

Microbiological safety cabinet MBB-IVF

State-of-the-art solution of microbiological safety workstation, so-called **biohazard**, for the purpose of **work in tissue centers and banks, IVF centers, etc.** The set consists of components that are tested in practice and together ensure **optimal laboratory work with cells and tissues**. This includes the possibility of full integration of the heating surface and the microscope.

Microbiological safety cabinet (MSC, BSC), class II, according to the standard EN 12469: 2000, it is intended for applications requiring laminar air flow to **protect the product from particulate and bacterial contamination and at the same time requiring protection of the operator and the environment from the influence of the processed product**. The MBB workstation is a **new generation device**, equipped with the latest components, security elements and a SMART control system.



DIMENSIONS

Type - size	External dimensions			Workspace			Power consumpti (W)
	/mm/			/mm/			
	width	height	depth	width	height	depth	
MBB-IVF-12	1240	1405	770	1230	690	560	500
MBB-IVF-18	1850	1405	770	1840	690	560	900

TECHNICAL INFORMATION

Parameter	Value
Performance index	
Leaktightness performance	LI-C
Cleaning performance	CI-C
Sterilization performance	SI-C
Cleanliness class acc. US FS 209 E	100 (M 3.5)
Cleanliness class acc. EN ISO 14644	ISO 5
Classification acc. to EU GMP Volume 4, Annex 1	A
Supply voltage [V/Hz]	230V / 50Hz
Airflow velocity within work chamber (m/s) **	0.40 ± 0,05
Noise level (dB(A)) during the operation mode	57
Noise level (dB(A)) during the reduce mode	54

* MBB was tested for all tests and obtained the highest performance and safety marks according to the scale of the EN 12469 standard

** in reduce mode, the airflow speed is significantly lower, but the safe protection of the operator and the lab is still maintained

Noise level has been tested acc. to EN ISO 11201, at downflow air velocity setting 0.32 m/s

Features of the CR2000 control system: selection of operating modes; user access rights management; remote control using Android, iOS, Windows; UV-C timers, heating surface, etc.; remote service support, setting of alarm limits for airflow speed, pressure, temperatures on heating surfaces, etc.; setting of light intensity level, indication of pressure on high-efficiency filter, temperature in working chamber, etc.; audit trail, warning on expiration of validation, possibility of connection to a monitoring center



Do you have any further questions? If you have not yet decided or would like to advise on the appropriate type and equipment of the workstation, we will be glad to prepare a tailor-made solution for you.

- **Fully automated operation** controlled by a smart control system CR2000 with a 7" touch panel, ensuring optimal parameters in the workspace for the selected operating mode, maximum security, remote control, advanced timers, accessory control, email and mobile phone notifications, and much more
- **State-of-the-art integration of a microscope with a heating surface** for works with living tissue
- **Front glass with electric movement** with automatic positioning and advantage protection against injury and damage
- **Ergonomic design, large workspace**
- **Quiet operation** thanks to perfect design, good sound insulation, powerful motor with low noise. The operator can therefore concentrate on working for a longer period of time.
- **Low vibration** is achieved by choosing low vibration components, anti-vibration components and special, flexible, fasteners and hinges. Thanks to this, the workstation is also suitable for vibration-sensitive operations, such as working with a microscope, weighing, etc..
- **Continuous monitoring** of main critical parameters such as a filter clogging, laminar airflow rate in the working space and air flow at the outlet of the MSC, temperature, etc.
- **Early warning system** for filter replacement, qualification, service, validation, etc.
- **Hour meter** for UV-C lamp, filters, fan, heating surface, etc.
- **Audit trail** registration of setting changes, alarms and other information
- **Temperature sensor** in the working space



LAMINAR AIRFLOW CABINET

The workstation housing is made of steel sheets with a powder coating enamel which is very **resistant to abrasion and disinfectants**. The working space, including the **waterproof tray** under the worktop, is made of first-class stainless steel with a uniform non-reflective matt surface. During the design, special attention was paid not only to maximum protection of the operator and the environment, a modern user-friendly interface, but also to a design suitable for laboratories and clean rooms according to **EN ISO 14644** clean room technology and **GMP** standards. Practically it means a smooth design, without sharp edges, minimizing joints, easy cleaning and decontamination, high IP protection in the workspace and other improvements.

The front suction grille in the work area has a V-shape design, which **prevents its covering by hands, contaminating them and prevent creation of airflow turbulence**.

The working space of the workstation can be fully closed with a **sliding front window with safety glass**. Thanks to the frameless solution, it allows an excellent view. The front window is fully motorized using precise linear drives with feedback and position monitoring. Thanks to this solution, long-term safe and reliable operation is ensured. The position control is in charge of the main workstation control system, which includes programs **enabling full cleaning of the glass as well as maximum opening of the glass for the possibility of inserting larger objects into the workspace**. The safety of the operator and objects located in the path of the front glass is ensured by a **security optical gate**.

The MBB workstation is **powered by a high-quality, powerful fan with an energy-saving electronically controlled ECM motor**. High quality components ensure maintenance-free operation. Compared to standard AC motors, **consumption is 70% lower**. Maximum environmental friendliness is supported by the possibility of using the reduce mode. The fan makes it possible to maintain the required air flow rate with high accuracy for a long time, despite the gradual clogging of the filter, and thus make **optimal use of its service life**.

Air filtration is provided by high-efficiency **HEPA filters, class H14** according to EN1822, with an filtration **efficiency of 99.999%**. The filters have a metal frame, quality seals and a protective grille. The control system continuously monitors their pressure loss. The system is equipped with notification system with **two notification levels - warning and action**. Warning level means that the HEPA filters would be replaced soon, so it is time to order the filter replacement. Action limit is activated when the filters are clogged and must be replaced immediately. In case the workstation is connected to the Internet, the control system will inform also supervisor and service engineer by email or by push notification to their mobile phone.

An efficient **germicidal, UV-C lamp** is installed in the work area. The shape and location ensure perfect decontamination of the workspace without disrupt the laminar airflow. The lamp is controlled via a touch screen, advanced timer, or remotely via a mobile phone.

The lighting of the working space is provided by **LED lighting with high luminosity**. It is equipped with **continuous regulation (0-100%) to set the ideal lighting comfort**.

The working space is equipped with a **controlled electrical socket 220 V / 50Hz**. It serves both for the connection of devices located in the working space and also in case of decontamination with formaldehyde vapors. The socket is controlled using workstation main control screen or remotely.

The workstation stand has a **robust and solid construction** made of powder-coated steel, in the same color as the workstation itself, with high resistance to abrasion and disinfectants. The stand has adjustable feet for the possibility of **rectifying the unevenness** of the surface in the laboratory. To minimize the transmission of vibrations, the stand is **equipped with anti-vibration inserts**. Thanks to the solid construction and use of anti-vibration inserts, **vibration is minimal** and significantly contributes to work comfort during vibration-sensitive operations.

The working space is **equipped with a temperature sensor** that measures and displays the temperature.

The MBB workstation **works fully automatically** according to the set mode. After selecting the mode, the CR2000 control system automatically sets the target parameters of the workstation for the given activity: idle state, operating and reduce mode, cleaning mode, sterilization and more. The mode is selected via the touch screen or remotely. The system is protected against access by unauthorized persons.

The **reduce mode** is used for **possible interruption of work**. It is implemented in such a way that after the subsequent transition to the operating mode, it is not necessary to sanitize the workspace. In this mode, the front glass is moved down and the airflow velocity in the work area is reduced. However, the suction speed through the front opening remains at the required values and thus the **safety of the surroundings** is still ensured. This achieves further **operational savings**.

Deviations from safe values are signaled both locally acoustically and optically, and are sent to email and / or mobile phone. All settings are made using the large, clear, touch screen of the CR2000 control system. The main page contains information on the operation status of the workstation, such as the selected mode, current parameters, possible alarm messages with a detailed explanation, controls for accessories (UV-C, electrical socket, gas valve, heating surface, etc.).

HEATING SURFACE WITH OR WITHOUT MICROSCOPE INTEGRATION

For works with heat-sensitive biological material, the **recessed heating surface (600x290mm)** is integrated into the working desk. This heating surface achieves **excellent stability and homogeneity**. The top of the heating surface is made of the same material as the surrounding workdesk surface, ie high-quality stainless steel. The basis of the heating surface is a special heated heating glass of a size covering the entire surface. Thanks to this solution, uniform heating is ensured both in the heating surface and in the quartz glass for the microscope.

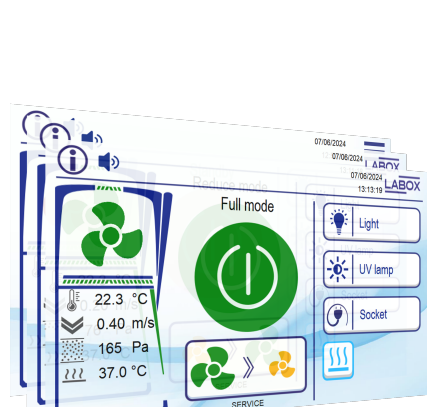
The heating surface temperature is controlled by means of **precise PID regulation** within the CR2000 SMART control system. The temperature is measured **continuously with a high precision digital temperature sensor**. The evaluation is continuous and the **latest algorithms** are used. This ensures fast heating of the heating surface without significant overshoot over the set temperature. The heating surface can be controlled both locally and remotely, both within the local data network and via the Internet. The user is able to control both the setpoint temperature setting and is able to enter alarms **according to GMP standard**.

Is recommended to integrate the NIKON SMZ (745, 800, 1000, 1250) microscope as the best solution. This microscope achieves top performance. In addition to high magnification and high working height, excellent ergonomics.

The concept of the solution of this workstation allows the **integration of the illumination developed by microscope manufacturer**. As a result, image quality is maximized, and **state-of-the-art technologies** (such as OCC) can be used. And even upgrades are possible in the future.

WORKSTATION CONTROL AND MANAGEMENT WITH SMART CR2000

The control and management of the workstation is provided by the state of the art **CR2000 smart control system**. This system ensures trouble-free operation of the device in 24/7 mode. Control is possible both through the **large touch screen** and using mobile devices and PC. The touch screen with IPS technology **reacts even through laboratory gloves**. The display shows all important parameters and states. The speed of the air flow in the working space, temperature in the working space, pressure drop on the filter and temperature of the heating surfaces, are measured continuously with precise sensors. These signals are processed by a microprocessor unit, which **optimizes the performance** of the device accordingly. **User interface is intuitive**. The control system allows the setting of timers for switching the device on and off, including the selection of the operating mode. Changing alarm settings, timers and other **parameters and functions are user-adjustable**.



Main functions and advantages of the CR2000 SMART Control system

- **Complete information** about main parameters values, status, alerts and alarms with full detail on the main screen
- **Easy mode change** (operating, reduce, stand-by) **and control of installed accessories**
- **Remote control** (android, iOS, PC)
- **Advanced timers** for UV lamp, heating surfaces, etc.
- **Sending alarms by email**
- **Sensors calibration** - airflow, temperature, heating surface
- **Remote service management**
- **Push notification on mobile phone**
- **Audittrail** – recording of changes, alarms, etc

The firmware is constantly being improved. New functions reflecting new legislative requirements and facilitating work and improving user comfort.

CONNECTIVITY

The workstation can be connected to the Internet. This state-of-the-art feature brings **freedom of control, time management and significant savings**.

REMOTE CONTROL

Trained users, supervisors and others can be granted **remote access**. This feature brings another level to complete control of the workstation. In addition to controlling the UV-C lamp, etc., you no longer have to wait for the workstation parameters to stabilize. This includes special accessories such as the heating surface. E.g. with a remote-controlled heating surface, you can **save more than 40 minutes**.

In the case of a remote connection, the local operator sees all operations performed remotely. This is also successfully used for **training, certain service tasks, firmware updates** and more.

ALARMS AND PUSH NOTIFICATION NOTICE

Early notification of non-standard operating conditions, service requirements such as filter replacement, impending need for revalidation, maintenance and more. The feature is available for smart devices running **Android and Apple IOS**.

REMOTE SERVICE SUPPORT

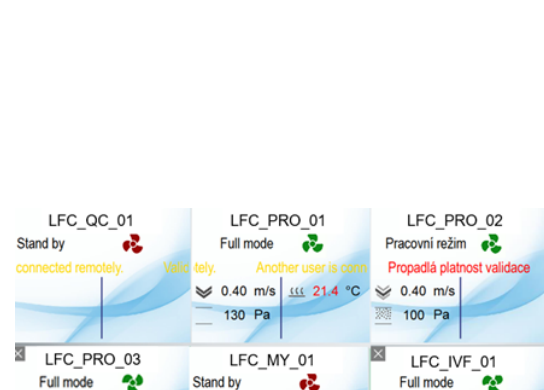
Arranging a remote service support service is available for all workstations controlled by the CR2000 control system, ie FBB, MBB, and others. This service includes **remote consultations, advice, if necessary setting parameters, remote check of technical condition, continuous control of critical equipment parameters**, such as pressure loss on the filter, etc. The service center is automatically informed about the technical condition of the equipment. It automatically accepts requests for the impending need for filter replacement, validation, etc. Thanks to the remote connection, the utility value of the workstations is significantly increased and the need and time of service interventions is reduced, and the resulting **significant reduction in operating costs**.

CENTRAL SUPERVISION CENTER (OPTIONAL)

Workstations with CR2000 control can be monitored using a comprehensive monitoring system. Monitoring software can be run on PC with Windows system. One installation **can monitor up to 50 workstations**. It brings all important information about the status of all installed devices and their main parameters on one screen in real time. In addition to the main physical parameters, such as speed in the work area, pressure drop, temperature, etc., it also displays a status bar for each workstation individually. The status bar is very useful because it **provides detailed information** about the status, but also describes any non-standard conditions, recommends the replacement of filters, and monitors important service / validation periods.

It is **possible to connect to each monitored workstation remotely**, if necessary. The operator in the control center sees what the end user sees. The end user is informed of this connection in the status bar.

This system **provides an absolute overview of workstations**. Combined with remote service support, this is the ultimate solution that saves time, minimizes uncontrolled workstation downtime and thus **significantly saves operating costs**.



OPTIONAL ACCESSORIES

The workstation can be modified / equipped with the following optional accessories:

- **Magnetic tool holder** on the rear work wall
- **19" LCD Screen or all-in-one recessed** in the rear working space wall. Convenient for microscope application, visualization or gravimetric preparation
- **Electric height adjustable standing** 65-110cm
- **Connection to building HVAC** exhaust system
- **Armrest** height-adjustable ergonomic armrest (across the entire width of the workspace)
- **Ionization system** for the removal of electric charge from the work area
- **Electrical sockets, data sockets, USB sockets, etc.**
- **Gas / vacuum / liquid supply valve**
- **Front panel color** (blue, white)
- **Uninterruptible power supply (UPS)** to ensure protection against electric power blackout and disturbances in the power network (including compensation of the local variations in the mains voltage and frequency)
- **Cabling organizer** - to hide the cabling under the worktop, can be supplied including a socket strip with five inputs
- **Integrated heating surface** (operating temperature 30 to 40 °C)
- **Integrated microscope**
- **Shelf, PC compartment, Pull-out keyboard tray**
- **Technology integration** - weighing worktop, microscope, waste containment, bushing, etc.

On customer's request, it is also possible to make individual modifications, such as different material or color design or other possible design modifications, or installation of additional special accessories, according to customer requirements. Please consult any modifications in advance.

MAXIMUM SECURITY AND USER FRIENDLY OPERATION

The workstation is designed for **works with hazardous materials, substances, tissues, viruses and cells, etc.** This workstation has all up-to-date protection and control systems to **keep safe the operator and the environment**. The most important security features are following..:

- **Continuous, rapid, monitoring and analysis** of filter pressure and airspeed velocity, heating surface temperature, and other critical parameters
- **Secure detection system** of objects located in the passage of the front glass movement – hands, fingers, tubes, cables etc. Even when the microscope is installed then it protect also the eyepiece
- **Advanced overheating protection** for heating surface (if installed)
- **Overcurrent electrical protection**
- **Tight technical plenum and solid construction**
- **Ingress protection rating IP65 waterproof working space**
- **Adjustable decontamination program**
- **Detailed alarm system identification**
- **Important information sent by e-mail, push notifications to mobile phone**



MAINTENANCE, DECONTAMINATION, SERVICE

The workstation is equipped with functions allowing to perform maintenance, sterilization of the workspace, and service. Performing **routine daily maintenance** (cleaning the work area, or inserting large samples) as well as sterilizing the working space is simple and intuitive. The responsible person of the client has the **possibility to change the basic parameters, set timers, as well as the setting of alarm limits**. Service, firmware update, sensor calibration, etc. is accessible for service technicians of the CR2000 control system.

QUALIFICATION, FINAL INSPECTION TEST, FAT TEST

All workstations are thoroughly and strictly checked during the production and also final inspection test. All physical parameters are tested by an accredited testing laboratory according to EN ISO/IEC 17025.

On request the Factory Acceptance Test (FAT) test is possible to hold at our production premises.

TRANSPORT AND INSTALLATION

The workstation is supplied and serviced by the manufacturer or certified distributors. The workstation can be transported through a standard door 80 cm wide.

WARRANTY

Lifetime warranty on spare parts availability and service support (at least for 10 years). Standard warranty period is 24 months. The warranty period can be extended upon service contract. The warranty does not apply to the service life of the installed filters, their service life is determined by specific operating conditions..