



# Captair<sup>®</sup> Flex<sup>™</sup>

## M 32I - M 39I - M 48I



# User Manual



# Congratulations!

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By choosing Captair® Flex™ ductless filtering fume hoods, you have chosen an **efficient, reliable** way to ensure safety.

Your Captair® Flex™ filtering fume hood guarantees that you are protected when working with chemicals that pose an inhalation risk for the user.

Your fume hood functions based on the recirculation of filtered air, which makes it possible to use high-efficiency filters to trap toxic particles and molecules and to recycle this air within the laboratory. The air downstream from the hood's modular filtration column, which uses the new Flex™ technology, is thus free of all chemical pollutants.

Nevertheless, **the effectiveness of this system is directly dependent upon it being used correctly and monitored by its users.** Your laboratory may also benefit from ergonomic, economic, and ecological advantages provided by the Captair® Flex™ fume hood throughout its life cycle.

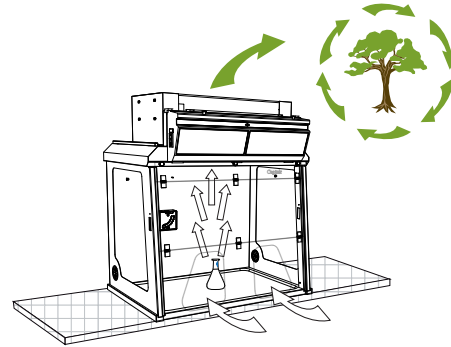


**Do you want to work in a 100% safe environment year after year?  
A careful reading of this manual is a must!**

Your new Captair<sup>®</sup> Flex<sup>™</sup> ductless filtering fume hood offers several advantages from day one:

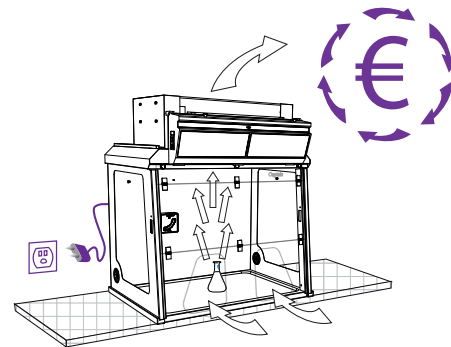
**Protect the environment**

Since no ductwork is required, a captair<sup>®</sup> Flex<sup>™</sup> filtered enclosure totally eliminates the direct discharge of pollutants into the atmosphere and therefore contributes to the protection of the environment. Furthermore, a captair<sup>®</sup> Flex<sup>™</sup> filtered enclosure does not generate any pollution linked to energy production unlike a traditional ducted fume hood.



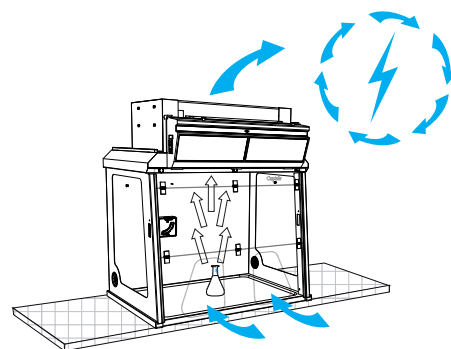
**Eliminate installation costs**

The installation of a captair<sup>®</sup> Flex<sup>™</sup> filtered enclosure is quick and easy. There is no need for a ductwork linked to an air supply / air extraction system, in comparison to traditional ducted systems. A single electrical outlet is all that is needed to make it work. Its setting up can be realized at any time, without any complex forward planning. Do not hesitate to compare this cost to a traditional ducted fume hood cost.



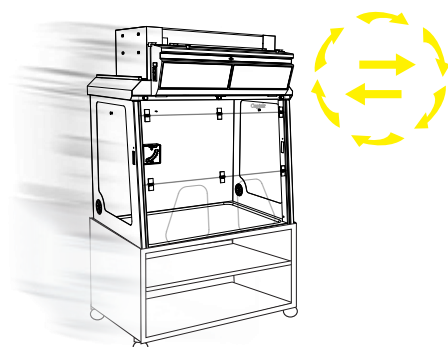
**Achieve significant energy savings**

Ductwork air balance is essential to the proper operation of a traditional ducted fume hood however; it is also the source of very important energy consumption. In fact, captair<sup>®</sup> Flex<sup>™</sup> filtered enclosures do not generate any energy costs associated with the use of expensive extraction systems or conditioned air supplies. Operational costs remain at a minimum even when taking into account filter changes.



**Benefit from the use of an immediately available unit, easy to relocate.**

Captair<sup>®</sup> Flex<sup>™</sup> filtered enclosures can be moved depending on the protection needs of the laboratory and can be easily relocated without disturbing room air balance.



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# Getting started

- Flex™ technology
- Description of the control box
- First start-up
- Navigating the digital display screen

## FLEX™ TECHNOLOGY

A modular filtration column which provides unprecedented adaptability and flexibility.

By combining molecular and particulate filtration technologies, erlab® was able to devise the new Flex™ modular filtration column technology.

This innovation developed by the erlab® R&D laboratory offers unprecedented flexibility, adaptability, and savings.

This single device can thus be configured to meet the protection needs of your laboratory.

Your device can be quickly reconfigured and can be easily used for other applications.

This flexibility was made possible by creating stackable, one-size-fits-all filtration cartridges—an innovation that is key to your new Captair® Flex™.

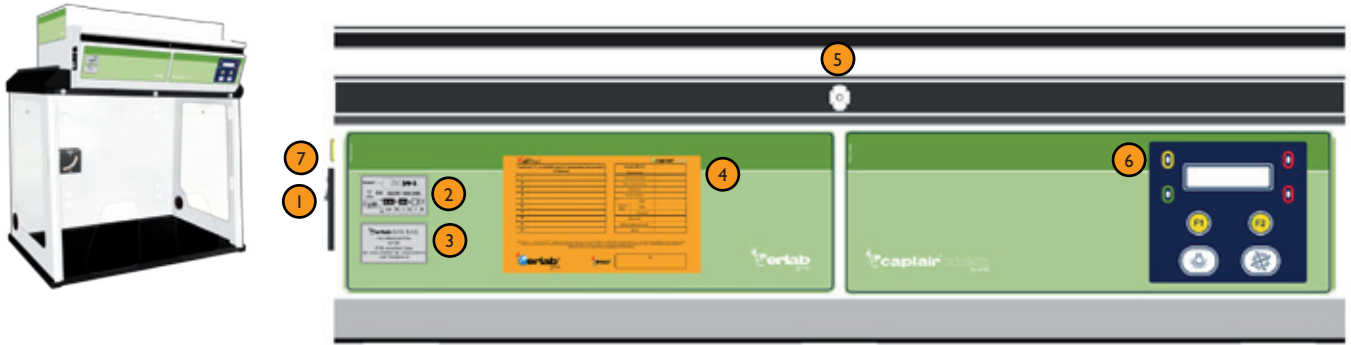
### Possible configurations for your Captair® Flex™ fume hood

#### Manipulated chemicals/ Applications

	<p><b>Liquids</b></p> <p>For dilutions, titrations, extractions, transfers, ...</p>	<p><b>1C</b></p> <p>Class 2 according to the NF X 15-211 : 2009 standard</p>	<p><b>2C</b></p> <p>Class 1 according to the NF X 15-211 : 2009 standard</p>
	<p><b>Solids</b></p> <p>For sievings, grindings, weighings, formulations, compressions...</p>	<p><b>1P</b></p>	
	<p><b>Liquids &amp; solids</b></p> <p>For dissolutions, filtration, extractions, ...</p>	<p><b>1P 1C</b></p> <p>Class 2 according to the NF X 15-211 : 2009 standard</p>	<p><b>1P 2C</b></p> <p>Class 1 according to the NF X 15-211 : 2009 standard</p>
	<p><b>Handlings in clean rooms</b></p> <p>Up to class ISO 5 rooms</p>	<p><b>1C 1P</b></p> <p>Class 2 according to the NF X 15-211 : 2009 standard</p>	<p><b>2C 1P</b></p> <p>Class 1 according to the NF X 15-211 : 2009 standard</p>

**You may contact your E.S.P. agent at any time to confirm the safety parameters related to the use of your device!**

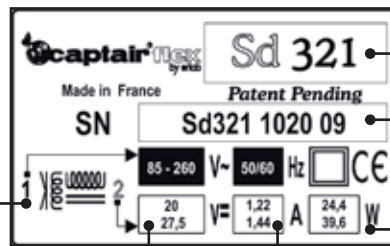
## DESCRIPTION OF THE CONTROL BOX



① Master switch

② Model label

Supply voltage  
and frequency  
supported



Fume hood model

Fume hood serial number

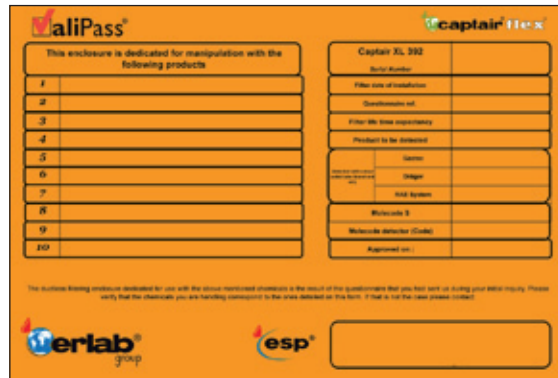
Power in Watts

Supply Intensity  
voltage

③ Name of the manufacturer or their representative

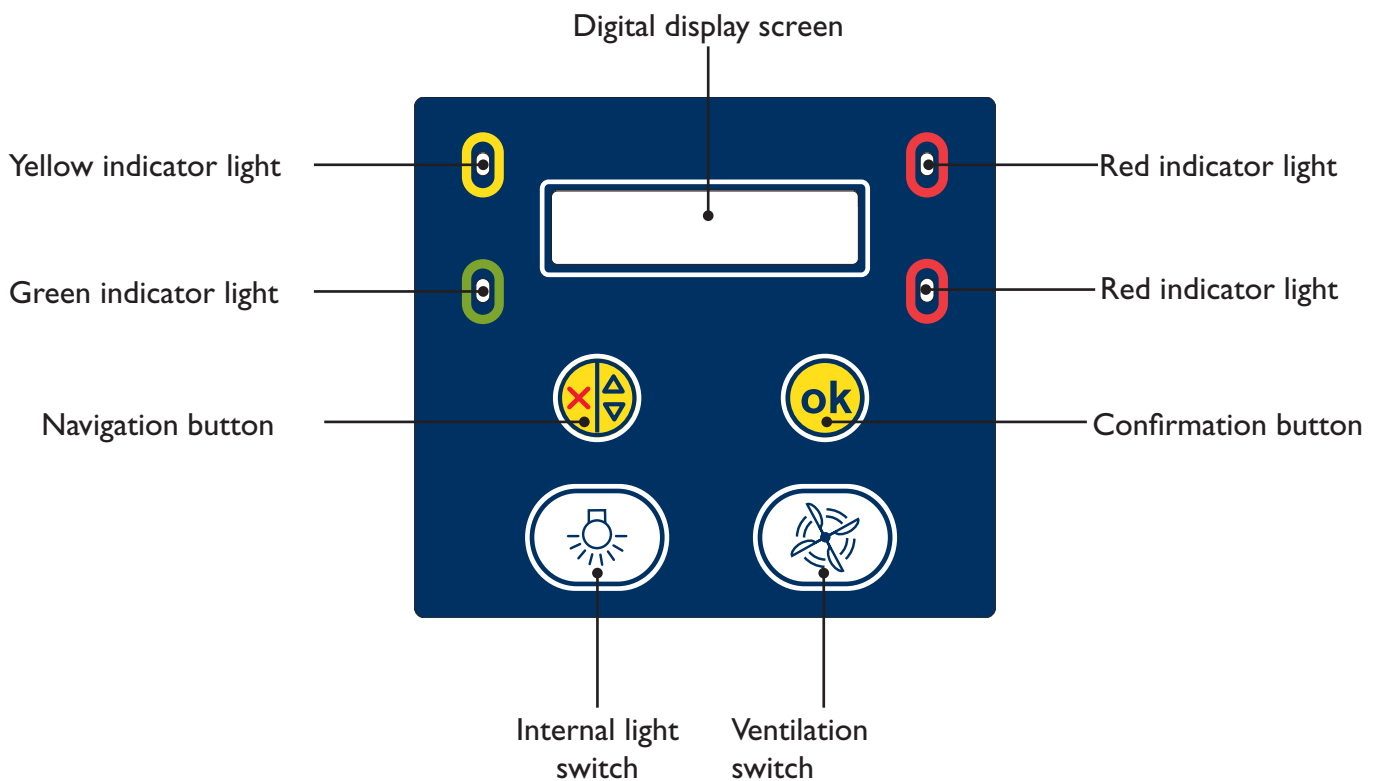


- 4 Valipass<sup>®</sup> form: Refer to the Valiquest<sup>®</sup> section for details.



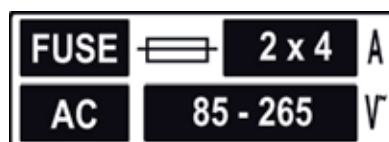
- 5 Sampling port for the manual filter saturation test or for an ambient air sensor when the machine is equipped with the Molecode<sup>™</sup> S option.

- 6 Control panel



For information on the various scenarios related to the triggering of the device's indicator lights and audible alerts, refer to the **EVENT ALERTS** section of the **FIRST START-UP** chapter.

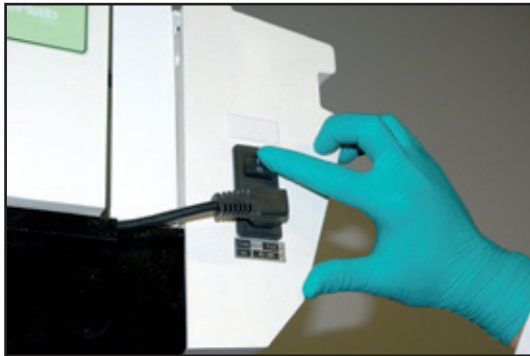
- 7 Fuse tag.





# FIRST START-UP

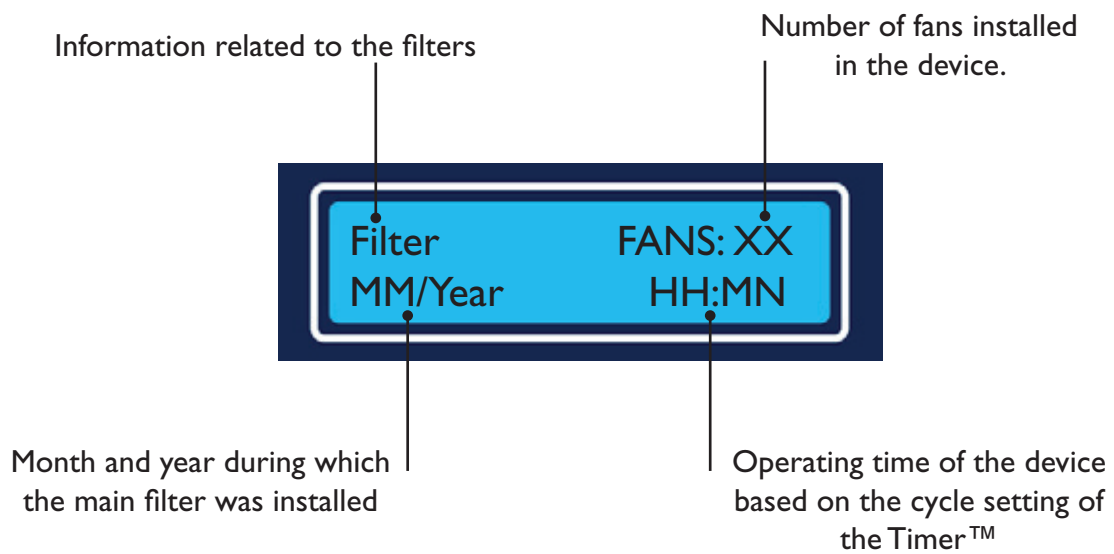
You have carefully followed the steps described in the assembly instructions and your Captair® Flex™ fume hood is ready to use.



Turn on the device using the switch located on the left side of the control panel. Activate the device's ventilation system using the ventilation button located underneath the digital display screen. The green indicator light comes on and the screen displays the DEFAULT SCREEN DISPLAY. The Timer™ begins to count down based on its factory settings (60 hours).

**We recommend to never turn off the main power switch after its first setting on.**

## Default screen display



In order to guarantee that your device functions properly and in order to ensure your safety, your Captair® Flex™ fume hood is equipped with a monitoring system linked to the air flow parameters and to the device's Flex™ technology.

## The Timer™

The Timer™ keeps track of the amount of time that your Captair® Flex™ fume hood has been in operation in order to remind the user when it is necessary to carry out a periodic filter saturation test.

The default setting (factory setting) is 60 hours (as required by NF X 15-211: 2009 standard).

An alarm will alert the user to check that the filter is still able to function properly.

A pre-warning alarm may go off between 0 and 10 hour(s) before the Timer™ alarm (according to factory settings).

### Activation / Deactivation:

It is possible to activate or deactivate the Timer™ and its pre-warning alarm.

To make use of this functionality please refer to the section on “**Navigating the digital display screen.**”

## Event alerts

This section describes all of the audible and visual alerts triggered by the alarms included in your Captair® Flex™ fume hood.

### Event 1:

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#### Fan control problem

#### Event conditions:

The fume hood does not reach the proper number of rotations per minute (RPMs) within a period of ten seconds after the ventilation system has been started.

#### Display screen



#### Solution:

Contact your maintenance service as quickly as possible.

#### Alarm type



Yellow indicator light on, constant  
Intermittent audible alarm

**Event 2:**

**Fan out of order**

**Event conditions:**

The rotation speed of the fan is less than 700 RPM.

**Display screen**



**Alarm type**



Red indicator lights on, constant  
Continuous audible alarm

**Solution :**

Contact your maintenance service as quickly as possible.

**Event 3:**

**Solvent detected in the sampling chamber**

**Event conditions:**

The detection limit of the Molecode<sup>™</sup> S unit has been reached during 5 min.

**Display screen**



**Alarm type**



Yellow indicator light on, constant  
Intermittent audible alarm

**Solution :**

The concentration at the exhaust of a filter nearing its saturation point can build up very quickly. Consider replacing the filter.

**Event 4:**

**Solvent detected 2**

**Event conditions:**

The detection limit of the Molecode<sup>™</sup> S unit has been surpassed.

**Display screen**



**Alarm type**



Red indicator light on, constant  
Continuous audible alarm

**Solution :**

It is necessary to replace the filter.  
Please contact your maintenance service.

**Event 5:**

**Pollutant detected in the ambient air of the laboratory**

**Event conditions:**

The ambient air sensor on the front detects that pollution is likely in the ambient air of the laboratory.

**Display screen**



**Alarm type**



Red indicator light on, blinking  
Continuous audible alarm

**Solution :**

Press the OK button to deactivate the alarm.  
Identify the source of the pollution.

**Event 6:**

**Pre-warning alarm maintenance**

**Event conditions:**

If the Timer<sup>™</sup>'s pre-warning alarm is activated, this alarm is triggered when the counter's value is less than the pre-warning value.

**Display screen**



**Alarm type**



Yellow indicator light on, blinking  
Intermittent audible alarm

**Solution :**

Press the OK button to deactivate the alarm.  
Consider checking whether or not the filter is saturated.  
Refer to the maintenance section of this manual.

**Event 7:**

**Maintenance**

**Event conditions:**

The value of the Timer<sup>™</sup> is equal to zero.

**Display screen**



**Alarm type**



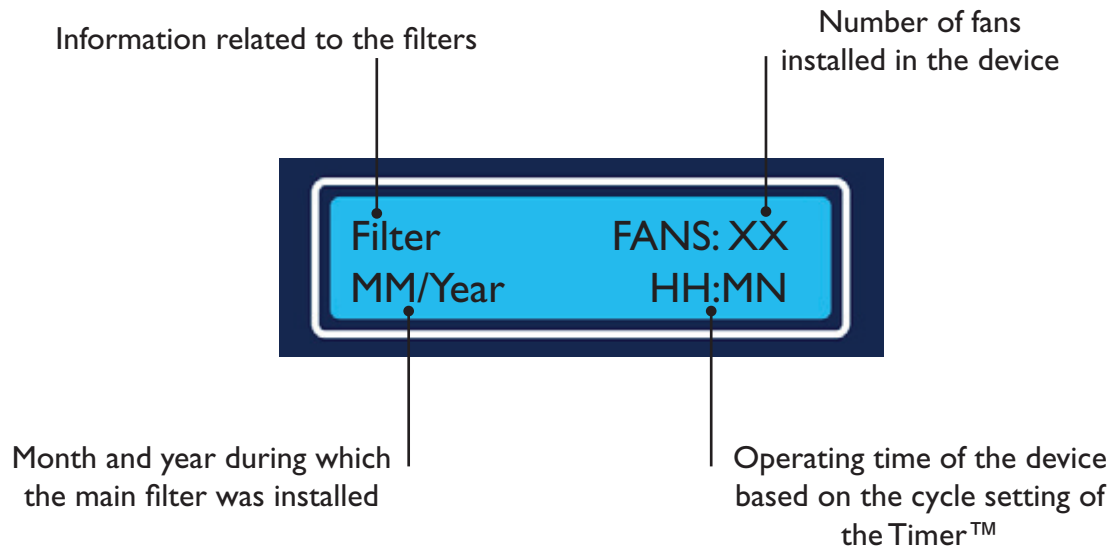
Red indicator lights on, constant  
Continuous audible alarm

**Solution :**

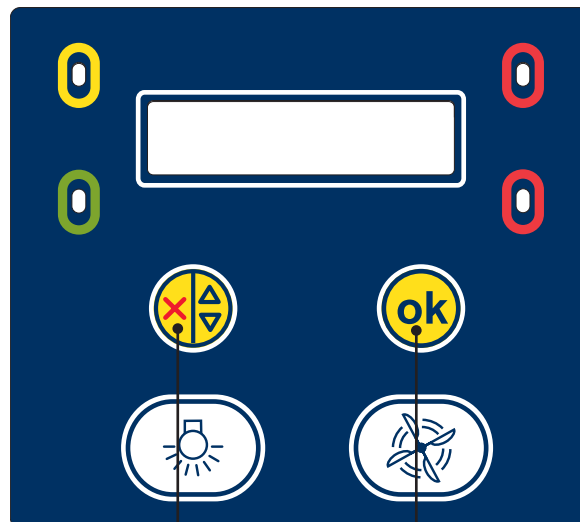
Press the OK button to deactivate the alarm.  
Consider checking whether or not the filter is saturated.  
Refer to the maintenance section of this manual.

## NAVIGATING THE DIGITAL DISPLAY SCREEN

### DEFAULT SCREEN DISPLAY



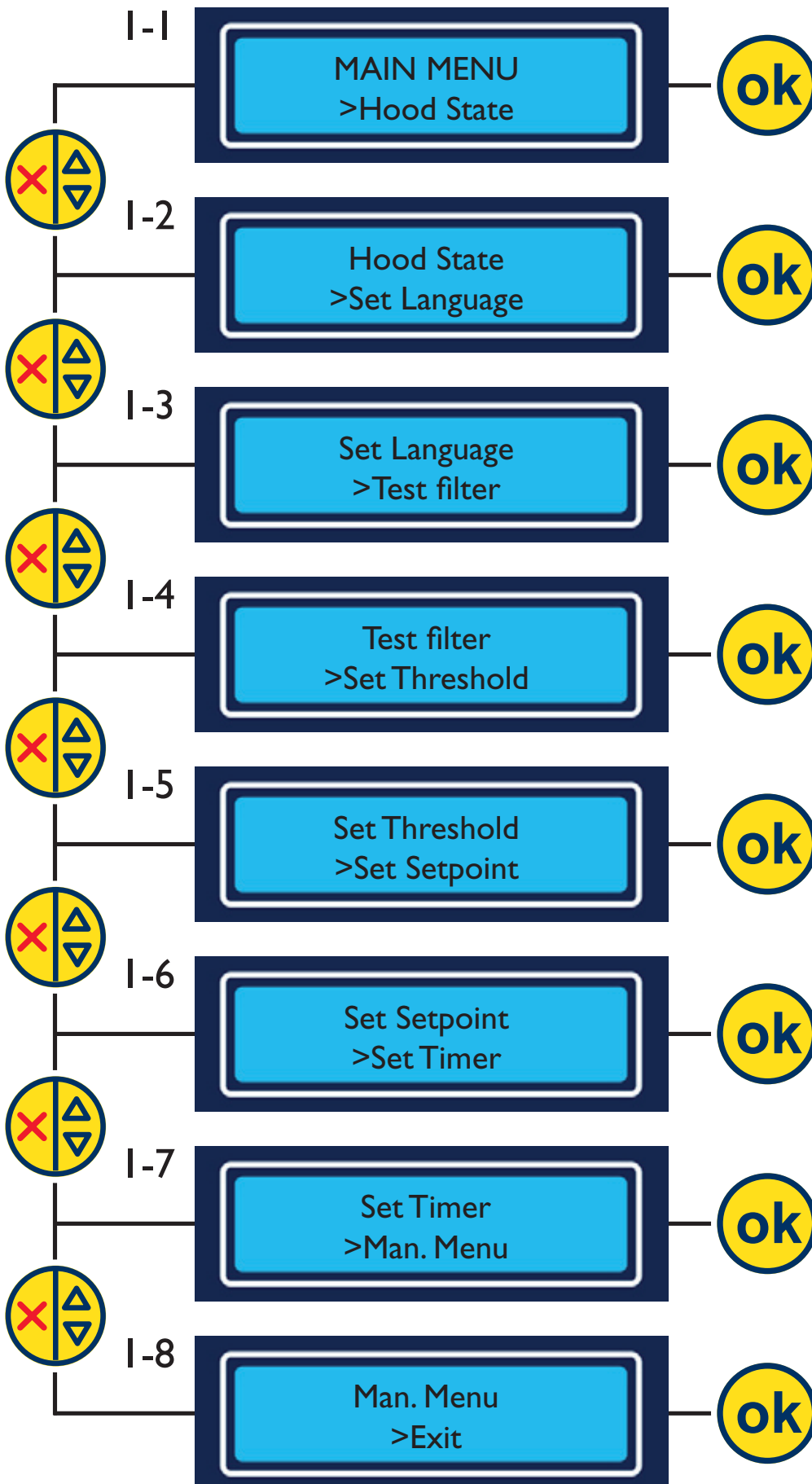
### ACCESSING THE MENUS



To access the menus of the screen, press down on the navigation and confirmation buttons simultaneously.

The menu will appear when the buttons are released.

## I Main Menu



## Notes:

Allows the user to view the status of the fume hood. Press the confirmation button to access the contents of the menu.

Allows the user to modify the parameters of the screen display language. Press the confirmation button to access the contents of the menu.

Allows the user to update information after testing for filter saturation. Press the confirmation button to access the contents of the menu.

Allows the user to modify the limit settings of the Molecode<sup>™</sup> S detection sensor. Press the confirmation button to access the contents of the menu.

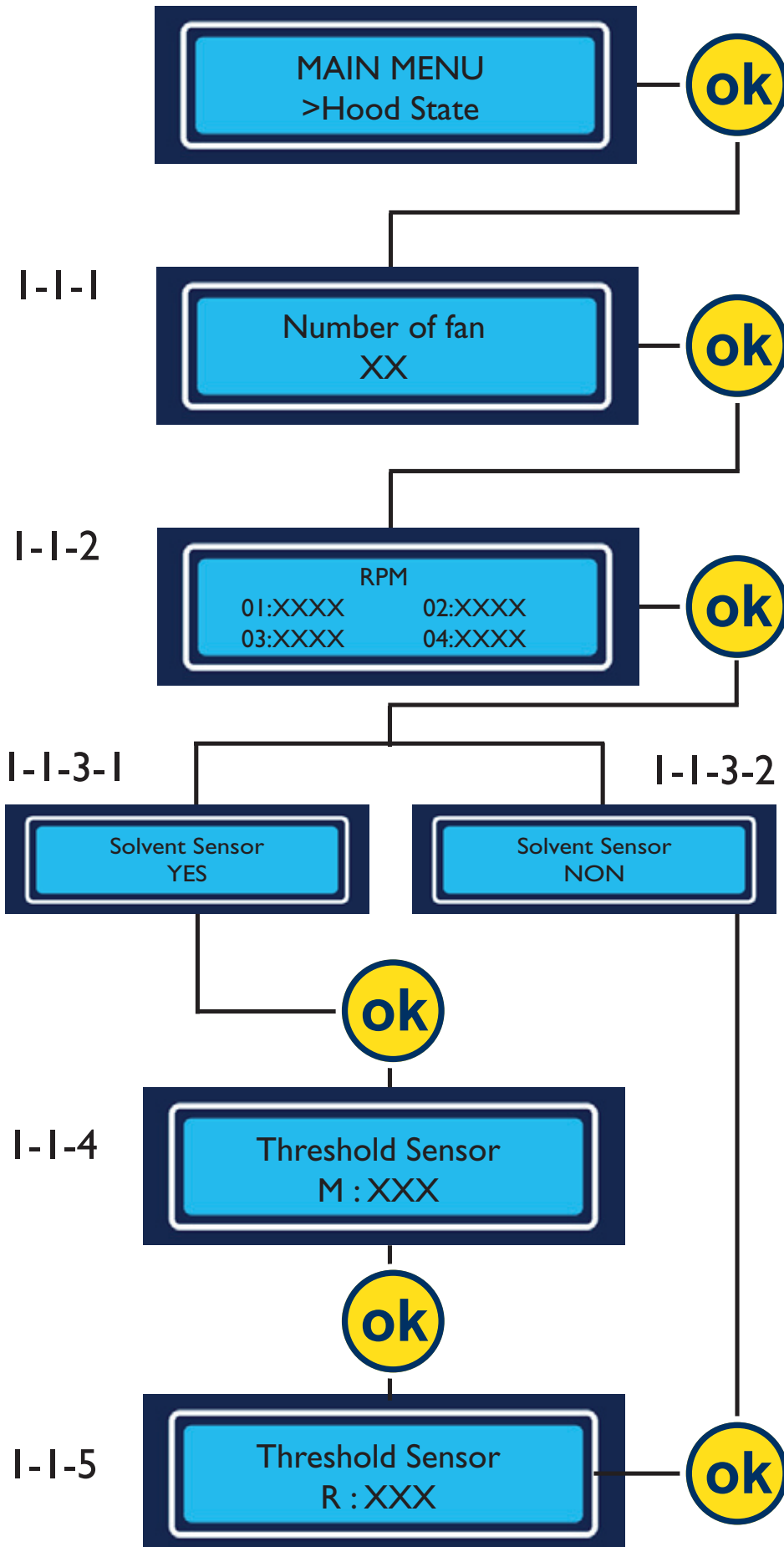
Allows the service engineer to set the ventilation flow rate. Protected by an access code. Press the confirmation button to access the contents of the menu.

Allows the user to activate or deactivate the Timer<sup>™</sup>. Press the confirmation button to access the contents of the menu.

Allows the service engineer to access the device's configuration. Protected by an access code. Press the confirmation button to access the contents of the menu.

Allows the user to exit the main menu. Press the confirmation button to display the default screen display.

I-1 Hood State



Notes :

This number corresponds to the number of fans detected by the device. It may be between 1 and 4 depending on the Captair<sup>®</sup> Flex<sup>™</sup> model in question. (Refer to the technical specifications listed at the end of the manual.)

RPM: rotations / minute. This number indicates the rotation speed of each fan. It may be between 0 and 3000 depending on the Flex<sup>™</sup> technology installed in your device and on the factory settings. The rotation speed must be the same for each fan installed, +/- 5%.

Indicates the presence or absence of the Molecode<sup>™</sup> S option on your device.

This number indicates the sensitivity on the Molecode<sup>™</sup> S Mesure sensor included on your device. If the device is not equipped with a Molecode<sup>™</sup>, the contents of this screen are not visible.

This number indicates the sensitivity on the Molecode<sup>™</sup> S Reference sensor included on your device. If the device is not equipped with a Molecode<sup>™</sup>, the contents of this screen are not visible.

Display the Hood Stat menu.



I-2

**Set Language**

**Notes:**

By default the screen displays the name of the factory-set navigation language. Other possible display languages: French, Spanish, German, and Italian.

Display the current navigation language.

**Display the Set Language menu.**

Allows the user to modify the language displayed on the screen.

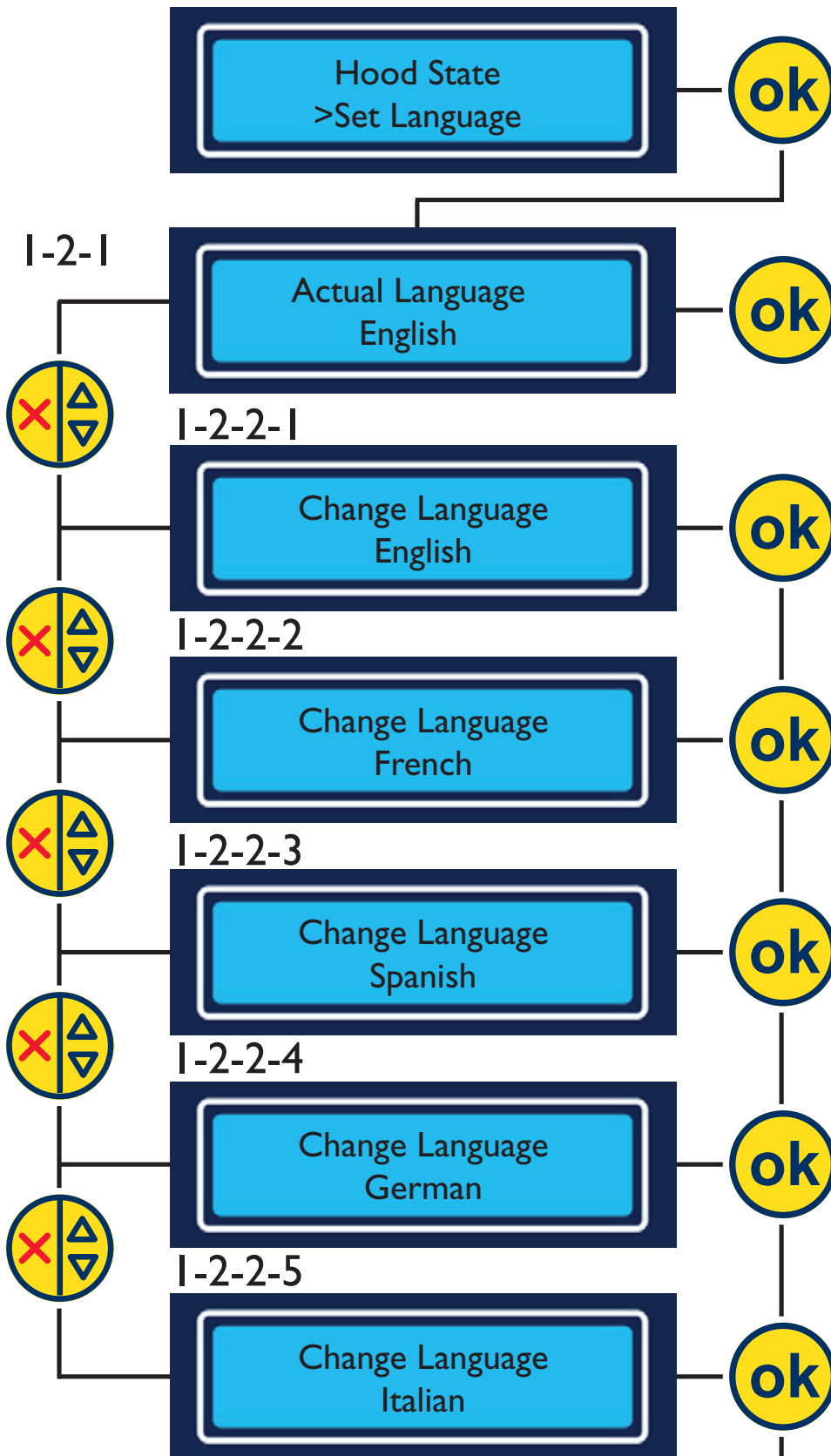
Confirm the chosen language to save the selection.

Confirm the chosen language to save the selection.

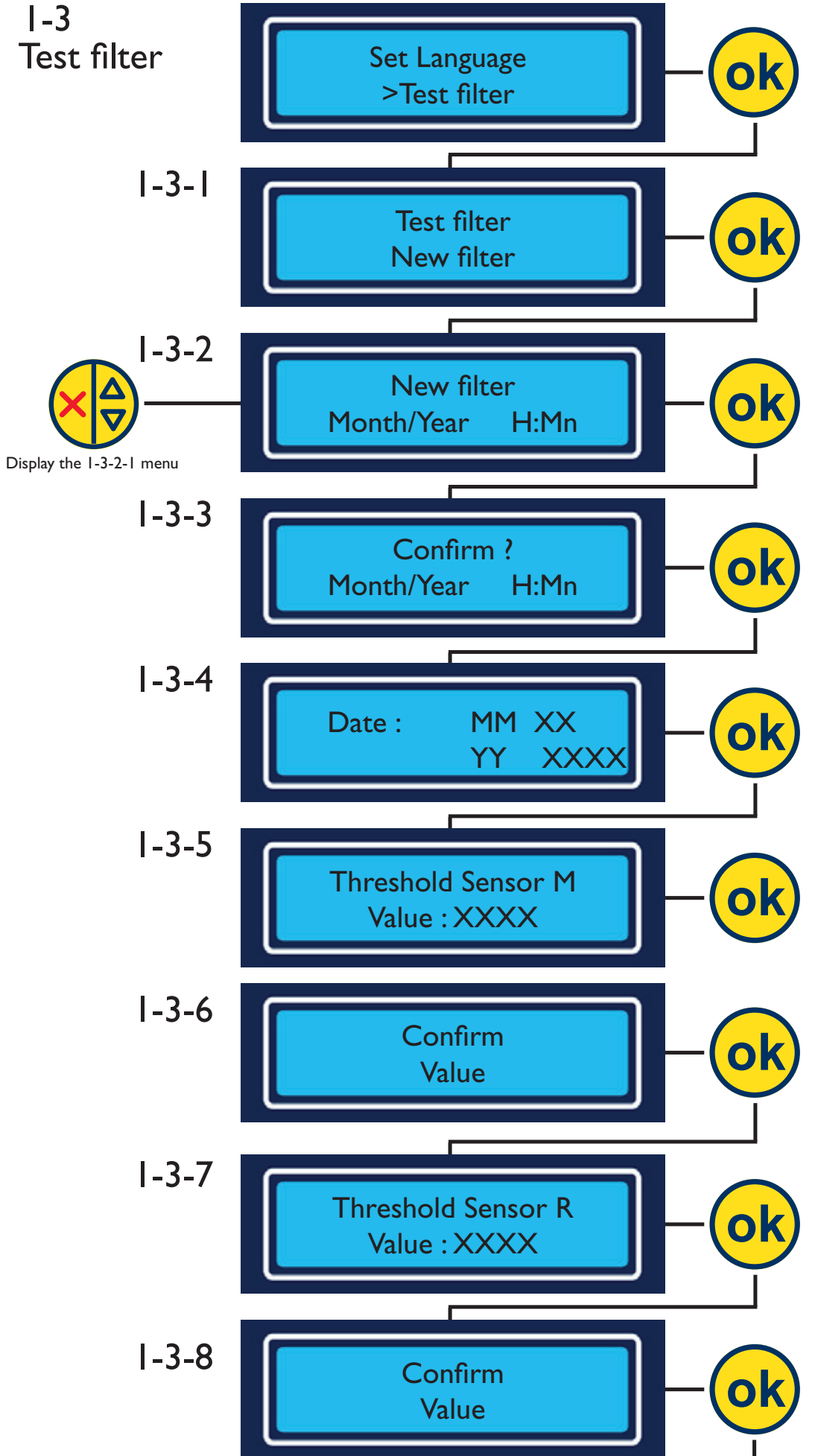
Confirm the chosen language to save the selection.

Confirm the chosen language to save the selection.

**Display the Set Language menu.**



**I-3**  
Test filter



**Notes:**

**N.B.:** accessing this menu interrupts the ventilation system of your device. It is strongly recommended to access this menu after the filter saturation tests have been performed. Press the confirm button to proceed to the next step.

Parameter reset menu after a new filter has been installed.

Displays the month, year, and operating time of the device after a new filter has been installed in the Manufacturer menu.

Allows the user to confirm the installation date of the new filter and to reset the Timer<sup>™</sup> if the Timer<sup>™</sup> is activated according to factory settings. If the Timer<sup>™</sup> is not activated, "H:Mn" is not displayed on the screen.

Allows the user to indicate the new filter installation date.

Displays the sensitivity value of the current sensor as stored in the device's memory or previously modified. If the Molecode<sup>™</sup> S is not installed on the device, screens I-3-5, I-3-6, I-3-7 and I-3-8 do not display.

Allows the user to adjust the sensitivity value of units (M & R) after a new filter has been installed. Scroll through the numbers using the scroll button and confirm each digit using the confirmation button.

Confirm the previously selected value.

Display the Test filter menu.

### I-3 Test filter

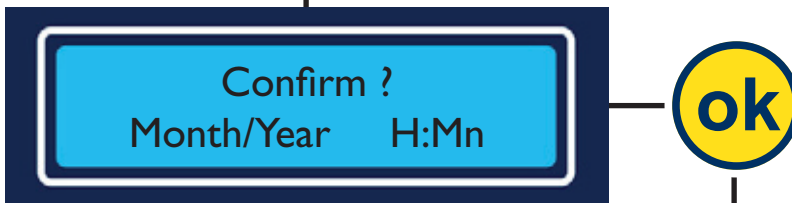
I-3-2-1



I-3-2-2



I-3-2-3



### Notes :

N.B.: Accessing this menu interrupts the ventilation system of your device. Press the confirm button to proceed to the next step.

After verifying the condition of the filter via a saturation test, display the installation date and operating time of this filter.

By pressing the confirm button, the Timer<sup>™</sup> is reset according to the factory configuration if the Timer<sup>™</sup> is activated.

Display the Test filter menu.

## I-4 Set Threshold

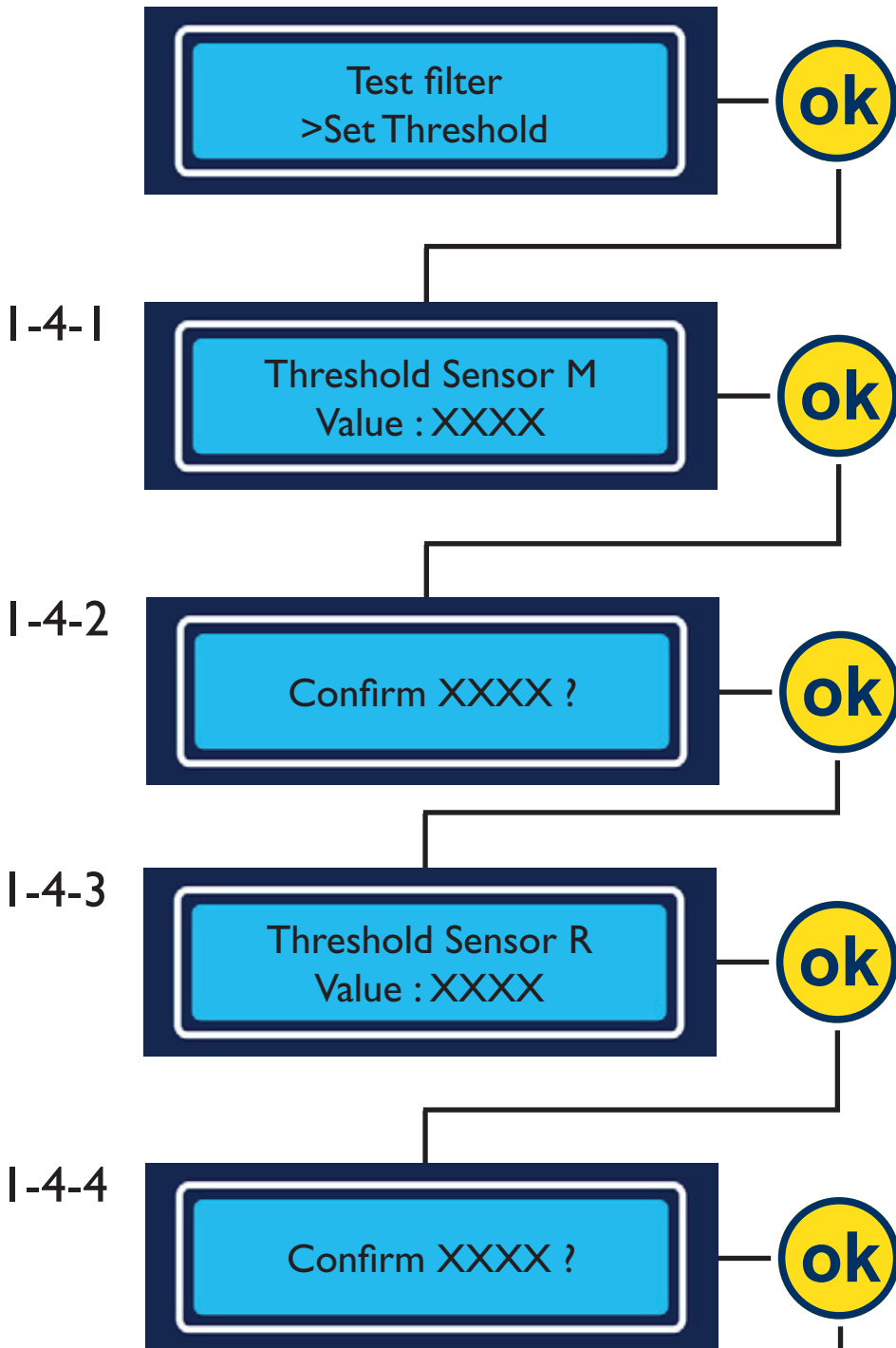
## Notes:

**N.B.:** accessing this menu interrupts the ventilation system of your device. Press the confirm button to proceed to the next step. **IMPORTANT:** this menu only appears if the device is equipped with a Molecode<sup>™</sup> S.

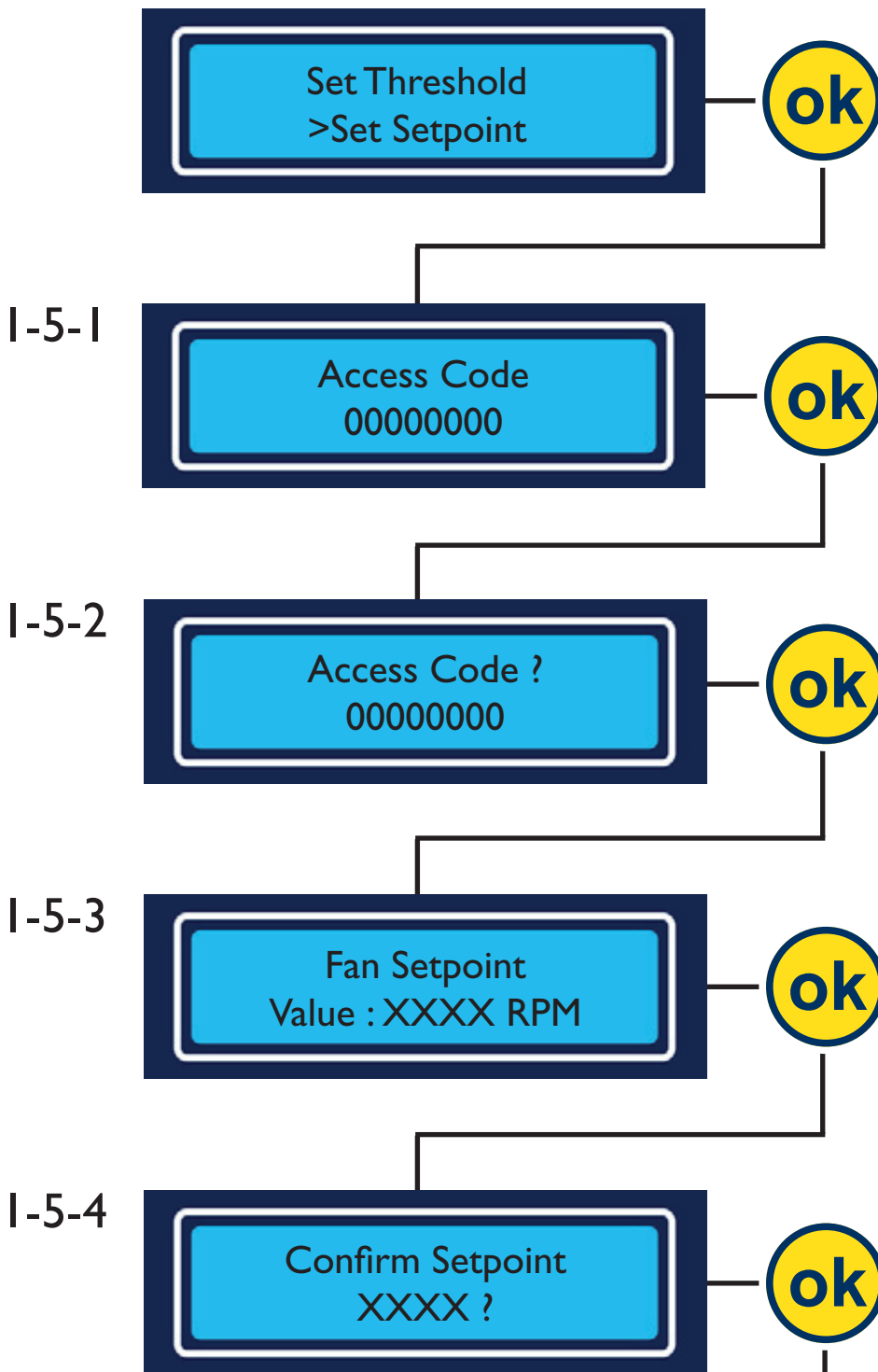
Displays the sensitivity value of the Molecode<sup>™</sup> S units ( M & R) as configured in the factory or previously modified. Scroll through the numbers using the scroll button and confirm each digit using the confirmation button.

Allows the user to confirm the selected value.

Display the Set Threshold menu



## I-5 Set Setpoint



## Notes:

**N.B.:** the contents of this menu are protected by an access code. Contact your maintenance service for additional information.

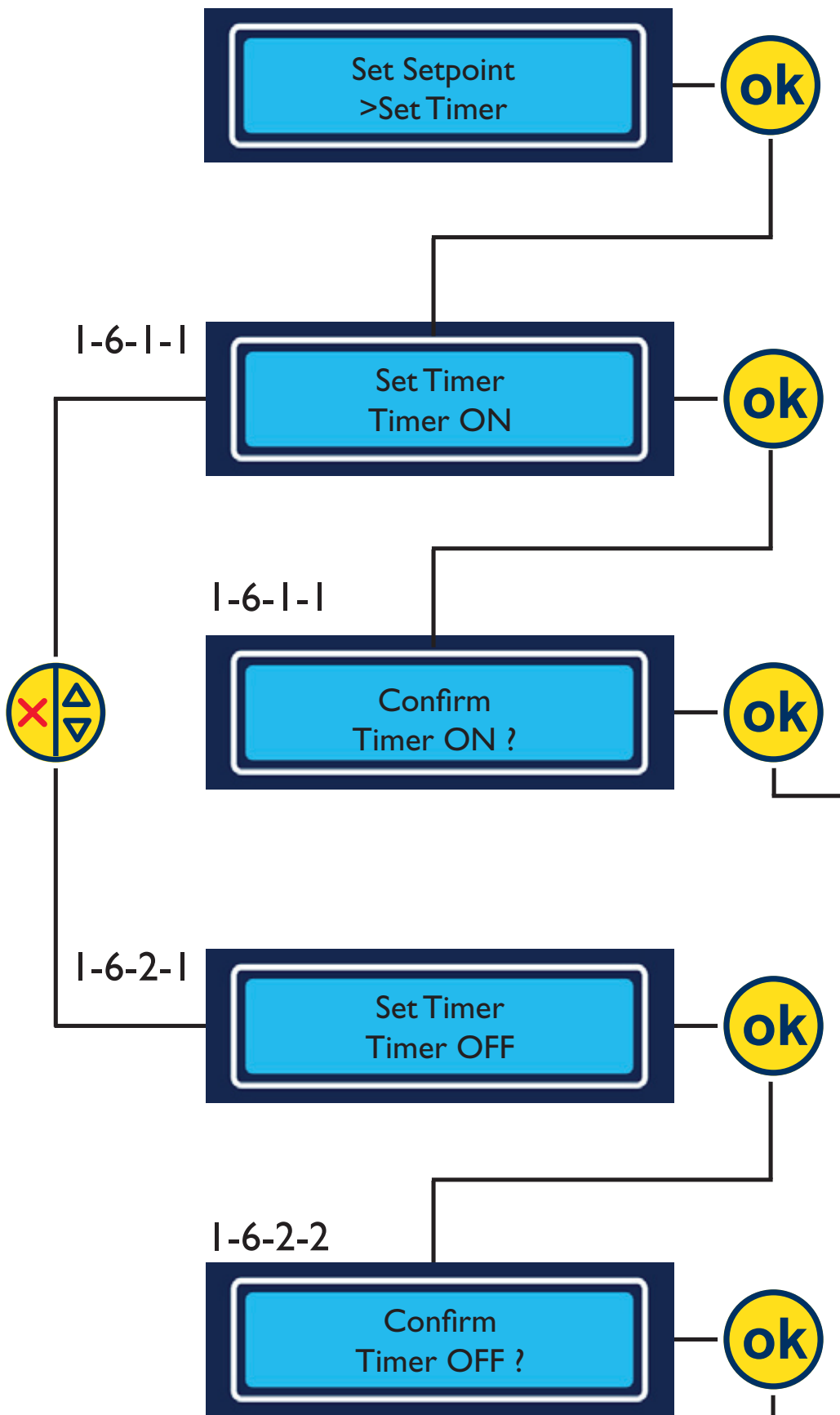
By default, the screen displays 00000000. Using the scroll buttons, select the appropriate digit in the active box and press the confirm button to move to the next digit.

Confirm the selected access code.

Allows the user to enter the device's ventilation settings based on the Flex<sup>™</sup> technology installed in your fume hood. This setting may be between 0 and 3000 RPM (rotations/minute). Using the scroll buttons, select the appropriate digit in the active box and press the confirm button to move to the next digit. Confirm the previously selected setting.

Display the Set Setpoint menu.

## I-6 Set Timer



## Notes:

This menu allows the user to activate or deactivate the Timer™.

Displays the fact that the Timer™ is activated.

Confirm activation of the Timer™.

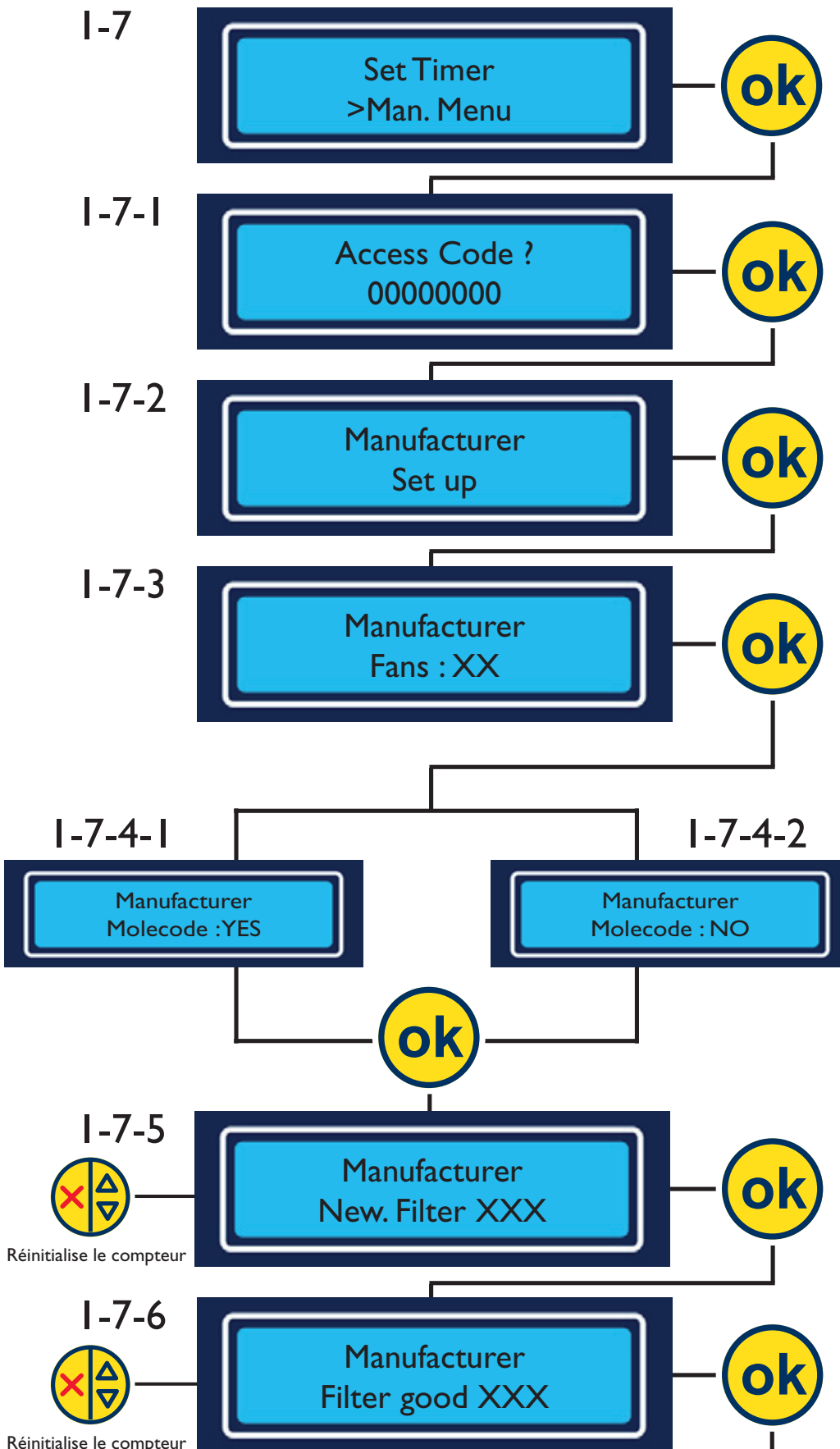
Display the **SetTimer** menu.

Displays the fact that the Timer™ is deactivated.

Confirm deactivation of the Timer™.

Display the **SetTimer** menu.

## I-7 Manufacturer Menu



## Notes:

N.B.: the contents of this menu are protected by an access code. Contact your maintenance service for additional information.

To enter the access code, scroll through the numbers in the active box using the scroll button. Press the confirm button to proceed to the next box. Once the code is entered, confirm the code using the OK button.

Indicates the number of fans detected by the CPU card when the device is first plugged in.

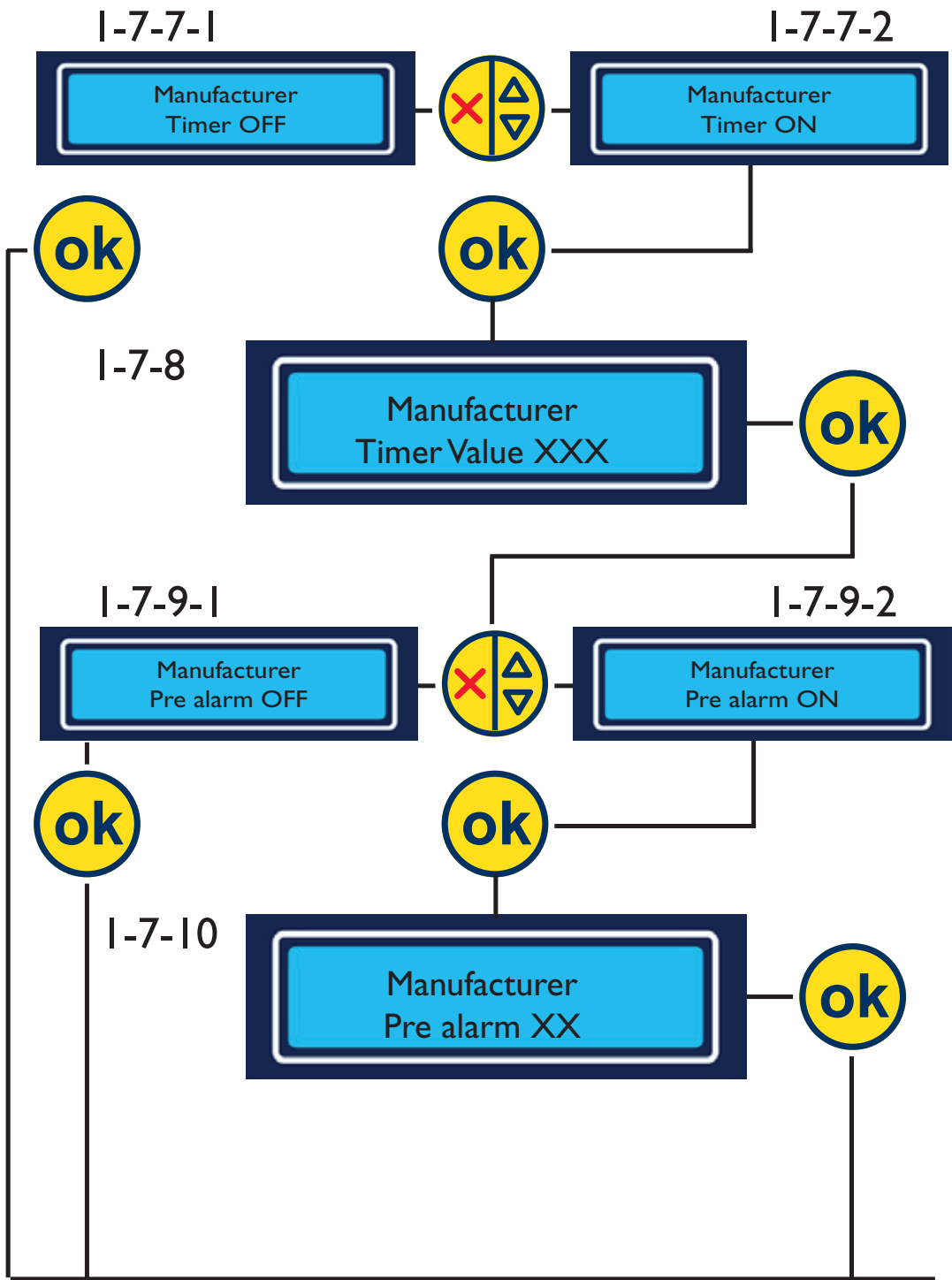
Indicates that the CPU card detects the Molecode™ S option when the device is first plugged in.

Counts the number of resets to the New filter mode (menu I-3-1-1).

Counts the number of resets to the Good filter mode (menu I-3-2-1).

**Allows the user to access menu I-7-7.**

## 1-7 Manufacturer Menu



## Notes :

Allows the user to activate or deactivate the Timer™.

Allows the user to set the Timer™'s time value if the Timer™ is activated. Possible values: from 1 to 250 hours. Scroll through the numbers in the active box using the scroll button and confirm the selected value using the confirmation button.

Allows the user to activate or deactivate the pre-warning alarm for the filter saturation test.

Allows the user to set the point at which the pre-warning alarm is triggered. Possible values: between 0 and 10 hour(s). Scroll through the numbers in the active box using the scroll button and confirm the selected value using the confirmation button.

**Allows the user to access menu 1-7-11.**



## I-7 Manufacturer Menu

### Notes:

Allows the user to modify the language displayed on screen.

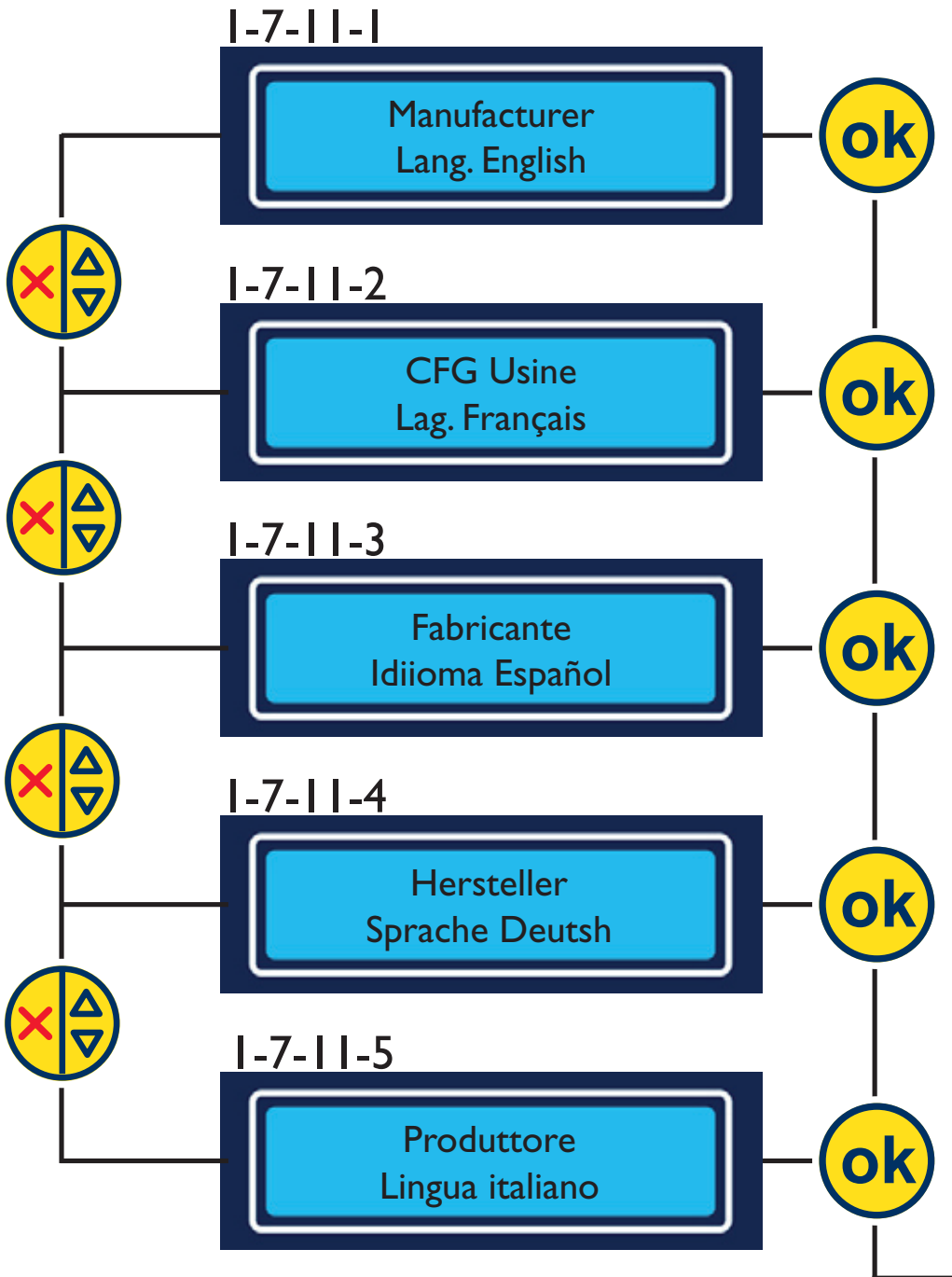
Allows the user to modify the language displayed on screen.

Allows the user to modify the language displayed on screen.

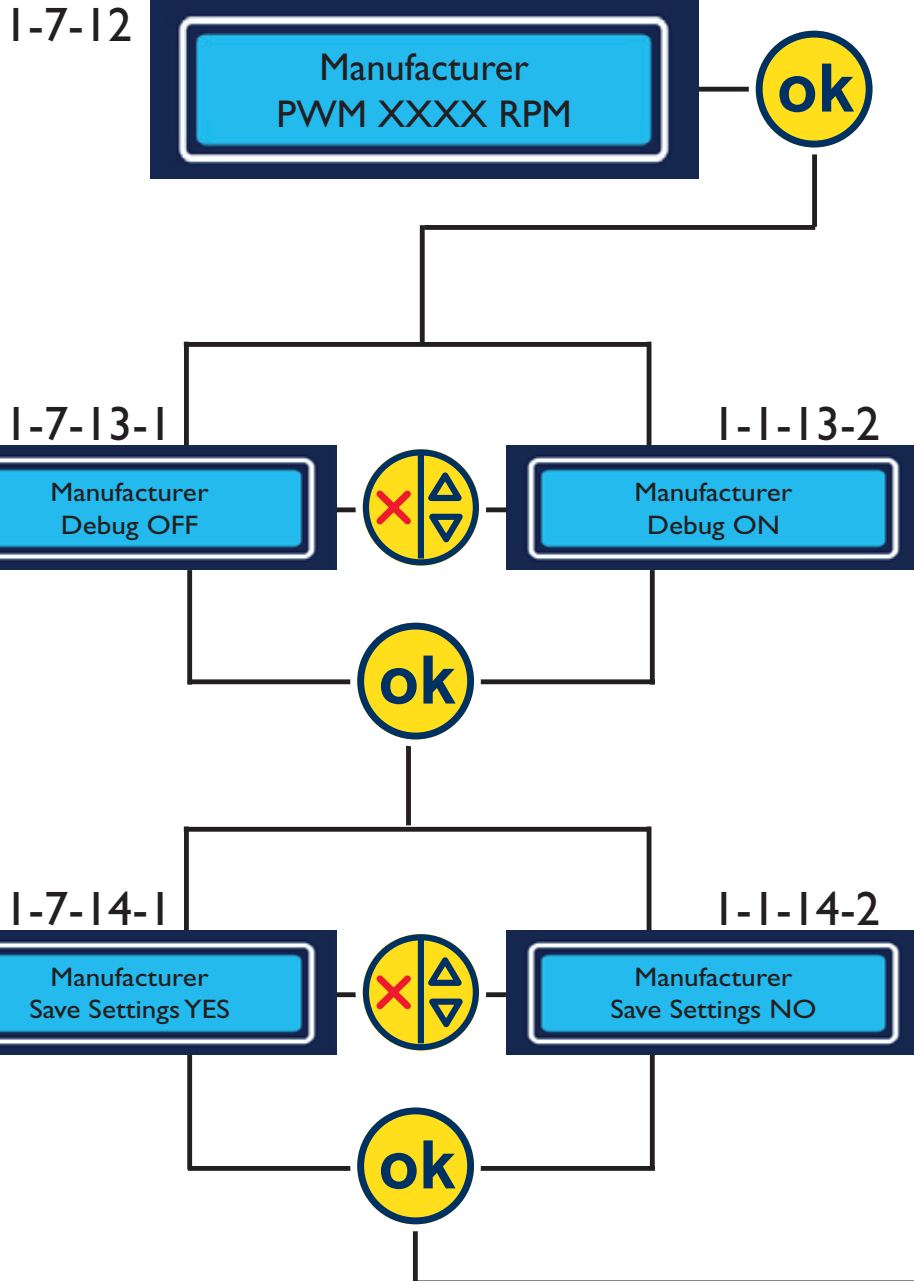
Allows the user to modify the language displayed on screen.

Allows the user to modify the language displayed on screen.

Allows the user to access menu I-7-12.



## 1-7 Manufacturer Menu



### Notes:

Allows the service engineer to enter ventilation settings for the device. The rotation speed, between 0 and 3000 RPM (rotations / min), must correspond to the device's Flex<sup>™</sup> technology settings. Refer to the various Flex<sup>™</sup> technology settings for more information. Scroll through the numbers in the active box using the scroll button and confirm the selected value using the confirmation button.

The Debug ON mode allows the user to reduce the Timer<sup>™</sup> cycle in order to verify the proper functioning of the alarms in the factory (pre-warning, Timer<sup>™</sup>, Molecode<sup>™</sup> S, etc.). The cycle takes 3 minutes to run.

Allows the service engineer to save or cancel parameters that were previously modified.

**Display the default screen display mode.**

# Protecting yourself

- Via the E.S.P. program (Erlab Safety Program)
- Via AFNOR NF X 15-211: 2009 standard

# THE PROGRAM—KEEPING YOU SAFE

## erlab<sup>®</sup> safety program

A long-lasting commitment by erlab<sup>®</sup> to the safety of the operator

*An essential part of user safety, our laboratory's mission is to assess the interactive behavior of molecules and their interactive effect with the Flex<sup>™</sup> filtration technology. Based on this scientific investigation, your E.S.P.<sup>®</sup> specialist will recommend the most appropriate unit, define the adapted filtration column and the enclosure design and ensure a complete protection to the user. After installation, your E.S.P.<sup>®</sup> specialist will provide you with a constant monitoring of the unit regarding the handlings performed.*

### The service:

**Determine the most appropriate filtering fume hood for total safety during your handlings**

Assisted by an E.S.P.<sup>®</sup> agent, you complete the investigation questionnaire, which precisely describes your intended chemical handlings. Our validation laboratory specialists will recommend the appropriate filtration fume hood and filter type. Personalized advice and accurate answer within 48 hours. A certificate validating the handling is supplied: real commitment of the manufacturer to the safety of the operator.



1

### The service:

**Certify and secure the usage framework at installation**

When you receive your Captair<sup>®</sup> filtering fume hood, a usage certificate will give precise details on the chemicals to be used, the filter type and an estimation of its lifetime expectancy, for which your Captair<sup>®</sup> filtering fume hood has been validated. This certificate is a permanent reminder to the user or the safety officer of the data relating to their protection.

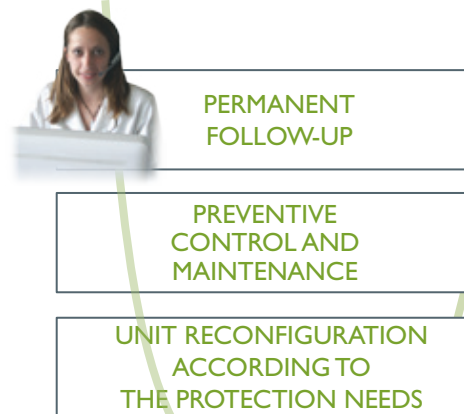


2

### The service:

**A constant monitoring of your filtering fume hood.**

Periodically (about every six months), the E.S.P.<sup>®</sup> agent will contact you to make sure that you have not changed your handlings and that the filter is still active. The E.S.P.<sup>®</sup> agent will show you how to perform step by step filter saturation tests and also the procedure for filter replacement. During this contact, if the E.S.P.<sup>®</sup> agent finds that there is a change in chemical handlings, you will be asked to complete a new questionnaire (see step 1). After review, a new certificate for use (to be placed on the front of the filtering fume hood) naming the approved chemicals will be sent to you to ensure that your chemical handlings are still performed within optimum safety conditions.



3

**Call your ESP<sup>®</sup> specialist today and configure this unique Captair<sup>®</sup> Flex<sup>™</sup> solution to your requirements.**

[www.erlab.com](http://www.erlab.com)



## A Information related to your applications

- 1 Name of the chemical (drop-down menu): Select the name of the chemical handled by your lab from the list of options. If the name of the chemical does not appear on the list, select the «unlisted chemical» field from the list, then enter the name of the chemical. If this is the case, you must provide the material safety data sheet for the chemical in question to the erlab® laboratory so that we can evaluate the behavior of this molecule.
- 2 Type of container (drop-down menu): Select the type of recipient used to handle the chemical in question from the list of options.
- 3 Open / Closed (drop-down menu): Indicate whether the recipient used is open or closed.
- 4 Dilution (text field): Enter the concentration of the chemical in question as a weight percentage. If the chemical is used in its pure form, enter 100; if it is diluted, enter its concentration: 50, 1N, etc. and enter the name of the diluting agent on the next line.
- 5 Temperature (text field): Temperature of the chemical when handled (in °C).
- 6 Handling frequency (drop-down menu): Number of times that the chemical is actually handled per month. Select the frequency of use of the chemical in question from the list of options.
- 7 Handling quantity (drop-down menu): Volume of the chemical per use. Select the volume of the chemical in question from the list of options.
- 8 Duration (drop-down menu): Time, in minutes, per use. Select the length of time that the chemical in question is handled from the list of options.
- 9 Type of handlings (drop-down menu): Select the type of application performed from the list of options. If your application does not appear in the list, describe the application in the “Comments” text field of section C.

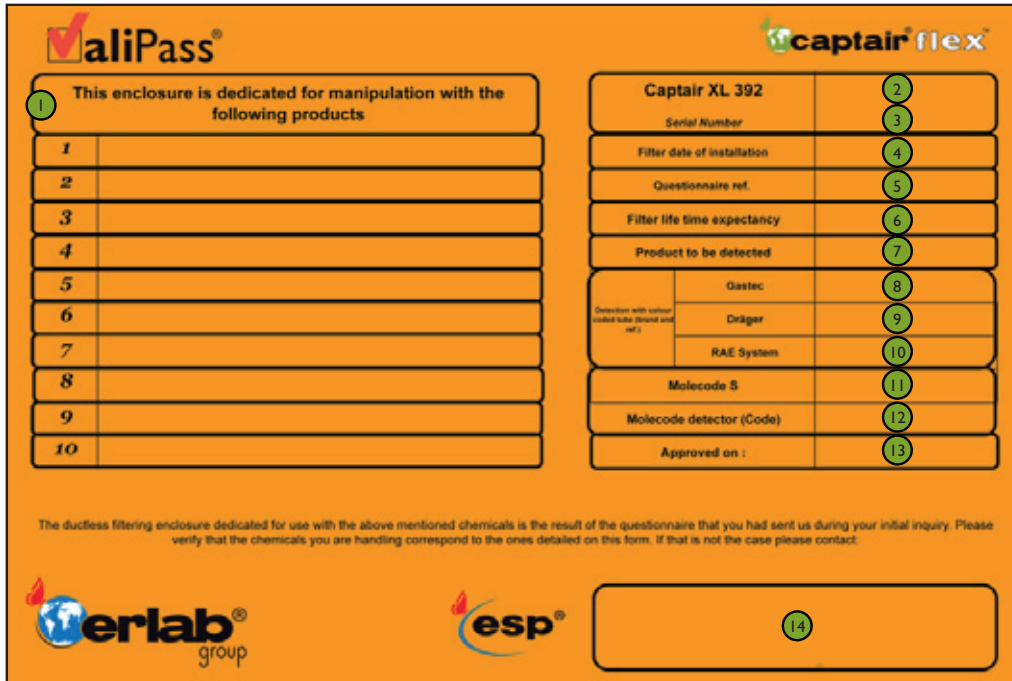
**B Contact details** : All fields marked with a \* are required—this information allows us to properly process your file and to trace any information provided.

**C Specifications of the request**: New device, updating of your Flex™ filtration technology. The «Comments» text field allows you to provide all necessary information to enable us to refine the analysis conducted by the erlab® laboratory.

**D Updating of your Flex™ filtration technology** : If you select this option, you must indicate the brand name and type of fume hood that you currently own as well as its serial number.

# THE ValiPass<sup>®</sup> SERVICE

## CERTIFIES AND CONFIRMS APPROPRIATE USE OF THE FUME HOOD FOR INSTALLATION




**ValiPass<sup>®</sup>** **captair<sup>®</sup> flex<sup>™</sup>**

1 This enclosure is dedicated for manipulation with the following products


1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

<b>Captair XL 392</b>		2
Serial Number		3
Filter date of installation		4
Questionnaire ref.		5
Filter life time expectancy		6
Product to be detected		7
(Detection with colour coded tube (brand and ref.))	Gastec	8
	Dräger	9
	RAE System	10
Molecode S		11
Molecode detector (Code)		12
Approved on :		13

The ductless filtering enclosure dedicated for use with the above mentioned chemicals is the result of the questionnaire that you had sent us during your initial inquiry. Please verify that the chemicals you are handling correspond to the ones detailed on this form. If that is not the case please contact:



**erlab<sup>®</sup>**  
group



**esp<sup>®</sup>**

14

- 1 List of chemicals authorized by the erlab laboratory for use with your fume hood in accordance with the information provided via the Valiquest<sup>®</sup> questionnaire of the E.S.P.<sup>®</sup> (Erlab Safety Program) program.
- 2 Device model and Flex<sup>™</sup> technology appropriate for your applications.
- 3 Serial number of your device.
- 4 Date of first use of the filter.
- 5 The reference number of your E.S.P.<sup>®</sup> file.
- 6 Expected life time of the filter.
- 7 Filter saturation detection: the chemical in question, which should be the subject of the saturation detection test.
- 8 Part number of the color coded tube made by this manufacturer.
- 9 Part number of the color coded tube made by this manufacturer.
- 10 Part number of the color coded tube made by this manufacturer.
- 11 Installation of the Molecode<sup>™</sup> S broad-spectrum automatic detector, if applicable.
- 12 Molecode<sup>™</sup> S setting for the detection of the chemical listed in field 8.
- 13 Date of issue of the Valipass<sup>®</sup> certificate.
- 14 User contact details

THE **ValiGuard<sup>®</sup>** SERVICE :

**CONTINUOUS MONITORING OF YOUR FILTERING FUME HOOD**

The **E.S.P.<sup>®</sup>** agent contacts users about every six months.



The agent checks to see whether or not the laboratory's applications have changed.



**ValiQuest<sup>®</sup>** Service



The **E.S.P.<sup>®</sup>** agent will guide the user step by step through the tests to check for filter saturation as well as through the filter replacement procedure.

You are asked to describe your new application in order to validate the safety parameters.



## AFNOR NF X 15-211: 2009 standard

Appointed by the AFNOR, the Union de Normalisation de la Mécanique (UNM), composed of a college of experts (INRS, national organizations, professional syndicates), has established the **AFNOR NF X 15-211 : 2009 standard**. This standard applies to filtration fume hoods (also named recirculatory fume hoods or ETRAF) designed for research, analysis, education works,... for all laboratories where chemicals subjected to professional exposure limit values (OEL or TLV) are manipulated. This text imposes performances criteria linked to:

- **Filtration efficiency**
- **Containment efficiency**
- **Air face velocity**

As well as a specific documentation attached with each filtration fume hood.

### The classes established by the standard

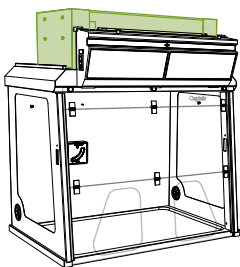
Class 1	Class 2
Filtration fume hood with safety reserve	Filtration fume hood without safety reserve
one main filtration level and one safety filtration level	One filtration level

### Classification according to filtration type

	Denominations according to the NF X 15 211:2009 standard	Denominations equivalence for the erlab® products
Particles filtration*	Type P	Type P
Vapours filtration**	Type V	Type C
Particles and vapours filtration**	Type PV	Type PC

\* :The particulate filter must be at least of H14 type according to the NF EN 1822-1 standard

\*\* :The filters for vapours must be submitted to two successive performance tests with Cyclohexane and Isopropanol for the filters designed to retain Volatile Organic Compounds (VOC). Another test for the acid vapours is carried out with Hydrochloric acid.



### The filtration efficiency

It is defined by the filter capacity to retain noxious molecules manipulated within the enclosure and qualifies the quality of the recirculated air at the filter exhaust.

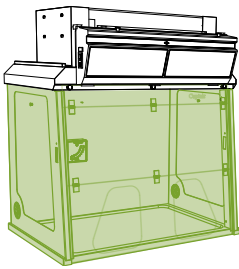
	Class 1	Class 2
Normal operation phase	Emissions concentration at the filter exhaust must be lower than 1% of the TLV	
Detection phase	The concentration at the filter exhaust must be lower than 1% of the TLV, and the automatic saturation detector must warn the user	The concentration at the filter exhaust must be lower than 50% of the TLV
Safety operation phase	The concentration at the filter exhaust must be lower than 50% of the TLV ; its duration must not be lower than 1/12 of the normal operation phase duration.	

**The retention** capacities recorded during the tests performed on our filters demonstrate **the technical performance developed by ErLab®**.

These results ensure a very high protection level to the Captair® Flex™ users.

Example of test carried out on a Captair® Flex™ XL 714, equipped with BE+ filters in class 1

Isopropanol	Cyclohexane	HCL (35%)
2250 gr	3204 gr	7862 gr



### Containment efficiency of the enclosure

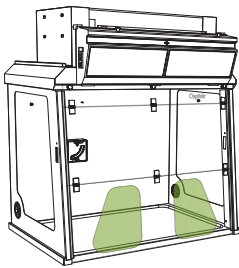
**It is defined by the fume hood capacity to maintain chemical vapors or particles within the enclosure without any propagation in the laboratory environment.**

To prove this efficiency, a test is carried out following the protocol described in the standard.

SF6 (Sulfur Hexafluoride) tracer gas emissions are made into the enclosure. A grid composed of sensors is placed in front of the working openings. Some samplings are done at the grid. Based on the emitted gas concentration and the samplings done (which will allow the determination

of an average operator exposure to this tracer gas), it is possible to determine a containment performance level of the filtration fume hood.

The containment threshold specified by the NFX 15-211:2009 standard imposes a maximum concentration of 0.1 ppm of SF6 gas at the measuring points on the grid.



### Air face velocity

**It represents the fume hood capacity to create a dynamic barrier between the operator and the handling.**

For filtration fume hoods with fixed front panel, the air face velocity at any point of the front openings must be between 0.4 and 0.6 m/s. They must be equipped with a permanent monitoring system for the air face velocity which also acts as a real time containment indicator.

### The documentation

**Filtration fume hoods must be delivered with a booklet containing an exhaustive list of chemicals, certified by the manufacturer, that can be handled into the filtering fume hood in the conditions described in the AFNOR NF X 15-211: 2009 standard. The following information must be indicated in the booklet for each chemical listed:**

- The chemical name, its formula, its CAS number, its boiling point, its molecular weight, its saturation vapour pressure
- The appropriate filter reference and its retention capacity during the normal operation phase
- The type of saturation detection system for the filter(s)
- The maximum quantity of the chemical that can be introduced within the enclosure
- The name of the test laboratory having performed the test



**Erlab<sup>®</sup> has created its own booklet called the CHEMICAL LISTING. This booklet contains a list of approved chemicals indicating analysis data for about 700 molecular substances commonly used in laboratories. This booklet is delivered with each unit, as per the requirements of the AFNOR NF X 15-211: 2009 standard.**

Every Erlab<sup>®</sup> filtration fume hood is in compliance with these safety criteria.

### The international standards

Erlab<sup>®</sup> products are in compliance with the following standards which guarantee your total protection.

France : **AFNOR NF X 15-211 : 2009**

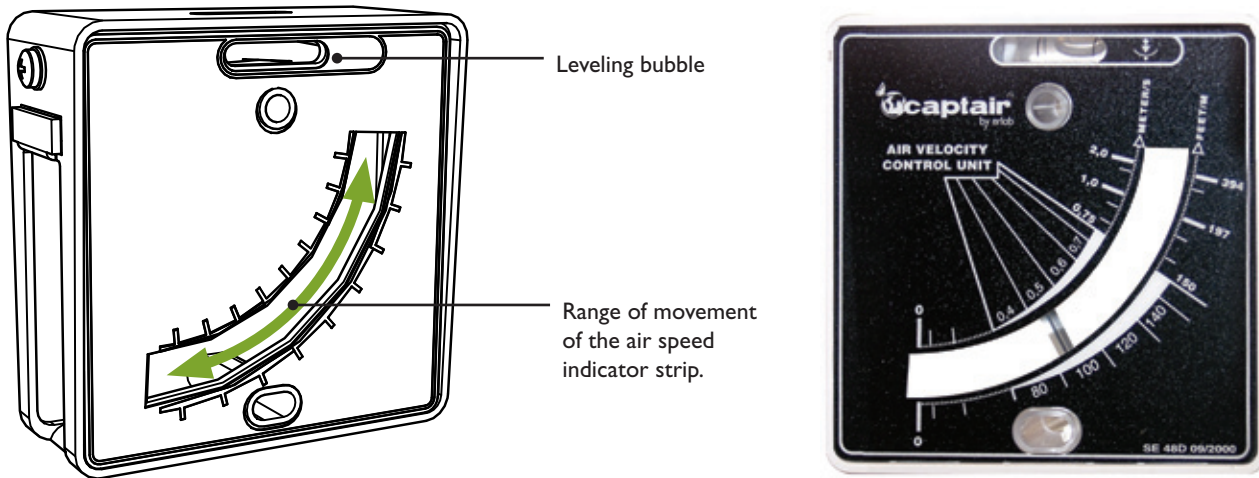
USA : **ANSI/AIHA Z9.5  
ASHRAE 110 : 1995**

# Maintenance

- Monitoring air face velocity
- Manually detecting filter saturation
- Automatically detecting filter saturation
- Replacing the filters
- The revolving system
- Cleaning and maintenance

## Monitoring air face velocity

The anemometer provided with your Captair<sup>®</sup> Flex<sup>™</sup> fume hood allows the user to constantly monitor the face velocity. If the anemometer is not installed during assembly, please install this device according to the steps listed in the installation instructions provided with your fume hood.

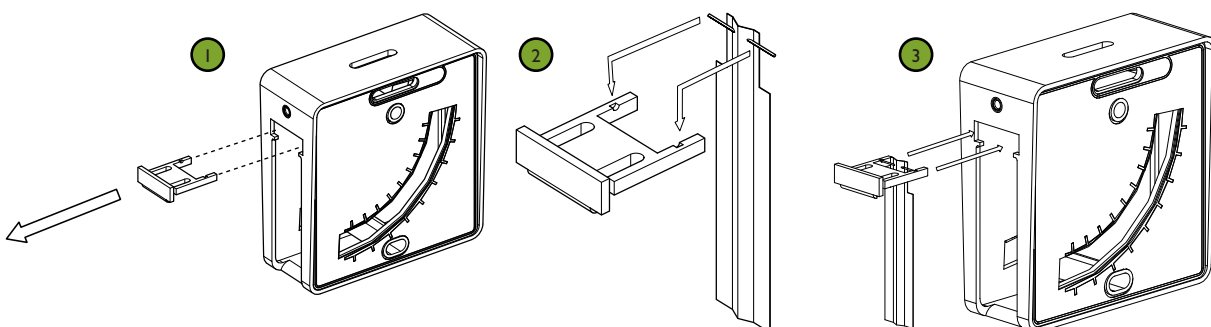


When reading the face velocity, first be sure to check that the leveling bubble on the anemometer is positioned correctly. To ensure proper movement of the strip, the anemometer must be level. The air face velocity must be between 0.4 and 0.6 m/s (as required by AFNOR NF X 15-211: 2009 standard).

### What should you do if the strip does not move or if its movement is irregular?

First of all, verify that the fume hood's ventilation system is turned on.

If the strip's movement is highly irregular, verify that the strip is correctly positioned in the housing located within the anemometer as shown in the diagrams below. The two pins of the strip must be correctly positioned in the support slots.

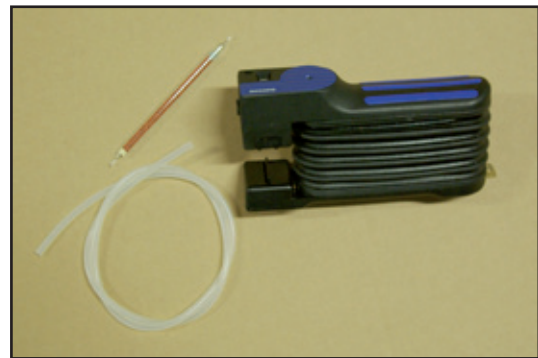


## MANUALLY DETECTING FILTER SATURATION

Your application was analyzed and validated by the erlab® laboratory as part of the erlab Safety Program (E.S.P.). During this validation, the erlab® laboratory used the information provided to determine the chemical that must be the subject of the molecular filter saturation test. You have access to this information at any time on your Valipass® certificate.

ValiPass®		Captair flex™	
This enclosure is dedicated for manipulation with the following products			
1		Captair XL 392	
2		Serial Number	
3		Filter size of replacement	
4		Gas/chemical set	
5		Filter life time (approximate)	
6		Product to be tested	
7		Name	
8		Synonym	
9		CAS Number	
10		Molecular Weight	
11		Molecular Formula	
12		Molecular Weight (Code)	
Approved on:			

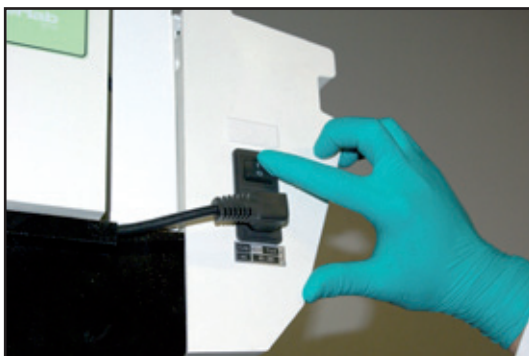
Verify the name of the chemical for which you will carry out the filter saturation test using the manual method.



To carry out a manual filter saturation test, you need the following equipment:

- a pump (not provided)
- a flexible silicone tube (provided)
- the chemical with which you will be testing (not provided)
- a color coded tube suitable for detecting this chemical (not provided)

The list of equipment not provided by erlab® may be purchased from various manufacturers including Gastec, Draeger, Kitagawa, RAE System, or their licensed distributors.



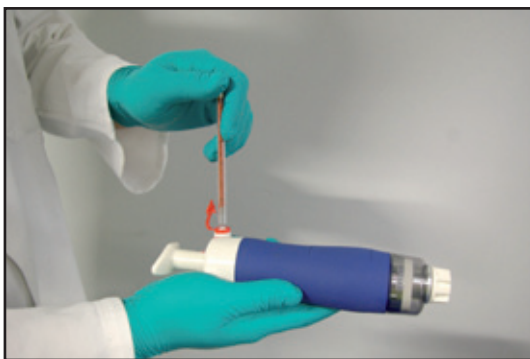
Power on you Captair® Flex™ fume hood and turn on the ventilation system.



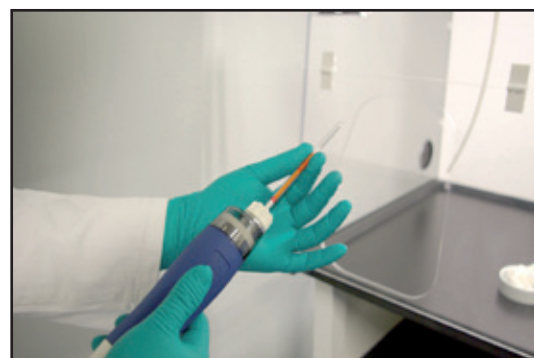
Evaporate a sufficient amount of the chemical for testing purposes within the enclosure. To do this, soak a rolled up piece of cloth in a container placed inside the enclosure of your Captair<sup>®</sup> Flex<sup>™</sup> fume hood.



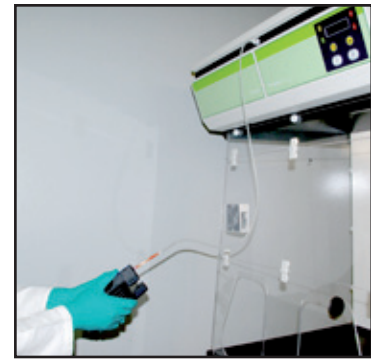
Connect one end of the silicone tube to the sampling port located on the control panel of your Captair<sup>®</sup> Flex<sup>™</sup> fume hood.



Break off the two ends of the color coded tube. Each pump is generally equipped with a system that allows the tubes to be broken without any risk to the operator or maintenance technician.



Connect the broken tube to the pump, being careful to verify that the tube is inserted in the correct direction. The color coded tubes are marked with this information.



After connecting the flexible silicone tube to the other end of the broken tube, collect an air sample using the pump. Refer to the instructions provided with the tubes for the number of times to pump.



Depending on the colorimetric reaction observed, you may need to replace the filter.

**After performing this test and depending on the results, you can then record this information by accessing the menus of the digital screen:**

**Either to enter the parameters related to the new filter installed (menu 1-3-1).**



**Or to confirm that the filter has not been changed (menu 1-3-2-1).**



## AUTOMATICALLY DETECTING FILTER SATURATION

### Molecode™ S:

The automatic Molecode™ S detector is automatically activated when the ventilation system of your Captair® Flex™ fume hood is started.

It uses a sensor designed to detect various organic vapors and gases, which, based on the parameters set for the sensor, make it possible to detect saturation of the main filter.

#### How do you modify the settings of the sensor ?

Before turning on your Captair® Flex™ fume hood for the first time, verify that the detector setting corresponds to the code provided by the erlab® laboratory after analyzing and validating your application. This configuration was factory-set using the information provided.

**This information is available at any time on your Valipass® form, which is attached to the control panel of your Captair® Flex™ fume hood.**

The image shows a Valipass form for a Captair XL 392 fume hood. The form is divided into two main sections. The left section is for product identification, with fields for 'This enclosure is dedicated for manipulation with the following products' and a list of products (1-10). The right section is for technical specifications, including 'Serial Number', 'Filter area of installation', 'Operational use', 'Filter life time expectancy', 'Product to be detected', 'System', 'Origin', 'Risk system', 'Molecode S', 'Molecode detector (if available)', and 'Approved on'. An arrow points from the text 'Find the setting for the Molecode™ S, automatic detection of filter saturation by solvents.' to the 'Molecode S' field in the right section.

Find the setting for the Molecode™ S, automatic detection of filter saturation by solvents.

To enter this setting, refer to section I-5 of the chapter on “Navigating the digital display screen.”

### MODIFYING THE LIMIT SETTINGS FOR THE UNIT

#### For the detection of a single chemical:

Refer to the limits listed on the next page.

#### For the detection of multiple chemicals:

Contact your E.S.P.® agent as soon as possible in order to determine the limit value corresponding to your application.



## MODIFYING THE LIMIT SETTINGS FOR THE MOLECODE™ S UNIT

You can modify the detection limit of the Molecode™ S at any time.

The table at left lists the setting codes to be entered for the detection of a single chemical.

To convey this information to the detector, refer to menu 1-4 of the section on “Navigating the digital display screen” in this manual.



CHEMICAL NAME	FORMULA	CAS Number	Molecode™ setting
1, 4-Dioxane	C4H8O2	123-91-1	3500
1, 1, 1-Trichloroethane	C2H3Cl3	71-55-6	2700
1, 1-Dichloroethane	C2H4Cl2	75-34-3	2800
1, 2-Dibromoethane	C2H4Br2	106-93-4	2700
1, 2-Dichloroethane	C2H4Cl2	107-06-2	2700
1, 2-Ethandiol	C2H6O2	107-21-1	3100
1-Aminobutane	C4H9NH2	109-73-9	2800
1-Butanol	C4H10O	71-36-3	4000
1-Chloro butane	C4H9Cl	109-69-3	3000
1-Propanol	C3H8O	71-23-8	4100
2, 2'-Dichlorodiethyl ether	C4H8OCl2	111-44-4	2800
2, 4-Dimethyl pentane	C7H16	108-08-7	3600
2, 4-Dimethyl-3-pentanone	C7H14O	565-80-0	2800
2, 6-Dimethyl-4-heptanone	C9H18O	108-83-8	3500
2-Amino butane	C4H9NH2	13952-84-6	2800
2-Butanol	C4H10O	78-92-2	4200
2-Butanone	C4H8O	78-93-3	4000
2-Butenal	C4H6O	4170-30-3	3600
2-Butoxyethanol	C6H14O2	111-76-2	2700
2-Chloroacetaldehyde	C2H3OCl	107-20-0	2700
2-Chloroethanal	C2H3OCl	107-20-0	2700
2-Chloroethanol	C2H5OCl	107-07-3	3000
2-Chloroethyl alcohol	C2H5OCl	107-07-3	3000
2-Ethoxyethanol	C4H10O2	110-80-5	3500
2-Furylmethanol	C5H6O2	98-00-0	3100
2-Heptanone	C7H14O	110-43-0	4300
2-Hexanone	C6H12O	591-78-6	2800
2-Hydroxymethylfuran	C5H6O2	98-00-0	3100
2-Methyl- 1, 3-butadiene	C5H8	78-79-5	2800
2-Methyl- 1-propanol	C4H10O	78-83-1	2800
2-Methylbutane	C5H12	78-78-4	3500
2-Methylpropyl acetate	C6H12O2	110-19-0	3000
2-Methylpropyl ester of acetic acid	C6H12O2	110-19-0	3000
2-Pentanone	C5H10O	107-87-9	4000
2-Pentanone	C5H10O	107-87-9	4000
2-Phenyl propane	C9H12	98-82-8	3000
2-Propanol	C3H8O	67-63-0	4100
2-Propanone	C3H6O	67-64-1	4200
2-Propen-1-ol	C3H6O	107-18-6	2800
2-Propenol	C3H6O	107-18-6	2800
2-Propyl acetate	C5H10O2	108-21-4	3000
3-Chloro- 1-propene	C3H5Cl	107-05-1	2800
3-Pentanone	C5H10O	96-22-0	4500
4-Methyl 2-pentanone	C6H12O	108-10-1	2800
4-Methyl-2-pentanone	C6H12O	108-10-1	2800

CHEMICAL NAME	FORMULA	CAS Number	Molecode™ setting
4-tert-Butyl toluene	C11H16	98-51-1	2800
5-Methyl-3-Heptanone	C2H6O2	541-85-5	3500
Absolute alcohol	C2H6O	64-17-5	4500
Acetaldehyde	C2H4O	75-07-0	2800
Acetic acid	C2H4O2	64-19-7	2800
Acetone	C3H6O	67-64-1	4200
Acetonitrile	C2H3N	75-05-8	3000
a-Chlorotoluene	C7H7Cl	100-44-7	2700
Alcohol	C2H6O	64-17-5	4500
Aldehyde ethylique	C2H4O	75-07-0	2800
Allyl alcohol	C3H6O	107-18-6	2800
Allyl chloride	C3H5Cl	107-05-1	2800
Allylglycidylether	C6H10O2	106-92-3	2800
Allylic alcohol	C3H6O	107-18-6	2800
Aminocyclohexane	C6H11NH2	108-91-8	2700
Aminoethane	C2H7N	75-04-7	2700
Ammonia	NH3	7664-41-7	2600
Ammonium hydroxyde sol	NH4OH	7664-41-7	2600
Amyl alcohol n	C5H12O	71-41-0	3200
Azine	C5H5N	110-86-1	2700
Benzene chloride	C6H5Cl	108-90-7	2700
Benzyl chloride	C7H7Cl	100-44-7	2700
beta-Methyl acrolein	C4H6O	4170-30-3	3600
beta-Methylpropyl ethanoate	C6H12O2	110-19-0	3000
Bicyclopentadiene	C10H12	77-73-6	2800
Bromoethane	C2H5Br	74-96-4	2700
Bromoform	CHBr3	75-25-2	2800
Butyl acrylate	C7H12O2	141-32-2	2800
Butyl alcohol	C4H10O	71-36-3	4000
Butyl alcohol sec	C4H10O	78-92-2	4200
Butyl alcohol ter	C4H10O	75-65-0	3000
Butyl carbinol	C5H12O	71-41-0	3200
Butyl Cellosolve®	C6H14O2	111-76-2	2700
Butyl ether	C8H18O	142-96-1	3500
Butyl glycol	C6H14O2	111-76-2	2700
Butyl lactate	C7H14O3	138-22-7	3000
Butyl metacrylate	C18H14O2	97-88-1	2800
Butyl vinyl ether	C6H12O	111-34-2	3500
Butyl vinyl ether	C6H12O	111-34-2	3500
Butylene hydrate	C4H10O	78-92-2	4200
BVE	C6H12O	111-34-2	3500
Carbon disulfide	CS2	75-15-0	2600
Cellosolve®	C4H10O2	110-80-5	3500
Chlorobenzene	C6H5Cl	108-90-7	2700
Chlorothene	C2H3Cl3	71-55-6	2700

CHEMICAL NAME	FORMULA	CAS Number	Molecode™ setting
Cinamene	C8H8	100-42-5	2800
Crotonaldehyde	C4H6O	4170-30-3	3600
Cumene	C9H12	98-82-8	3000
Cumol	C9H12	98-82-8	3000
Cyanomethane	C2H3N	75-05-8	3000
Cyclohexane	C6H12	110-82-7	2800
Cyclohexanol	C6H12O	108-93-0	3000
Cyclohexanone	C6H10O	108-94-1	3500
Cyclohexene	C6H10	110-83-8	3800
Cyclohexyl alcohol	C6H12O	108-93-0	3000
Cyclohexyl ketone	C6H10O	108-94-1	3500
Cyclohexylamine	C6H11NH2	108-91-8	2700
Cyclopentane	C5H10	287-92-3	2800
Decane	C10H22	124-18-5	2700
Dibutyl ether	C8H18O	142-96-1	3500
Dichloropropane 1, 2	C3H6Cl2	78-87-5	4500
Dicyclopentadiene	C10H12	77-73-6	2800
Diethamine	C4H11N	109-89-7	3200
Diethyl ether	C4H10O	60-29-7	3700
Diethyl ketone	C5H10O	96-22-0	4500
Diethyl oxide	C4H10O	60-29-7	3700
Diethylamine	C4H11N	109-89-7	3200
Diethylene dioxide	C4H8O2	123-91-1	3500
Diethylene oxide	C4H8O	109-99-9	4200
Diisopropyl ketone	C7H14O	565-80-0	2800
Diisopropyl ketone	C9H18O	108-83-8	3500
Dimethoxymethane	C3H8O2	109-87-5	3800
Dimethyl amine	C2H7N	124-40-3	2700
Dimethyl benzene (and isomers)	C8H10	95-47-6	2800
Dimethyl carbinol	C3H8O	67-63-0	4100
Dimethyl ketone	C3H6O	67-64-1	4200
Dimethyl sulfoxide	C2H6SO	67-68-5	2700
Dimethylacetone	C5H10O	96-22-0	4500
Dipropyl ketone	C7H14O	123-19-3	4300
DMA	C2H7N	124-40-3	2700
DMSO	C2H6SO	67-68-5	2700
Ethanal	C2H4O	75-07-0	2800
Ethanoic acid	C2H4O2	64-19-7	2800
Ethanol	C2H6O	64-17-5	4500
Ether	C4H10O	60-29-7	3700
Ethyl acetate	C4H8O2	141-78-6	4000
Ethyl acrylate	C5H8O2	140-88-5	3000
Ethyl alcohol	C2H6O	64-17-5	4500
Ethyl benzene	C8H10	100-41-4	2800
Ethyl bromide	C2H5Br	74-96-4	2700
Ethyl ethanoate	C4H8O2	141-78-6	4000
Ethyl ether	C4H10O	60-29-7	3700
Ethyl formate	C3H6O2	109-94-4	3000
Ethyl ketone	C5H10O	96-22-0	4500
Ethyl methyl ketone	C4H8O	78-93-3	4000
Ethyl nitrile	C2H3N	75-05-8	3000
Ethyl oxide	C4H10O	60-29-7	3700
Ethylamine	C2H7N	75-04-7	2700
Ethylen chlorhydrin	C2H5OCl	107-07-3	3000
Ethylene alcohol	C2H6O2	107-21-1	3100
Ethylene bromide	C2H4Br2	106-93-4	2700
Ethylene chloride	C2H4Cl2	107-06-2	2700
Ethylene chlorohydrin	C2H5OCl	107-07-3	3000
Ethylene dibromide	C2H4Br2	106-93-4	2700
Ethylene dichloride	C2H4Cl2	107-06-2	2700
Ethylene glycol	C2H6O2	107-21-1	3100
Ethylene glycol mono ethyl ether	C4H10O2	110-80-5	3500

CHEMICAL NAME	FORMULA	CAS Number	Molecode™ setting
Ethylidene chloride	C2H4Cl2	75-34-3	2800
Formic acid	CH2O2	64-18-6	2600
Furfuryl alcohol	C5H6O2	98-00-0	3100
Furyl carbinol	C5H6O2	98-00-0	3100
Glacial acetic acid (pure compound)	C2H4O2	64-19-7	2800
Glutaraldehyde	C5H8O2	111-30-8	2600
Glycol	C2H6O2	107-21-1	3100
Heptan-4-one	C7H14O	123-19-3	4300
Hexane	C6H14	110-54-3	2800
Hexone	C6H12O	108-10-1	2800
Hydroxybenzene	C6H6O	108-95-2	2800
Hydroxycyclohexane	C6H12O	108-93-0	3000
IPA	C3H8O	67-63-0	4100
Isoamyl acetate	C7H14O2	123-92-2	3700
Isoamyl alcohol	C5H12O	71-41-0	3200
Isobutanol	C4H10O	78-83-1	2800
Isobutenyl methyl ketone	C6H10O	141-79-7	3000
Isobutyl acetate	C6H12O2	110-19-0	3000
Isobutyl alcohol	C4H10O	78-83-1	2800
Isobutyl methyl carbinol	C6H14O	108-11-2	2700
Isobutyronone	C7H14O	565-80-0	2800
iso-Nitropropane	C3H7NO2	79-46-9	3000
Isooctane	C8H18	540-84-1	3400
Isopentane	C5H12	78-78-4	3500
Isopentyl acetate	C7H14O2	123-92-2	3700
Isoprene	C5H8	78-79-5	2800
Isopropanol	C3H8O	67-63-0	4100
Isopropyl acetate	C5H10O2	108-21-4	3000
Isopropyl alcohol	C3H8O	67-63-0	4100
Isopropyl benzene	C9H12	98-82-8	3000
Isopropyl benzene	C9H12	98-82-8	3000
Isopropylcarbinol	C4H10O	78-83-1	2800
Isopropylideneacetone	C6H10O	141-79-7	3000
MEK	C4H8O	78-93-3	4000
Mesityl oxide	C6H10O	141-79-7	3000
Mesitylene	C9H12	108-67-8	4000
Methanoic acid	CH2O2	64-18-6	2600
Methanol	CH4O	67-56-1	4200
Methyl acetate	C3H6O2	79-20-9	3000
Methyl acetone	C4H8O	78-93-3	4000
Methyl alcohol	CH4O	67-56-1	4200
Methyl benzene	C7H8	108-88-3	3000
Methyl butyl ketone	C6H12O	591-78-6	2800
Methyl cellosolve	C3H8O2	109-86-4	2700
Methyl chloroform	C2H3Cl3	71-55-6	2700
Methyl cyanide	C2H3N	75-05-8	3000
Methyl cyclohexanol	C7H14O	25639-42-3	3800
Methyl ethyl ketone	C4H8O	78-93-3	4000
Methyl formate	C2H4O2	107-31-3	2700
Methyl isobutenyl ketone	C6H10O	141-79-7	3000
Methyl isobutyl ketone	C6H12O	108-10-1	2800
Methyl metacrylate	C5H8O2	80-62-6	3000
Methyl propyl ketone	C5H10O	107-87-9	4000
Methyl styrene	C9H10	25013-15-4	3700
Methyl-2-propanol-2	C4H10O	75-65-0	3000
Methyl-3-butanol-1	C5H12O	71-41-0	3200
Methylal	C3H8O2	109-87-5	3800
methylamyl alcohol	C6H14O	108-11-2	2700
Methylethyl carbinol	C4H10O	78-92-2	4200
MIBC	C6H14O	108-11-2	2700
MIBK	C6H12O	108-10-1	2800
n-Amyl acetate	C7H14O2	123-92-2	3700

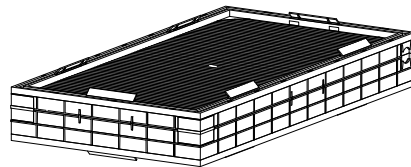
CHEMICAL NAME	FORMULA	CAS Number	Molecode™ setting
Naphta 30/60	85% Nonane/15% trimethylbenzene	8052-41-3	3600
n-Butanol	C4H10O	71-36-3	4000
n-Butyl acetate	C6H12O2	123-86-4	3000
n-Butyl amine	C4H9NH2	109-73-9	2800
n-Butyl chloride	C4H9Cl	109-69-3	3000
N-Ethylethanamine	C4H11N	109-89-7	3200
n-Hexane	C6H14	110-54-3	2800
Nitroethane	C2H5NO2	79-24-3	3700
Nitropropane 2	C3H7NO2	79-46-9	3000
n-Octane	C8H18	111-65-9	3400
Nonane all isomers	C9H20	111-84-2	3600
n-Pentane	C5H12	109-66-0	3000
o-Xylene	C8H10	95-47-6	2800
p-Dichlorobenzene	C6H4Cl2	106-46-7	2700
Pentanol I	C5H12O	71-41-0	3200
Phenol	C6H6O	108-95-2	2800
Phenyl chloride	C6H5Cl	108-90-7	2700
Phenyl hydroxide	C6H6O	108-95-2	2800
Phenylethane	C8H10	100-41-4	2800
Phenylethylene	C8H8	100-42-5	2800
Phenylmethane	C7H8	108-88-3	3000
Propanol-I	C3H8O	71-23-8	4100
Propyl acetate	C5H10O2	109-60-4	3000
Propyl alcohol	C3H8O	71-23-8	4100
Propylacetate	C5H10O2	109-60-4	3000
Propylamine	C3H9N	107-10-8	3500
Propylbenzene	C9H12	108-67-8	4000
Propylene aldehyde	C4H6O	4170-30-3	3600
Propylene chloride	C3H6Cl2	78-87-5	4500
Propylene dichloride	C3H6Cl2	78-87-5	4500
Propylene oxide	C3H6O	75-56-9	2800
Pyridine	C5H5N	110-86-1	2700
SBA	C4H10O	78-92-2	4200
sec-Amyl acetate	C7H14O2	123-92-2	3700
sec-Butyl amine	C4H9NH2	13952-84-6	2800
Stoddard solvent	85% Nonane/15% trimethylbenzene	8052-41-3	3600
Styrene	C8H8	100-42-5	2800
ter-Butyl acetate	C6H12O2	540-88-5	3500
tert-Butyl alcohol	C4H10O	75-65-0	3000
Tetrahydrofuran	C4H8O	109-99-9	4200
THF	C4H8O	109-99-9	4200
TMA	C3H9N	75-50-3	2700
Toluene	C7H8	108-88-3	3000
Toluol	C7H8	108-88-3	3000
Tribromomethane	CHBr3	75-25-2	2800
Triethylamine	C6H15N	121-44-8	2700
Trimethyl carbinol	C4H10O	75-65-0	3000
Trimethyl pentane-2,2,4	C8H18	540-84-1	3400
Trimethylamine	C3H9N	75-50-3	2700
Trimethylbenzene	C9H12	108-67-8	4000
Turpentine oil	C10H16	8006-64-2	3500
Vinyl acetate	C4H6O2	108-05-4	3500
Vinyl carbinol	C3H6O	107-18-6	2800
Vinyl toluene	C9H10	25013-15-4	3700
Vinylbenzene	C8H8	100-42-5	2800
White spirit	85% Nonane/15% trimethylbenzene	8052-41-3	3600
Xylene (isomers)	C8H10	1330-20-7	2800

## REPLACING THE FILTERS

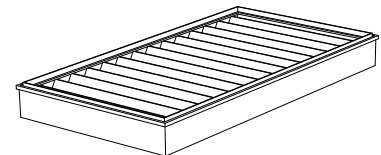
Your device is equipped with FLEX<sup>™</sup> technology that was configured to the user's protection needs when the device was purchased. The design of the column is thus directly dependent on the applications carried out in the enclosure. These applications may change over time. Your FLEX<sup>™</sup> technology can therefore be reconfigured if your fume hood is used for applications other than those anticipated when the device is first set up.

The table below summarizes all possible Flex<sup>™</sup> technology configurations for your device.

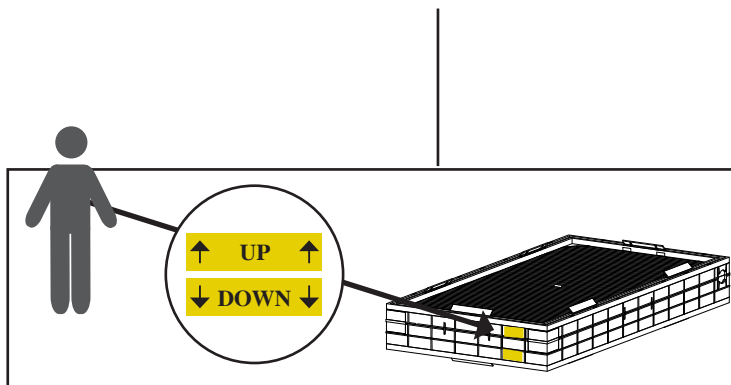
**Molecular filter**



**HEPA filter H14**



M 321 - M 391 - M 481	<b>1C</b>	<b>x1</b>	
M 321 - M 391 - M 481	<b>2C</b>	<b>x2</b>	
M 321 - M 391	<b>1P</b>		<b>x1</b>
M 321 - M 391 - M 481	<b>1P 1C</b>	<b>x1</b>	<b>x1</b>
M 321 - M 391 - M 481	<b>1P 2C</b>	<b>x2</b>	<b>x1</b>
M 321 - M 391 - M 481	<b>1C 1P</b>	<b>x1</b>	<b>x1</b>
M 321 - M 391 - M 481	<b>2C 1P</b>	<b>x2</b>	<b>x1</b>



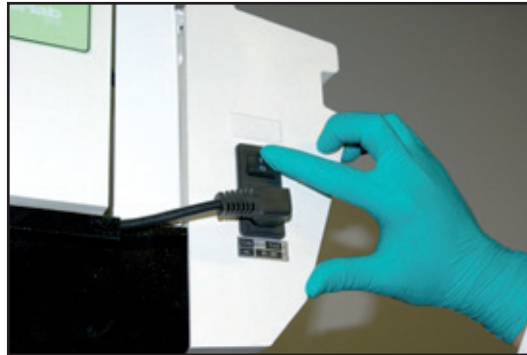
Each molecular filter is labeled as shown at left. Please follow these markings.

The table below summarizes the different types of carbon filters that erlab<sup>®</sup> offers as well as the range of application of these filters.

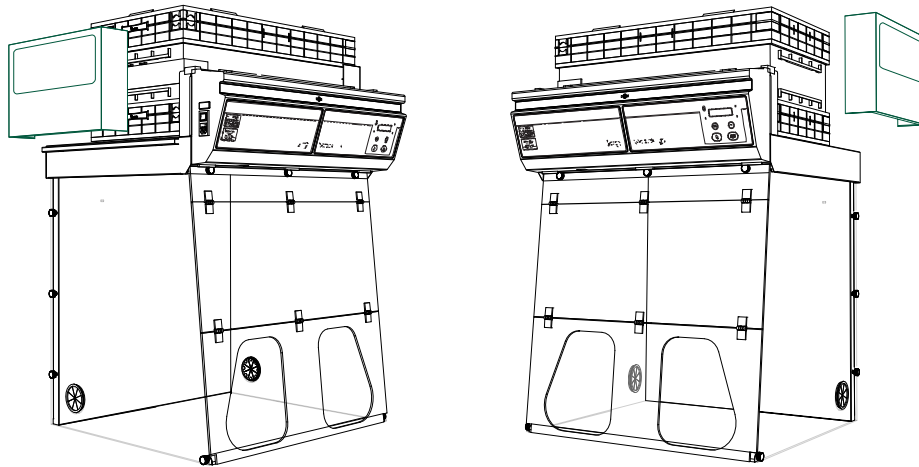
<b>Type AS</b>	For organic vapors
<b>Type BE +</b>	For acid and organic vapors
<b>Type K</b>	For ammonia vapors
<b>Type F</b>	For formaldehyde vapors
<b>HEPA H14</b>	For powders



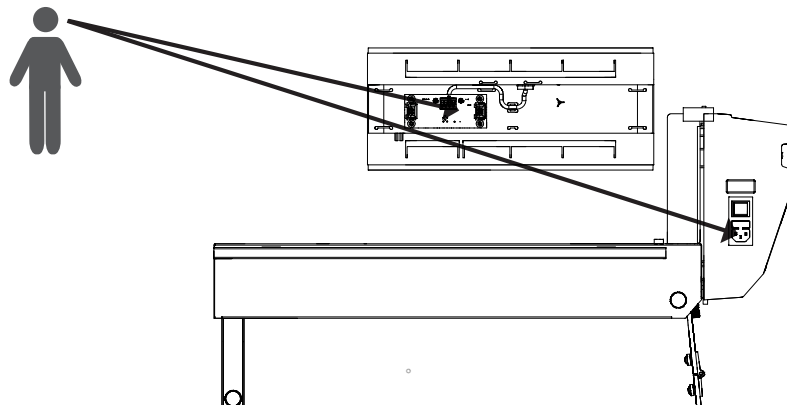
For these operations, we strongly recommend that the user or maintenance technician wear the necessary safety equipment, including: safety glasses, a safety suit, and gloves.



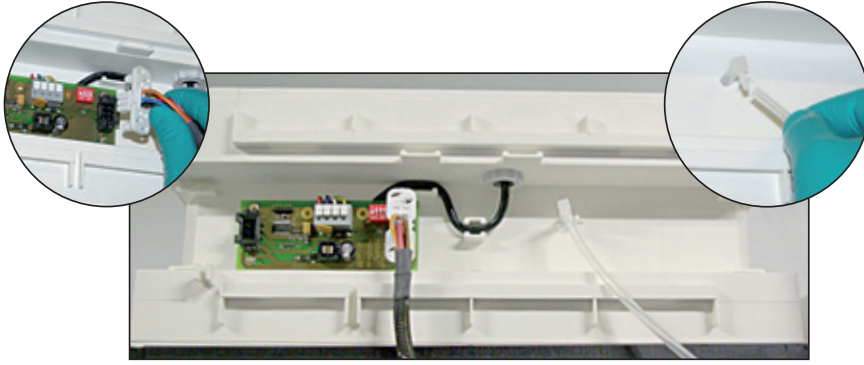
Turn off your Captair<sup>®</sup> Flex<sup>™</sup> fume hood.



Remove the two protective casings on either side of the hood.



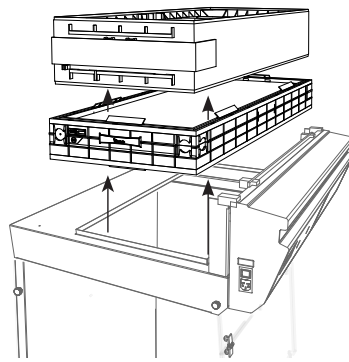
You should be able to see the ventilation card located beside the master switch.



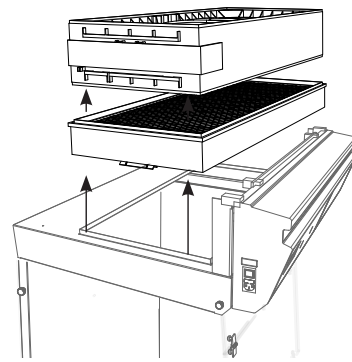
Disconnect the power supply to the ventilation card then the flexible silicone tube.

Remove all items comprising your fume hood's Flex<sup>™</sup> technology.

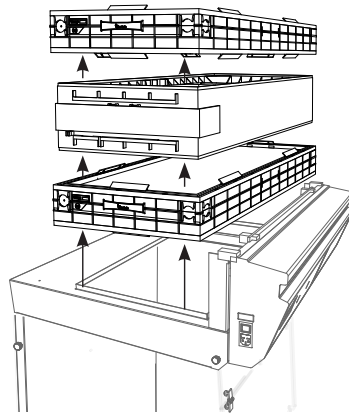
**IC**



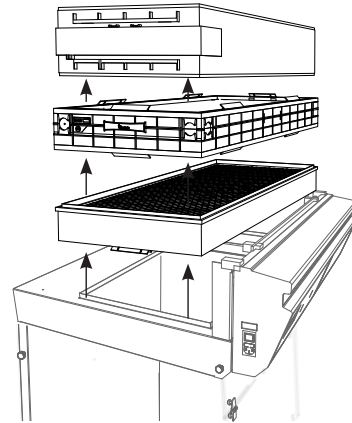
**IP**



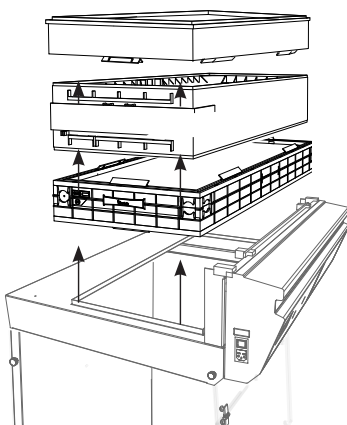
**2C**



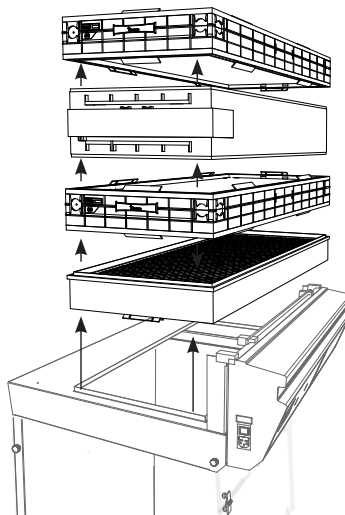
**IP IC**



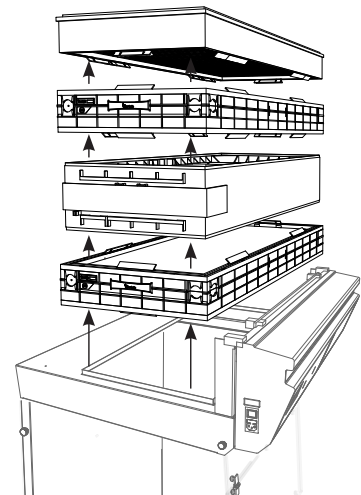
**IC IP**



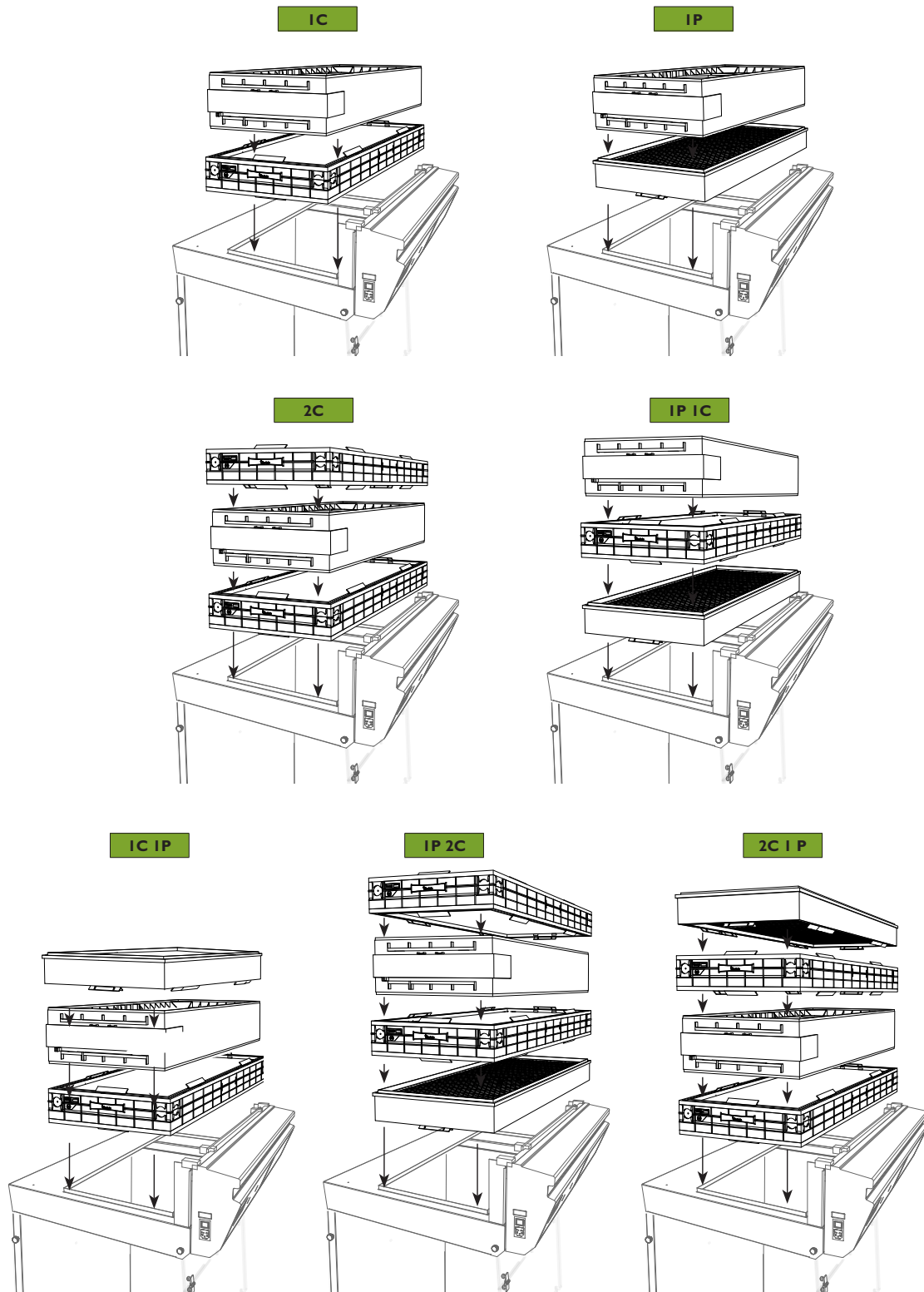
**IP 2C**

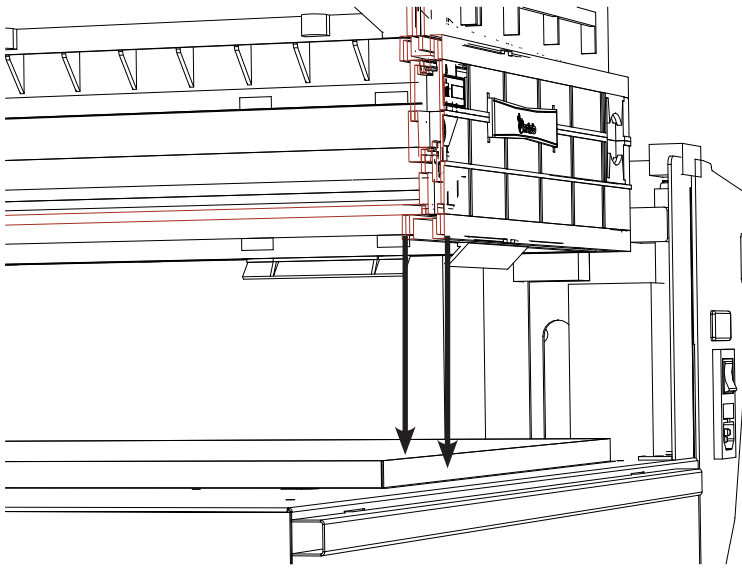


**2C IP**



After carefully removing the filters from their packaging, assemble the column based on the Flex™ technology to be installed.

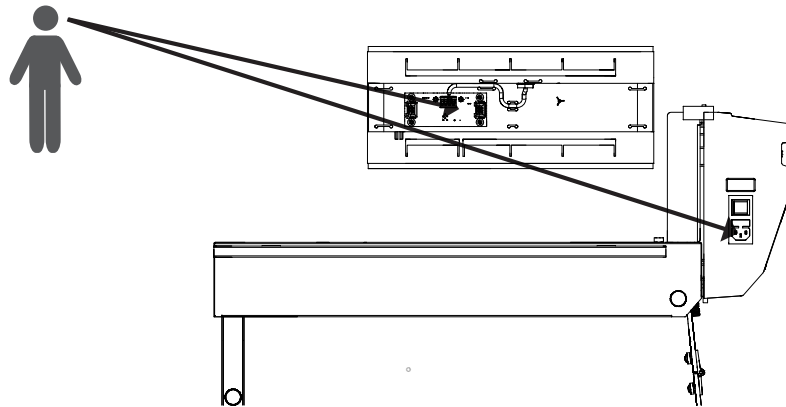




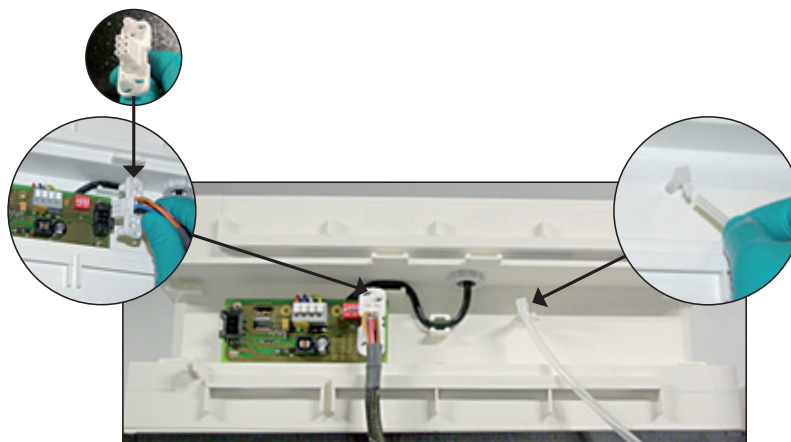
**The column is guaranteed to be airtight:**

The design of the filtration cartridges guarantees that the filtration column is completely airtight. The vertical stacking principle of the modular filtration column uses a gel-based joint technology that, when applied to the perimeter of all of the filtration cartridges, ensures a perfect seal of the entire column thanks to gravity.

Be sure that the filters are positioned as shown in this diagram.

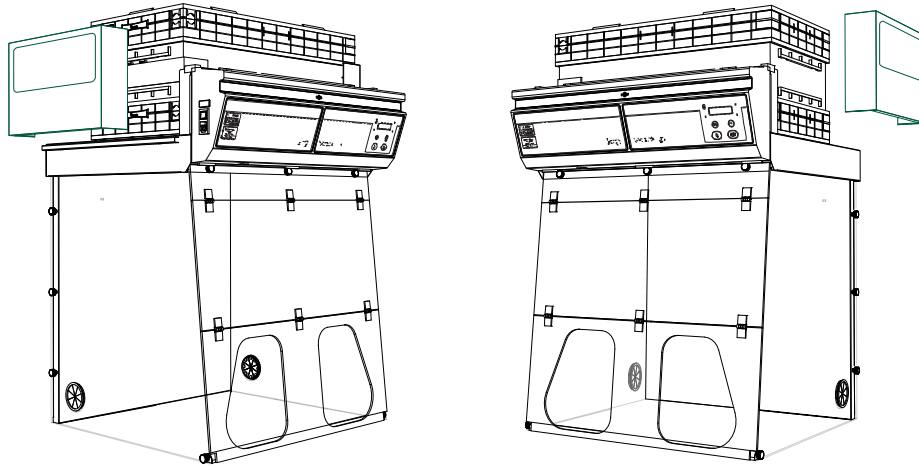


When reassembling the filtration column, be sure that the ventilation module is positioned correctly.

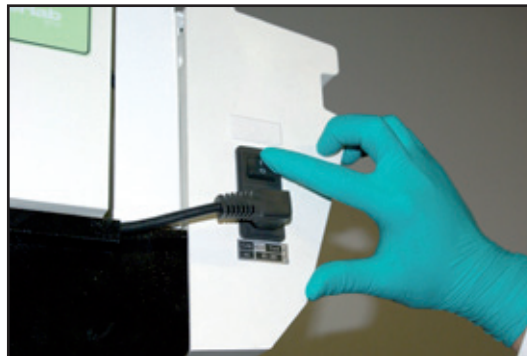


Reconnect the power supply to the ventilation card and the flexible silicone tube to the sampling chamber.





Re-attach the two protective casings.



You may then turn on your Captair<sup>®</sup> Flex<sup>™</sup> fume hood.

**Do not forget to record the information related to the new filter installed by accessing the menus of the digital display screen (menu 1-3).**

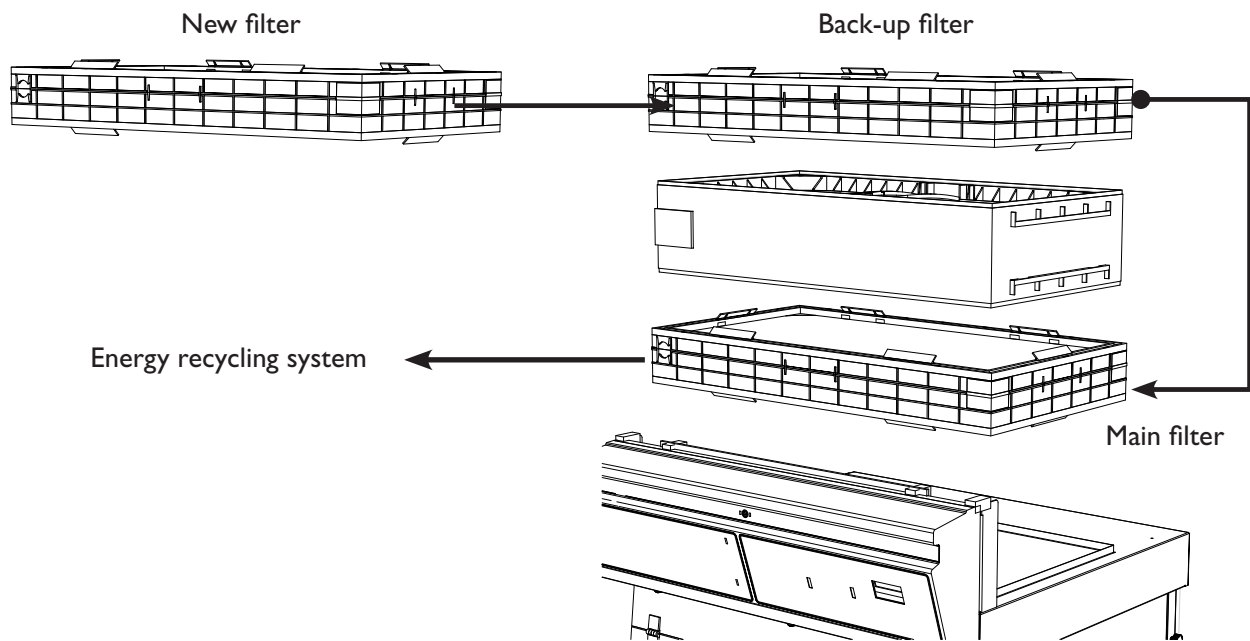


## THE «REVOLVING» SYSTEM

This simple concept involves placing one chamber equipped with a molecular detection system between two filters having the same capacity. When the main filter is saturated, the molecules are directed to an identical back-up filter that is placed just above the detection chamber.

This system prevents all molecules from being released into the environment since they are automatically absorbed by the back-up filter. The back-up filter replaces the main filter when the main filter has reached its maximum saturation point. A new filter is then installed in place of the back-up filter. This cycle may be repeated indefinitely.

Compared to traditional filtration systems, the “revolving filter” concept increases the retention capacity of the filter by 25% and decreases replacement costs by 25%.



The “revolving system” may be used with following Flex<sup>™</sup> technology types:

IP 2C

2C

2C I P

## Replacement Hepa filter procedure

### Before the maintenance:

- The customer must send a list with all manipulated products in the enclosure and all the information useful to determine the toxicity of those which will allow the technician to determine individual security equipments needed
- No staff in the room and all manipulations need to be stopped
- The laboratory must be mechanically or naturally aerated during the intervention

### Individual security equipments needed:

- overall + mobcap + bloomers
- particulate mask
- goggles
- laboratory gloves



**This procedure has been made for HEPA filters located on the low part of the filtration column and dedicated to the filtration of powders coming from the enclosure.**

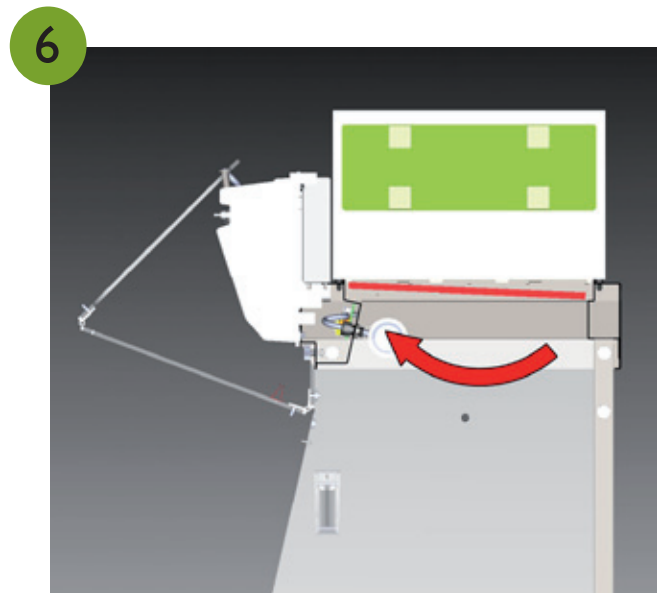
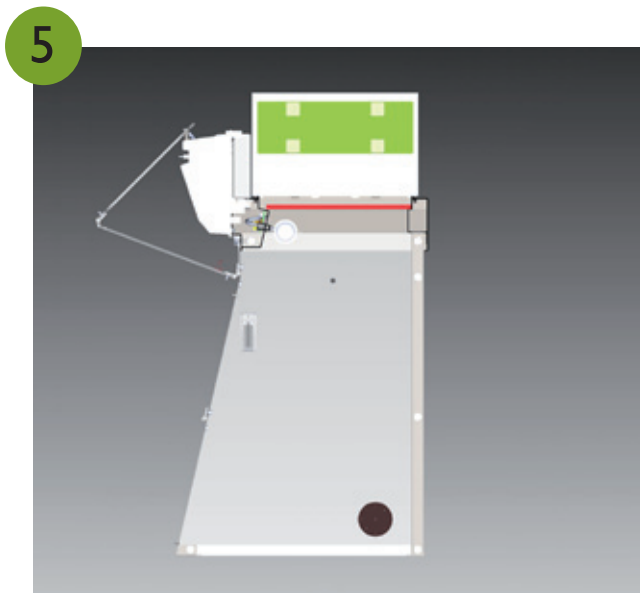
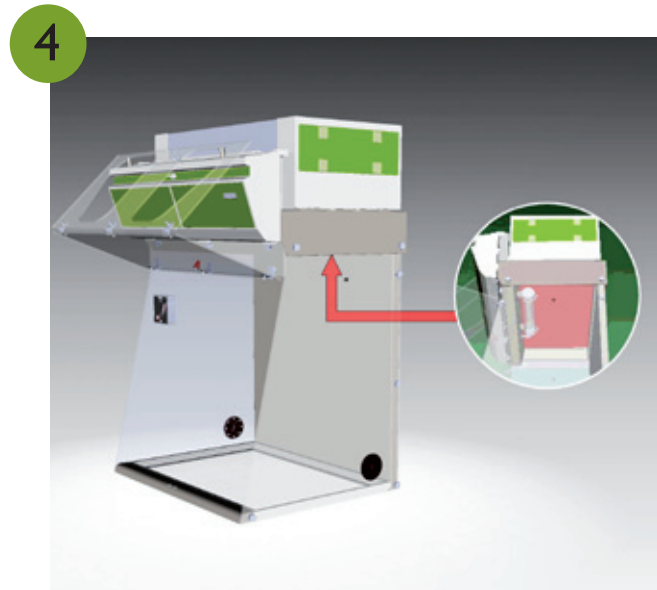
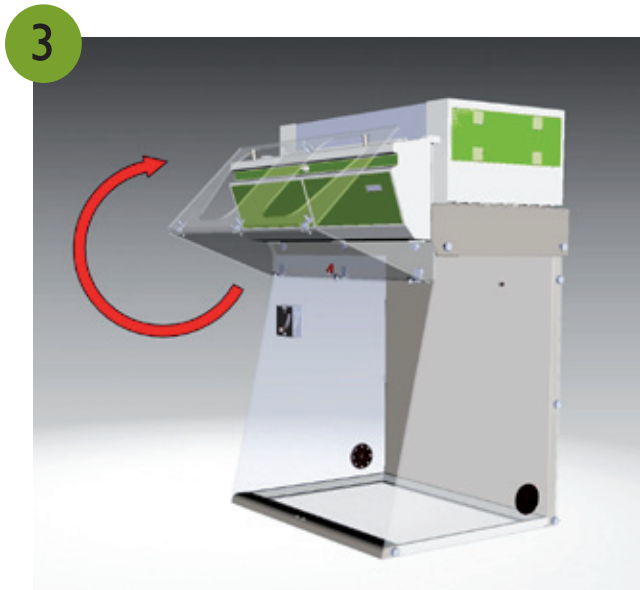
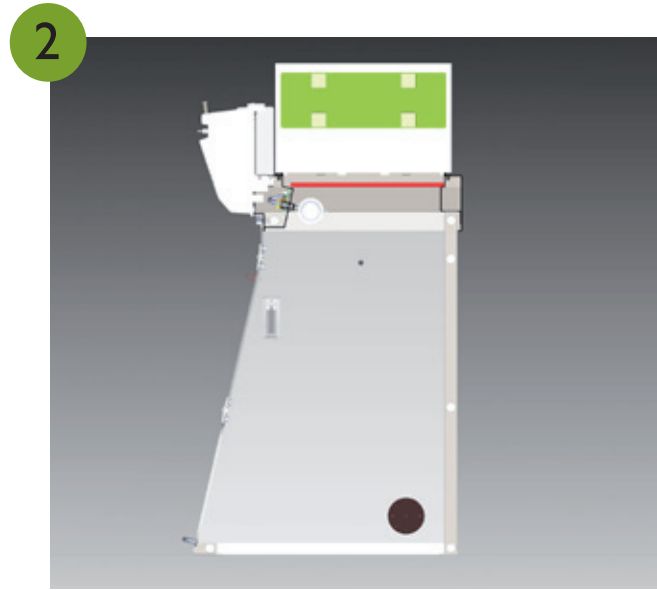
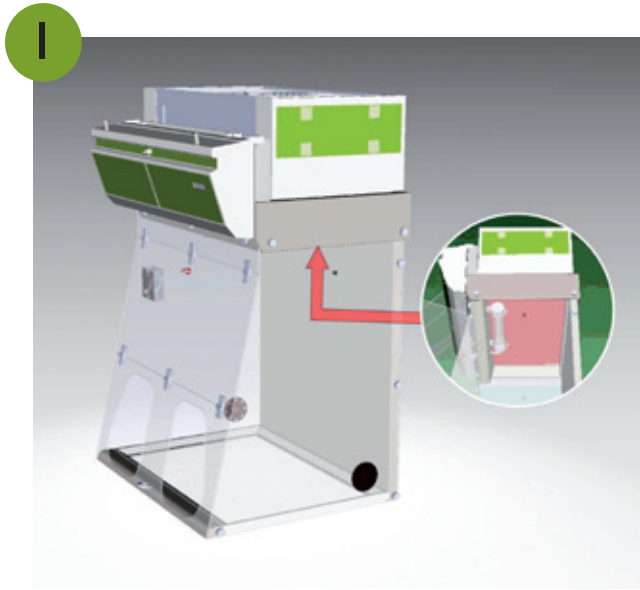
Following the Chronological order is imperative:

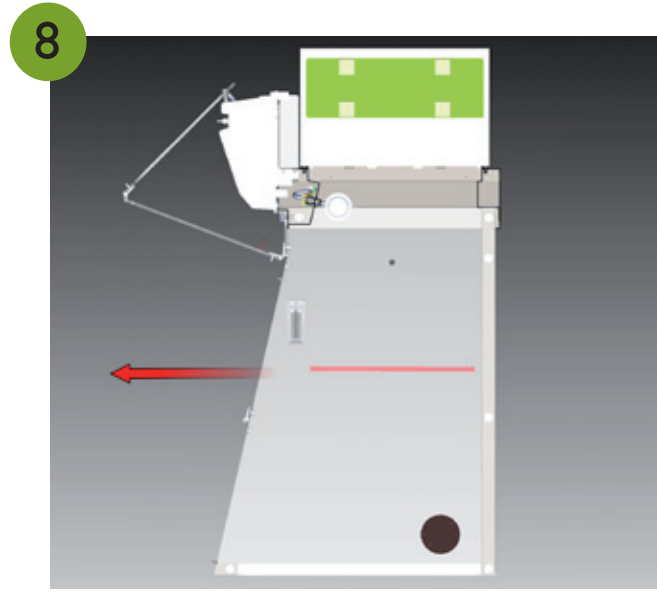
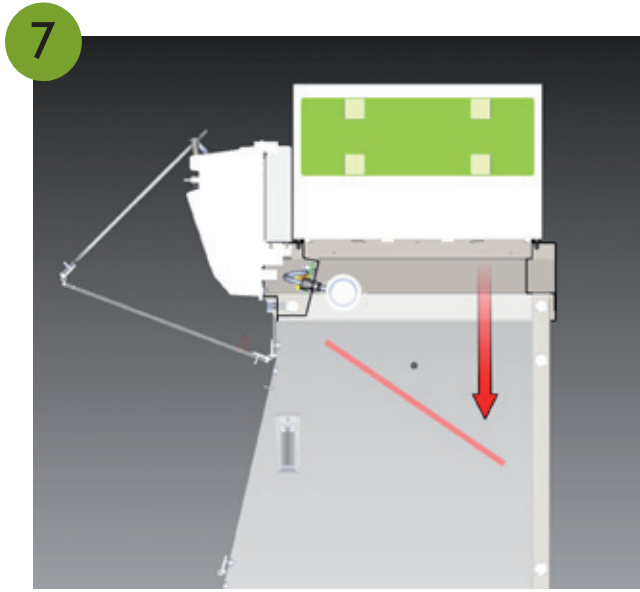
1. Switch on the Ductless Fume Hood
2. Fix the particles trapped by the Hepa filter by spraying the air lacquer (non inflammable) by crossed and repeated movements (to be done into the hood) on the lower face of the filter
3. Let dry for 5 minutes with the ventilation turned on
4. Switch off the ventilation, unplug the unit electric cable, the fan electric cable (or cables if several filtration columns) and the sample silicon pipe
5. Take off, cautionary, molecular filters (if any) and the fan box
6. Unwrap, cautionary, the new filter. Keep the plastic protection and the box to bag the used filter. The plastic protection must be placed on a flat surface close to the intervention spot.
7. Take off the used Hepa filter, lay it on the plastic protection, dirty face down.
8. Wash the filter housing with laboratory clothes impregnated with cleanser liquid. Wash the internal enclosure with the same way by fogging.
9. Wrap the used filter with used clothes and gloves. Close the plastic protection air tight with large scotch tape. If the plastic protection is damaged, do not hesitate to warp it again in an additional air tight bag.
10. Bag the sealed filter into the new filter's box and close it with scotch tape.

**[Used filters must be disposed through an appropriate process, valorizing chemical wastes]**

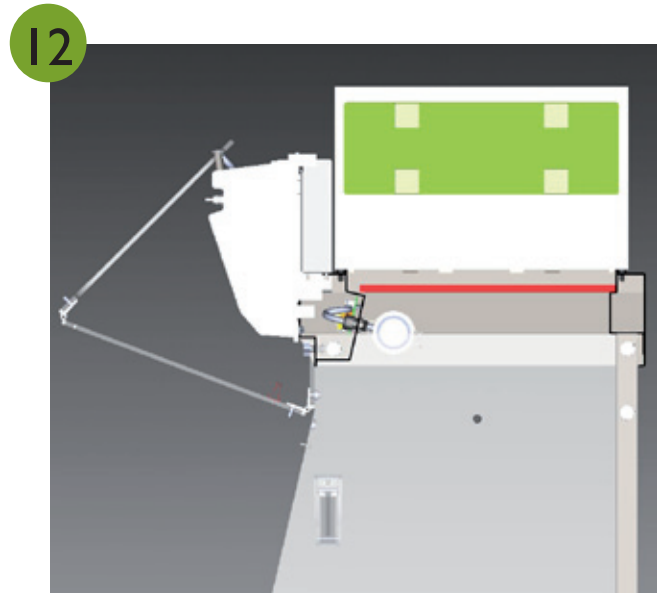
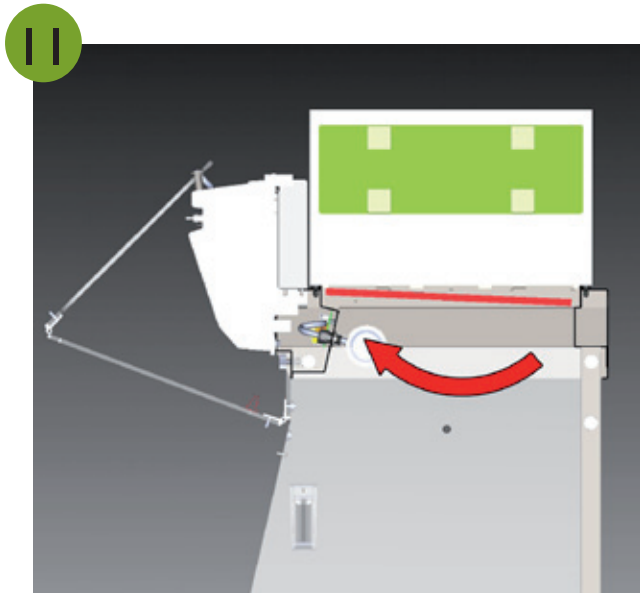
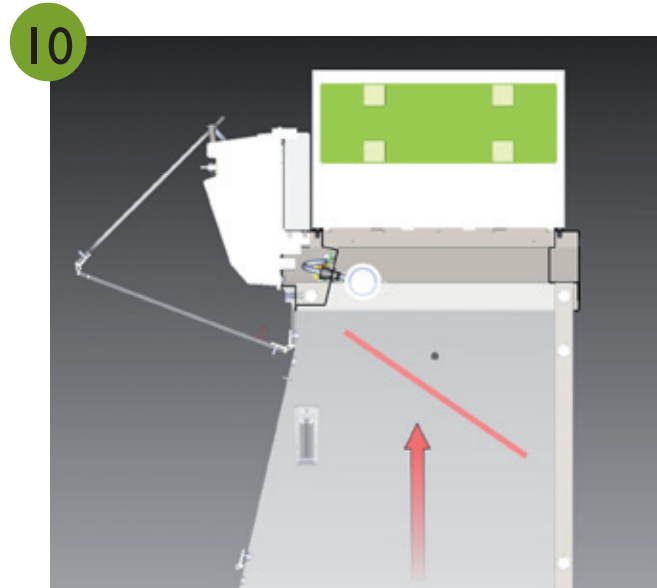
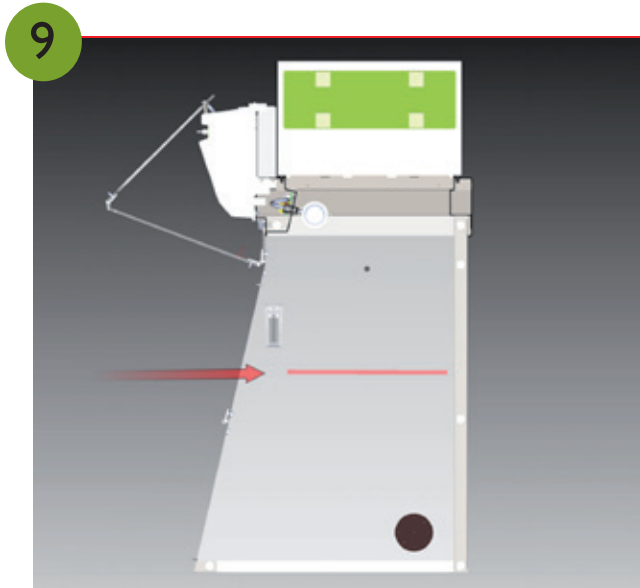
11. Install the new HEPA filter and reinstall the main molecular filter (if one), the column of filtration and the back-up filter (if one). Be sure that different layers are perfectly piled up with blades perfectly introduced into gutter.  
Note that it must form a perfect parallelepiped.  
Note that, in that process dedicated to the HEPA filter, molecular filter change is not considered
12. Reconnect pipes and electric cables, switch on the fume hood. Security control of the air face velocity according to the method described by the NFX 15-211 : 2009.

## Replacing the prefilter option (1 time per year)





New prefilter installation



## CLEANING AND MAINTENANCE

### CHECKING THE MECHANICAL PARTS

**Hinges:**

Hinges must be properly attached and should not jam; they must allow the front panel of the hood to be instantly and easily lifted upward.

**Acrylic parts:**

These parts must be clean; white streaks or spatters indicate rather heavy use of acid (hydrochloric acid) or products handled at a high temperature. Ensuring the transparency of the panels is a part of regular maintenance for the enclosure.

### CLEANING THE ENCLOSURE

**The enclosure must be cleaned on a regular basis.**

This can be done using several different methods:

- Using soapy water then rinsing with clean water and drying with a smooth, non-abrasive paper towel.
- Using a commercial pH neutralizer and drying with a smooth, non-abrasive paper towel.
- Using a commercial window cleaner.

**Metal-plated parts:**

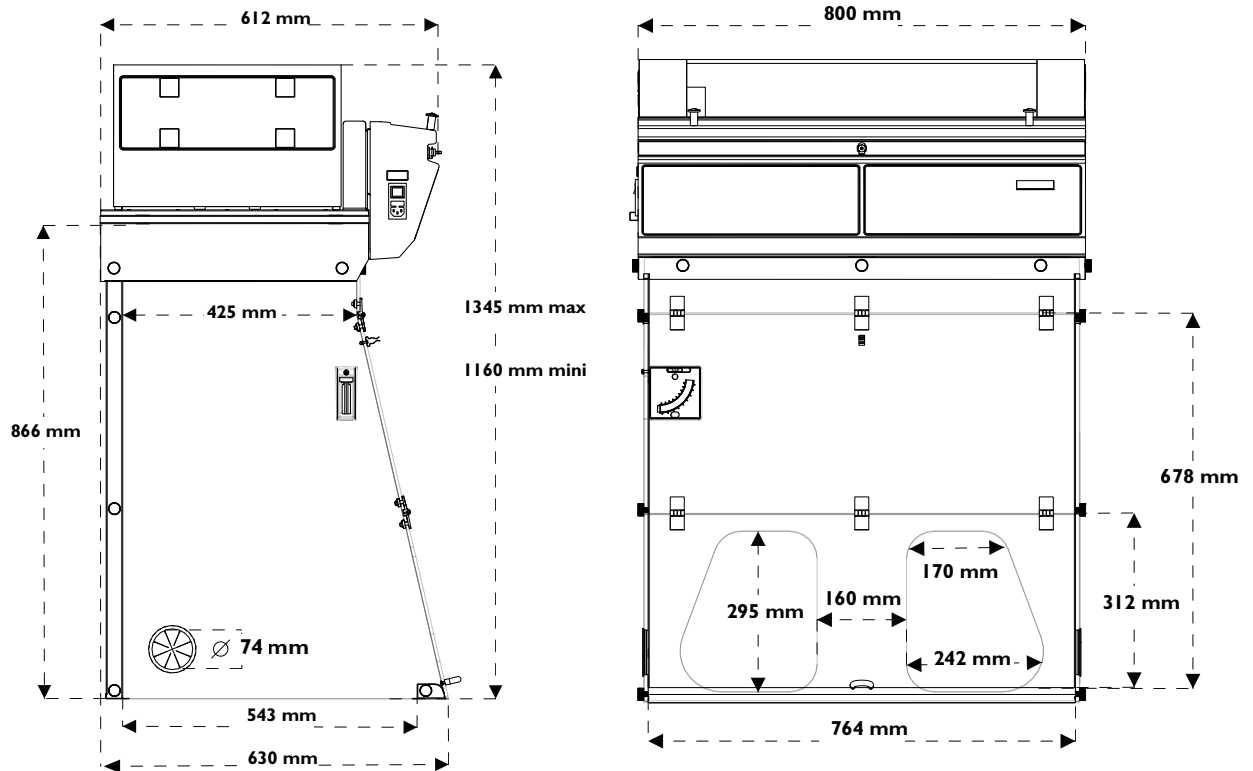
These parts should be inspected and must be free from any sign of corrosion. Verify that there is no stagnant water in the retention tray. Clean the retention tray if necessary.

# TECHNICAL SPECIFICATIONS

- Technical specifications
- Spare parts list
- Installing your hood

## TECHNICAL SPECIFICATIONS

### TECHNICAL SPECIFICATIONS M 321



Dimensions (mm)						
Ref.	External dimensions			Internal dimensions - without work surface		
	Width	Depth	Height*	Width	Depth	Height
M 321	800	630	1160 mini 1345 maxi	764	543	866

\*According to filtration column type

Specifications	
Number of columns	1
Number of fans (IP44)	1
Processed air flow	230 m <sup>3</sup> /h
Air velocity at the openings in working position	0,4 to 0,6 m/s
Voltage / Frequency	90 - 264 V / 50 Hz
Total power consumption including electricity for the lights	19 - 53 Watts
Amperage absorbed	1,6 amp.

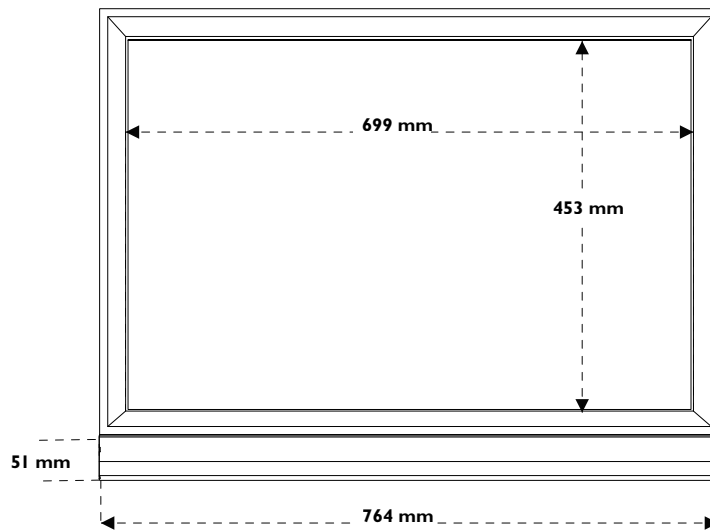
Structure	
Metallic parts	Anti-corrosion metallic alloy protected by a thermo-hardened anti-acid polymer coating
Side and front panels	8 mm thick acrylic
Filtration module	Polypropylene

*Total height according to filtration column type (mm)			
Type IP	1160	Type 2C	1256
Type IC	1160	Type IP 2C	1345
Type IP IC	1256	Type 2C IP	1345
Type IC IP	1256		

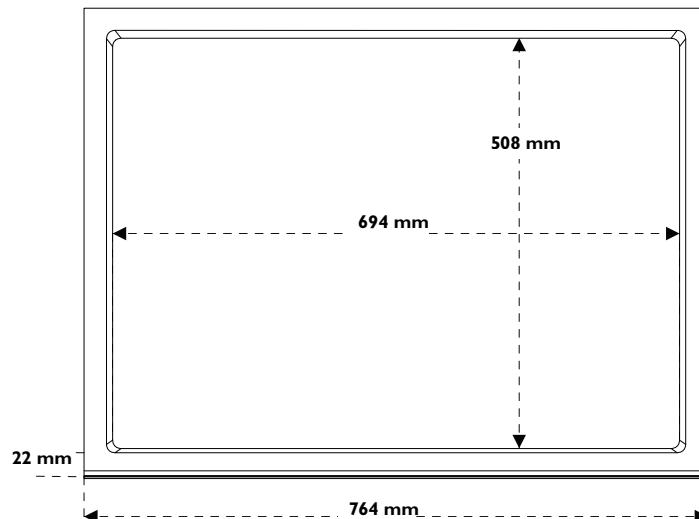


# TECHNICAL SPECIFICATIONS M 32I

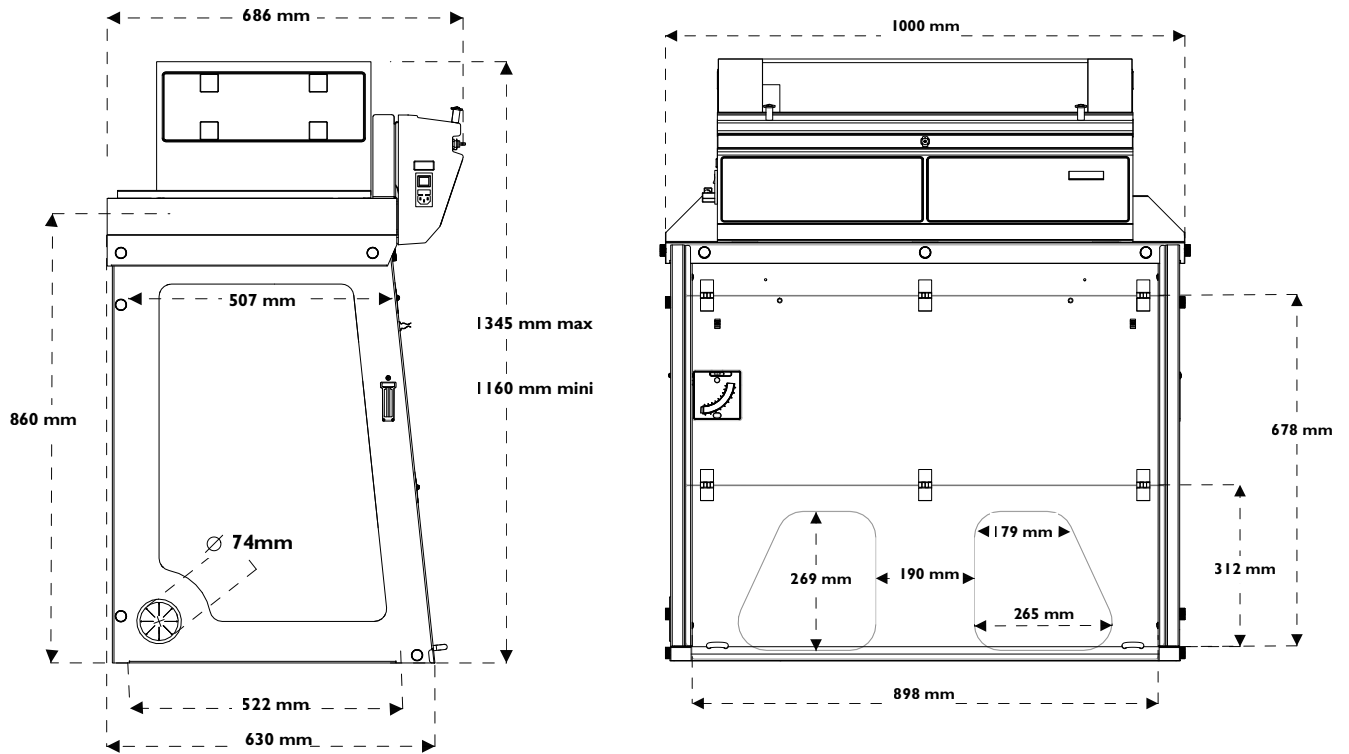
**Work surface N°1** Tempered glass work surface with seeled frame



**Work surface N°2** In phenolic resin with built-in retention tray



# TECHNICAL SPECIFICATIONS M 391



Dimensions (mm)						
Ref.	External dimensions			Internal dimensions - without work surface		
	Width	Depth	Height*	Width	Depth	Height
M 391	1000	630	1160 mini 1345 maxi	965	522	860

\*According to filtration column type

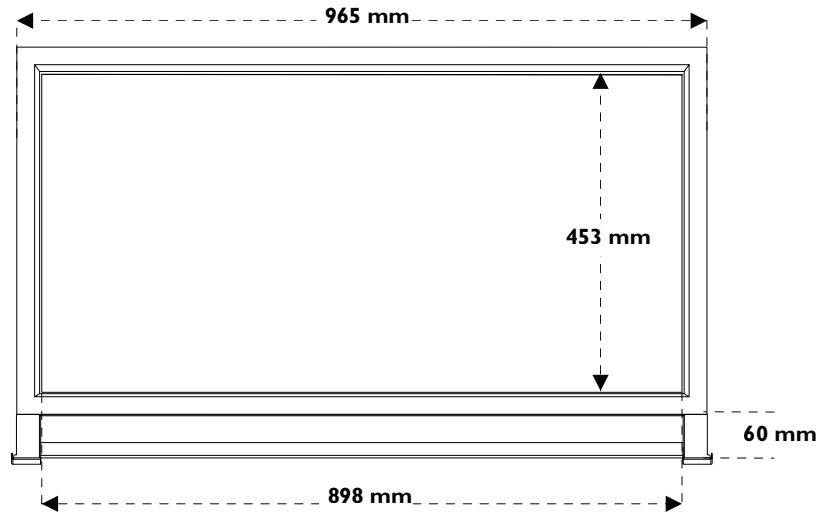
Specifications	
Number of columns	1
Number of fans (IP44)	1
Processed air flow	230 m <sup>3</sup> /h
Air velocity at the openings in working position	0,4 to 0,6 m/s
Voltage / Frequency	90 - 264 V / 50 Hz
Total power consumption including electricity for the lights	19 - 53 Watts
Amperage absorbed	1,6 amp.

Structure	
Metallic parts	Anti-corrosion metallic alloy protected by a thermo-hardened anti-acid polymer coating
Side and front panels	6 mm thick acrylic
Filtration module	Polypropylene

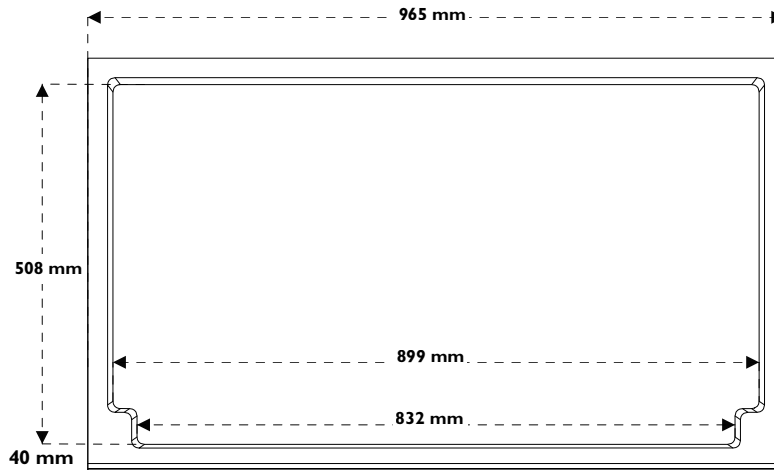
*Total height according to filtration column type (mm)			
Type IP	1160	Type 2C	1256
Type IC	1160	Type IP 2C	1345
Type IP IC	1256	Type 2C IP	1345
Type IC IP	1256		

# TECHNICAL SPECIFICATIONS M 391

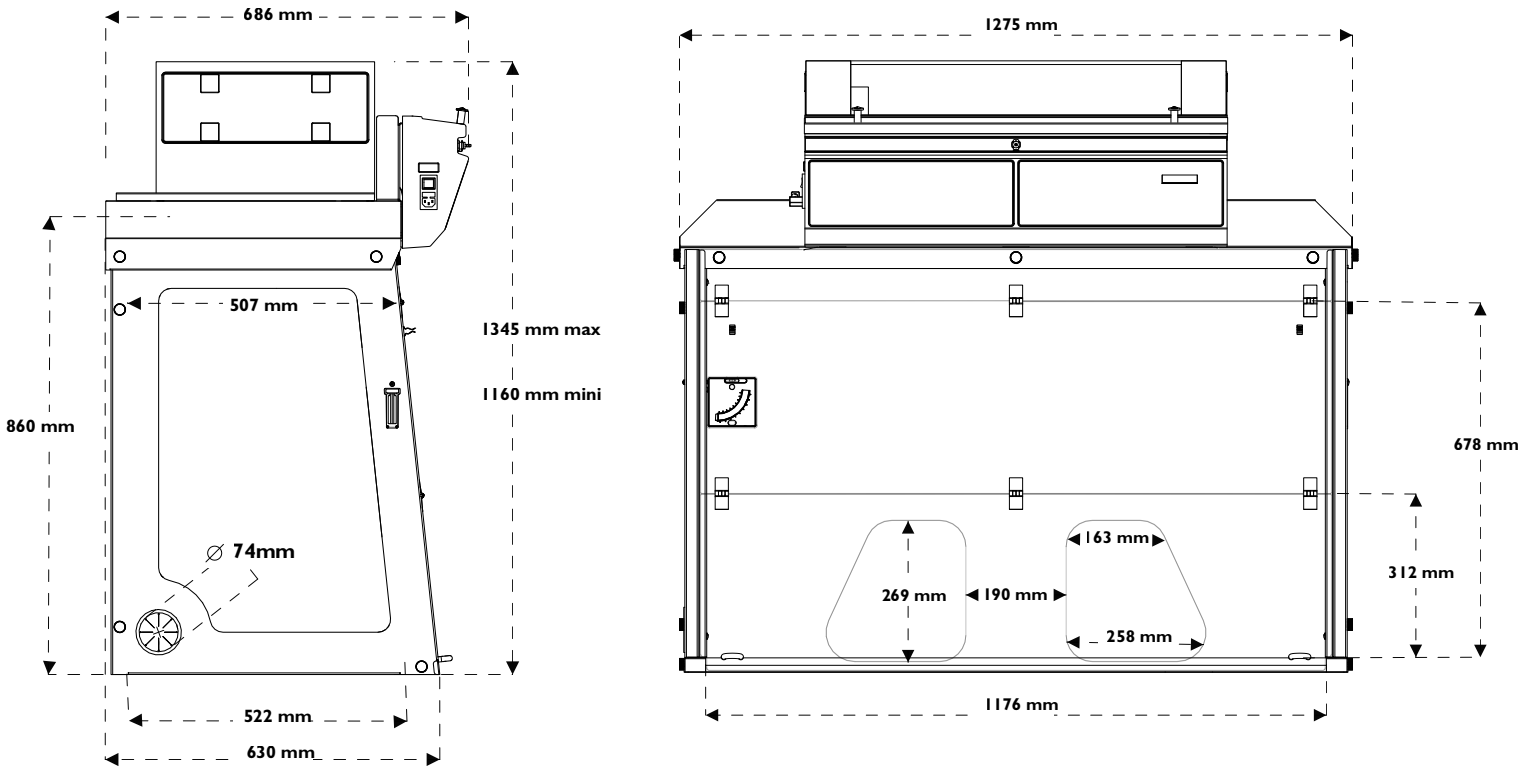
**Work surface N°1** Tempered glass work surface with seeled frame



**Work surface N°2** In phenolic resin with built-in retention tray



# TECHNICAL SPECIFICATIONS M 481



Dimensions (mm)						
Ref.	External dimensions			Internal dimensions - without work surface		
	Width	Depth	Height*	Width	Depth	Height
M 481	1275	630	1160 mini 1345 maxi	1240	522	860

\*According to filtration column type

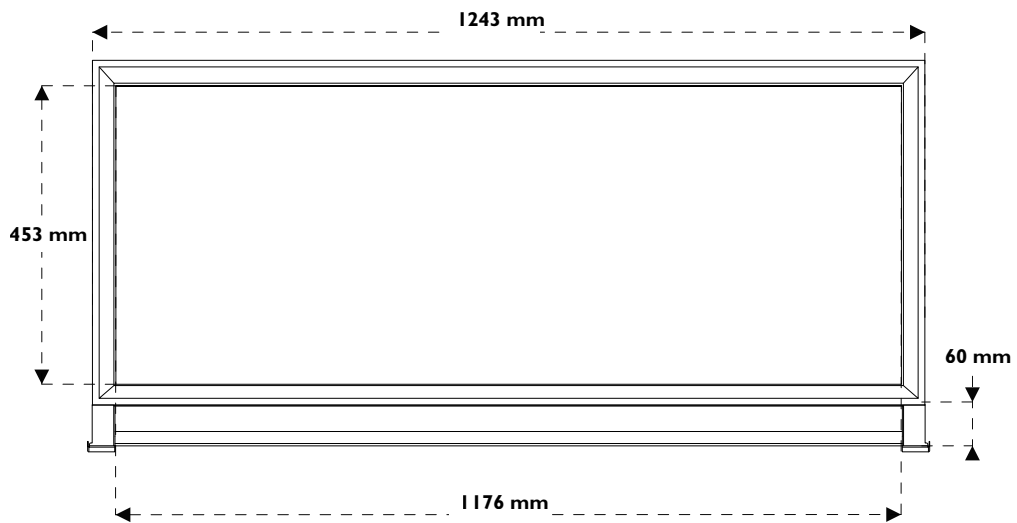
Structure	
<b>Metallic parts</b>	Anti-corrosion metallic alloy protected by a thermo-hardened anti-acid polymer coating
<b>Side and front panels</b>	6 mm thick acrylic
<b>Filtration module</b>	Polypropylene

Specifications	
<b>Number of columns</b>	1
<b>Number of fans (IP44)</b>	1
<b>Processed air flow</b>	230 m <sup>3</sup> /h
<b>Air velocity at the openings in working position</b>	0,4 to 0,6 m/s
<b>Voltage / Frequency</b>	90 - 264 V / 50 Hz
<b>Total power consumption including electricity for the lights</b>	19 - 71 Watts
<b>Amperage absorbed</b>	1,6 amp.

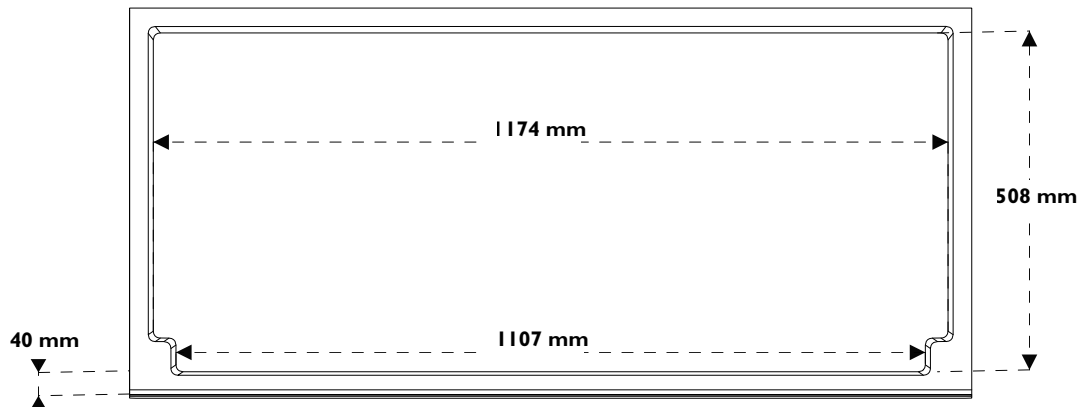
*Total height according to filtration column type (mm)			
<b>Type 1C</b>	1160	<b>Type 2C</b>	1256
<b>Type 1P 1C</b>	1256	<b>Type 1P 2C</b>	1345
<b>Type 1C 1P</b>	1256	<b>Type 2C 1P</b>	1345

# TECHNICAL SPECIFICATIONS M 481

**Work surface N°1** Tempered glass work surface with sealed frame






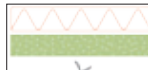


**Work surface N°2** In phenolic resin with built-in retention tray




# TECHNICAL SPECIFICATIONS

## M 321 - M 391 - M 481

Modular filtration column	
Class 2 - (NFX 15-211 : 2009 standard)	Class 1 - (NFX 15-211 : 2009 standard)
<b>Type IC</b> Liquid chemicals handlings 	<b>Type 2C</b> Liquid chemicals handlings 
<b>Type IP IC</b> Liquid chemicals and powders handlings 	<b>Type IP 2C</b> Liquid chemicals and powders handlings 
<b>Type IC IP</b> Liquid chemicals and powders handlings in clean room 	<b>Type 2C IP</b> Liquid chemicals and powders handlings in clean room 

 Molecular filter       H14 HEPA filter

Modular filtration column	
<b>Type IP *</b> Powders handlings 	

\* : only for M 321 & M 391

### Equipments

Standard Equipment	
<b>Air flow meter</b>	Permanent air face velocity monitoring system
<b>Flow monitor</b>	Permanent ventilation control device according to EN 14175-2:2003 standard
<b>Internal lighting</b>	Compact tubular fluorescent lighting - 18Watts - 500 Lux - IP 67
<b>Sampling port</b>	For filter saturation detection (N/A if Molecode S installed)
<b>Programmable timer</b>	Timer - 60 hours setting by default according to NFX 15 211 : 2009 standard
<b>Energy ports</b>	For the passage of cables
<b>Chemical Listing</b>	List of approved chemicals

Options	
<b>Molecode S*</b>	Automatic alarm to detect filter saturation by solvents according to NF X 15 211 : 2009 standard (*compulsory for class 1 configuration)
<b>Work surface N°1</b>	Tempered glass work surface with sealed frame
<b>Work surface N°2</b>	In phenolic resin with built-in retention tray
<b>Mobicap</b>	Rolling cart made of anti-corrosion metallic alloy (only for M 321 & M 391)
<b>Benchcap</b>	Fixed work bench made of anti-corrosion metallic alloy
<b>Shelf</b>	Adjustable sliding shelf for Mobicap and Benchcap
<b>Transparent back panel</b>	Acrylic
<b>Access door on rear panel</b>	For maintenance interventions
<b>Particular Pre-filter</b>	40 % filtration efficiency for particles > 0,3 µm

### Types of filters available

<b>GF4 AS</b>	For organic vapours
<b>GF4 BE +</b>	For organic vapours + acid vapours
<b>GF4 F</b>	For formaldehyde vapours
<b>GF4 K</b>	For ammonia vapours
<b>GF4 HP</b>	H14 HEPA Filter for powders

### Compliance to standards

- AFNOR NF X 15-211:2009 - France
- ANSI/ASHRAE 110-1995 - USA
- BS 7258 - England
- CSA Z316.5 - Canada
- CE Marking
- NF P.92.507 (Acrylic part)
- EN 1822 : 1998 (H14 HEPA filter)

## SPARE PARTS LIST

### M 321 - M 391 - M 481

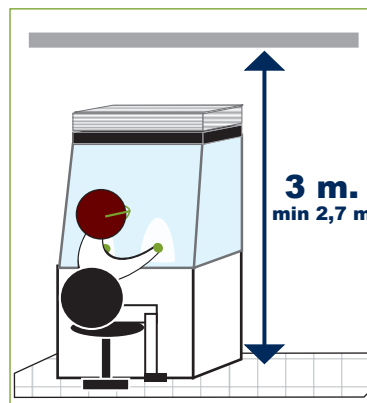
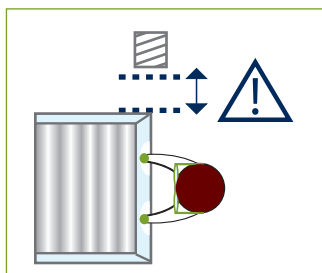
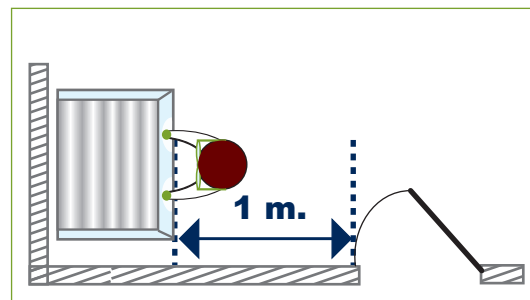
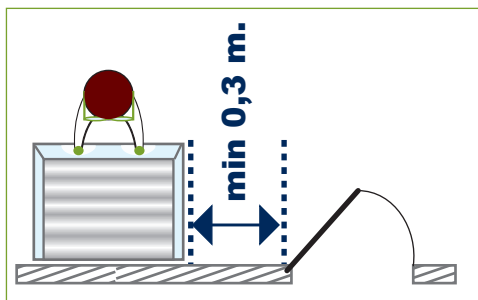
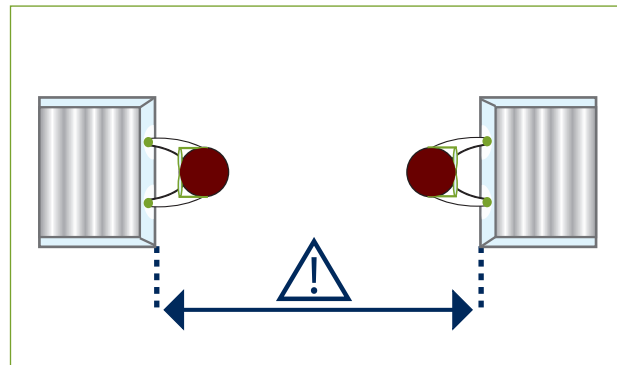
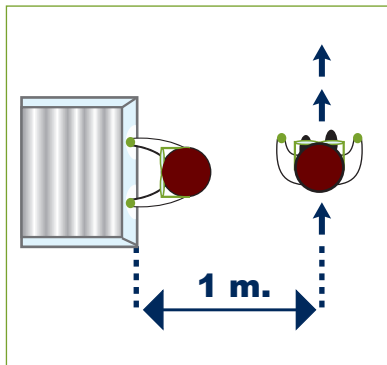
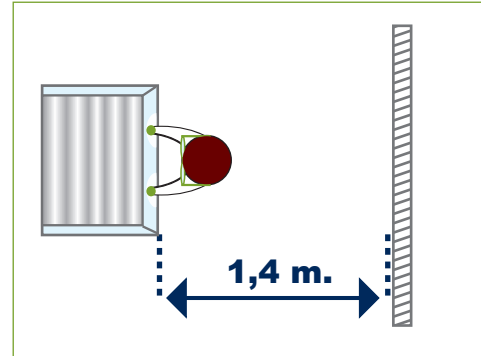
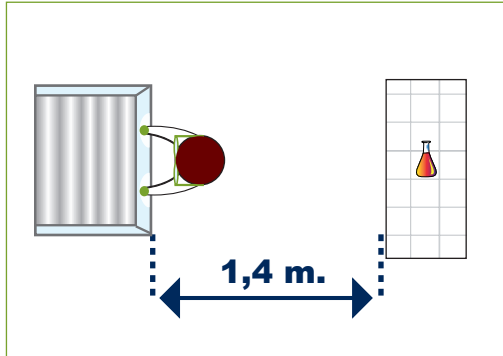
Name	Part numbers		
	M 321	M 391	M 481
Ventilation card		PIDEL8502	
Switch mode power supply		PIDEL8509	
Line conditioner		PIDEL8513	
5x20 4A fuse		PIDEL085	
CPU card		PIDEL8523	
175 mm fan		PIDVE8500	
Nylon screw M8 x 20		PIDB087	
Nylon screw M8 x 25		PIDB086	
White polypropylene hinge		PIDMS301	
White knurled nut PA 6.6		PIDMS302	
Acrylic panel with cut-out for anemometer B	PIDVI3736-I	PIDVI3748	
Plain acrylic panel	PIDVI3737-I	PIDVI3748	
Lower door	PIDVI3750	PIDVI3745	PIDVI3757
Upper door	PIDVI3504	PIDVI3509	PIDVI3756
Visor	PIDVI3506	PIDVI3511	PIDVI3755
Prefilter	1101500001		

# WARNING



## INSTALLING YOUR HOOD

Recommendations: Required space and dimensions – in accordance with EN 14175: 2006 standard



## WARNING

The E.S.P.<sup>®</sup> program (Erlab Safety Program) was established to guarantee your safety. We remind you of the need to verify the safety parameters before using the device for the first time and in the event of a new application.

Substances that are carcinogenic, mutagenic, or toxic for reproduction (CMRs) may be handled underneath a fume hood according to the French Labor Code. However, the nature of these chemicals requires special attention from their users.

The device is not designed to be used in an explosive environment.  
The filters delivered with this device must be removed from their packaging, positioned correctly, and must be suitable for the type of chemicals being handled in order to guarantee user safety.

Erlab<sup>®</sup> recommends testing for filter saturation on a regular basis.

Although the Timer<sup>™</sup> alarm can be deactivated, Erlab<sup>®</sup> recommends keeping the alarm activated. This alarm is triggered after every sixty hours of operation.

Erlab<sup>®</sup> recommends regularly monitoring the air face velocity according to the values set forth by AFNOR NF X 15-211: 2009 standard.

The quantities of the chemicals handled in the enclosure should not be greater than those listed in the guide of approved chemicals (the Chemical Listing).

AFNOR NF X 15-211: 2009 standard specifies that only those chemicals with a TLV (Threshold Limit Value) should be handled in the enclosure. These chemicals must also be included in the exhaustive list of authorized substances provided by erlab<sup>®</sup>. In accordance with NF X 15-211: 2009 standard, it is only possible to carry out operations that can be immediately stopped in a class 2 enclosure. The fume hood's filter must also be replaced as soon as the presence of a chemical is detected downstream from the filter.

New filters must be stored in their packaging, laid flat, in a dry place.

Erlab<sup>®</sup> recommends keeping a log specific to this device that includes the chemicals handled, the frequency with which these chemicals are handled, as well as any operations related to device maintenance.

**Feel free to contact our company at any time  
with any questions related to the set-up,  
maintenance, or use of this device.  
Our team is at your disposal, providing you with clear and  
detailed responses in a timely manner.**



[www.erlab.com](http://www.erlab.com)


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