LAMINAR FLOW CABINET
USER MANUAL
HORIZONTAL TYPE:

OPTIGEL
9 - 12 - 18

ADS LAMINAIRE S.A.: 34 Rue Maurice de Broglie – ZI des Mardelles – 93600 AULNAY SOUS BOIS– France
Tel: +33 (0) 1 48 17 85 10 - Fax: +33 (0) 1 48 17 85 11 - E-mail:info@adslaminaire.com - Website: http://www.adslaminaire.com
Capital €80,000 - SIRET 69204043900030 - APE 2825 Z - VAT FR 65692 040 439

USER MANUAL FOR A HORIZONTAL LAMINAR FLOW WORKSTATION TYPE: OPTIGEL

Dear Sir or Madam,

Congratulations on your purchase of an ***OPTIGEL*** *horizontal laminar flow cabinet.*

This enclosure guarantees:
- a sterile working environment.
- protection of the products handled from any risk of contamination.

The OPTIGEL unit is manufactured in accordance with ***European standard ISO 14644****, which is specific to laminar flow hoods and clean rooms. This unit is intended for use in operations where it is necessary to protect the external environment during handling. It provides a working volume in ISO class 5.*

We hope you enjoy using it and remain at your disposal for any information regarding its use or technical details. Yours sincerely,

Eric FITOUSSI ***Bernard BIJAOUI***

Deputy Chief Executive Officer **Managing Director**

SUMMARY

I. PRESENTATION

Handling protection

Objective: Working in a sterile environment and product protection - Compliant with ISO Class 5 (ISO 14644 standard)

II. STRUCTURE

1. FRAME

The frame is made entirely of epoxy-coated steel and stainless steel.

The quality of the materials allows us to guarantee excellent resistance to impact, scratches and temperature variations in the environment.

Fire rating: M1.

The surfaces are perfectly smooth and extremely easy to maintain and clean with standard laboratory products.

The work area is enclosed on the sides by safety glass panels.

2. WORK SURFACE

The worktop is made of 304 L stainless steel.

3. LIGHTING

Lighting is provided by white fluorescent tubes located outside the working area, which allows all electrical components to be isolated in accordance with ISO 14644.

Lighting level of 600 to 800 lux on the work surface.

Photo of lighting tubes (light diffusion plate removed) on Optigel 18

4. CURTAINS (OPTIONAL)

Option to add a mechanical roller blind to the front. This ensures a clean working environment in standby mode.

5. BASE (OPTIONAL)

The base structure is made of epoxy-coated mild steel (or 304L stainless steel, as required).

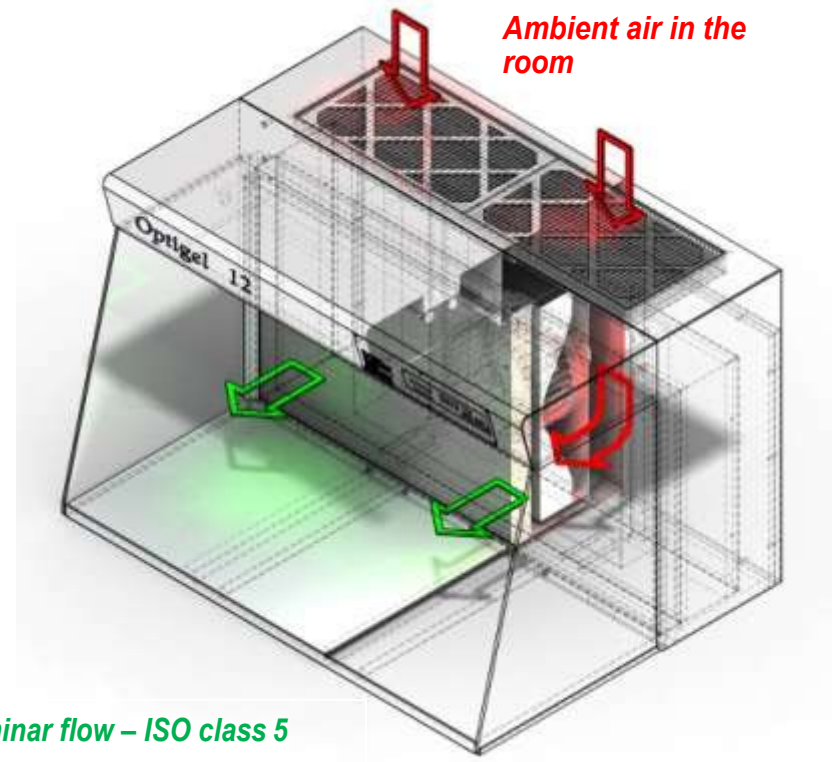
Possible additions to the base:

- Castors
- Power socket

Example of Optigel 18 on a base with 2 power sockets in a strip (1 on the right and 1 on the left)

III. OPERATING PRINCIPLE

1. PRINCIPLE DIAGRAM



Horizontal laminar flow – ISO class 5

2. OPERATING PRINCIPLE

The Optigel is a horizontal laminar flow hood designed for applications requiring protection of the products being handled when they pose no danger to the operator.

Particularly suitable for sterility testing, cell culture, pharmaceutical preparations, microelectronics assembly, optics, etc.

The horizontal laminar flow protects the work area from environmental contamination by creating an ultra-filtered environment in the work zone.

Air is drawn in through a pre-filter (G4) at the top. The air flow is propelled by the fan through an absolute filter (HEPA H14). At the outlet, the entire working volume is swept in a perfectly linear and homogeneous manner by ultra-filtered air. Thanks to its flow velocity, this laminar flow produces positive pressure compared to the surrounding environment, thus creating a barrier that prevents external particles from entering the working volume. This ensures **protection during handling**.
(see diagram above)

Filtration and overpressure therefore make it possible to achieve a working volume that complies with ISO5 class [ISO 14644: 2015).

3. AUTOMATIC FLOW RATE REGULATION

The air velocity at the outlet of the absolute filter is maintained, regardless of the clogging state of the filters, thanks to flow management by a programmable microprocessor (ECM technology) integrated into the fan.

4. SAFETY / ALARMS

To ensure maximum safety during operation, this hood is equipped with a fully automatic control system that maintains constant flow rates regardless of the clogging status of the filters.

The display on the control panel shows the remaining life of the absolute filters (100% = new filter). An audible and visual signal indicates when the HEPA filter(s) need to be changed.

Finally, the various alarms are displayed in full text (see alarms section).

5. PERFORMANCE

- **Laminar flow:**

The average speed of the horizontal laminar flow (ISO class 5) is between 0.25 and 0.5 m/s. This flow is laminar at all points (the speed does not differ from the average speed ± 20%). Thanks to the HEPA filter, class H14 (EN1822), the air quality in the working volume is higher than that required in class ISO 5 of the European standard ISO 14644, which allows up to 3520 particles with a diameter equal to or greater than 0.5µ per m^3.

- **Automatic regulation / No sensor:**

The Optigel's air handling system is provided by a variable speed centrifugal motor fan incorporating ECM technology. This technology ensures fully automatic control and maintains constant flow rates regardless of filter clogging, without the need for an external sensor (speed or pressure). **The absence of a sensor** eliminates the need for calibration and avoids measurement variations linked to climatic changes (temperature, pressure, humidity) to which sensors are sensitive. Regulation is therefore **more accurate and reliable** over time.

The display on the control panel shows the **progress of the absolute filters' life**. An audible and visual alarm indicates when the HEPA filter needs to be changed when the filter is too clogged.

A standby position ensures continuous scanning of the working volume outside of periods of activity to keep the working area clean.

- **Noise level / Power supply:**

The noise level is less than 60 dB.

The power supply is 230 V + T - 16A - 50 Hz (power consumption: 0.7 kW).

6. STORAGE AND TRANSPORT

When storing the enclosure, it is essential to cover the hood with plastic film and store it in a place that is protected from climatic variations and complies with the conditions stipulated below.

If the hood needs to be transported, it must not be subjected to any impact. After each move, it is strongly recommended that the installation be checked again.

7. CONDITIONS OF USE

The environmental conditions must be complied with in order to ensure proper operation of your OPTIGEL:
Ambient temperature: +5°C to +40°C.
Humidity: 30% to 95%.

The OPTIGEL must not be installed near an open window, under a vent or in a draught.

Press the "ON/OFF" button to start the Optigel.
If no password has been programmed, the device will start immediately. If a password has been programmed (factory setting), you must enter it first. *(Code 0001)*

IV. FILTRATION

The **OPTIGEL** unit is equipped with two filtration stages: a pre-filter and an absolute filter.

1. PREFILTER

A synthetic fibre pre-filter filters out the largest particles. G4 efficiency.
Lifespan: 3 to 6 months depending on use of the unit.

Photo of pre-filters on Optigel 18

2. ABSOLUTE FILTER

A panel-type H.E.P.A absolute filter with a minimum efficiency of 99.999% for particles of 0.3µ, DOP test (H14 classification) guarantees a perfectly sterile laminar flow, ISO class 5 (according to ISO 14644-1):

- aluminium filter frame
- fibreglass filter media
- epoxy-coated steel protective grille

Service life: 3 to 5 years depending on use. The efficiency certificate can be provided on request.

Photo Absolute Filter on Optigel 12

Photo of Optigel 18 (2 Absolute Filters)

3. FILTER MAINTENANCE

The dimensions of the filters comply with international standards.

The absolute filter can be accessed by detaching the rear panel of the work enclosure, and the pre-filters are located above the enclosure and can be accessed without a ladder.

The display on the control panel indicates the remaining life of the absolute filters. An audible and visual signal indicates when the HEPA filters need to be replaced.

V. VENTILATION

This unit is equipped with high-efficiency variable centrifugal motor fans mounted on shock absorbers. The ECM version guarantees **a constant flow rate** despite clogging of the absolute filters and low noise levels.

The on-board electronics simplify the management of information relating to alarms and possible faults. **Automatic regulation of the constant flow rate** is achieved by simple programming, using a **microprocessor** that analyses three parameters (intensity, torque, engine speed) to find the balance point corresponding to the required flow rate in relation to the pressure drop.

Automatic regulation compensates for clogging by increasing the air flow rate. This maintains ISO class 5 (according to ISO 14644 – speed between 0.25 m/s and 0.5 m/s) in the working volume.

All motors are protected in accordance with electrical safety standards. The earthing of all electrical parts and all electrical masses complies with regulations.

DF 280 ECM fan

Advantages

- Low consumption: reduced by 30 to 40% compared to conventional fans
- Very high efficiency of 80% for a continuously powered fan (compared to 40% for a conventional asynchronous motor fan)
- Low temperature rise
- No sensor (speed or pressure) to regulate flow: no calibration issues related to measurement variations or climatic changes (temperature, pressure, humidity) to which sensors are sensitive.
- Very high accuracy
- Low noise level

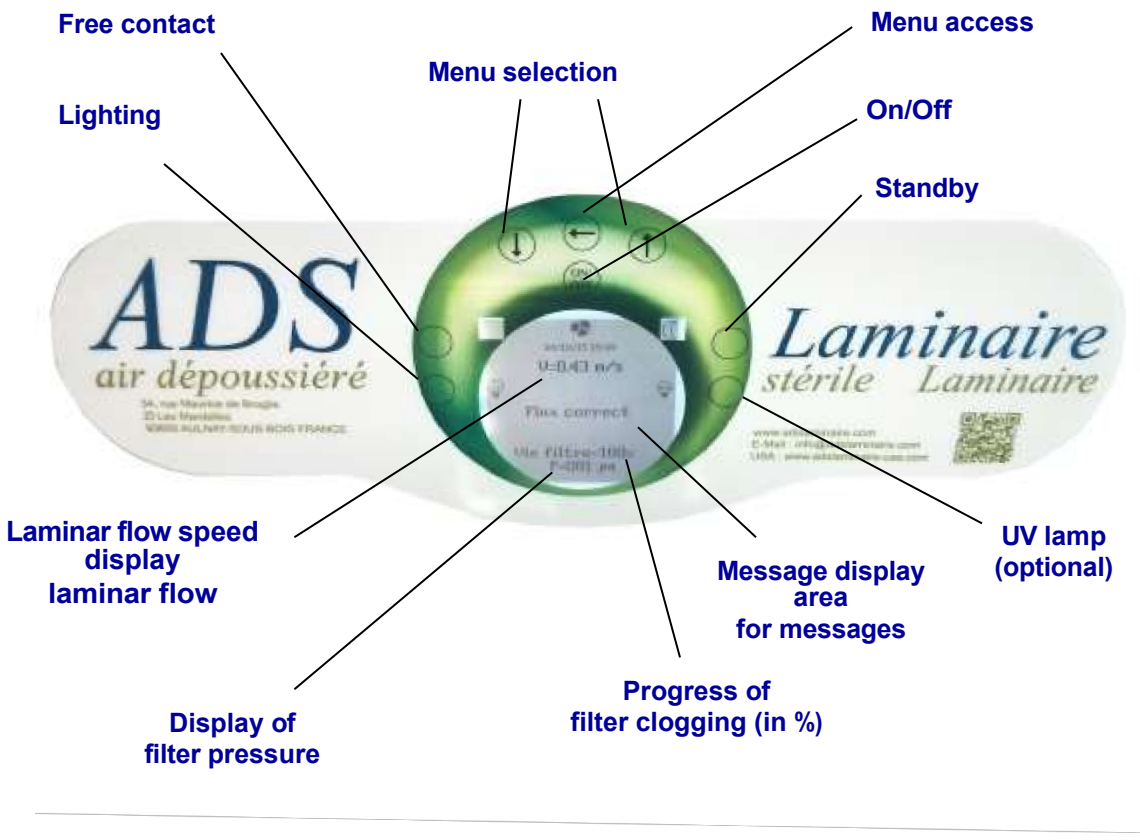
VI. CONTROL PANEL

1. PRESENTATION

This control panel offers significant technical innovations:

- Built-in backlit graphic display
- Real-time display of flow rates, pressure and throughput
- Real-time display of consumable status (absolute filters, UV lamp depending on model)
- Icon-based controls
- Scrolling text display of various alarm messages
- Future updates via computer
- Password lock for different modes
- Multilingual menu and display
- Automation of procedures (standby, start-up, etc.)

2. CONTROL PANEL



3. CONTROLS

- *On/Off*: Turns the unit (i.e. ventilation) and all functions on or off. Allows you to exit a menu or cancel an action.
- *Standby:* Switching from normal mode to standby mode and vice versa
- ↕ *:* Used to navigate through the menu, select an option or scroll through characters.
- ⇦ *:* Enter button. Used to enter a menu or submenu, or to confirm an action or selection.
- *Lighting:* Turns the main lighting on/off.
- *UV* (optional): Turns the UV lamp on/off (optional).
- *Free contact:* Opens and closes a free contact on the power board designed to connect an accessory (solenoid valve, electrical socket, etc.).

4. START-UP:

Press the ON/OFF button to start up the Optigel.
If no password has been programmed, the device will switch on immediately.
If a password has been programmed (factory setting), you must enter it first.

The factory default password is "0001". It can be changed in the Menu.

The screen will display "Wait" until the flow reaches a minimum speed.

To switch off the hood, follow the reverse procedure:

Press the ON/OFF button.
If no password has been programmed, the appliance will switch off immediately.
If a password has been programmed (factory setting), you must enter it first. The factory-set password is "0001". It can be changed in the Menu.
The ventilation and light switch off.

5. STANDBY MODE:

Between uses, it is strongly recommended not to switch off the ventilation system, as this would compromise the cleanliness of the working area. It is recommended to keep the hood in standby mode, i.e. a minimum ventilation flow is maintained, thus ensuring that the area remains clean when not in use. It is then advisable to fit the cover.

To switch to standby mode, press the button for 2 seconds. Standby mode is activated as soon as the moon icon turns dark.
If no password has been programmed (factory setting), standby mode will activate immediately.

If a password has been programmed, you must enter it first.

The flow rate decreases and the light turns off. In standby mode, the light can be turned back on if necessary.

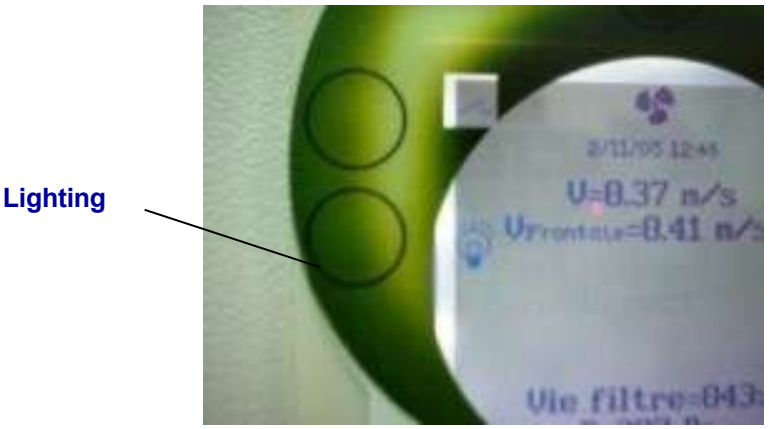
After a few seconds, the flower logo appears in standby mode and the air flow automatically decreases to the programmed value.

To return to working mode, follow the reverse procedure:

Press and hold the button for 2 seconds (as shown on the screen). The ventilation increases until it reaches operating speed.

6. MISCELLANEOUS FUNCTIONS:

- ***Lighting***: Press the lighting button to turn it on or off. When the lighting is on, small rays appear on the screen logo.



- ***UV (optional)***: Press the UV button to turn the UV lamp on or off. The UV lamp can only be turned on in Standby mode. If the device is in normal mode, the message "Standby mode for UV" appears.

When the UV lamp is on, small rays appear on the screen logo.

- ***Free contact***: Press the "Free contact" button to close or open the free contact (solenoid valve, electrical socket, etc.).

7. ALARMS

Alarm messages, coupled with an **audible alarm,** warn the user of an anomaly during operation and thus prevent prolonged use in the event of an incorrect flow.

The various alarm **messages** that can be displayed on the "flower" panel are:

- Start-up alarm: the alarm stops once normal operating parameters are reached (flow rate)

- Clogging alarm: When the filters are clogged, the following message appears: "**Filter Clogged**"

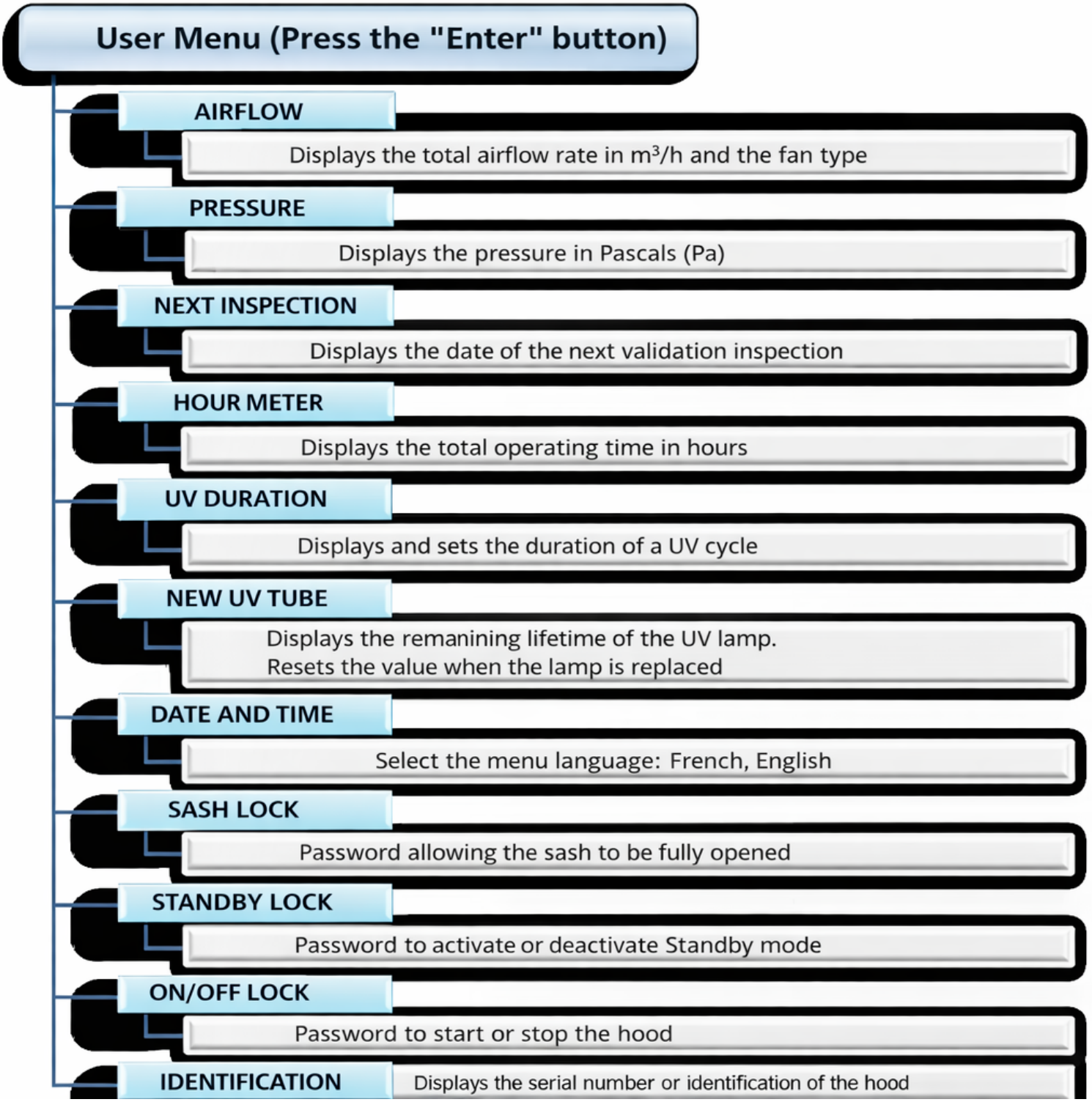
- Incorrect flow alarm: If the flow rate is outside the normal range, one of the following messages appears: "**Speed too** low" or "**Speed too high**"

- Ventilation alarm: If the fan is out of service, the following message appears: "**Ventilation fault**".

- ***Validation Alarm***: If the hood's validation date has passed (based on a one-year cycle), the message "schedule inspection" appears. (There is no audible alarm.)

NOTE: A predefined 4-digit numerical code can prevent the hood from going into standby mode and/or switching off.

8. USER MENU: FLOWCHART



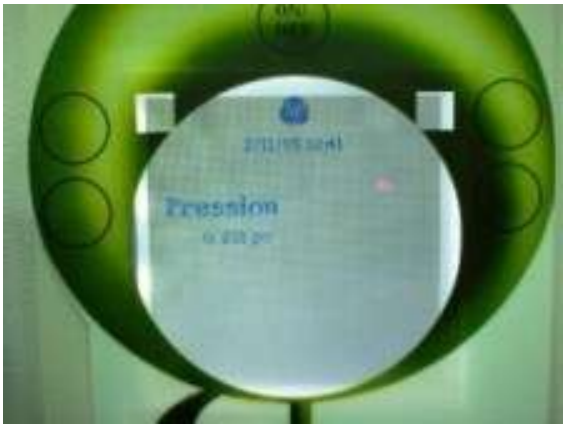
9. SETTINGS

Flow rate:

Displays the flow rate in m^3/h.

Pressure:

Displays the pressure in Pascals.



Next inspection:

Displays the date of the next validation check.

Hour Meter:

Displays the total duration of use of the hood.

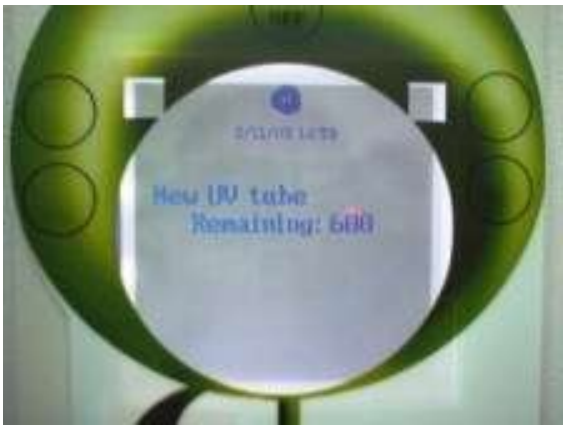
UV Duration (Option):

Displays the duration of the UV lamp ignition cycle, after which the UV lamp switches off automatically.

New UV Tube (Option):

Displays the remaining life of the UV lamp.

Allows you to reset this counter when changing the UV tube.
(Manufacturer password required)



Date & Time:

Allows you to change the date and time

Menu language:

Change the menu language:

French or English

Standby Mode Lock:

Allows you to enter a password to lock the device in sleep mode.

This password will be required to enter or exit Standby mode.

The setting "0000" means that no password will be required (factory setting).

To change the password, you must first enter the old password, then the new one.

Power Lock:

Allows you to enter a password to lock the On/Off procedure.

This password will be required to switch the hood on or off.

The setting "0000" means that no password will be requested.

To change the password, you must first enter the old password, then the new one.

The factory setting is 0001.

Identification:

Displays the serial number and/or model of the hood

VII. TECHNICAL DATA

	OPTIGEL 9	OPTIGEL 12	OPTIGEL 18
Useful width (mm)	910	1225	1820
Height (mm)	945	1245	1845
Useful height (mm)	575 - 620		
Height H T (mm)	813 (excluding base) 1663 (including base)		
Useful depth Worktop (mm)	570		
Depth H T (mm)	916		
Flow rate (m^3/h)	750	1000	1500
Fan type	DF 280 ECM		DF 280 ECM x2
Absolute filter (supply air)	M14-69-250-A-P, Quantity: 1	M14-612-250-A-P, Quantity: 1	M14-69-250-A-P, Quantity: 2
Pre-filter	W0412202C, Quantity: 1	W0412202C, Quantity: 2	W0412202C, Quantity: 3
Lighting	(18 W), Quantity: 2		
Noise level	< 60 dB according to European standard		
Power supply	Mono 220 + T 16 A 50 Hz		
Maximum power	500 W		< 1 kW
Illuminance level	600 to 800 lux		
Weight	Approximately 90 kg	Approximately 100 kg	Approximately 150 kg

ADS Laminar reserves the right to change the references of certain OPTIGEL components.

VIII. EQUIPMENT

1. STANDARD EQUIPMENT

The standard equipment for Optigel horizontal laminar flow hoods is as follows:

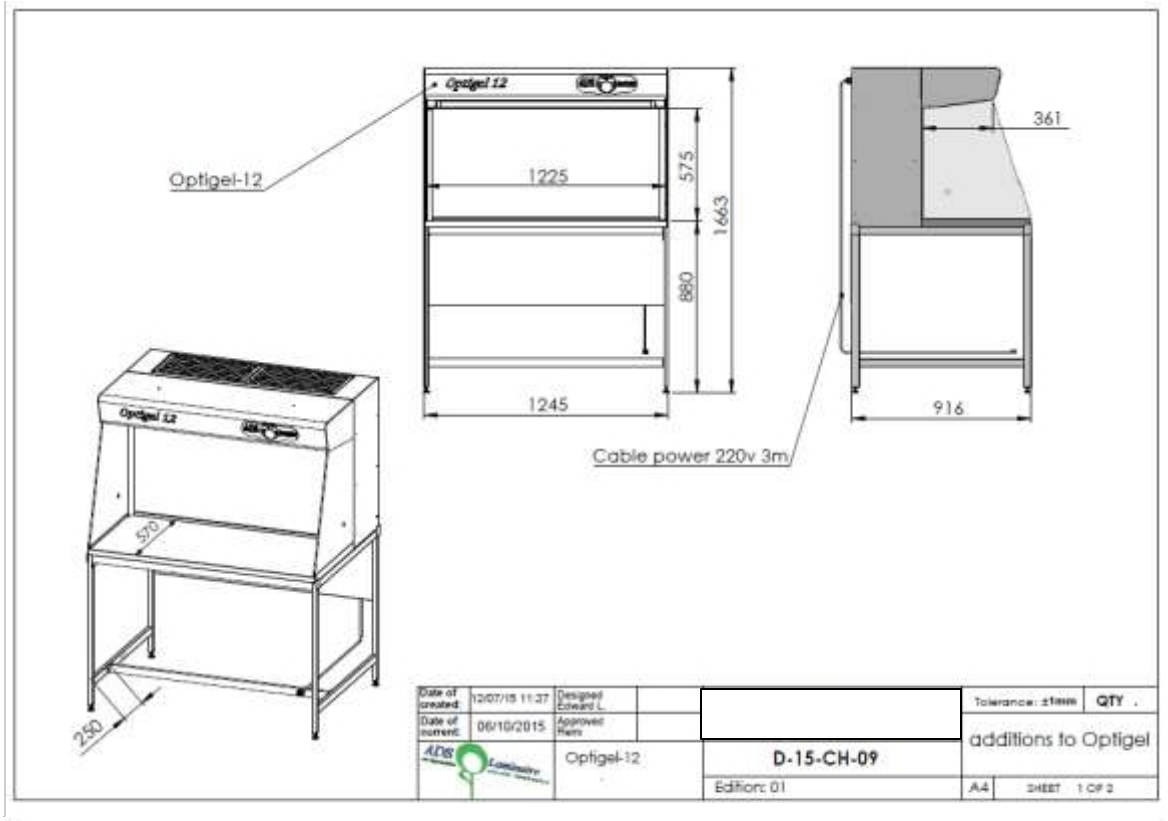
- Control panel (with standby mode)
- White fluorescent tube lighting (600 and 800 lux)
- Glass walls
- 304L stainless steel worktop
- Filtration (2 stages: Pre-filters and HEPA filter)
- ECM control

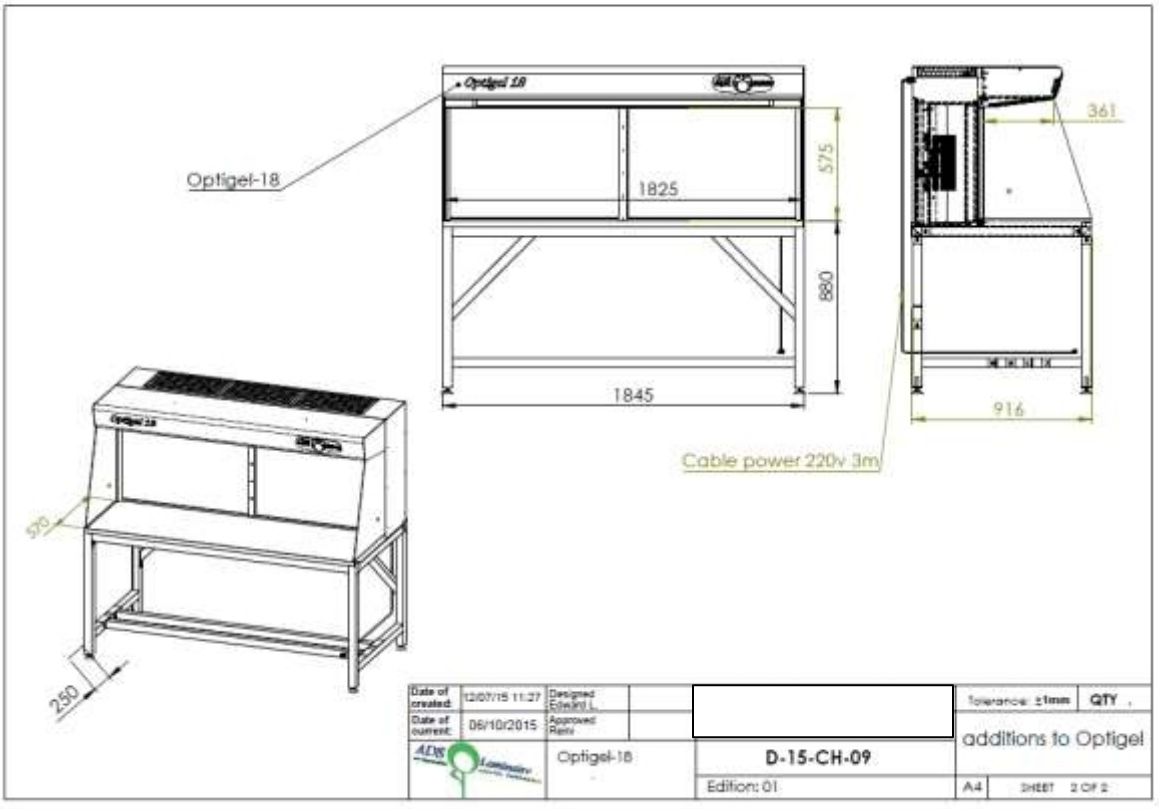
2. AVAILABLE OPTIONS

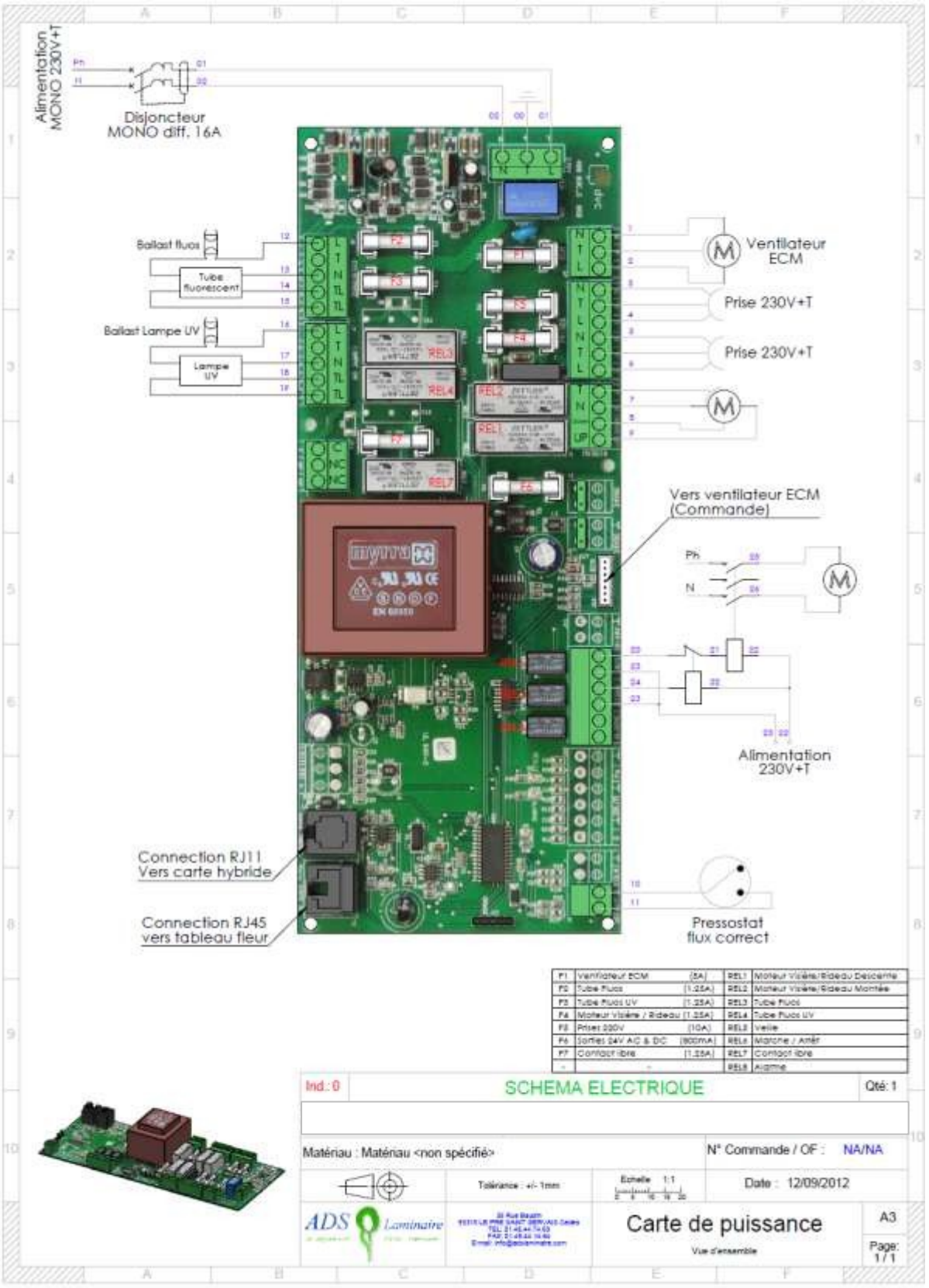
Other equipment is available as an option:

- Painted steel base (on jacks or with castors)
- Mechanical roller blind
- Fluid passage (air, gas) with tap
- Non-ionising lighting
- Power socket (on base)
- UV lamp
- Suspension bar for nutrition bags

IX. STANDARD PLANS






Alimentation MONO 230V+T
Disjoncteur MONO diff. 16A
Ballast fluos
Tube fluorescent
Ballast Lampe UV
Lampe UV
Ventilateur ECM
Prise 230V+T
Prise 230V+T
Vers ventilateur ECM (Commande)
Alimentation 230V+T
Connection RJ11 Vers carte hybride
Connection RJ45 vers tableau fleur
Pressostat flux correct
F1 Ventilateur ECM (5A) REL1 Moteur Visière/Rideau Descente
F2 Tube Fluos (1.25A) REL2 Moteur Visière/Rideau Montée
F3 Tube Fluos UV (1.25A) REL3 Tube Fluos
F4 Moteur Visière / Rideau (1.25A) REL4 Tube Fluos UV
F5 Prises 230V (10A) REL5 Veille
F6 Sorties 24V AC & DC (800mA) REL6 Marche / Arrêt
F7 Contact libre (1.25A) REL7 Contact libre
REL8 Alarme
Ind.: 0
SCHEMA ELECTRIQUE
Qté: 1
Matériau : Matériau <non spécifié>
N° Commande / OF : NA/NA
Tolérance : +/- 1mm
Echelle 1:1
Date : 12/09/2012
Carte de puissance
Vue d'ensemble
A3
Page: 1 / 1

X. MAINTENANCE

1. CLEANING THE WORK VOLUME

Laminar flow hoods must be cleaned **after each use and before being placed on standby**.

While cleaning the working area (**excluding the exhaust filter**), leave the hood in normal operation.

Use large non-woven or disposable cloths that are preferably ISO 5 compatible (e.g. ADS ref: 7–C30L–99L–00). This type of cloth is large enough and lint-free (or non-shedding) to guarantee ISO 5 compliance. (**Our PPE/Utilities department is available to advise you and direct you to the best product**).

Impregnate the cloth with a bactericidal and fungicidal cleaning product. All alcohol-based products are compatible with the structure of the hood (e.g. impregnated wipes: ADS ref: 6LS7030). You can also spray the walls of the enclosure (do not spray the filter).
Clean all accessible parts using circular movements with the impregnated cloth.

Avoid:
- Using chlorine-based products such as bleach on any stainless steel parts unless they are highly diluted.
- The use of alcohol-based products or solvents is not recommended on Plexiglas parts.

2. FILTRATION

Refer to Chapter XI: Maintenance in this booklet.

XI. MAINTENANCE

ADS Laminaire has designed the **OPTIGEL** unit to be easy to maintain.

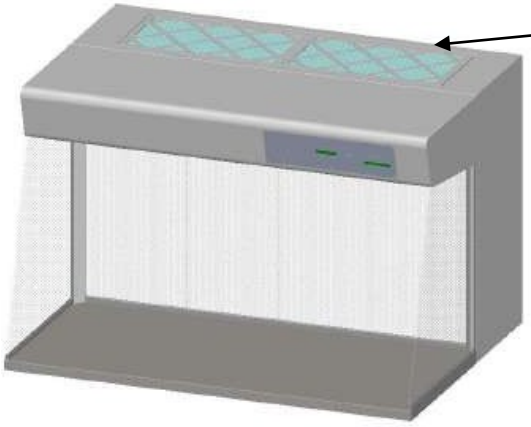
1. PREFILTER

The pre-filter is located above the enclosure.

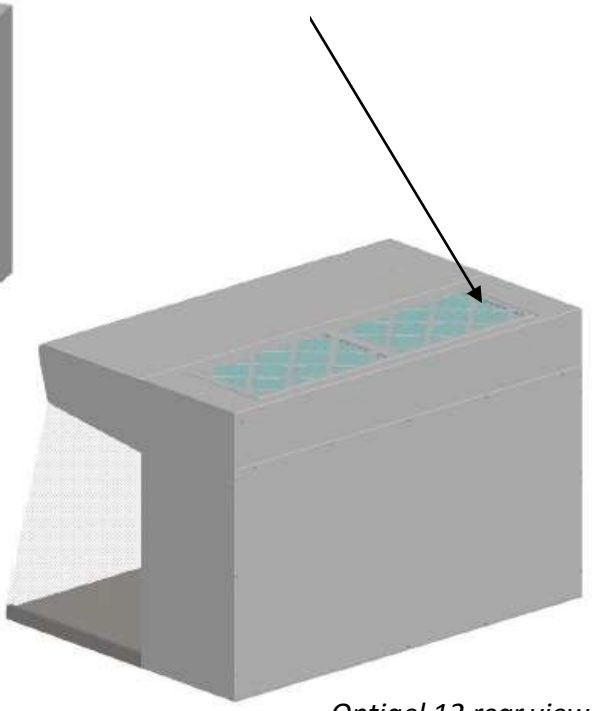
Remove the used pre-filter and install the new pre-filter. Average

service life: 3 to 6 months.

Visually check for clogging.



Optigel 12 front view



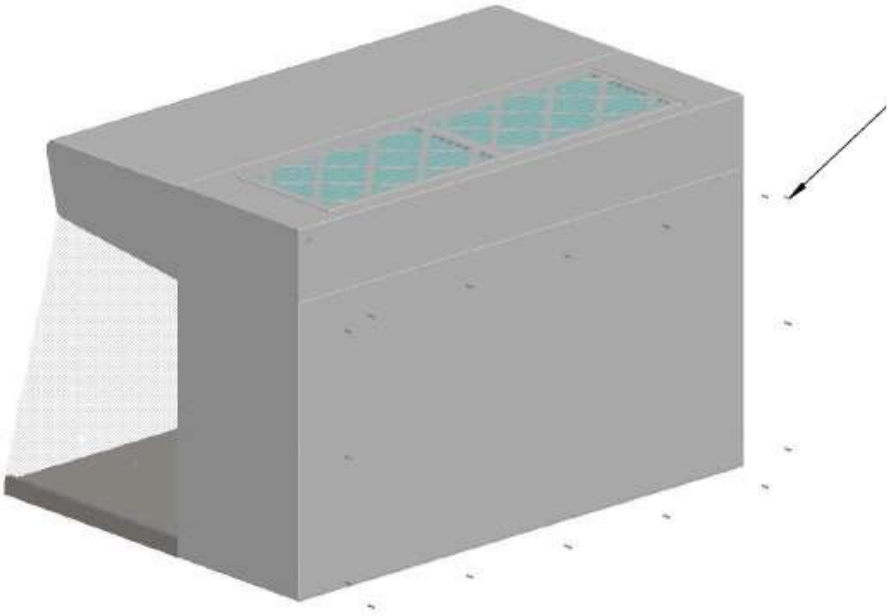
Optigel 12 rear view

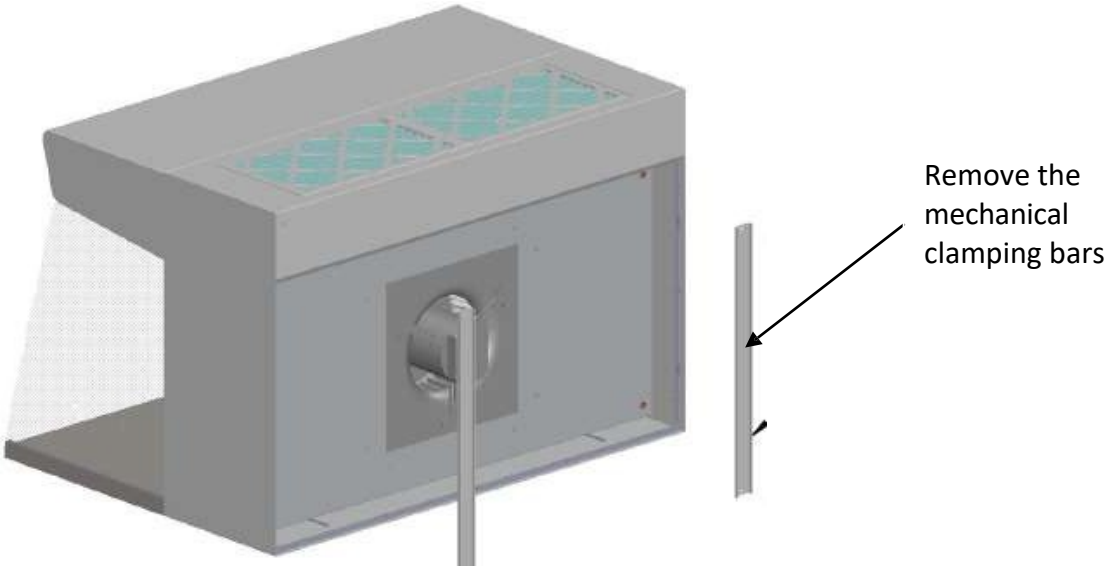
2. ABSOLUTE FILTER

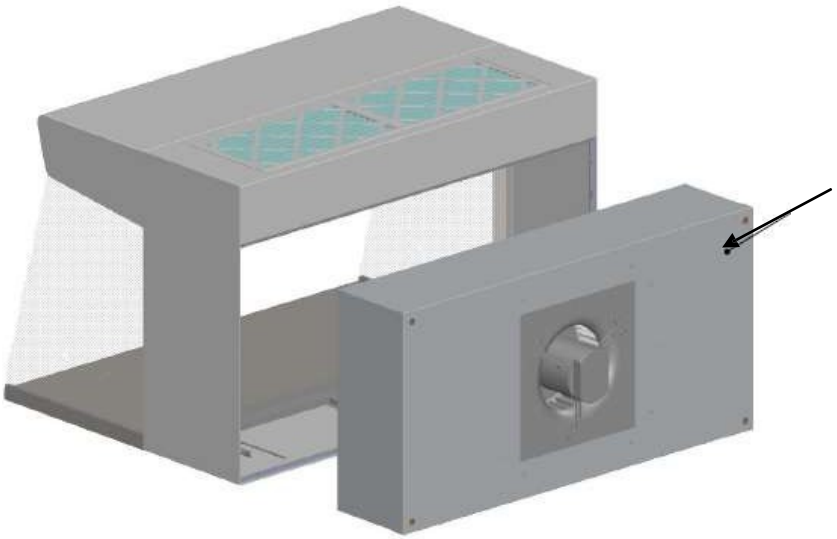
As soon as the filter life display falls below the 10% threshold, replace the HEPA filters.

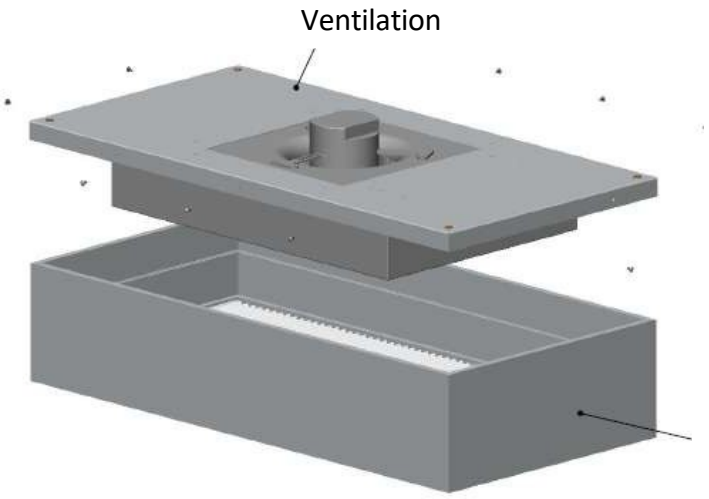
The absolute filter is attached to the FANJET-type housing. Maintenance of the absolute filter is facilitated by detaching the rear housing from the working chamber.

On average, HEPA filters have a service life of approximately 2 to 5 years, depending on conditions of use.









Replace the absolute filter (reference: see section VI. Technical Data in t h i s booklet)

Reinstall the Fanjet filter box, replace the mechanical clamping bars and the plate. Then check the Optigel

IMPORTANT

- **Absolute filter replacement operations must be carried out by a qualified technician and must be followed by a validation check of the enclosure**
- **In the event of replacement, relocation or prolonged shutdown of an enclosure, a validation check must be carried out by a qualified technician before it is restarted.**

3. MOTORISED FANS

Maintenance-free.

4. FLUORESCENT LIGHTING

Direct access from the work area, behind the Plexiglas plate.

XII. PERIODIC INSPECTION CONTRACT

To ensure that your OPTIGEL enclosure is used in optimal conditions, we have drawn up a periodic inspection contract for you, which can be carried out by our after-sales service.

This contract commits our company, ADS LAMINAIRE, to carry out inspection and monitoring visits to your hood at intervals defined with your establishment and agreed upon by mutual consent.

This maintenance contract includes:
- the deployment of our technical service (as part of a tour).
- checking connections and contactors.
- Particle counting in the working volume to verify compliance with ISO class 5 standard ISO 14644-1.
- scanning the filter and its joint surface with a particle counter to verify the integrity of the filter surface.
- Speed mapping and calibration of its display (flower chart).
- Restarting the hood.
- Sending of the inspection report.

To ensure compliance with ISO 14644, we can offer you a contract that includes two annual visits.

ADS LAMINAIRE will repair and/or replace defective parts and filter elements if it deems necessary, and after agreement, to ensure the proper functioning of the equipment until the next scheduled visit under the contract.

Three-month warranty on spare parts replaced by us during the service call.

Your maintenance contract is available upon request. Please do not hesitate to contact your ADS LAMINAIRE representative.

XIII. WARRANTY AGREEMENT

The OPTIGEL speaker is covered by a 1-year warranty on parts and labour (in mainland France, BENELUX and Switzerland) for any manufacturing defects (excluding consumables).

WARRANTY TERMS AND CONDITIONS:

- During the warranty period, the customer will benefit from free parts and labour in the event of a breakdown (in mainland France).

- The warranty does not apply to consumables that need to be replaced.

- The warranty does not cover:
  - In the event of damage resulting from misuse or lack of maintenance (failure to follow instructions) or damage resulting from external causes (theft, water damage, fire, falls, etc., see your establishment's insurance policy).
  - In the event of external intervention, other than by ADS LAMINAIRE, during the warranty period.

OPTIGEL is certified compliant with ISO 14644; under no circumstances can ADS Laminaire be held liable for changes in standards taken into account at the time of construction of the hood.

XIV. TO DEAL WITH UNFORESEEN EVENTS

1. MALFUNCTIONS:

If the appliance malfunctions, it is possible to reset the system. The procedure is as follows:

- Press the "up" and "down" buttons simultaneously for 3 seconds
- The settings are reset to factory defaults.

2. NO POWER

Check that the speaker is plugged into a 220 V + T single-phase power outlet. Check the circuit breaker located under the lighting cover plate.

3. NO LIGHTING

Replace the fluorescent light bulb.

Please do not hesitate to contact your ADS LAMINAIRE representative for any incidents on: 01.48.17.85.12.