



Tools for data recovery experts

Guide for using HddSurgery™ Horizontal Laminar Flow Cabinets:

■ HDDS Horizontal Laminar Flow Cabinet M

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1. Introduction

Thank you for purchasing the HddSurgery Horizontal Laminar Flow Cabinet M. Please read this manual thoroughly to familiarize yourself with the many unique features which distinguish this product from the others.

HddSurgery has gone a step further, optimizing and improving the standard form of a Horizontal Laminar Flow Cabinet, implementing various features engineered specially for the use in the area of Data Recovery.

Anyone working with, on or around this equipment should read this manual. Failure to read, understand and follow the instructions given in this documentation may result in damage to the unit and poor equipment performance.

2. HddSurgery™ Horizontal Laminar Flow Cabinet M

HddSurgery™ **HHDS Horizontal Laminar Flow Cabinet M** is one of many steps that HddSurgery has taken in order to cover all the possible aspects of the daily needs of Data Recovery engineers. This time, HddSurgery advances into a new field, providing the adequate working environment, improving the quality of the work surroundings and thus increasing the success rate of Data Recovery activities.



Picture 2.1. - HddSurgery™ Horizontal Laminar Flow Cabinet M

Our company has a strong opinion on the use of the Laminar Flow Cabinets and Clean Rooms as the only suitable work environment for Data recovery procedures which are performed on open drives. Security of data always come first, and we feel that this is of utmost importance for the success of these operations. With this in mind, HddSurgery has stepped into a completely new area, trying to improve and adjust the Laminar Flow Cabinet design for the use in Data recovery purposes.

HddSurgery Horizontal Laminar Flow Cabinet M incorporates all the standard features of an ordinary Laminar Flow Cabinet, enhanced with several Data recovery oriented aspects. Our engineering team has accented the design and the visual appearance of this product, while maintaining the ergonomic requirements.

3. Product Overview

3.1. Quick Views

3.1.1. Horizontal Laminar Flow Cabinet M - Front/Back view



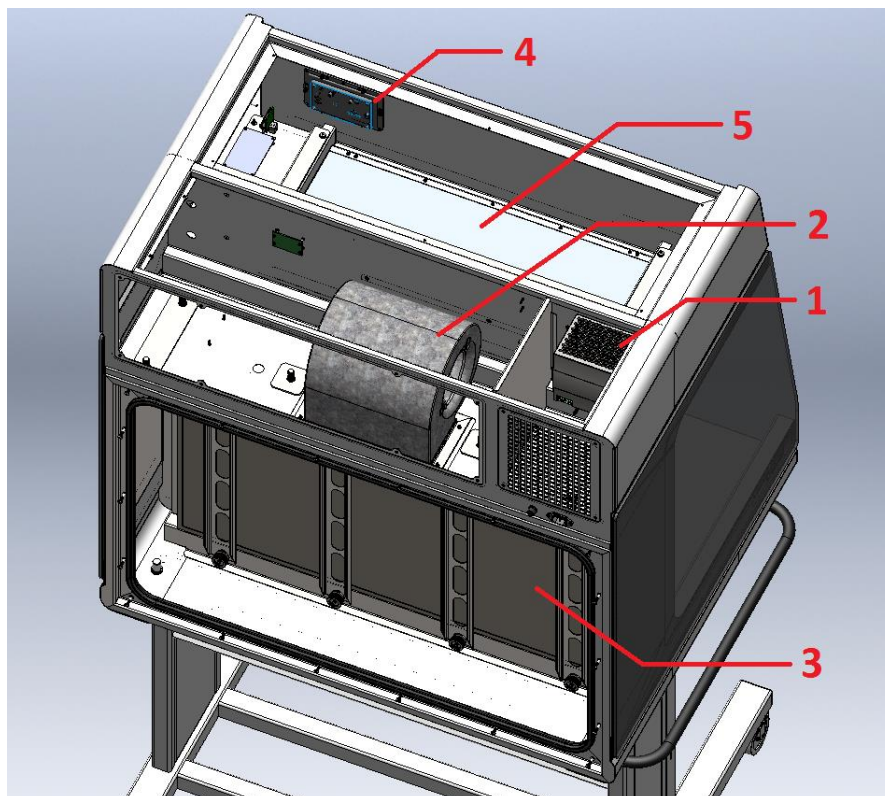
3.1.2. Front panel View



1 - Power on/off switch

2 - Touch screen

3.1.3. Back Isometric View



1 - Power Supply

2 - Blower

3 - HEPA Main Filter

4 - Touch Screen

5 - LED panel

3.1.4. - Air flow chart in HDDS Horizontal Laminar Flow Cabinet M



Arrows depict the flow of air getting sucked in through the pre-filter into the blower, and blown through the main filter to the work area, creating a volume of air moving in a laminar fashion.

4. Product Specifications

Physical Dimensions:

Height: 1625mm

Width: 950mm

Depth: 780mm

Weight: 144kg

Work Area Dimensions:

832,60 x 646,30 x 520mm

Work table height: 700mm

Airflow

0.3 - 0.5m/s airflow velocity

Filter Specifications

Pre-Filter: Polyester fibers with 85% arresstance

Main Filter: TROX™ HEPA Filter, H13, with >99,995% efficiency according to EN 1822

Size: 820x520mm

Cabinet Lighting: : LED light panel 595x295mm, 4000K, up to 1950lx

Noise: ≤70dB

Side Windows

Construction Tempered Parsol Glass

Visible Opacity: Semi-Transparent

UV Opacity: UV Absorbing

Color: Green Tint

Construction

Color: Matte-White powder coated steel frame

Work Surface: Stainless steel

Other Features

Blower: Ebm-Papst™ external rotor motor, permanently lubricated, low noise and vibration levels

Electrical Controls: All controls are being handled via the touch screen

Monitoring: Air Pressure, Temperature, Humidity, Filter Clogging

Two MOLEX® ports with overload protection with retry
Electrical characteristics: 5V 2.5A, 12V 2.5A
Stopwatch function
Auto Turn-off function
HEPA filter functionality test
Work hour statistics

5. Product Features

HddSurgery Horizontal Laminar Flow Cabinets incorporate Ebm-Papst™ permanently lubricated direct drive centrifugal blowers. The energy efficient design reduces operating costs and has extremely low noise and vibration levels.

In order to be able to generate a laminar flow of air within the work area, HddSurgery Horizontal Laminar Flow Cabinets M needs to maintain airflow velocity in a scope of 0.3 - 0.5m/s, measured 150mm from the filter with an uniformity of +/- 10% across the filter face. This face velocity is in compliance with USA and international standards for safety and performance.

The HEPA filter used in HddSurgery Horizontal Laminar Flow Cabinets M belongs to class H13, has its performance data tested to EN 1822 and meets the hygiene requirements of VDI 6022. The filter can be easily replaced using common tools.

HddSurgery Horizontal Laminar Flow cabinets M are equipped with several sensors which monitor various parameters including:

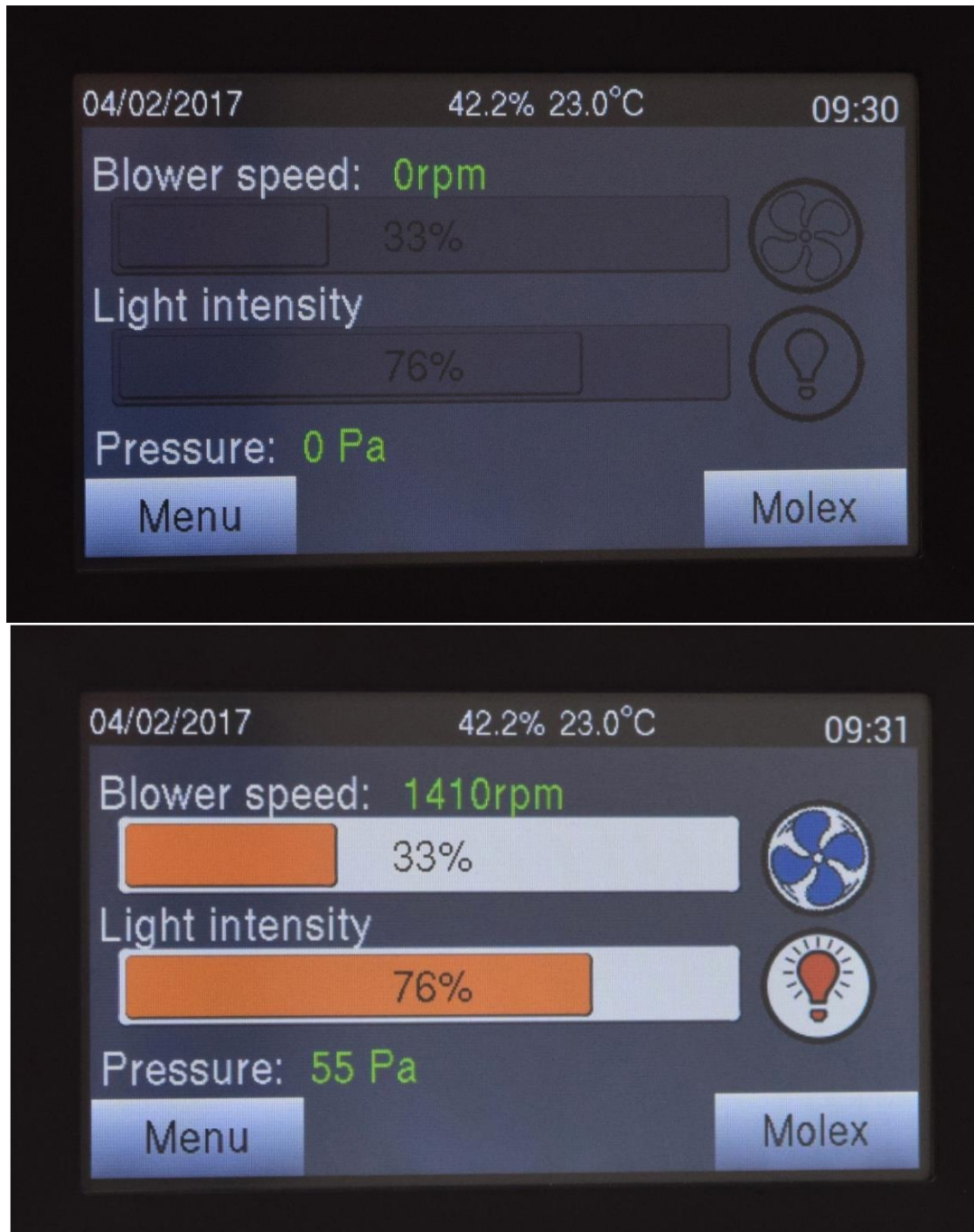
- Temperature
- Moisture
- Air pressure
- Filter clogging

As a special addition towards the field of Data recovery, HddSurgery Horizontal Laminar Flow Cabinets M are equipped with two MOLEX connectors, enabling the user to plug in hard drives inside the cabinet's workspace in order to gain further on-site diagnosis of the possible hard disk drive failures.

The cabinet also has a few features which help keep track of the work hours spent, an Auto Turn-off function and a stopwatch function.

6. User Guide

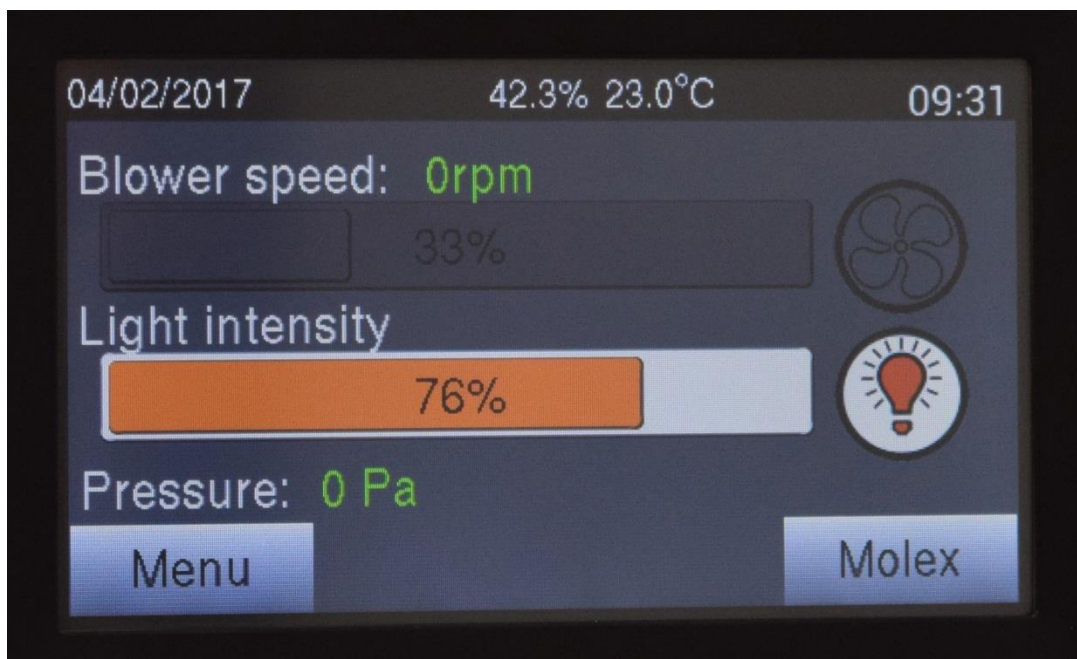
6.1. Touch Screen Controls



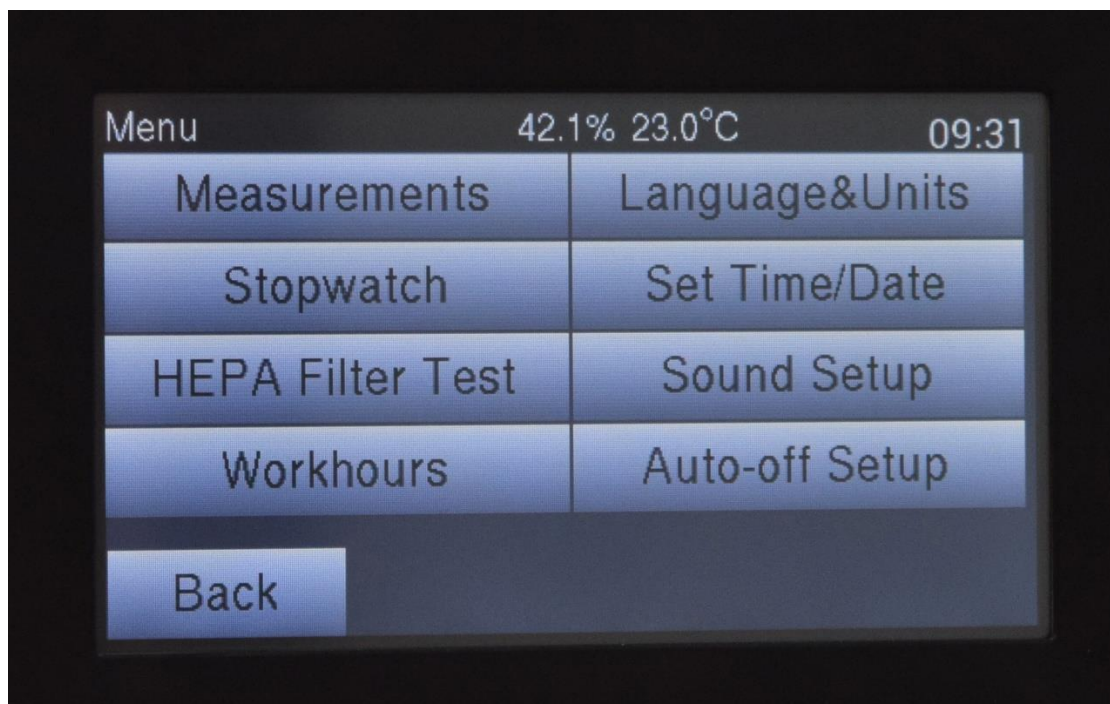
Picture 6.1.1. - Main screen



Picture 6.1.2. - Fan power up and speed settings screen



Picture 6.1.3. - Light on/off and intensity control screen

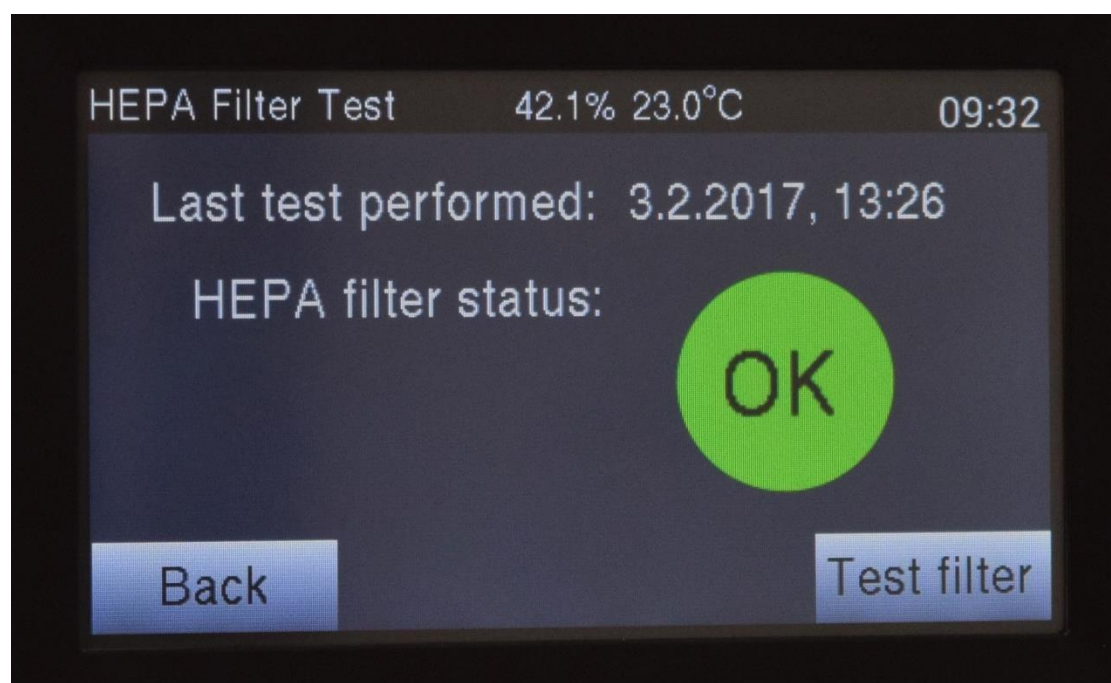
*Picture 6.2.1. - Menu screen**Picture 6.2.2 - Measurements screen*

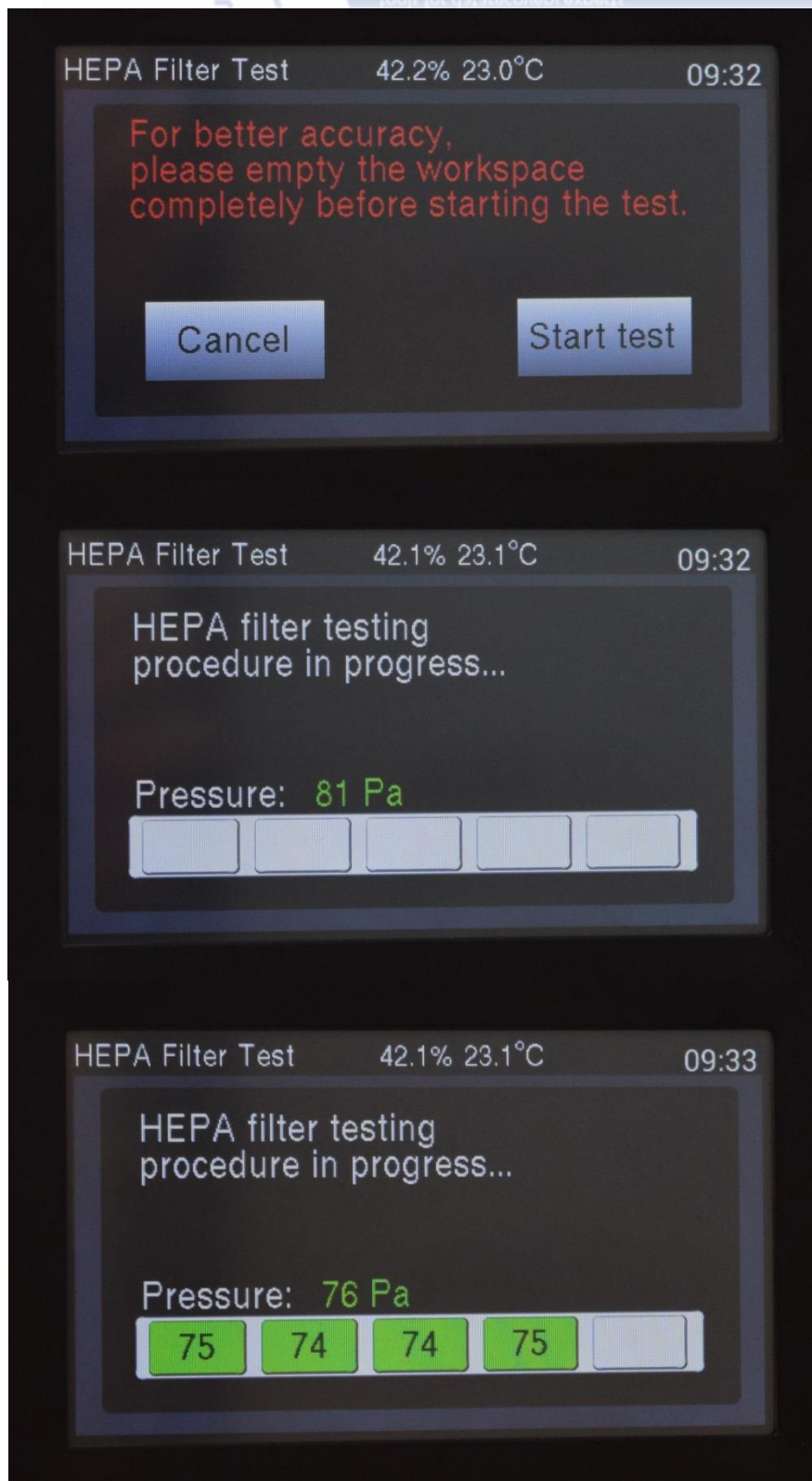


Picture 6.2.3 - Language screen

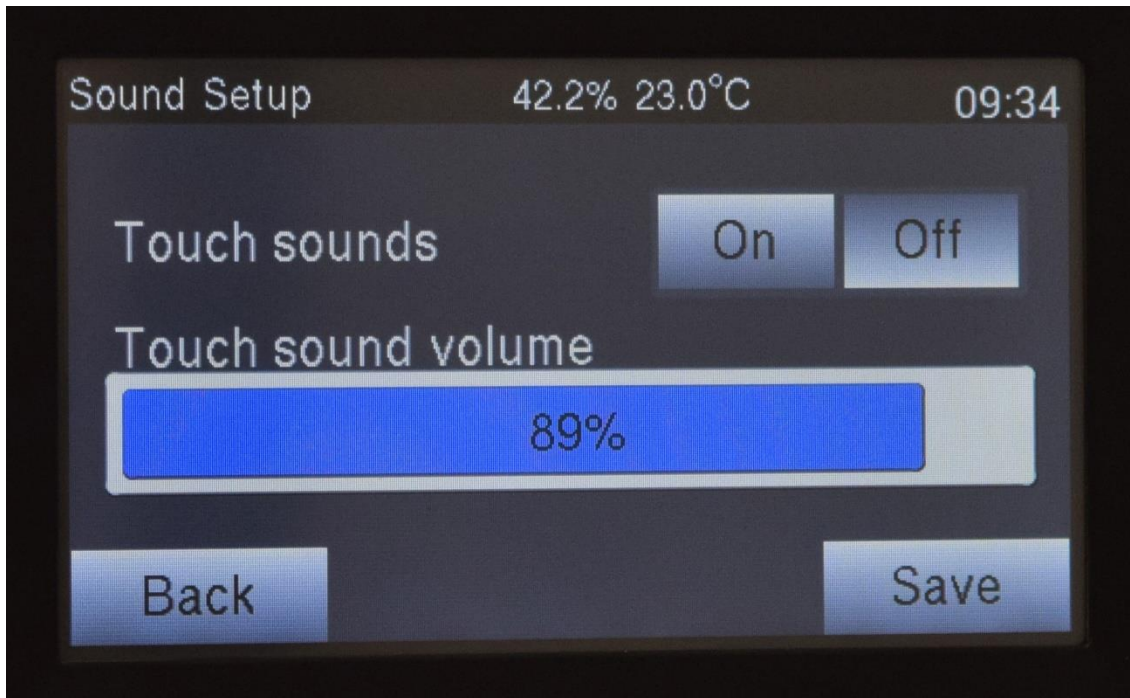


Picture 6.2.4 - Stopwatch screen

*Picture 6.2.5 - Set Time/Date screen**Picture 6.2.6 - HEPA Filter Test screen*



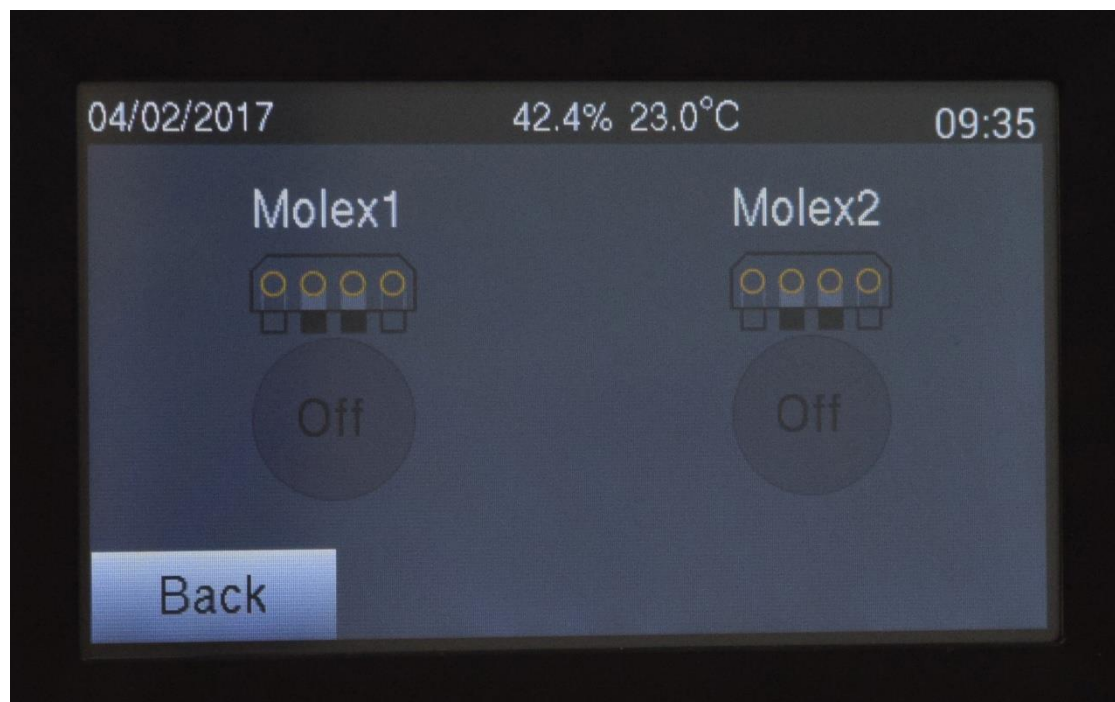
Picture 6.2.7. - HEPA Filter Test progress screens



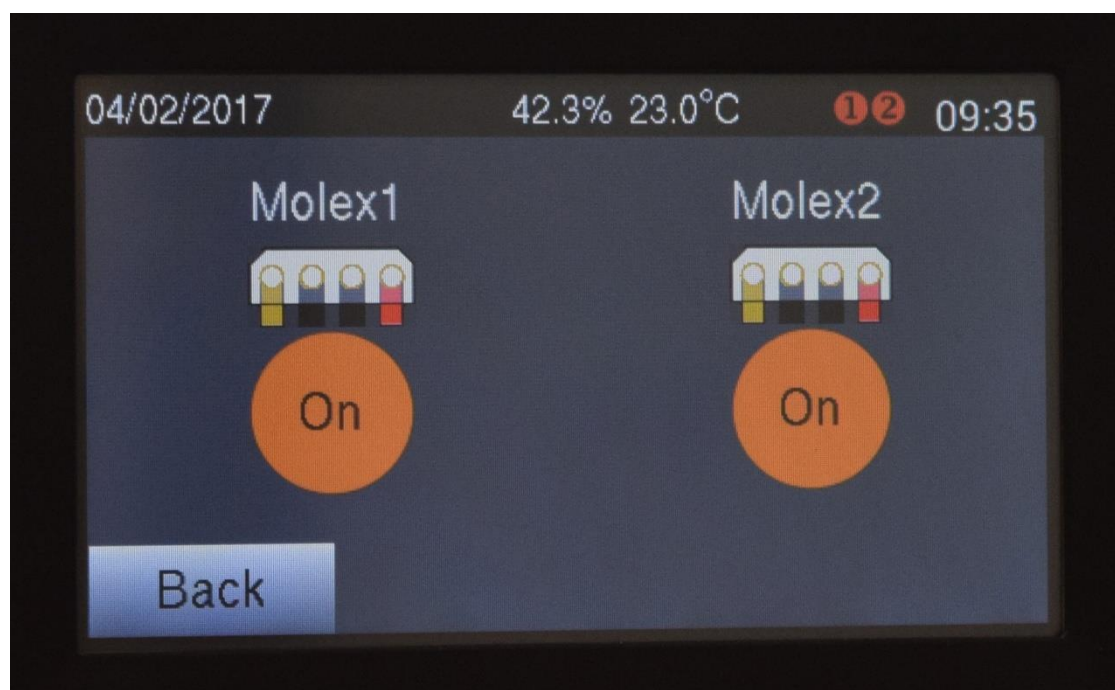
Picture 6.2.8. - Sound options screen



Picture 6.2.9. - Workhours statistics screen



Picture 6.2.11. - Molex connector screen - powered down



Picture 6.2.12. - Molex connector screen - powered up



Picture 6.2.13. - Automatic Shut Down Setup screen

6.2. Working in the Clean Cabinet - Recommendations

1. Always make sure that the work area surface is clean, as well as the side walls and back perforated plate. You can use 70% ethanol or some other cleaning liquid. Do not use any disinfectants containing chlorine-based substances as this may cause corrosion of the stainless steel surfaces.
2. Minimize room activity (personnel movements, closing and opening of doors, etc.) since these external airflow disturbances may adversely affect the clean bench's internal airflow, thereby possibly impairing the containment capabilities of the clean bench.
3. Allow only essential items in the work zone, do not fill the workspace with tools which aren't necessary. Items/instruments should not be placed between the filter and any area where the clean environment is needed. New items introduced into the work zone should be placed downstream of items already in the work zone for several minutes to allow contaminants to flush off.
4. Work in the clean cabinet in a slow and controlled manner. While putting items inside / removing items from the work zone, move your hands in and out of the work zone opening slowly and in a direction perpendicular to the plane of the work zone opening. Rapid movement of arms in a sweeping motion may disrupt the air barrier, thereby allowing contaminants to enter the clean bench.
5. Exercise particular care when placing equipment within the work space.

6. Perform all work with the operator's hand or head downstream of the critical process points. Keep unnecessary movement within the work zone to a minimum.

6.3. Ergonomics

On most occasions, you would most likely be operating the clean bench in sitting rather than standing posture. There are some obvious advantages of the sitting posture:

- the physiological energy cost and fatigue involved in sitting are relatively less,
- sitting posture provides the body with a stable support

However, sitting position has some drawbacks too:

- The working area available is fairly limited,
- There is a potential risk of being constrained in the same posture for a long time,
- Sitting posture is one of the most stressful postures for one's back.

Therefore you should pay careful attention to the following guidelines in order to achieve comfortable and healthy working conditions:

- Always ensure that your legs have enough legroom.
- Keep your lower back comfortably supported by your chair. Adjust the chair or use a pillow behind your back whenever necessary.
- You should place your feet flat on the floor or on a some sort of a footrest. Don't dangle your feet and compress your thighs.
- You should keep varying your sitting position throughout the day at regular intervals so that you are never in the same posture for too long.

Observe the following precautions with respect to your eyes:

- Give your eyes frequent breaks. Periodically look away from the work area and focus at a distant point.
- Keep your glasses clean.
- Arrange the items/apparatus frequently used in your work in such a way that you can minimize the physical strain involved in handling them.

The clean bench's noise emission has been tested and found to be in compliance with EN 12469, ISO 4871 and NSF/ANSI 49 which is important to ensure health and comfort for the operator.

6.4. Unpacking

The HDDS Horizontal Laminar Flow Cabinet M is shipped in a wooden crate, packed and secured within. When the crate arrives, the cabinet will be in a horizontal position, and we advise the following steps for the unpacking process:

1. Flip the crate, so it stands on its shortest side panel, as shown on the picture below.
2. Remove the screws holding the side of the crate as marked on the picture below.
3. Remove the Styrofoam and free the cabinet's sides.
4. Release the breaks on the wheels.
5. Gently pull the cabinet out of the crate.

Some of the more delicate surfaces of the cabinet are covered with protective foil, in order to preserve their condition during the transport. These areas are: the stainless steel work space surface, the perforated sheet metal plate (the laminator) and the perforated pre-filter carrying steel frame.

The protective foils can and should be easily removed before you start working in the cabinet. Each foil has a special marking, showing the side from which the foil should be removed.

6.5. Maintenance

6.5.1. Cleaning the Laminar Flow Cabinet

The work surface and walls (stainless steel surfaces) should be regularly cleaned with an appropriate disinfectant agent and soap water afterwards.

Use a simple damp cloth to clean the exterior surface of the clean bench, particularly on the front and top in order to remove dust that accumulated there. The glass windows should be cleaned with any window cleaning liquid. Use clean water to finish the cleaning and wash away any residue of disinfectant agent, soap-water and glass cleaner. Regularly cleaning the stainless steel surface can help you retain the attractive factory finish look of the chamber's workspace.

Before you begin your work within the Laminar Flow Cabinet, after turning it on, simply turn the fan on for a few minutes. This allows any dust or other small particles that have possibly accumulated within the work area to clear out.

Check the state of the pre-filters twice per year, and replace them if necessary. This is done by removing the perforated lids, separating the two steel parts and replacing the pre-filter.

For the main filter, you can use the HEPA Filter Testing feature in the menus. This will perform a series of tests, checking if the filter is still fully functional, providing you with the useful data regarding the filter's functionality. The average lifespan of the HEPA (main) filter can be anywhere from 5 to 10 years, although this heavily depends on the conditions of the room in which the Laminar Flow Cabinet is stored.

6.5.2. Replacing the HEPA Filter

The process of replacement of the HEPA Filter is simple and easy to perform, just follow these simple steps.

1. Remove the back lid by unscrewing the screws securing it.
2. Remove the vertically positioned filter-securing steel profiles by unscrewing the butterfly nuts (easily done by hand).
3. Replace the used HEPA filter with a new one.
4. Put the filter-securing profiles back to their positions, and secure them with the butterfly nuts.
5. Put the back lid back and secure it with its screws.

7. Conclusion

This guide was written by HDDSurgery™ team and it is based on our experience acquired during the process of development, design and testing.

HddSurgery™ is not responsible for any possible consequential damage, including the loss or recovery of data or any other damage made by using or working with HddSurgery™ tools.

You can find more information about HddSurgery tools and many other tools used for data recovery on our website:

<http://www.hddsurgery.com/>

Also you can watch videos which show how HddSurgery tools work on our YouTube channel:

<http://www.youtube.com/user/HddSurgery>

If you have any doubts or questions regarding use of any HddSurgery tools, you can contact our support team any time:

support@hddsurgery.com