



**Monmouth
Scientific**

OPERATORS MANUAL

LAMINAR FLOW CABINET

MIKROFIL

Unit manufactured by:

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CABINET USING VERTICAL FLOW PRINCIPLE

PRODUCT MANUAL

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1 INTRODUCTION

1.1 General

This document has been produced by Karstulan Metalli Oy (KM) to give information concerning their range of laminar flow cabinet, covering the operation and working principles.

KM laminar flow cabinets work on the vertical flow principle. The air is drawn in through the intake filter situated at the front of the upper section; the air passes via the pressure chamber through the Hepa filter down into the working area. The air flow is 0.45 m/s +/- 20%. The air inside the working area is filtered to 99.995% of 0.5 micron particulates.

The cabinet is designed for the handling of such material which needs to be handled in a sterile atmosphere.

1.2 Application

The laminar flow cabinet is designed for work in health clinics, hospitals and both pharmaceutical and research laboratories.

2 TECHNICAL INFORMATION

2.1	Model	External dimensions width x depth x height	Working area dimensions width x depth x height
	Mikrofil	680 x 598 x 1160mm	630 x 570 x 615mm

2.2	Weight	Net	Packed for shipment
	Mikrofil	50kg	60kg

2.3	Filters	Main filter	Intake filter
	Mikrofil	305 x 610 x 69mm	255 x 480 x 10mm

2.4	Air volume M ³ /h	Max	
	Mikrofil	810	
	Vertical laminar flow speed		0.45 M/S +/- 20%

4 TRANSPORTATION – LIFTING AND ASSEMBLY INSTRUCTIONS

4.1 Transportation and storage

In Finland the cabinets are delivered direct to the customer, the cabinet is wrapped in plastic film and protected with cardboard whilst being transported in the car or trailer. For export the cabinets are firstly wrapped in plastic film then placed into a cardboard or plywood box with polystyrene to protect the cabinet from moving inside the box. The plastic film protects the cabinet from dust and dampness. Cabinets must not be stored outside. They must be stored in a warm and dry place.

4.2 Lifting and assembly

The aluminium framed lower section is lifted onto the working surface with the black rubber seal facing up. The Mikrofil is packed with one glass panel removed, slide the glass into the groove the insert the plastic seal strip by pushing with a flat side of a screwdriver (lubricate the seal with a little fairy liquid, it goes into place a lot easier). The glass and plastic seal should now look the same as the opposite side that was left in place during transportation. Lift the upper section on to the lower section leaving a 5cm gap at the back, when lifting make sure not to put too much strain on the light panel. Push the upper section back the final 5cm (making sure that the lighting panel corners cover the outer edge of the aluminium frame) until the predrilled holes on the lower section line up with the holes on the upper section. Screw the two parts together using the four 2,9 x 10 screws. The cabinet is now ready to use, the electrical connection is on the top right hand corner, insert the lead connector and then place the plug into a suitable electrical socket.

5 CONSTRUCTION

The cabinet is made from two different sections, the lower section has an aluminium frame with glass on both sides and a laminated back panel, this is the working area of the cabinet. The upper section is an epoxy powder painted zinc steel case, This laminar cabinet has been designed to give complete protection to the material being handled. The cabinet's surfaces are easily cleaned and disinfected. Laminar safety cabinets HEPA filter is easily tested and if required replaced. HEPA filter must be changed after 5 years. Laminar flow and filter inspection can be carried out by our engineers, a yearly agreement is recommended.

5.1 PROTECTION NET

The HEPA filter is a protected, protection net.

5.2 EQUIPMENT

The standard cabinet comes complete with electronic control panel containing on/off switch, light switch seven speed fan control and an hour counter. The cabinet is fitted with a fluorescent lighting tube for the working area. Situated on the right hand side of the upper casing is an electrical socket for the use of electrical equipment. On customer request a u/v light can be fitted. The u/v tube is situated under the normal lighting tube with the on/off switch for the tube being situated next to the electrical socket on the upper right hand side of the cabinet.

6 SITUATING THE CABINET

The cabinet is to be placed onto an even work surface, situated in a position where only the person working with the cabinet moves around in front of the cabinet, thus not creating disturbance to the air flow.

The cabinet must never be situated near to a door or opening window, it is advised to situate the cabinet in a corner of a room or in an area where there is little movement by personnel

The cabinet must be plugged into an earthed electrical socket, (230v, 50 Hz, fuse 6 amp). It is advised to plug the cabinet directly to a socket and not use an extension cable where other equipment is also connected.

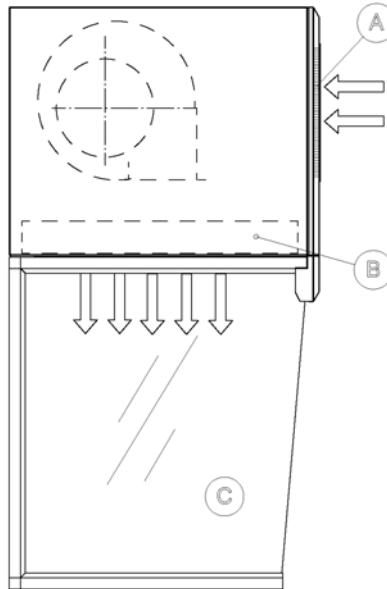
7 GENERAL INSTRUCTIONS, TURNING ON

When the cabinet has been plugged in and switched on at the top of the cabinet, you can then switch the cabinet on using the ON switch on the electronic panel. After switching on the fan listen to check that the fan is spinning freely, adjust the fan speed to the correct speed (advised by KM or Supplier).

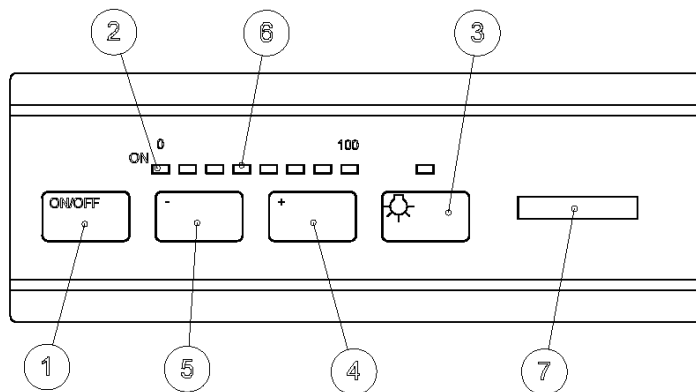
Before commencing work with the cabinet wipe all surfaces with 70% alcohol. Make a note of the date when the cabinet is first used and the reading on the hour meter.

A WORKING PRINCIPLE

The fan draws air in from the room through the intake filter (A). The fan pushes the air through the Hepa filter (B) into the working area of the cabinet (C), the air then passes back into the room.



B CONTROL PANEL



- 1 On / Off switch
- 2 green power on light
- 3 cabinets light switch
- 4 fans speed control + increase
- 5 fans speed control - increase
- 6 fan speed indicator 0 -100% (red light)
(Correct speed to achieve laminar flow will be advised by KM on delivery)
- 7 Hour counter

8 ELECTRICAL COMPONENTS AND INFORMATION

The cabinet has been EMC tested and complies to the standards: EN50081-1, EN50082-1 and EN50015 which includes the following: EN55022 (1994), EN55015 (1996), IEC801-3 (1984), IEC801-4 (1988), EN55014 (1993), EN61000-3-2 (1995), EN61000-3-3 (1995).
The cabinet holds the CE sign for electrical safety EN 60 335-2-80:1997

8.1 Electrical supply

Laminar safety cabinet electrical supply 230v, 50Hz, single phase.

8.2 Connection, switch and fuse

On the top, back right hand corner is the power connection and main switch, a 6 amp fuse is located in this socket, a spare fuse is also incorporated in the socket. Situated on the right hand side of the light panel is the control panel, the on / off switch (1) is located on the panel. The cabinets light switch is also located on the panel.

8.3 Lighting

The cabinet's fluorescent light is situated at the top front of the working area, the light is a Phillips 15w Fluorescent tube (white).
U/V lighting; 15w TUV Phillips fluorescent tube.

8.4 Fan

In the upper section of the cabinet is located the centrifugal motor fan, the fan is statically and dynamically designed for balance, thus giving the quietest running speed possible.

	Fan	Power	Voltage
Mikrofil	D2E 146-AP 47-22	330w	240v /50Hz

9 AIR REGULATING SYSTEM

Regulating system comprises of the fan and its motor, with pressure distribution through the HEPA filter.

9.1 Fan and Motor

The fans speed can be set to 7 different settings by relay voltage control.

9.2 Pressure distribution

In the cabinets upper section between the fan and the HEPA filter is situated the pressure bag.

The top of the pressure bag is attached to the fan by means of a clamping frame, the bottom of the bag is connected attached to the main HEPA filters frame, the right hand side top of the bag is connected to the extract HEPA filters frame. All these connections are sealed to guarantee that only air that has passed through the HEPA filter passes into the working area of the cabinet, or back into the room.

10 Filters

The main HEPA filter is DOP efficiency tested to 99.999% 0.3 micron particles and smoke particles (H14).

The HEPA filters are constructed within a frame, with the fibre material making up the filter being pleated and sealed into position. With the filter being pleated this way it gives the largest possible surface area available, i.e. a filter with dimensions of 610 x 915 x 69mm has an area surface of 15 m²

The filters are checked to standard EN 1822 Class H14.

11 MAINTENANCE

11.1 Cleaning

The cabinet is to be cleaned everyday, the working area, also the outer surfaces are to be wiped with 70% alcohol.

11.2 Working control

Check that the fan, light and other working parts are functioning correctly. If a fault occurs correct it or contact your supplier who will arrange for a service engineer to call.

11.3 Air flow speed

The fan is started by the on / off switch. The cabinets air flow is regulated by the +/- Switches, the recommended setting for laminar flow (0.45 m/s +/- 20%) is indicated by the manufacturer KM or supplier on delivery. The air flow through the working area of the cabinet only changes when the HEPA filter becomes full of micron particles. A yearly inspection with an air flow meter and particle meter will indicate the condition of the filter; the fan speed is increased accordingly.

11.4 Intake filter maintenance

The intake filter is to be well maintained, this is the best way of prolonging the life and efficiency of the Hepa filter. The intake filter is to be washed after 160-180 working hours. The intake filter is situated in the upper front panel of the cabinet behind the grille; the grille is removed by turning the four plastic locking screws by half a turn. The filter can be washed in warm water 40c, using a soft detergent i.e. fairy liquid. After being washed leave the filter to dry do not fold or squeeze, the filter can be washed up to 5 times before being discarded, a record of washing times can be kept on the intake filter calendar.

11.5 HEPA filters

The HEPA filters are recommended to be changed after 5 years. The manufacturer / supplier will keep a maintenance record of the cabinet. Maintenance can be arranged with a service contract with the supplier.

12 CHECKS AND STANDARDS





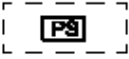



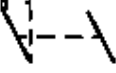








Before the cabinet is delivered it is tested for air flow speed, air particle count and noise level, a report is supplied with the cabinet on delivery. Laminar flow cabinets comply to strict rules set down by official bodies, and as recommended in the pharmaceutical GMP program. The programme follows the guidelines of the ISO standards with which our cabinets also comply too. Air flow and HEPA filters are to be checked at least once a year.

TECHNICAL INFORMATION AND SPARE PARTS LIST

Model MIKROFIL

PART	MODEL	AMOUNT	SUPPLIER
Fan	D2E 146-AP47-22	1	Ziehl-Ebm
Main filter	610 x 305 x 69mm	1	AAF
Intake filter	255 x 480 x 10mm	1	AAF
Lighting	15 w	1	Phillips Oy
U/V lighting	TUV 15w	1	Phillips Oy
-fuse	S10	2	Elektroskandia Ab
-transformer	L20	2	Elfresta Oy
Control panel	12v	1	Sreentec Oy
Relay card	7 relay	1	Sreentec Oy
Transformer	7 voltage	1	Polarvent Oy
Connection lead	earthed	1	Partco Oy
Electrical socket	earthed	1	Elektroskandia Ab

LAMINAR FLOW CABINETS WIRING DIAGRAM SYMBOLS

Sign	Symbol	Function
L		Live wire
N		Neutral wire
PE		Earth wire
LK		Wire from control panel to power card
PS		Power card
CP		Control panel
E1		Working area light
M		Fans motor
FK		Supply switch
F1		Supply switch's fuse
X10		Earthed electrical socket
A1		Transformer (7 area's)
C1		Fan motors starting condensator
K1		Lighting transformer
S		Fuse
X1		Wire connection 1
X2		Wire connection 2

