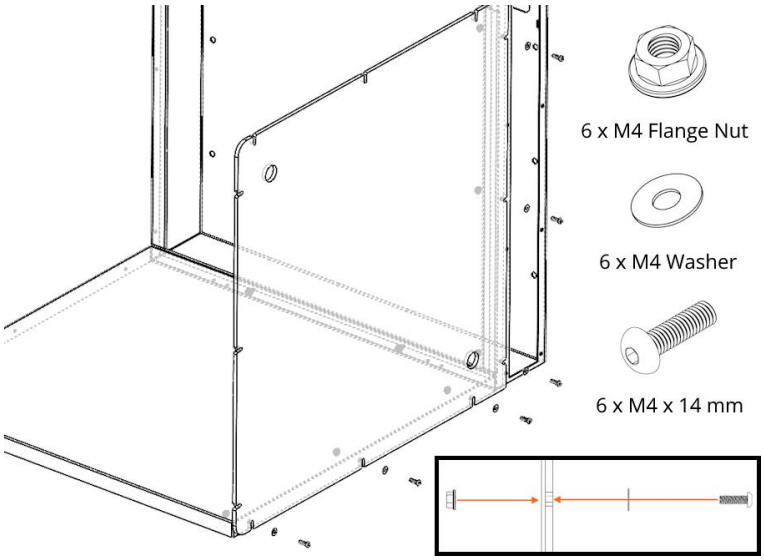


Figure 7.2.2 Attach the acrylic side panel to the plenum and tray.

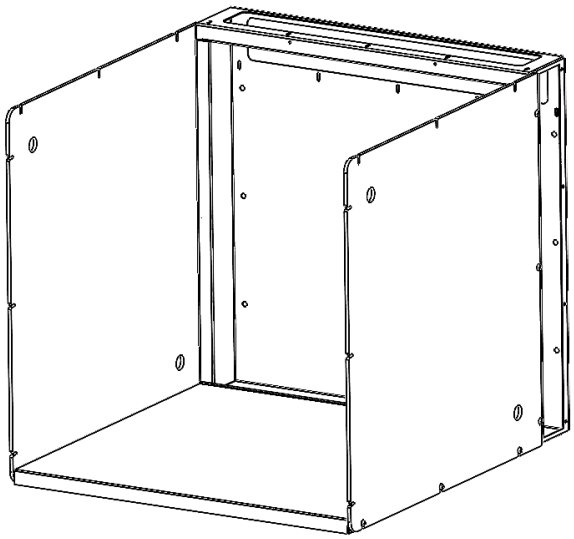


Figure 7.2.3 Repeat with the second acrylic panel on the other side of the hood.

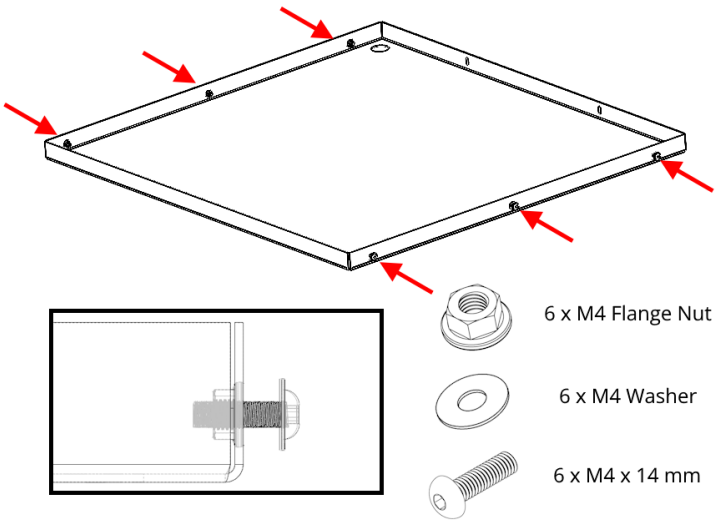


Figure 7.2.4 Attach the screws and washers to the side of the top panel. Make sure not to screw them in and to leave a gap > 8 mm.

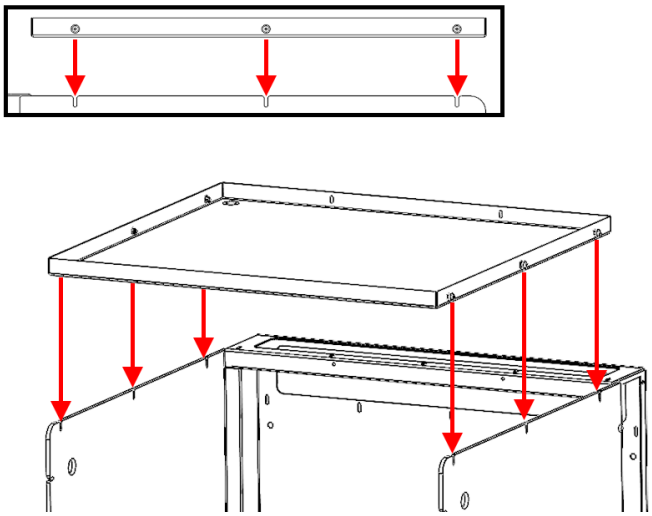


Figure 7.2.5 Slot the top panel screws into the slots on the acrylic panel and tighten them.

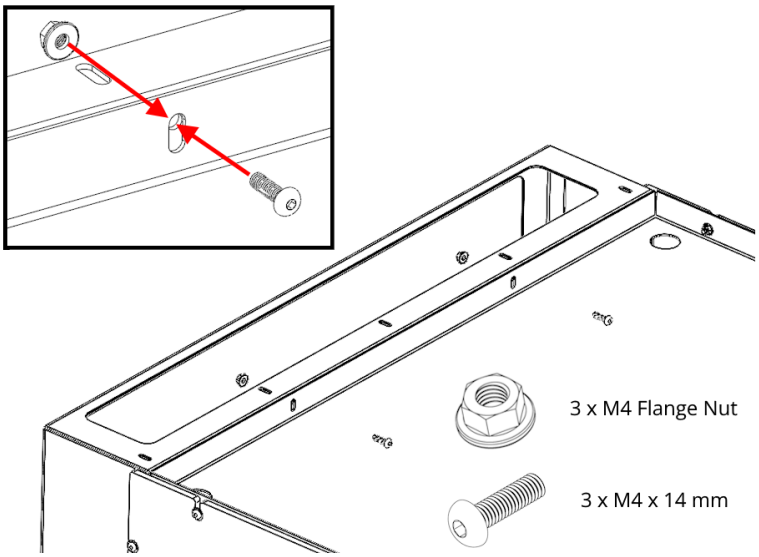


Figure 7.2.6 Attach the top panel to the plenum.

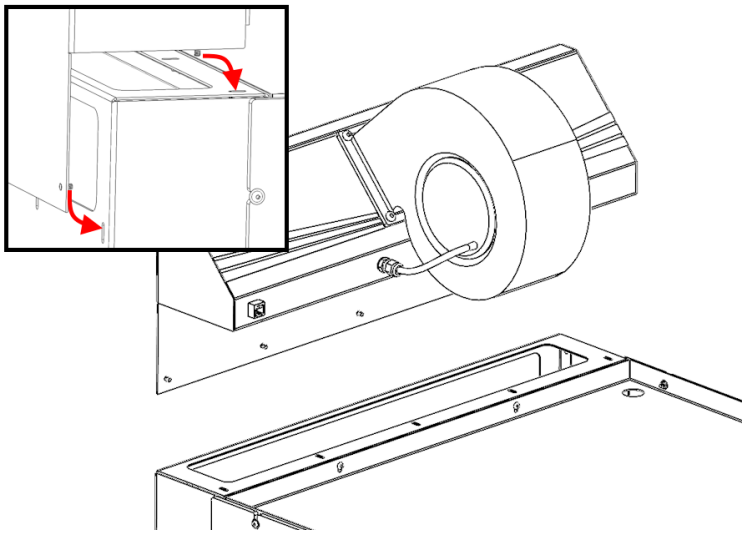
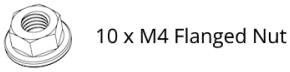


Figure 7.2.7 Slot the baffle onto the plenum make sure the studs slot into the slots of the plenum.



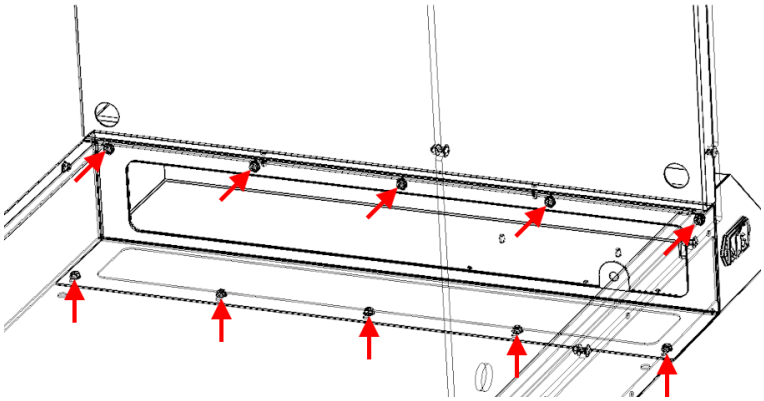


Figure 7.2.8 Using M4 flanged nuts firmly attach the plenum and baffle together by screwing onto the studs of the baffle from within the plenum.

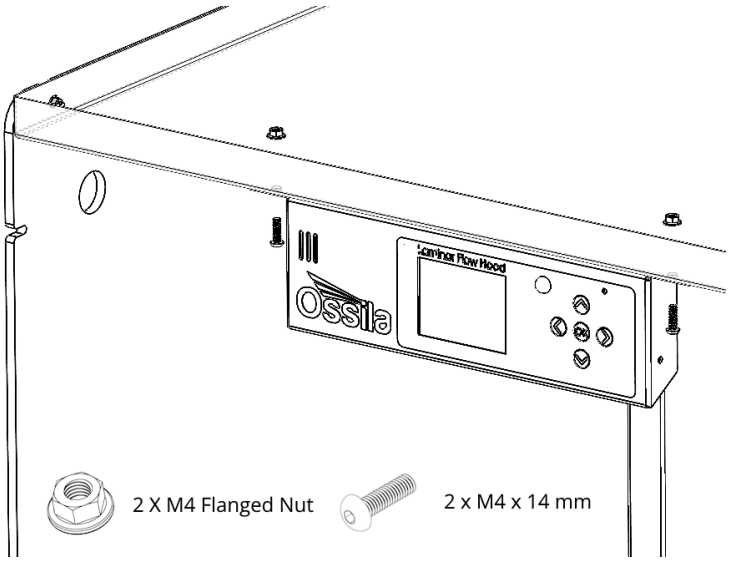


Figure 7.2.9 Attach the electronics case to the top panel.

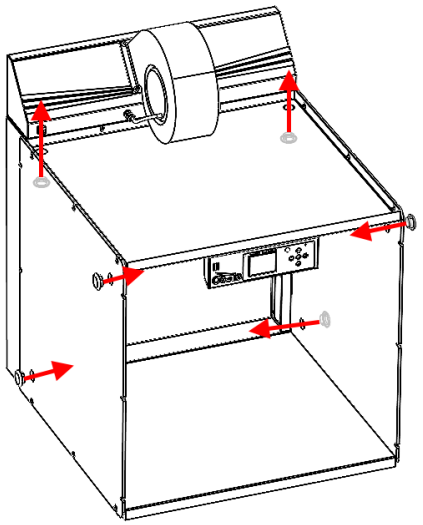


Figure 7.2.10 Plug in the six break-through plugs into the holes on the acrylic panels and top panels

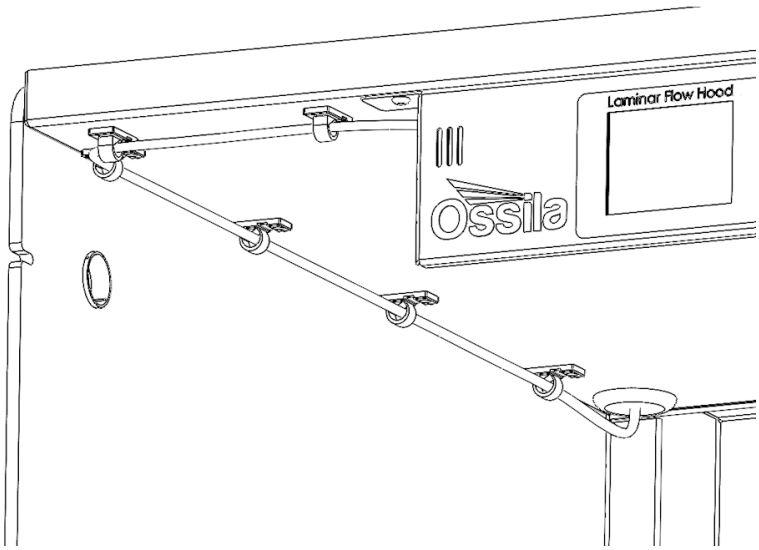


Figure 7.2.11 Using the adhesive cable clips plug the ethernet cable into the rear of the electronics case and route it to the rear of the hood.

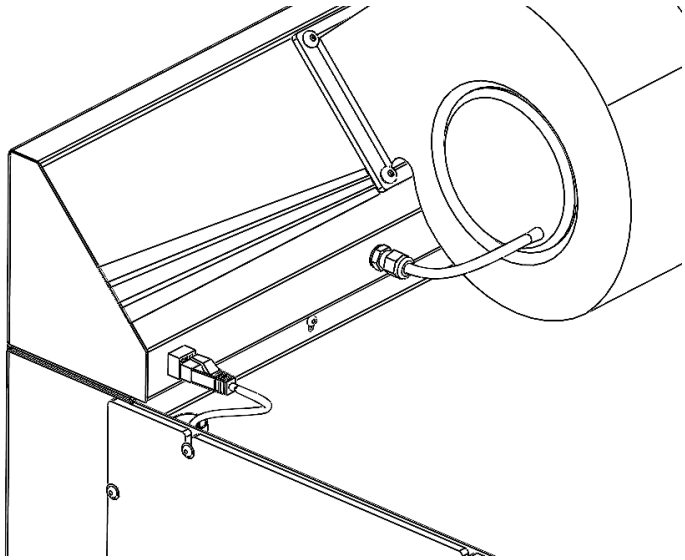


Figure 7.2.12 Making a small hole in the breakthrough plug, pass the ethernet cable through and connect to the baffle.

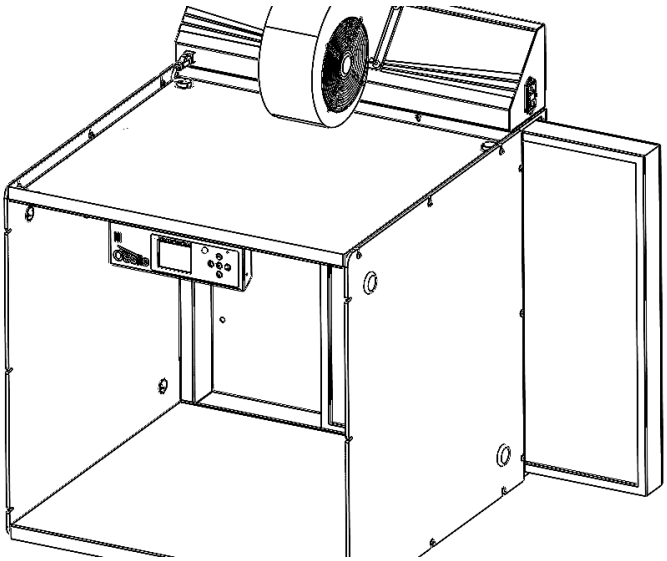


Figure 7.2.13 Slide the HEPA filter into the laminar flow hood ensuring the arrow on the side of the filter points towards the hood.

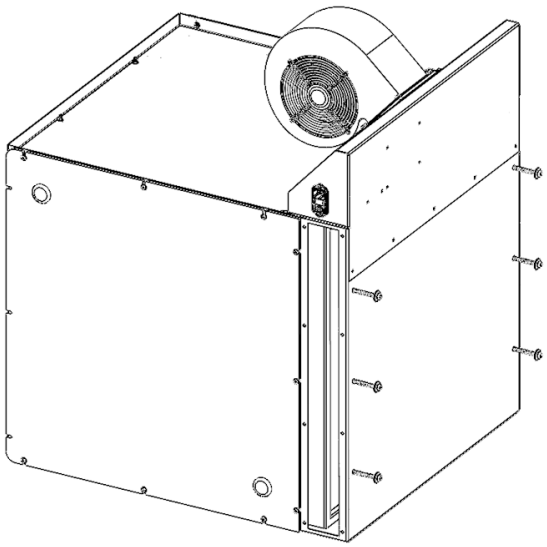


Figure 7.2.14 On the rear of the plenum tighten the filter clamp screws on the rear ensuring that the filter remains centred on the opening of the plenum.

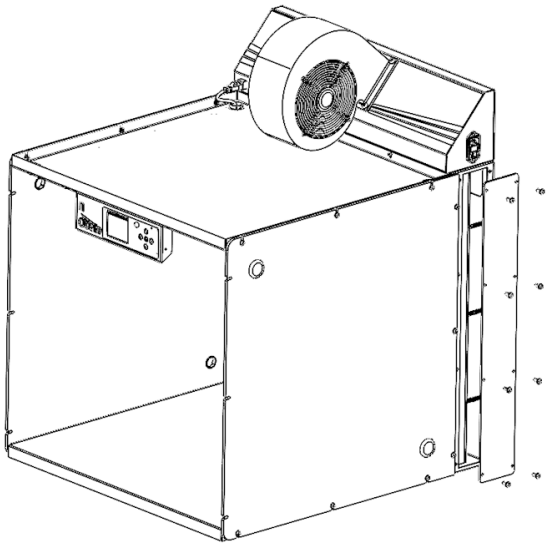


Figure 7.2.15 Attach the filter access panel to the side of the plenum sealing the plenum up.

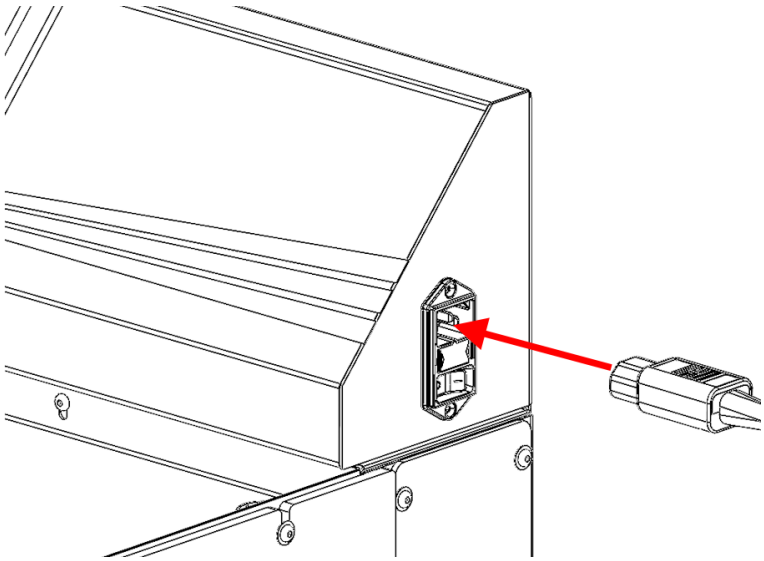


Figure 7.2.16 Insert the power cable into the system and power up.

7.3 System Bootup

After turning on the system for the first time it will run through the filter setup procedure. This process involves measuring the initial pressure differential across the filter to determine the current filter saturation levels. This will involve turning on the motor and waiting for a period for the pressure within the plenum to stabilise. The system will then take several background pressure measurements and determine a current stable average pressure differential value which is then saved in memory. The

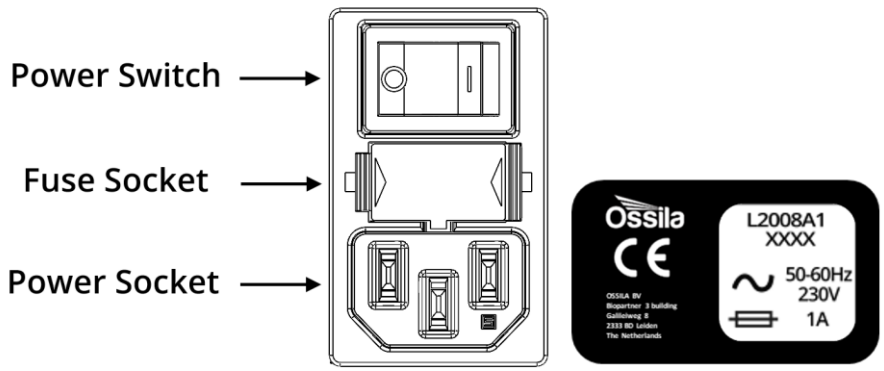
motor will then turn off and the system will be returned to the main menu. Once this is complete the system will be free to use.

8. Operation

8.1 Overview

Figure 8.1 shows the power inlet and a representative example of the corresponding CE sticker. This sticker shows the address of Ossila's EU offices, the serial number of the unit, the required frequency and voltage of the power supply, and the required fuse for the system.

Figure 8.1. Laminar Flow Hood power inlet with the switch, fuse socket, and power socket labelled. The CE sticker should be present alongside the power inlet.



8.2 User Interface

Figure 8.2 shows the front panel of the Laminar Flow Hood. The function of each of the keypad buttons is explained in **Table 8.1.**

Figure 8.2. Laminar Flow Hood LCD screen and keypad.

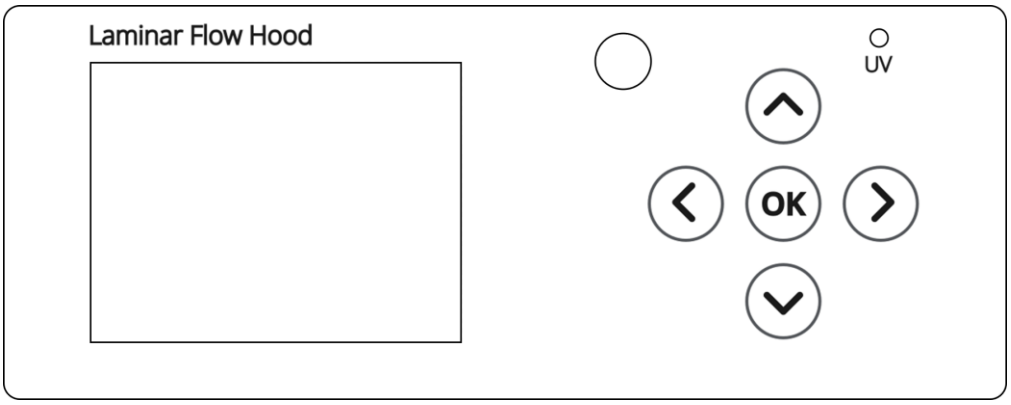


Table 8.1. Operational buttons and their associated functions.

Button	Function
OK	Main Display: Enter Quick Settings Bar Quick Settings: Toggle Quick Settings State Settings Pages: Navigate Back to Main Display
^	Quick Settings Bar: Navigate Upwards Through Quick Settings Options Settings Page: Navigate Upwards Through Settings Options
v	Quick Settings Bar: Navigate Downwards Through Quick Settings Options Settings Page: Navigate Downwards Through Settings Options
<	Main Display: Navigate to Settings Pages Settings Page Title: Navigate Left Through Settings Pages Editing Settings: Cycle Left Through Options
>	Main Display: Navigate to Settings Pages Settings Page Title: Navigate Right Through Settings Pages Editing Settings: Cycle Right Through Options

8.3 Practical Operation

1. The Laminar Flow Hood should be cleaned prior to use to ensure internal surfaces are free from contamination.
2. The motor of the system should be in continuous operation in order to maintain a clean atmosphere within the hood.
3. Visible light should be used to ensure sufficient illumination is available for the tasks at hand.
4. When using the system ensure that upstream of the item you are working with is free from object to continuous unidirectional air flow across the surface. Similarly avoid placing hands and arms upstream of items within the work area.
5. UV light should be used to aid in decontamination of the area after working with biological material. UV lights will only turn on when users are at a safe distance to limit exposure of potentially hazardous UV radiation.

8.4 Initial Operation

1. Before turning on the system and using it we recommend cleaning the inside of the laminar flow hood. This is described in detail in section 9.1.
2. After cleaning, turn the Laminar Flow Hood power switch on (position 'I'); the bootup screen will appear as shown **Figure 8.3**.

Figure 8.3. Bootup screen.

3. The system will start in a state with the fan and lights turned off. Press the 'OK' button to enter the quick settings bar, the fan should be highlighted automatically. Press 'OK' again and the fan will turn on.

4. The particle count sensor takes time to initiate its first readout as a time weighted measurement is made to obtain a high enough degree of sensitivity to measure to ISO Class 5. It will take approximately one minute before the first readouts of cleanliness will appear.

5. Once cleanliness readings begin wait until the readings reach the desired minimum ISO classification required for your use.

8.5 Quick Settings Options

There are three options on the quick settings bar of the main display, these are for setting the motor on and off, the visible light on and off, and the UV light on and off. These options can be accessed from the main menu by pressing the 'OK' button and using the up and down arrows to navigate to the desired option. Once highlighted the setting can be toggled between states by pressing the 'OK' button.

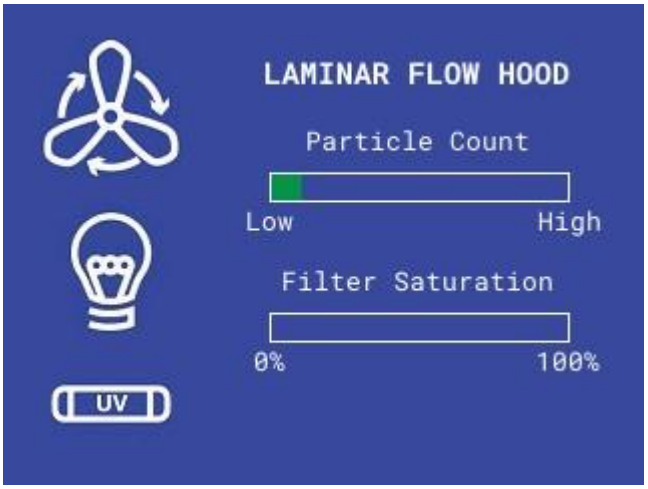


Figure 8.4 Main display with particle count and saturation readout, and quick settings bar.

The main display menu will also show the current particle count and filter saturation as bars. Particle count measurements can be used to ensure that the air coming from the hood is sufficiently clean enough to allow for work within. While the filter saturation indicates when the main HEPA filter should be replaced.

8.6 UV Light Operation

The UV light operates at 280nm wavelength and emits with a high optical intensity therefore it is essential users are not exposed to the radiation due to the photobiological hazards it presents. The system comes integrated with a passive infrared (PIR) sensor which can detect motion of users within

a set distance. Once the UV light is turned on through the quick settings menu the system will monitor for motion in front of the system, it will immediately turn off the UV light if movement is detected and will keep it off until there has been 30 seconds without motion detected within a 1.5m distance.

The UV light therefore can be in one of three states and the blue light on the front of the unit will display what state it is in. These states are as follows:

Settings State	PIR State	UV LED	Indicator LED
UV Off	Off	Off	Off
UV On	On – Motion Detected	Off	Blinking
UV On	On – No Motion	On	On

8.7 Settings Menu

The settings menu consists of several pages with different options available to the user. **Figure 8.5** shows the lighting options, the UV lighting can be set to automatically turn off after a set time or if set to off will be left on indefinitely when turned on. The screen brightness can also be adjusted to reduce power consumption in the unit.

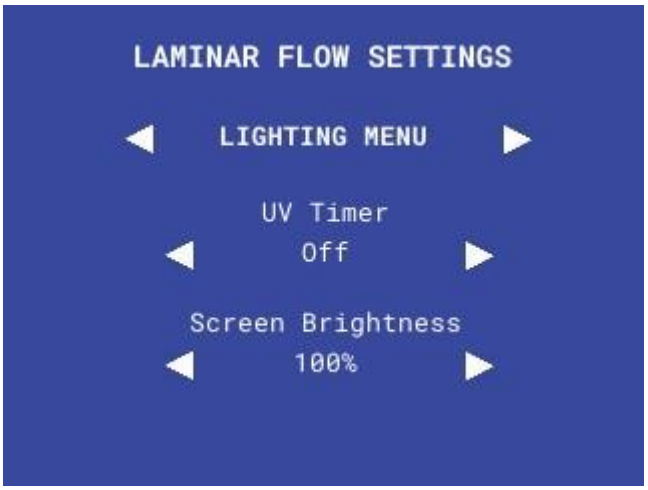


Figure 8.5 Lighting menu page.

The filter menu allows the user to reset the filter, this should be done when changing filters. This option allows the system to determine the baseline pressure drop across the filter for an unsaturated filter allowing the laminar flow hood to determine the level of saturation of the unit.

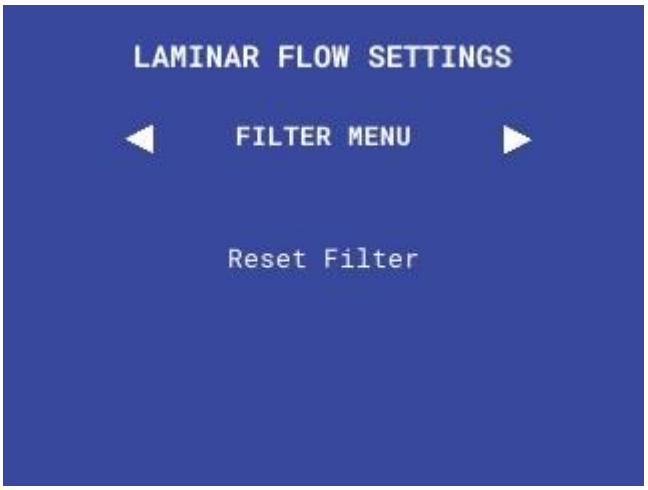


Figure 8.6 Filter menu and reset options.

The about menu provides information about the system to the user this shows the current software version number of the instrument.

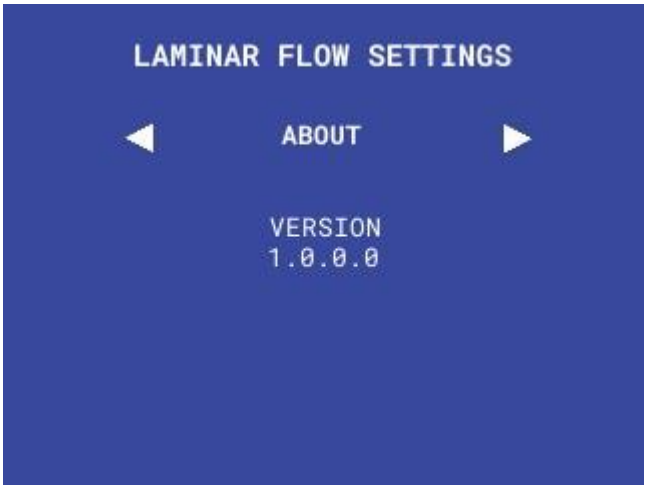


Figure 8.7 About menu in settings.

8.8 Filter Change Menu

When changing the filter, the user will be required to navigate to the filter settings page and select the filter change option. When this occurs a series of check will be done which include setting the motor running, monitoring the pressure levels, and recording the pressure differential of the system. The system will update the display indicating what has been done, what is currently being done, and what needs to be complete before the filter change process has been completed. The user should avoid turning off the unit during this process and wait until it is fully complete.

Figure 8.8 The filter reset process after completion.

Once complete the system will save the new baseline back pressure and use this to reference the current back pressure against in determining the current level of filter saturation. The default saturation percentage is a percentage increase in the baseline back pressure. So for example if the baseline back pressure is 100pa and the current measured back pressure is 135pa this would be a saturation of 35%.

9. Maintenance

9.1 Cleaning

Maintenance consists of routine cleaning of the inside of the cabinet for the purposes of decontamination. It is recommended that a solution of 70:30 ethanol to water or 80:20 isopropyl alcohol to water is used. This should be liberally sprayed to all interior surface of the hood, excluding the filter face and the electronics case. The spray should be left for approximately 10 minutes before any residual liquid is wiped up using a clean lint free tissue.

The exterior of the instrument can be cleaned with a clean, dry cloth to remove any oil, grease, or grime. Avoid use liquid solvents or detergents. Repairs or servicing not covered in this manual should only be performed by qualified personnel.

9.2 Pre-filter Replacement

Replacement of the pre-filter should be done regularly; it is suggested that this is done at least once a quarter and ideally once a month if the system is in continuous operation. To replace the pre-filter the following steps should be done:

1. It is recommended that users wear at a minimum disposable protective glove while undertaking this procedure. If any hazardous materials are regularly used in the open environment within the lab extra care and suitable additional PPE should be used when handling filters due to them acting as an accumulator.
2. Using the 2.5mm hex key remove the external fan guard to the motor.

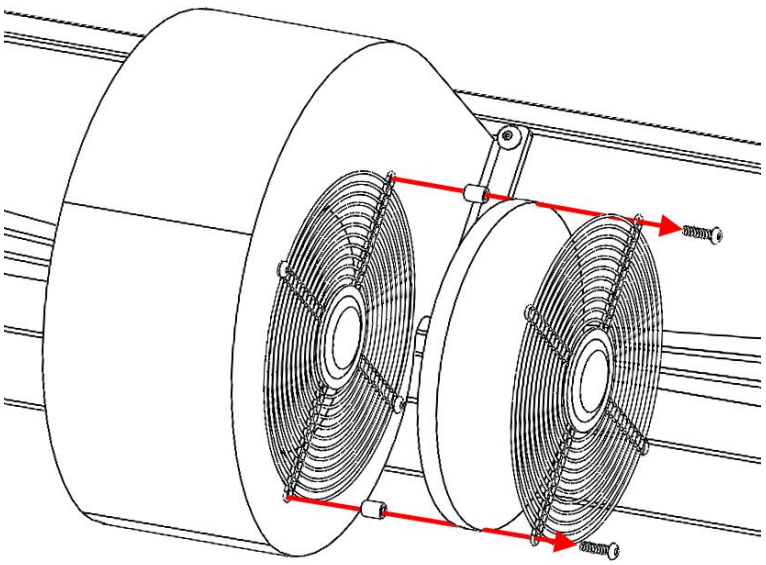


Figure 9.2.1. Remove the screws holding the fan guard in place and dispose of the old pre-filter disc.

3. Remove the spent pre-filter and dispose of in a suitable waste stream replace with a fresh pre-filter disc.
4. Re-attach the external fan guard to the motor with the new pre-filter disc sandwiched between the fan guards.

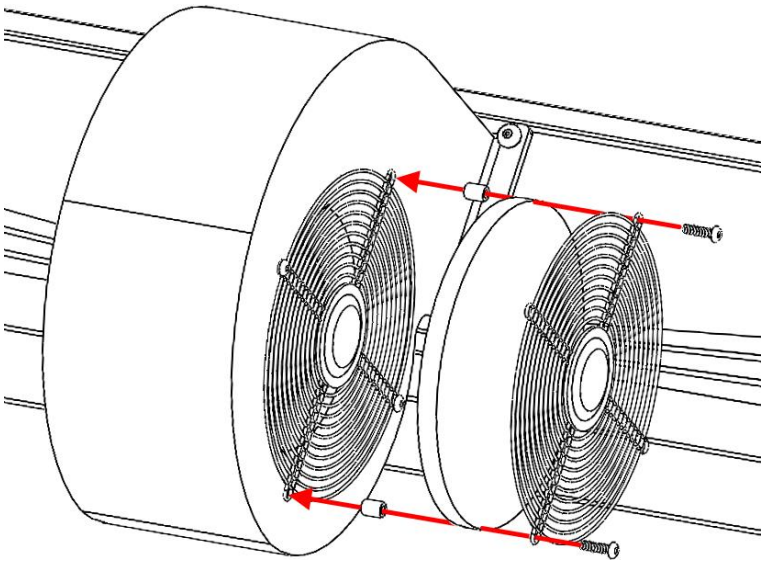


Figure 9.2.2. Place the new pre-filter disc over the first fan guard and reattach the second using the spacers to ensure correct distance is maintained.

Additional pre-filter discs cut to size can be purchased from Ossila. Alternatively, users can purchase any pre-filter they wish, it is recommended that a minimum filter grade of F8 or F9 should be used.

9.3 HEPA Filter Replacement

The replacement of the HEPA filter should be done on a periodic basis, the system has a built-in pressure differential sensor which can monitor the change in pressure drop across the filter face. This is used as an indicator of how saturated the filter is. It is recommended that when the pressure drop across the filter has doubled the user should replace the filter. The software's in-built saturation filter shows this as a percentage value. When the filter reaches 100% saturation replace the HEPA filter by following these steps:

1. It is recommended that users wear at a minimum disposable protective glove and a FFP2 face mask while undertaking this procedure. If any hazardous materials are regularly used in the open environment within the lab extra care and suitable additional PPE should be used when handling filters due to them acting as an accumulator.

2. Turn off the power to the system ensuring that is completely disconnected.
3. Open the plenum access panel that can be found on the side of the plenum using the 2.5 mm hex key provided.

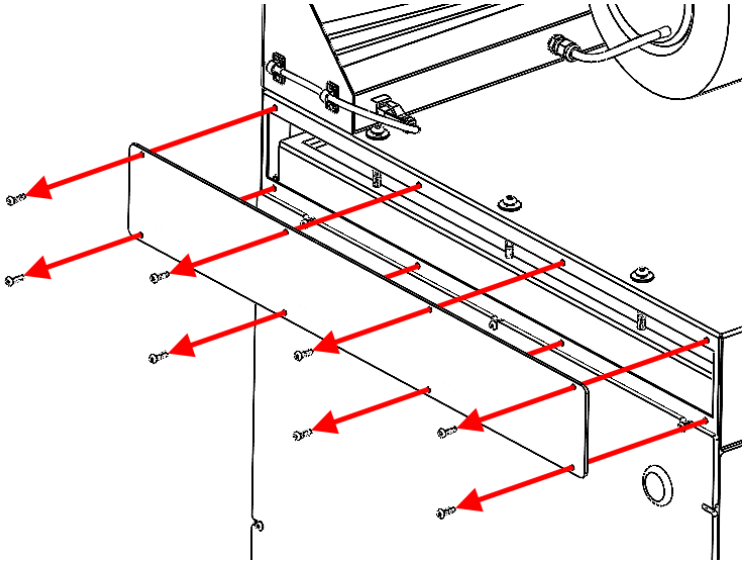


Figure 9.3.1. Remove the filter access panel on the side of the plenum.

4. Fully loosen the 6 filter clamp screws on the back of the unit using the 4 mm hex key provided

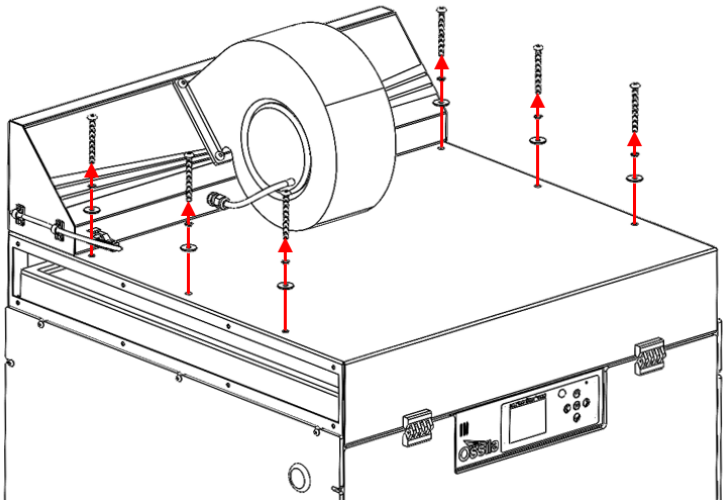


Figure 9.3.2. Loosen all clamping screw on the rear side of the plenum.

5. From the front of the unit, lift and slide the filter part way through the access opening.
6. From the side of the unit slide out the filter the remainder of the way being sure not to disturb the filter.

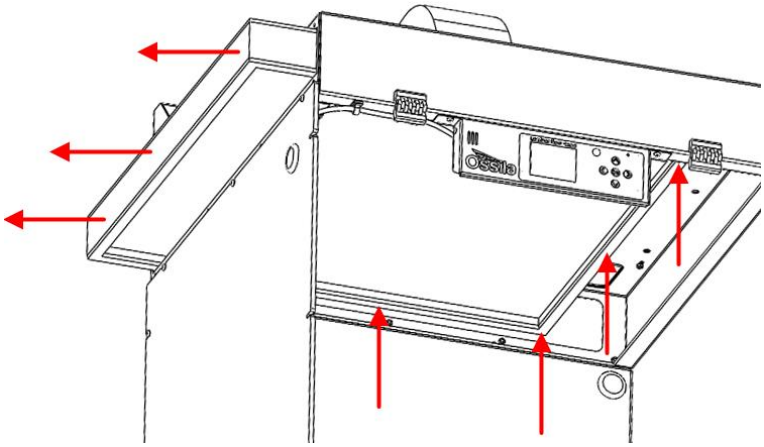


Figure 9.3.3. The HEPA filter should be lifted and slid through the cut out behind the filter access panel. This can then be removed from the side of the unit.

7. Place the filter inside of a clear plastic bag and seal it with tape. This should then be disposed of in a suitable waste stream.
8. Slide the new filter into the plenum ensuring the arrow printed on the side of the filter is facing towards the hood.

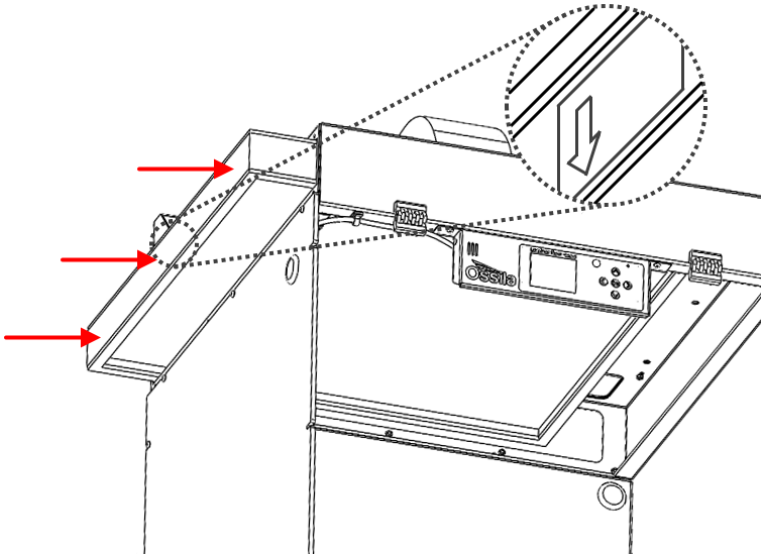


Figure 9.3.4. Slide the filter back in through the access panel cut out ensuring the arrow on the filter points towards the hood.

9. Position the filter so that the clamping screws meet the frame of the filter rather than the filter itself.

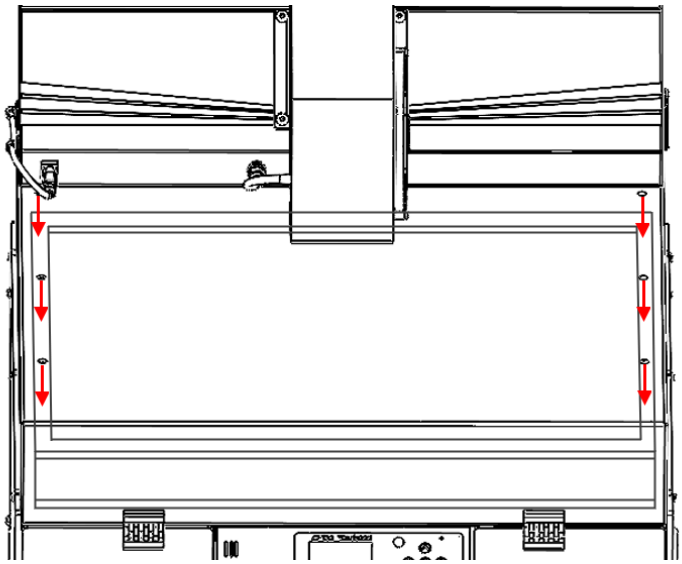


Figure 9.3.5. Align the filter so that the gasket lined frame is positioned directly below the clamp screw cut outs.

10. Tighten all the filter clamping screws fully.

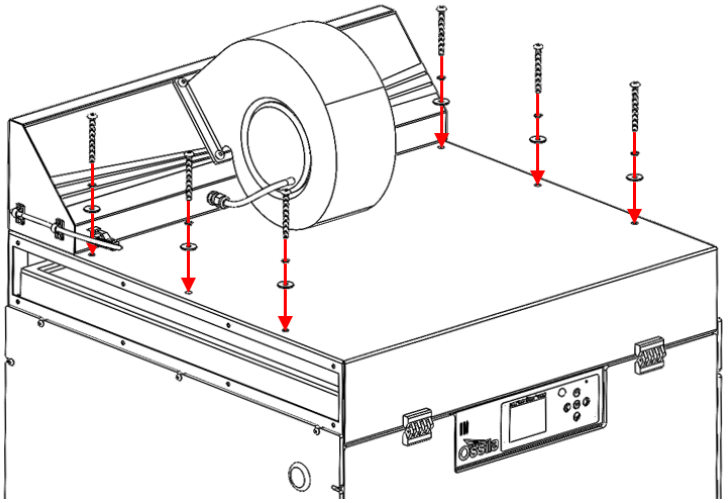


Figure 9.3.6. Screw the filter clamp screws back into the plenum, ensuring that the flat and spring washers are put in place.

11. Place the plenum access panel back onto the plenum.

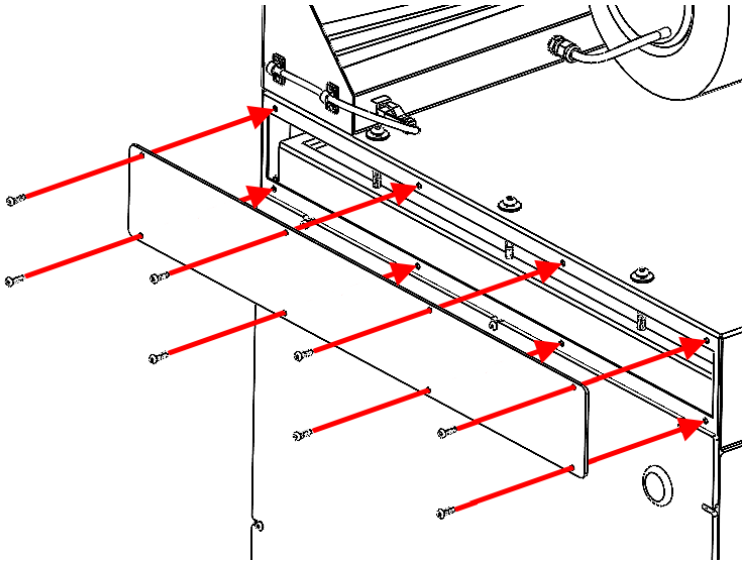


Figure 9.3.7. Screw the filter access panel back in place.

12. Turn on the unit and navigate to the filter replacement in the settings.
13. The unit will then run through a preconditioning cycle of the filter, record the initial pressure drop across the filter and set the estimated saturation pressure drop for the filter.
14. Once this is done the system is ready to use again.

Replacement HEPA filters can be purchased from Ossila. Alternatively, users can purchase HEPA filters from other suppliers, the dimensions should be 610mm x 610mm x 50mm and should be either H12 or H13 grade HEPA filters.

9.4 Repair and Service

There are no user-serviceable parts in this unit except for the fuse, and filters. If the unit is faulty, return it to Ossila Limited. Our service department will promptly quote to repair any faults that occur outside the warranty period.

9.5 Storage Conditions

The Laminar Flow Hood should be kept in dry conditions; away from direct sources of heat or sunlight, and in such a manner as to preserve the working life of the instrument.

10. Troubleshooting

Problem	Possible cause	Action
No power / display	a.) The power switch on the unit is in the OFF position.	a.) Check the connection and ensure the power is turned ON.
	b.) The power supply may not be connected properly.	b.) Ensure the unit is firmly plugged in to the power supply, and the plug is firmly connected to both the adapter and the working power socket.
	c.) The fuse on the rear panel has blown.	c.) Ensure the unit is unplugged. Check the fuse on the rear panel. If it has blown, replace with a suitably rated 1A slow blow fuse.
	d.) Fault on circuit board.	d.) Please contact Ossila for information.
Power but fan does not operate	a.) Software is not correctly turning on the fan.	a.) Turn the unit on and off again and attempt to start the motor again.
	b.) Wrong voltage being used.	b.) If unit is being operated in a country with 110V power supply a step-up transformer should be used. If a step-up transformer is being used ensure that is correctly set to 220V
	c.) Cable connection or motor fault	c.) Please contact Ossila for information.
Low Plenum Pressure	a.) Filter is not sealing properly.	a.) Ensure all screws on the rear are fully tightened and that the filter is flush against the filter stops in the plenum.
	b.) Plenum – Baffle mating is not sealed correctly.	b.) Using your hand, while the motor is turned on run it across the areas where the two parts meet to check for any air currents. If any are present reseat the plenum and baffle.
	c.) Pressure sensor error.	c.) Please contact Ossila for information.