

Mars IVF
900, 1200, 1500, 1800
Class 2- Biohazard Safety Cabinet
or Cytotoxic Cabinet with
automatic control system
MICROPROCESSOR BASED



USER MANUAL



Symbols used in this Manual



NOTE

Used to direct attention to a special item.



WARNING

Used in case of danger of a serious accident.

© Copyright 2010 – version June, 2011.

Origio ScanLab Equipment A/S

Industrivej 6-8

Vassingerød

DK-3540 Lyngø.

Tel: +45 3940 2566; Mobil: +45 3016 0990;

Fax: +45 4498 1741

Mail: info@origioscanlab.com

Internet: www.origioscanlab.com ,

CVR-No.: 33038178

ORIGIO

ScanLab Equipment

Contents.

1.	General Notes	4
1.1	Safety Instructions for Service Work and Repairs.....	4
1.2	Standards and Safety Regulations.....	5
1.3	Warranty	6
2.	Introduction.....	7
3.	Safety Precautions.....	8
4.	Description.....	9
5.	EN 12469 / DIN 12980 Approvals.....	11
6.	Technical Specifications	11
6.1	.Property of materials.....	12
7.	Installation.....	12
7.1	Transport.....	13
7.2	Preparation	13
7.3	Connections.....	14
8.	Testing.....	15
8.1	Air velocity in laminar flow.....	15
8.2	Air velocity in inlet and exhaust opening	16
8.3	Airflow patterns, visualization.....	16
8.4	Test of filters.....	17
8.5	Test of the retention at front opening	17
9.	Work Rules	18
9.1	Before start-up	18
9.2	While working.....	19
9.3	After work.....	20
10.	Control Panel	21
10.1	Programming.....	22
10.2	Supervision – Alarm	22
11.	Cleaning and decontamination.....	23
11.1	Weekly	24
11.2	Regularly.....	24
11.3	Decontamination by use of formaldehyde	24
12.	Maintenance.....	26
12.1	Filters	26
12.2	Part list for Filter.....	28
12.3	Fuses	28
12.4	UV GERMICIDAL LAMP – Fluorescent lamp	29
12.5	Spare parts.....	30
13.	Log-Book	31
14.	Statement.....	32
	Declaration of Conformity.....	33

1. General Notes

1.1 Safety Instructions for service work and repairs.

Please note that any servicing or repairs to this product must be carried out only by personnel with the appropriate qualifications and training. They must have attended an Origio ScanLab Equipment service training course on ScanLaf Cabinets and have the appropriate certificate. Failure to show proof of this training will invalidate the product warranty prior to carrying out any service on the product or changing any components this service document must be read carefully and fully understood.



Please also remember:

- Any electrical work is to be carried out by trained electricians
- Any work on gas lines / supplies is to be carried out by Corgi registered personnel (UK only) or by appropriately trained engineers.
- National and local regulations must be adhered to when any service work is carried out
- The contents of this service manual are liable to change or be updated without notice.
- For any service issues not covered adequately in this manual, please immediately contact Origio ScanLab Equipment at the Head Office for your own safety.



WARNING !– Potential Contamination hazard!



The Safety Cabinet can be used for manipulations of Biohazardous and toxic materials so internal components and filters can be contaminated. Service personnel must therefore observe strict safety precautions when handling potentially contaminated material.

It is required by law that prior to service maintenance on any potentially contaminated zone that the cabinet is first decontaminated by either formaldehyde vapour or hydrogen peroxide vapour (VHP) so any hazardous residues are removed completely for the unit.

It is recommended that:

- Prior to any maintenance work, the users should be asked about the potential hazards used and should make sure that the cabinet is cleaned and decontaminated.
- A certificate of decontamination from the operator is given to the service engineer.




WARNING ! – Electric shock hazard!

Contact with current carrying components and wiring may cause lethal electric shock. Motor driven components (eg Fans / window motors) may cause injury if switched on accidentally. Prior to any repair work it is therefore recommended to disconnect the cabinet from the mains supply source.

- Isolate the cabinet from the electrical supply
- Ensure the cabinet cannot be reconnected accidentally
- Ensure any components such as capacitors etc are fully de-energized.
- Ensure the cabinet is fully grounded.
- Cover or isolate any nearby components that are still powered and under voltage.



CAUTION! – Hazardous Gases!

If  the cabinet is connected to any external gas supply then this must be shut off prior to any service or repairs.



- Ensure the work area is adequately ventilated
- Read any data sheets for gas supply / fittings
- Report any faulty or suspect supply pipes to cabinet user / facility manager.



NOTE Recycling

All cabinet components except the HEPA filters can be recycled.

If the cabinet has been used to process hazardous biological or chemical material (powders etc.) then it must be fully decontaminated prior to disposal and a Certificate of



Decontamination must be produced by the operator before removal from the laboratory.

NOTE – Start up after service / repair

If any safety devices (shielding / earthing etc.) were removed or disabled prior to or during repairs then the cabinet must not be started up until these devices are re-installed and checked for correct operation. Before the cabinet is operated fully, it is recommended that a test run be carried out.

1.2 Standards and safety regulations.

The cabinet complies with, and has been tested to, the following standards and directives:

- EN 12469:2000,
- DIN 12980/2005/6
- EN 292-1, EN 292-1,
- EN 50081-1, EN 50082-1, EN 50081-2, EN 50082-2, EN 55011
- IEC 801-2, IEC 801-4, IEC 1010-1 / EN 6101-1, UL 3101-1
- EMC Directive 89/336 EEC-93/68/EEC
- Low Voltage Directive 73/23 EEC-93/68/EEC
- ENV 50140, ENV 50141
- NFX 44-201

1.3 Warranty

Origio ScanLab Equipment guarantee the operational safety and functions of the cabinet provided that:

- The cabinet is not modified or changed without authorization.
- Only original spare parts or accessories as supplied by Origio ScanLab Equipment are used. Use of non original parts will invalidate the warranty.
- Maintenance and service checks are carried out at specified intervals.
- A repeat commission test is carried out after any service or repair to components influencing these tests.

The standard warranty period is 1 year from date of delivery.

2. Introduction

You are now in possession of a high quality microprocessor-controlled Class II cabinet, Mars IVF, designed to provide protection of the operator, the environment, and the processed product against particle-/microbiological contamination.

The ScanLaf Mars IVF Class II cabinets have:

Microprocessor controller with:

- LCD display indicating fan and alarm status.
- Air velocity sensors.
- Clock (7 days) and hour-counter.
- Pre-setting of automatic start-up, timer for delay start and timer for UV-light.
- Alarm for any deviation from safety conditions.
- Full programming of alarms and fans through pass word protection.

Ergonomically correct sloping front for maximum operator comfort.

Motor-driven front window, with both sliding and hinged modes.

Side windows, for perfect light conditions and view to the surroundings.

Negative pressure plenum for highest operator and product safety.

Opportunity to select FAN off, reduced, or normal air velocity.

Divided table tops for easy cleaning and legs for increased stability.

Digital EI direct adjustable Fan speeds.

3. Safety Precautions

- To avoid unintended or improper operation of the cabinet, please carefully read this manual.
- Also, please pay attention to the short form operating instructions on the label stuck on the cabinet.
- If you have questions related to the function or control of the cabinet or wish to order spare parts, please always indicate the nameplate data.



The proper function and safety of the cabinet are only secured if personnel authorized by us do so perform the required tests, maintenance and repair work.

Please also refer to sections “Testing” and “Maintenance”.

The following precautions must be taken for operation of the ScanLaf Mars IVF series.



The safety cabinet must not be used for Group 4 pathogens.

Attention is drawn to the risk assessment requirements of the Control of Substances Hazardous to Health (COSHH) Regulations 1999. (UK)



The cabinet is not suitable for HIGH-RISK biological agents.

HIGH RISK biological agents include all etiologic agents designated Class 4 by CDC, and oncogenic viruses classed high risk by NCI. (USA)



Never operate the ScanLaf Mars IVF cabinets if the fan compartment cover is removed.

If this cover is removed, the cabinet will give no protection of the operator or the environment and the fan will run with openly rotating blades.



The ScanLaf Mars IVF Class II cabinets will not provide any protection for operator or environment against harmful gases or vapours.



Always keep your hands out of the work chamber before activating the sliding window.

The airspeed monitoring system needs approximately 5 minutes to warm up and stabilise after the fan has been switched on.

4 Description

Working principle

The microbiological safety cabinet is a modified exhaust cabinet with a turbulence-free (laminar) vertical displacement flow of clean air in the work chamber protecting the product against particle contamination. During operation the front window is partly open and the in-going airflow prevents the escape of particles from the inside of the work chamber thus protecting the operator and the environment.

Air filtration

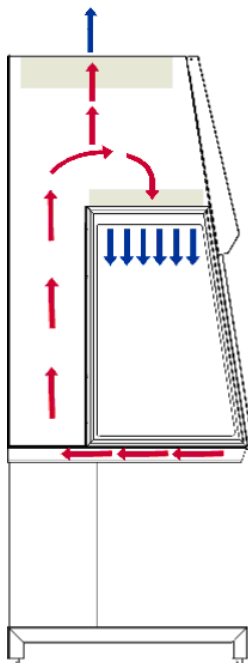
The ScanLaf Mars IVF main filter and exhaust filter of ScanLaf Mars IVF are all high-efficiency HEPA filters.

Air velocity monitoring

The low turbulence vertical flow and the exhaust flow are monitored by means of air velocity sensors. Any deviation from safe conditions will be indicated optically and acoustically.

Airflow diagram

Mars Flow diagram



Design:

The safety cabinet consists of

- Fan and filter compartment and return air duct (double back wall) made of polyester-coated sheet steel.
- Support stand made of polyester-coated sheet steel and equipped with levelling feet.
- Work chamber with tabletop and trough in stainless steel (AISI 304).
- Side windows and sliding front window all in safety glass.
- Internal ventilation system with negative pressure plenum.
- Microprocessor control and supervision system.

The work chamber is formed by the ceiling (main HEPA filter and air distributor), side windows, side panels with installation zones, back wall, tabletop and trough; the front is partly closed by the sliding front window; the work opening is situated below the front window.

- The air distributor after the main HEPA filter covers the entire ceiling surface thus giving an extremely uniform airflow.
- The trough will collect and hold any spillage of fluids. A drain valve can be installed.
- The installation zones in the back wall can be equipped with electric outlets.
- The side windows come with holes for installation of valves.
- The stainless steel modular tabletop is easily removed for cleaning.
- The internal light is installed between the air distributor and the main filter. This secures that the light is glare-free and the airflow is turbulence free.

Options:

- UV light mounted on the front wall above the front window.
- Protective ground sockets 230V~ / 4A installed in the side panels.
- Valves for various gasses i.e. gas, nitrogen (N₂) vacuum, or Carbon dioxide (CO₂), a maximum of 3 installed in each side window.
- Exhaust valve for connection to the exhaust system consult your dealer for detailed information.
- Double HEPA-filter exhaust system as specified by BS 5726-(92).
- Carbon filter exhaust system takes organic solvents when doing recirculation

Please contact our sales department for information regarding other available options.

5. EN 12469 Approvals

The ScanLaf Mars IVF 1200 and 1800 are approved by TÜV Nord.

The ScanLaf Mars IVF is approved with the following options:

- Max. 2 pcs. Electrical outlets in each side panel (left and right)
- UV-light
- Marble stone built-in the table top for supporting a balance.

6. Technical Specifications

Model Mars	Unit	M-900	M-1200	M-1500	M-1800
External dimension (DxWxH)	mm	798x1003x1248	798x1303x1248	798x1603x1248	798x1903x1248
Working chamber dimensions (DxWxH)	mm	650x900x720	650x1200x720	650x1500x720	650x1800x720
Front opening, fixed	mm	200	200	200	200
Working, height	mm	750 - 1050	750 1050	750 - 1050	750 – 1050
Air velocity, vertical flow	m/s	0,30	0,30	0,30	0,30
Down Flow rate	m ³ /h	800	1100	1300	1500
Noise level, ISO6081	dB(A)	<54	<54	<54	<54
Light intensity variable	Lux	0-2000	0-2000	0-2000	0-2000
HEPA filters		H-14	H-14	H-14	H-14
Voltage/frequency	V/Hz	220-240/50 or 115/60	220-240/50 or 115/60	220-240/50 or 115/60	220-240/50 or 115/60
Power	W	200	200	300	300
Fuses	A	10	10	10	10
Net weight	Kg	225	250	275	300
Shipping volume	m ³	2,2	2,9	3,5	4,1
Window material		hardened/laminated glass	hardened/laminated glass	hardened/laminated glass	hardened/laminated glass
Cabinet material		Polyestercoated /AISI 304 stainless steel	Polyestercoated /AISI 304 stainless steel	Polyestercoated /AISI 304 stainless steel	Polyestercoated /AISI 304 stainless steel
			GS approved		GS approved

6.1 Property of materials

Units	Material	Treatment
Support stand	Steel 1203, 2 mm	Polyester-coated RAL 9016MAT
Front shield	Al Mg, 3,2 mm	Polyester-coated RAL 9016MAT
All other painted parts	Steel 1203, 1,5 mm	Polyester-coated RAL 9016MAT
Trough and tabletop	Stainless steel AISI 304	Polished
Internal main and exhaust plenum	Galvanized steel	
Damping plate	MPM Sandwich: Galvanized - Viscoelastcal-Galvanized	
Front / Side Windows	Laminated / tempered	2×3 mm / 1×5 mm

7. Installation

Transport of the ScanLaf Mars IVF can be carried out by lifting the cabinet using a forklift either sideways under the support stand or directly under the trough. Furthermore the cabinet can be moved manually by using hooks in the dedicated holes in the support stand.



Whenever transportation of the cabinet is needed, precautions should be taken to prevent it from overturning due to the high-located mass centre.



In order to prevent damage to the cabinet it must be handled as fragile goods.

Storage of the cabinet must be in an environment of maximum 80 % relative humidity and at temperatures between 5 °C to 50 °C.

7.1 Transport

The cabinet can be moved through a standard 800-mm wide door.

7.2 Preparation



The installation site for the unit must be draught-free and should be selected so that frequent passing of people in front of the work opening is avoided.

1. The tabletops of stainless steel are mounted over the trough.
2. Adjust the levelling screws to assure that the tabletop is in horizontal position and levelled.
3. Valves for gases or vacuum are installed in the side windows. A qualified technician must make the connections for the supply.
4. For connection of the exhaust air to the exhaust air systems, special precautions which must be discussed with the cabinet supplier must be taken.

When the cabinet has been installed

1. Check that the front window is in the correct position, i.e. parallel to the front shield.
2. Never lift the front window manually; , this will cause window to malfunction.
3. Check that the window slides from top to bottom without any irregular sound.
4. If the window does not move when the UP or DOWN button is pressed, authorized service personnel must be called to correct the fault.
5. Always keep hands and arms away from the working chamber when activating the front window.

7.3 Connections

Required fusing: Circuit breaker 10 A or fuse T 10 A.

In addition, the applicable safety requirements of the local power Supply Company shall apply.



If an automatic relay for disconnection of power in case of electric fault is needed, it must be installed in the supply, as it is not built-in.



Before connecting the power supply it must be checked that the mains specifications correspond to those stated on the type plate.



The safety cabinet is provided with a flexible power cord. The connection may be installed hard-wired or by means of a wall outlet with protective ground.

If a hard-wired connection is used, a main switch, which will cut off all poles to the unit, must be used. This switch must be lockable both in the ON and OFF positions.

If the unit is connected through a protective-ground wall outlet, the connector has the all-pole insulator function. The wall outlet is to be installed out of reach of operators and may only be accessible to authorized personnel.

8. Testing

After installation or change of location and before the initial start-up



According to the standard EN 12469, the following must be tested:

- Check that manufacturers specifications are met.
- Leakage test of the main and exhaust air filter.
- Air inlet speed in the work opening.
- Check air flow patterns.
- Optionally a KI-Discus test for testing operator protection in situ.

All tests have to be done by authorized test technician approved by ScanLaf.

The test results must be entered in a test book.

8.1 Air velocity in laminar flow

Equipment:

The down flow is measured with a calibrated thermo-anemometer.

Procedure:

Turn on the cabinet and wait until the airflow has been stabilized.

The thermo-anemometer is placed in the measuring spot in a height 75 mm (50-100) over the upper edge of the front opening.

The measuring spots on the tabletop are for Mars IVF: Min 4 in a line evenly divided 125 mm from the back wall and 4 in another line 200 mm from the front window.

Each point is to be measured in at least 1 min and the value is to be recorded.

Calculate the mean value; record it as well as the maximum and minimum airflow.

Acceptance:

Mean downflow. 0.30 m/sec.

Distribution: All velocities between mean ± 20 % m/sec.

The fan speed settings are to be recorded.

Alarms:

The alarms for high and low downflow are set to the mean: min. 0.25 m/sec and max. 0.35 m/sec and the matching alarm level settings are to be recorded.

8.2 Air velocity in inlet and exhaust opening

Equipment:

The inflow is measured with a suitable volumetric measuring device.

Procedure:

The measuring can take place directly in the opening or directly at the exhaust filter.

Cover the front opening with a plate and seal it so only an opening for the measuring device, i.e. Balometer, is free.

Measure the volumetric flow and calculate it into velocity in m/s, and record the result.

Formula for the calculation: $X \text{ m}^3/\text{h} / (3600\text{s}/\text{h} \times \text{aperture in m}^2) = Y \text{ m}/\text{s}$.

Acceptance:

Air velocity in inlet = $0.45 \pm 10\%$ m/s, = 390 m³/h (Mars 1200), 590 (Mars 1800).

The fan speed settings are to be recorded.

Alarms:

The alarm for inflow velocity is set to 0.4 m/sec = 345 m³/h (Mars 1200), 518 m³/h (Mars 1800), and the matching alarm level setting is recorded.

8.3 Airflow patterns, visualization

The purpose of the test is to verify that no smoke escapes from the working space to the room, and that smoke will be drawn into the working space from the room.

Equipment:

Smoke stick, i.e. Dräger, Air Current Tube

Procedure:

Move the smoke stick in a steady movement along the front opening outside the cabinet. The smoke must be drawn into the cabinet without visible turbulence.

Test the laminarity of the downflow and along the side- and back wall. No smoke must come out in the room and only small turbulence must be observed.

8.4 Test of filters

Equipment:

Aerosol generator capable of producing test aerosol for HEPA filter leak testing.

Aerosol photometer with an upper measuring threshold of 10 µg/l to 100 µg/l and a range covering not less than 5 log rates.

Test aerosol: PAO-4 from ATI, or
Emmery 3004 from Henkel Company, or an equivalent material.

Procedure:

Mars:

Main- and exhaust filter:

Turn on the Mars and introduce the aerosol directly under the table top at the centre of the cabinet.

Adjust the Photometer to 100% up-stream concentration

Scan the downstream side of the filter over the entire surface. Scan all filter joints and sealant for leaks.

Acceptance:

Maximum local penetration: 0.01% of upstream concentration.

8.5 Test of the retention at front opening

General:

This test is optional, but useful for determination of the operator protection after installation where the cabinet is under influence of the laboratory environment.

Equipment:

KI Discus tester, equipment with an aerosol that challenges the air curtain, established by the down- and inflow.

Procedure:

With a spinning disc the test aerosol (Potassium iodide 1.5% in Ethanol) is spread inside the Mars IVF, in a homogeneous aerosol cloud. The particles leave the disc in a horizontal course, and try to pass the air curtain.

Four Air Samplers each with a filter membrane, catch particles which escape through the air curtain.

With a developing agent (Palladium chloride 0.1%) particles deposited on the filter membrane will show up as brown spots. The amount of spots is to be counted.

Acceptance:

$A_{pr} = 1 \times 10^5$ – Refer to EN 12469 for details.

9. Work Rules

9.1 Before start-up

- The cabinets may only be operated at temperatures between 15 °C and 35 °C, at maximum 80% relative humidity, and at normal air pressure.
- All cabinets are developed and produced for use in clean environments.
- They must not be operated outdoors or in environments with extreme air pollution. The safety cabinets are not intended to filter vapours containing acids or organic solvents. The safety cabinets must not be used as a fume hood.
- Approximately 15 minutes before any work in the cabinet, the fan of the unit must be switched on at normal velocity.

The work chamber and the front- and side windows are to be carefully cleaned and disinfected. Use an ethanol solution or similar. It is recommended to use special lint-free material. Do not use explosive disinfectants. See also section 10.

- Objects and appliances must be carefully cleaned or disinfected before being introduced into the work chamber. Do not bring in writing utensils, packing material, etc.
- The front window is positioned in working position and kept in that position during the entire work process.
- Necessary appliances for use during work must be placed within easy reach.
- Secure the appropriate protection of the operator as well as the product (e.g. clothes, gloves, etc.).

9.2 While working



Important for work with environmentally harmful substances!

- Do not perform work while the fan is running at reduced speed.
- The front window must be in work position.
- Place the product behind the perforated area of the work surface.
- Work with calm, smooth movements.
- Never overload the work chamber.
- Reduce the number of transfers into and out of the work chamber.
- Avoid equipment with high heat emission.
- Avoid a cabinet location where personnel frequently pass avoid draughts.



The efficiency of the laminar airflow in the work chamber is essential for personnel and product protection. Negative influences of the flow conditions must therefore be avoided.

They are primarily raised due to:

- Rapid movements of the operator's hand, arm, or body both in and in front of the work chamber.
- Covered perforations in the tabletop, both at the front and the back of the work chamber.
- Large objects and apparatus.
- Devices making rapid movements, e.g. agitators, centrifuges.



Do not damage the air distributor or the main filter in the ceiling of the work chamber by mechanical objects or heat sources, otherwise the microbiological safety is no longer ensured.

The acoustic and optical monitoring devices of the fan and front window must not be deactivated.

Devices developing strong heat, e.g., burners which can disrupt airflows. If burners cannot be avoided, use safety burners.

Operate heat sources only with the cabinet fan activated.

9.3 After work

Remove objects and appliances from the work chamber.

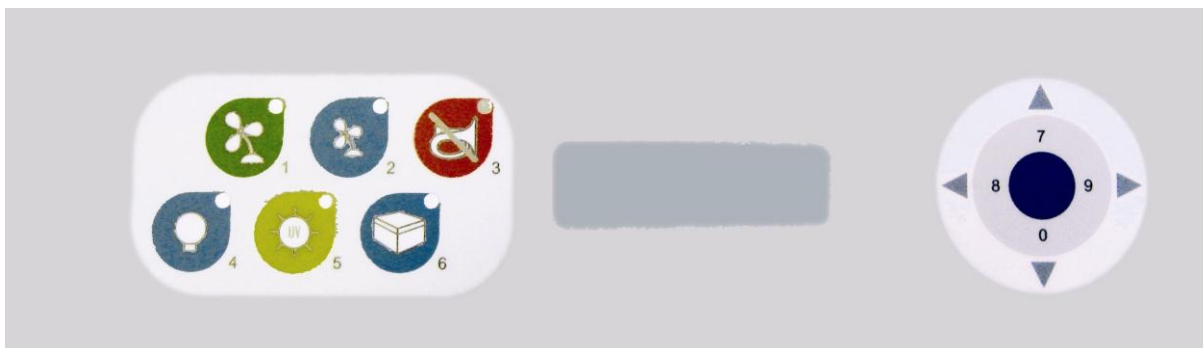
Clean the work chamber, remove fluids, if any, from the trough and dry it. Disinfect if required.

Leave the cabinet fan in operation for about another 10 minutes.

Close the front window to its lowest position.

10. Control Panel : standard set up

All functions are controlled by an electronic card with microprocessor



Control panel.

1. Button **1** with green LED light to select the fan ON/OFF at normal velocity. The green light indicates that the fan is running at normal velocity, and that conditions are safe.
2. Button **2** with blue LED to select the fan ON/OFF at reduced velocity. Can be adjusted to any level desired for individual requirements (See Service menu).
3. Button **3** with red light to silence the acoustic alarm.
4. Button **4** with blue light for normal light ON/OFF.
5. Button **5** with yellow light is if UV light is required for decontamination or activation of the table top. The time for the light is set in the user menu (See User menu).
6. Button **6** can be connected to an internal plug in the chamber for remote on/off of the plug/gas resetable valve.
7. Not active: Only for programming.
8. Not active: Only for programming.
9. Not active: Only for programming.
0. Not active: Only for programming

The user can by pressing enter see following **User menu's**

A. **Light intensity**. – this means that user can choose between 0-100 % light intensity to get best light conditions. Please choose desired level and press enter.

B. By pressing 8 or 9 the user can move to **Display mode** – where there is a possibility for constant read out of velocity speeds – both inflow and down – flow – showed in counts from 0-255

C. By pressing 8 or 9 again the user can see **UV-light** (if this is installed) and choose the time how long the UV –light should be activated for

D. By pressing 8 or 9 again the user can choose **Auto start** – auto stop. Here it is possible to select Monday to Friday – whole week or only a single day when the cabinet should start up in full speed

Code No. 9.900.900.752

\\Server1\data\QA\Manualer\Manuals- Labogene-Origio-GKO\Manualer-WORD\ScanLaf\Origio\Mars IVF manual-Origio-rev.5.doc

and after how long it should wait until it switches off again.

E. By pressing 8 or 9 the **Time setting** on the cabinet can be set by the end-user – date, month, year, clock 24 hours or AM/PM.

F. By pressing 8 or 9 **Password** shows up – this means the user can select a Password so the keys can not be activated – without the entered Password. It can always be overruled by the Service access code

G. By pressing 8 or 9 **Service mode** can be reached. To enter this you need to be trained personnel and to have got the Service access code

10.1 Programming

Only for trained personnel!!

Service mode: This menu is only operated by authorised service people from ScanLaf A/S, distributors and trained technical people for safety reasons – who has got the Service access code.

In Service mode can be adjusted – the

- **Airflow speeds** down flow and exhaust through 2 air flow sensors
- The setting and calibration of the **Alarms**: analogue air flow sensors or pressostats.
- The configuration of the cabinet options: with or without UV–light, light mode setting, el-out lets, gas resettable valves, Pir sensor.
- External control setting: output 0-10 volt to volustats, external blower dampers or CTS, input from External blower or CTS or pressostats mounted in the exhaust channel
- USB-port
- Decontamination through H₂O₂ or Formalin

10.2 Supervision – Alarm


The cabinet safety is constantly supervised so that any deviation from safe conditions or any fault in the supervision system will be indicated immediately.

Safe conditions are indicated by a green LED light in the button for fan at normal velocity.

Unsafe conditions will be indicated both acoustically and visually by red flashing LED light.

The alarm will be initiated if

- The vertical air velocity inside the work area is outside the limits.
- The air volume exhausted is below the limits:
- The fan is running at reduced velocity.
- After a power failure
- Optional 3rd sensor: A pressostat mounted in the exhaust channel – the pressure drop is too low

By activating the alarm  when the cabinet runs at reduced speed the red LED will change from flashing to constant light.

The alarm will be silenced off when the fan is running at normal velocity, all conditions are safe, or the cabinet is switched off.

(The whole display can be flashing if there is an alarm – this setting is done as a default in alarm setting).

Optionel mounting of Pir sensor.

If the set-up of the cabinet has to be automatic – it means the cabinets is ready to work when the operator stick the arms in the work chamber:

In this case a Pir sensor can be mounted – let the cabinet run at full speed for defined time – as long as there is movements. If no movements it will stop after preset time from 30 seconds.

In order to ensure the clean environment inside and that the cabinet instantly provides operator safety – the cabinet has to run at constant reduced speed – in the working hours (Programmable through the Autostart – menu).

Setting of light

The light setting of the cabinet upon alarm can be set in 3 different alternatives:

- Light always on when blue light button is activated.
- Light always on when blue light button is activated and in full speed – if reduced speed is pressed the light turns out.
- Light is always on when blue light button is activated and in full speed – if there is an alarm the light will turn out automatically and will only light again when all alarms have disappeared.

11. Cleaning and decontamination

Cleaning must be done daily after work in order to obtain a safe working environment.

The cabinet should be kept clean and free from unnecessary equipment.

The interior should be swabbed with a suitable disinfectant with the right biological spectrum after use. Phenolics, quaternary ammonium compounds and aldehydes can be used for disinfecting these surfaces. Recommended disinfectants are 2% (vol.) gluteraldehyde or 15% (vol.) formaldehyde. Use alcohols on caution because of the risk of fire.

DO NOT USE ANY COMPOUNDS CONTAINING HYPOCHLORITE SOLUTIONS, as this will damage the stainless steel.

Heavy duty polyvinyl chloride (PVC) or rubber gloves which provide suitable protection for the hands and wrists and which can be disinfected for re-use should be worn when cleaning the cabinet.

Procedure:

1. Leave the cabinet running at normal speed. Turn on the light.
2. Remove objects and appliances from the work chamber.
3. Lift up the table tops one by one and clean them carefully on both sides. Remove them from the working chamber.
4. Remove all loose objects from the trough or flock filter.
5. Swab the trough carefully on surfaces, along edges and in corners.
6. Clean the back wall and the side windows.
7. Raise the sliding front window to the highest position using the control panel and open the hinged front cover.
8. Clean the window on the inner side.
9. Close the front cover.
10. Put the clean tabletops back in their place.
11. Let the fan run for 10 minutes.

11.1 Weekly

Wipe the outside of the unit with a mild household cleaner. Anti-static spray may be used to clean the front window.

11.2 Regularly

Reliable function of the cabinet and compliance with standards are based on the following conditions:

1. Correct air velocities.
2. Efficiency of the HEPA filters installed.
3. Correctly adjusted alarm limits.
4. Tightness of the construction.

11.3 Decontamination by use of formaldehyde

The purpose of this section is to state guidelines regarding decontamination by using formaldehyde.



Certification is required in certain countries for decontamination by using formaldehyde.

Procedure for decontamination by use of formaldehyde

1. Dismantle the exhaust system, and close the exhaust opening tight with a sealed plate
2. Disconnect the exhaust fan from by removing the fuses (fan 3).
3. Prepare the formaldehyde- and the neutralization solution and place in the evaporator and place it inside the Mars. (The evaporator has a timer function).

Code No. 9.900.900.752

\\Server1\data\QA\Manualer\Manuals- Labogene-Origio-GKO\Manualer-WORD\ScanLaf\Origio\Mars IVF manual-Origio-rev.5.doc

4. Bring the sliding window to the lowest position and open the front cover.
5. Seal the window by means of adhesive tape.

Procedure for decontamination in the Mars

- 1 Let the Mars run with reduced speed during evaporation of the formaldehyde. This distributes the formaldehyde in the Mars.
- 2 Let the influence with formaldehyde last for 6 hours, and let the neutralization last for ca. 1 hour.
- 3 Switch off the fan.
- 4 Dismantle the metal plate on the exhaust opening, and mount the exhaust connection.
- 5 Connect the exhaust fan, reinstalling the fuses.
- 6 Remove the tape on the front window.
- 7 Close the front cover and set the sliding window in working position.
- 8 Let the Mars IVF run for at least 30 minutes.
- 9 The Mars IVF is ready for use.

Decontamination and possible neutralization agents *(The formaldehyde is diluted with water):*

Model ScanLaf Mars IVF 900:

Formaldehyde 36%: 54 ml; Water: 54 ml; Ammonia 25%: 38 ml

Model ScanLaf Mars IVF 1200:

Formaldehyde 36%: 72 ml; Water: 72 ml; Ammonia 25%: 50 ml

Model ScanLaf Mars IVF 1500:

Formaldehyde 36%: 90 ml; Water: 90 ml; Ammonia 25%: 63 ml

Model ScanLaf Mars IVF 1800:

Formaldehyde 36%: 108 ml; Water: 108 ml; Ammonia 25%: 75 ml

ScanLaf refers to our Formaldehyde Vaporizer catalogue number: 9.001.020.117.

Decontamination procedure

Formaldehyde evaporation	30 minutes
Effect time	8 hours
Neutralization	30 minutes
Effect time	30 minutes
Airing	30 minutes

12. Maintenance



Every 5000 operating hours or at least once every year the cabinet has to be inspected and tested.



Before repair work is carried out inside the contaminated and/or infected cabinet and prior to filter replacement and upon change of location, proper cleaning and disinfecting by the operator is required. The lab Manager/Safety Manager must confirm this in writing to service personnel. For the appropriate form, refer to section 13.

After completion of work, tests are required according to the standard.

- Leakage test of main and exhaust air filter.
- Test and adjust air velocities and alarm settings in the vertical flow inside the work chamber and the horizontal in-flow in the work opening.
- Test of air flow patterns.
- General function and safety tests in accordance with local requirements.

For this purpose we recommend a maintenance agreement.

Before work on the electrical system, disconnect the power.

Fuses are accessible and situated on top of the cabinet (authorized person only).

All maintenance and repair work performed, as well as filter replacements and required tests, must be documented in a test book. See section 12.

12.1 Filters



The HEPA filter is very fragile. Even a light touch on the filter surface may damage the filter.

In order to avoid any possible harm, it is recommended that while changing filters the service technician wears a mask with filter of HEPA quality. (H 14 or better).

The used filters must be placed in special bags for biohazard waste immediately after removal. The special bags should be handled as toxic material and sent for destruction as the normal toxic waste from the lab.

REPLACEMENT OF THE HEPA FILTERS

When the main- or the exhaust HEPA filters need to be replaced on Mars IVF, due to leakage or to higher pressure drop, it is recommended that both filters are replaced at the same time.



It is important that the service technician is equipped with personal protection gear like lab-coat, gloves and mask, and that the cabinet is documented decontaminated.



To replace the HEPA filters proceed in the following manner:

- Open the service panel of the cabinet, set the window in the highest position and open the service panel.
- Remove the front panel and place it in a safe area.
- The internal filter/fan compartment is now accessible. Now unhook the anchors of the main filter by following the steps: loosen the lock nut, unscrew the two handle bolts (placed on the right-hand and the left of the cabinet below the plastic stoppers) and remove the squads.
- Now lift up the frame and the pressure plenum and carefully remove the main filter, place the filter in a plastic bag and treat it as biohazard waste.
- Now release the anchors of the exhaust filter by following the steps listed below:
- Remove the rectangular steel frame placed on the cabinet's ceiling. Now the exhaust filter is accessible; lift it up and place it in a plastic bag for biohazard waste. Insert the new filter by performing the reverse operations for its installation.

Filters must be provided with gasket on both sides.

Before installing the new filters, the filter frame must be cleaned very carefully.

The new filters must correspond to make and the model indicated on the tags placed on the removed panel (also see paragraph 11.2 LIST OF SPARE PARTS).

Code No. 9.900.900.752

\\Server1\data\QA\Manualer\Manuals- Labogene-Origio-GKO\Manualer-WORD\ScanLaf\Origio\Mars IVF manual-Origio-rev.5.doc

A ROUTINE TEST IS COMPULSORY AFTER THE REPLACEMENT OF THE FILTERS
(see dedicated paragraph).

12.2 Part list for Filter

The cabinet has been tested and approved with main and exhaust filters from Camfil.

Main filter: Camfil Megalam MG14-G10-1220×054×110-01PUH14

Exhaust filter: Camfil Megalam MD5014-33-G10-610×054×069-01PUH14

12.3 Fuses

The fuses of Mars are located in the right side of the top of the cabinet behind a protective cover.

Component	Fuse	Phase/zero
Main	T10A	Ø5x20
Main	T10A	Ø5x20
Electrical outlet	T6.3A	Ø5x20
Electrical outlet	T6.3A	Ø5x20
Option 1	T1A	Ø5x20
Option 2	T1A	Ø5x20
Option 3	T1A	Ø5x20
Light	T1A	Ø5x20
UV-light	T1A	Ø5x20
Fan	T5A	Ø5x20

Equipment required

Small screwdriver for slotted screws and

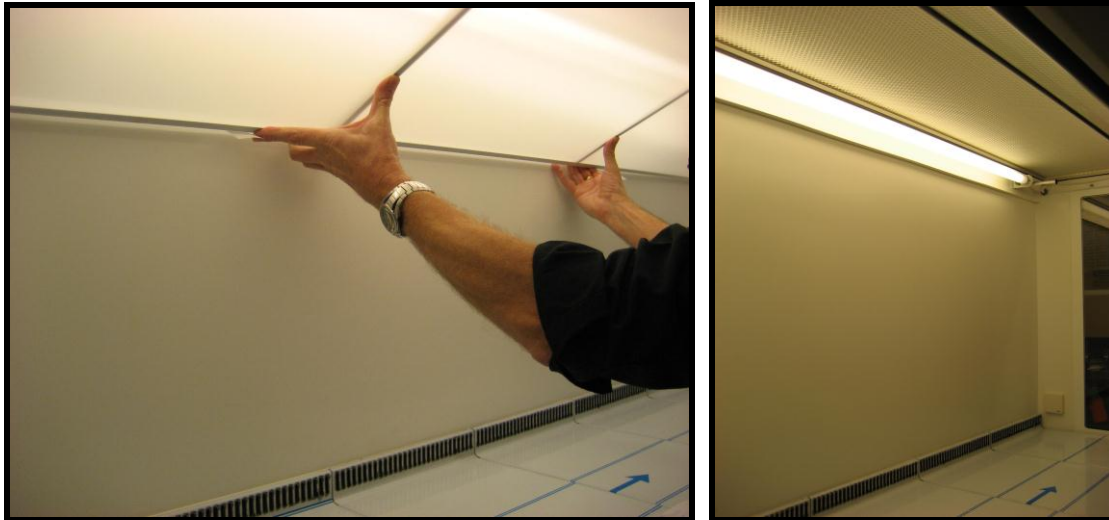
Fuses (see the Instruction Manual).

Procedure for replacement of fuses (Authorized persons, only)

- Switch off the power
- Remove the protective cover
- Locate the burned fuse
- Replace the fuse
- Install the protective cover
- Switch on the power

12.4 UV GERMICIDAL LAMP – Fluorescent lamp

To open the service panel of the cabinet, set the window in highest position and you can open the service panel.



The fluorescent and UV lamp (germicidal) have an average life time of about 5000 hours. SCANLAF, however, suggests its replacement after no more than 2000-3000 hours. The luminous potential delivered drops to 70% after said period.

REPLACEMENT OF THE FLUORESCENT LIGHT TUBES

Remove the air distributor located in top of the work chamber (handle with care)
Release the two lamps from the fixtures by rotating them 90°.
Install the new lamps performing the inverse operation.

REPLACEMENT OF THE UV lamp TUBES

The UV light is located on the back wall
 Release lamps from the fixtures by rotating it 90°.
 Install the new UV -lamp performing the inverse operation.

NOTE: Use gloves when manipulating a germicidal UV lamp, to prevent leaving hand prints that reduce the effects of the ultraviolet radiation.
 Replace UV lamp every 2000 or 3000 hours of life.

12.5 Spare parts

Cat. No.	Item
9.000.040.001	UV-light tube for Mars/Fortuna 900-1800
9.000.040.011	Light tube for Mars/Fortuna 900
9.000.040.012	Light tube for Mars/Fortuna 1200
9.000.040.013	Light tube for Mars/Fortuna 1500
9.000.040.014	Light tube for Mars/Fortuna 1800
9.000.050.001	Main HEPA filter for Mars/Fortuna 900
9.000.050.002	Main HEPA filter for Mars/Fortuna 1200
9.000.050.003	Main HEPA filter Mars/Fortuna 1500
9.000.050.004	Main HEPA filter Mars/Fortuna 1800
9.000.050.005	Main circuit board for Mars, Fortuna, Titan PCR
9.000.050.006	Flowsensor
9.000.050.007	Light ballast for Mars/Fortuna 900 1200
9.000.050.008	Light ballast for Mars/Fortuna 1500 1800
9.000.050.009	Window motor for Mars
9.000.050.012	Display board Mars, Fortuna, Titan PCR
9.000.050.011	Motor board Mars
9.000.050.010	UV-light ballast
9.000.050.014	Blower for Mars
9.000.060.001	Exhaust HEPA filter for Mars 900, 1200
9.000.060.002	Exhaust HEPA filter for Mars 1500, 1800
9.000.071.001	Laminator for Mars 900
9.000.071.002	Laminator for Mars 1200
9.000.071.003	Laminator for Mars 1500
9.000.071.004	Laminator for Mars 1800
9.000.050.024	Microswitch for Mars window

Declaration of Conformity

We declare under our responsibility, that the following product

Laminar IVF Flow Cabinets:

Fortuna 900 IVF, Fortuna 1200 IVF, Fortuna 1500 IVF, Fortuna 1800 IVF, Mars 900 IVF, Mars 1200 IVF, Mars 1500 IVF, Mars 1800 IVF, Sirius IVF, Titan IVF.

to which this declaration relates is in conformity with the following standard(s) directives or other normative document(s):

**EN ISO 12100-1: 2003 Safety of machinery
(basic concepts – General principles)**

**EN ISO 12100-2: 2003 Safety of machinery
(Technical principles and specifications)**

**EN 60204-1: 2006 Safety of machinery
(Electrical equipment of machines – General requirements)**

EN 61010-1: 2001 Safety requirements for electrical equipment for measurement, control and laboratory use. General requirements

**EN 61000-6-3: 2007, EN 61000-6-1: 2002
Electromagnetic compatibility
(Generic immunity/emission standard)**

**EN ISO 14121-1: 2007 Safety of machinery
Risk assessment - Part 1: Principles**

EN ISO 11201 – Acoustics – Noise emitted by machinery and equipment

following the provisions of:

EU Medical Devices Directive 93/42/EEC

Directive 2006/42/CE Machinery safety

**Directive 2006/95/EEC, per August 2007
(Electrical equipment designed for use within certain voltage limits)**

Directive 2004/108/EEC EMC Electromagnetic compatibility

Lynge, June 2011

A handwritten signature in blue ink that reads "Finn Kokholm".

**Finn Kokholm
Managing Director**

LaboGene ApS, Industrivej 6-8, Vassingerød, 3540 Lynge, Denmark



