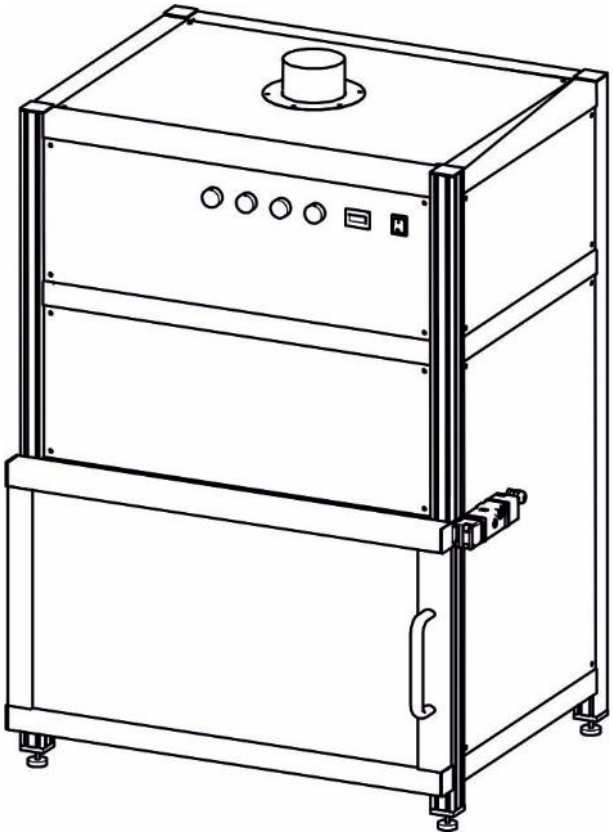
Irradiation chamber BSM-03

Special version CBD Device



Instructions
Version: 1.0.2

Opsytec Dr. Gröbel GmbH
Am Hardtwald 6-8
D-76275 Ettlingen

Phone: +49(0)7243 / 9 47 83-50
info@opsytec.de

1 Table of contents

2 Foreword

Dear customer!

Thank you for choosing a product from us!

Please take some time to read this manual carefully. Please pay particular attention to the safety instructions.

This is a prerequisite for safe handling and safe operation of the system and its components.

If you have any questions that are not answered in this manual, please do not hesitate to call us. We will be happy to help you. We are also always happy to receive suggestions or ideas.

Our products are subject to constant further development; therefore, there may be small differences between your system and the illustrations in this operating manual.

Opsytec Dr. Gröbel GmbH
Am Hardtwald 6-8
D - 76275 Ettlingen
Phone: +49(0)7243 / 9 47 83-50
info@opsytec.de

3 Guidelines and standards

The system is a machine in accordance with Annex II A of the Machinery Directive and is therefore supplied with a declaration of conformity and a CE mark (in accordance with the Machinery Directive).

Guidelines	
EU Directives	06/42/EC (machinery) (partially applicable) 2014/30/EC (EMC) 2014/35/EC (low voltage)
Harmonized standards	
EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 61000-6-2:2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-4:2007 + A1:2011	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission for industrial environments

4 Quick guide

The brief instructions are intended to demonstrate the commissioning and some functions of the device to experienced users by means of an operating sequence. The detailed instructions can be found from page 30. Please observe the safety instructions in this manual.

Commissioning

- Unpack all components and remove the packaging materials.
- The BSM-03 is supplied with a pre-assembled lamp. You do not need to install the lamp.
- Connect compressed air for the shutter to the back of the BSM-03.
- The BSM-03 has a ventilation system. Make sure that the air inlets are not covered.
- If necessary, connect the UV-MAT to the BSM-03.
- Guide the sensor cable through the cable gland on the back of the radiation chamber.
- Connect the sensor to the UV-MAT
- Switch the system on using the power switch on the back of the BSM-03
- Switch on the lamp using the switch on the front of the BSM-03

Operation:

- Switch on the irradiation chamber using the mains switch. Then ignite the UV lamp using the lamp on switch on the front. Wait 10 minutes until the lamp has reached operating temperature.
- Open the front door of the irradiation chamber and place the objects to be irradiated in the irradiation chamber.
- Close the front door of the radiation chamber, otherwise the shutter will not open.
- Select operating mode: Timer or dose*

  If necessary, check the sensor factor (see chapter 10.5).
- Start the irradiation with UV-MAT. At the end of irradiation, open the front door of the irradiation chamber and carefully remove the irradiated objects.
- Switch off the lamp and allow the system to cool down. Then switch off the system.

Information on safety instructions can be found from page 19.

Information on commissioning can be found from page 30.

Information on operation can be found from page **Fehler! Textmarke nicht definiert.**.

5 Important information

5.1 Manufacturer

Opsytec Dr. Gröbel GmbH
Am Hardtwald 6-8
D - 76275 Ettlingen
Phone: +49(0)7243 / 9 47 83-50
Fax: +49(0)7243 / 9 47 83-65
info@opsytec.de
www.opsytec.de

5.2 Change history

We reserve the right to make changes to the content. Opsytec Dr. Gröbel GmbH is not liable for any errors in this documentation. No liability is accepted for indirect damage arising from the delivery or use of this documentation, to the extent permitted by law.

Version	Processor	Date	Amendment
1.0.0	Paravia	20.02.2024	Original version
1.0.1	Paravia	17.5.2024	Editorial changes Chamber factor EXT & UVC
1.0.2	Paravia	01.10.2024	changes CEE

5.3 Copyright

5.4 Device identification

Information for internal use:

Description of the machine:	Irradiation chamber BSM-03
Year of construction:	.....
Machine no.	.....
Project no.	.....

5.5 Intended use

The irradiation chamber BSM-03 is a curing chamber for the laboratory for the reproducible irradiation of liquids in a Petri dish according to the so-called colimated beam principle.

The system is intended exclusively for industrial use. It is prohibited to use the devices in potentially explosive atmospheres or for general lighting.

- Installation, commissioning, operation, maintenance and service work may only be carried out by trained and qualified personnel who comply with all safety guidelines and standards.
- Responsibility: Damage resulting from unintentional or unauthorized tampering terminates any right to assert warranty or liability claims against the manufacturer.
- Warranty exclusion: The use of all non-original parts invalidates the warranty.
- Environmental protection: Defective parts that contain environmentally harmful substances must be disposed of accordingly.
- During operation, high-energy UV radiation or visible radiation is generated in the irradiation chamber.
- Operation is only permitted in a dry environment. The installation is horizontal.
- Only suitable for operation in closed rooms.
- Before opening, the system must be disconnected from the power supply and it must be checked that no voltage is present.
- Wear gloves when servicing, cleaning and replacing the lamp.
- The system must not be cleaned when it is in operation.
- High-energy UV radiation and possibly ozone are generated during operation.
- The door must not be opened during irradiation.
- Any use other than that mentioned above will result in damage to the product. It is also associated with risks to people such as photochemical damage to the eye, retinal damage and erythema, as well as short circuits, fire and electric shock. The entire appliance must not be modified or converted! The safety instructions must be strictly observed.

  This is also associated with hazards such as short circuits, fire and electric shock. The entire appliance must not be altered and/or modified! The safety instructions must be observed at all times.

⚠ CAUTION

The system may fall down! Damage to the appliance and personal injury are possible

- Always carry the radiation chamber with two people.

5.6 Foreseeable misuse

The following is considered foreseeable misuse:

- Operation of the appliance without safety devices and safety equipment.
- Activities of untrained personnel on the appliance.
- Non-compliance with the owner's/operator's operating instructions.
- Ignoring the operating manual.
- Any use outside the specified purpose.

5.7 Legal information

5.7.1 Limitation of liability

All information in this manual has been compiled taking into account the currently applicable standards and regulations, the technical standard and our many years of knowledge and experience.

The manufacturer is not liable for damage in the event that:

- This manual has been ignored,
- the device has been used improperly,
- untrained personnel were deployed,
- untrained personnel have used the machine incorrectly,
- impermissible modifications have been made,
- technical changes have been made
- unauthorized spare parts were used.

We are not liable for common faults of the appliance caused by a power failure or a failure of the control system.

The actual scope of delivery may differ from the explanations and images in this manual in the case of special versions, if additional options are ordered, or due to the latest technical changes.

The obligations agreed in the delivery contract as well as the manufacturer's terms of delivery and the legal regulations valid at the time of conclusion of the contract shall apply.

5.7.2 Declaration of conformity

The declaration of conformity can be found in the appendix or can be requested from the manufacturer.

5.7.3 Warranty conditions en

The warranty conditions are subject to the German Civil Code (BGB) of the Federal Republic of Germany. The warranty period is 1 year, unless otherwise agreed in the purchase documents.

6 General

6.1 Information about this manual

This manual is intended to make the handling of this system and its components safe and efficient. This manual is part of the system and must be kept in its immediate vicinity where it is accessible to personnel at all times.

This documentation contains the necessary information for the intended use of the system described. It is intended for technically qualified personnel who have been specially trained for operation, quality assurance, laboratory, maintenance and repair.

Personnel must read this manual carefully and understand its contents before starting any work. The basic requirement for safe working is that all the safety and operating instructions in this manual are observed.

Knowledge and technically correct implementation of the instructions, safety requirements and warnings are a prerequisite for safety during operation, maintenance and repair. Only qualified personnel have the necessary expertise to apply the safety instructions, safety instructions and warnings specified in this operating manual in a general manner in a specific situation.

In addition, the local accident prevention regulations and the general safety regulations for the area of application of the system apply.

Illustrations in this manual are for the purpose of general understanding; they may differ from the actual version.

Apart from this manual, the instructions for the installed components contained in the appendix apply.

This operating manual cannot cover every possible maintenance case. If you require further information or if specific problems occur that are not covered comprehensively enough in this manual, please request the necessary information from the manufacturer.

For ease of description, the above components are referred to collectively as a system.

6.2 Information about the symbols

6.2.1 Safety instructions

In this manual, the safety instructions are represented by symbols. The safety instructions are preceded by signal words that indicate the extent of the danger.

To avoid accidents and damage to persons or property, always follow the information and act with caution.

Throughout the text you will find the following pictograms with the following meanings:

DANGER

Imminent danger

Possible consequences: Death or serious injury.

- Prevention

WARNING

Dangerous situation

Possible consequences: Death or serious injury.

- Prevention

CAUTION

Possible situation

Possible consequences: Slight or minor injuries. Sometimes also used as a warning of material damage.

- Prevention

Note

Information on the application or useful, important information

6.2.2 Prohibition signs

General "prohibition sign"

6.2.3 Warning signs

Warning of optical radiation
(such as UV, IR or visible radiation)

Warning of hot surfaces!

Warning of electricity!

6.2.4 Attention

Wear eye protection!

Opaque eye protection must be worn!

Disconnect the mains plug from the socket!

Disconnect before carrying out maintenance or repairs!

Wear hand protection!

Wear foot protection!

Refer to the instructions!

6.2.5 Fire protection sign

Extinguishing hose

Fire extinguisher

6.2.6 Escape sign

Emergency exit: All emergency exits are marked with this symbol

6.2.7 Optional function

* Optional function,
not available
for every system.

6.3 Owner/operator information

The system is used in a commercial environment. The owner/operator of the system is therefore subject to legal obligations with regard to occupational safety.

In addition to the safety information in this manual, the generally applicable regulations that are valid for the area of application of the system with regard to safety, prevention of accidents and protection of the environment must be observed and complied with.

The following applies in particular:

The owner/operator must obtain information on the applicable health and safety regulations and carry out a risk assessment to identify additional hazards that have arisen due to the specific operating conditions at the system's place of use. He must implement these in the form of operating instructions for the operation of the system and specifically for the individual workstations.

The owner/operator is obliged to check during the entire service life of the system whether the operating instructions that he has developed comply with the current status of the regulations and must update them if necessary.

The owner/operator must clearly assign and define the responsibilities for installation/operation, troubleshooting, service and cleaning.

The owner/operator must ensure that all personnel involved with the system have read and understood this manual. Furthermore, he is obliged to offer staff training at regular intervals and to provide information about the risks and hazards.

The owner/operator must provide the necessary personal protective equipment for their personnel. Furthermore, the owner/operator is responsible for ensuring that the system is always in perfect technical condition. To ensure this, the service intervals specified in this manual and in the technical documents for the individual system must be observed and all safety installations must be regularly checked for function and completeness.

The owner/operator must regularly check that all safety devices are functioning and complete.

The owner/operator must ensure that the operating personnel have knowledge of first aid measures and the local rescue equipment.

6.4 Personnel requirements

6.4.1 Qualifications

⚠ WARNING

Risk of injury if the personnel are insufficiently qualified!

If unqualified personnel carry out work on the system or are in the danger zone of the system, risks arise that can cause serious injuries and serious material damage.

- Have all measures carried out only by personnel who are qualified to do so.
- Keep unqualified personnel away from the danger zone.

⚠ WARNING

Risk of injury when touching live parts or hot surfaces

In general, low-voltage devices such as this system may have dangerous live parts and hot surfaces. All transportation, installation, commissioning, start-up and maintenance work must be carried out by suitably trained and responsible personnel (in accordance with EN 50110-1 (VDE 0105-100); IEC 60364). Inappropriate behavior can lead to serious injury or damage.

⚠ WARNING

Risk from UV radiation and intense visible light

The system is equipped with a UV lamp. There is a risk of photochemical damage to the eye, retinal damage and erythema. The operating personnel must be suitably trained.

Always wear face protection, safety goggles and protective gloves when working with the BSM-03.

To protect the operating personnel: Never look directly at the UV lamp and do not expose your skin to UV radiation for long periods.

Note: In the event of a malfunction, the UV lamp may be on even if the BSM-03 / control unit does not indicate this. Before carrying out any work on the system, check that the UV lamp is switched off.

The handbook lists the personnel qualifications for the various areas of activity below:

6.4.1.1 Qualified electrician

Due to their training, competence, experience and knowledge of the relevant standards and regulations, qualified electricians carry out work on the electrical systems and recognize and avoid risks independently.

Qualified electricians are specially trained for the working environment in which they work and are familiar with the relevant standards and regulations. Qualified electricians must meet the requirements of the applicable legal regulations for accident prevention.

6.4.1.2 Qualified specialist

Qualified specialists are or can be trained by Opsytec Dr. Gröbel GmbH in the advanced operation and parameterization of the system, as well as in the performance of preventive service work.

In addition to their technical training, competence and experience, as well as their knowledge of the relevant standards and regulations, they are able to carry out the work assigned to them and independently recognize and avoid potential hazards.

6.4.1.3 Operator

Operators use and operate the system within the scope of its intended use. They are trained by the owner/operator in the work assigned to them and informed about possible hazards.

6.4.2 Training and qualification of staff

Operating personnel must be informed of the specific risks and hazards involved in working with and handling the system in regular instructions and training sessions.

The instruction and training should have the following content:

Dangers when working with the system during normal operation.

Hazards in connection with service, repair and cleaning activities.

Behaviour to minimize the consequences of accidents.

Behavior in the event of accidents.

Rescue of injured persons.

Working without personal protective equipment can lead to damage to health. The company supervisor is instructed to ensure that personnel wear personal protective equipment.

Special hazards when working on electrical systems.

The instructions and training must be carried out at regular intervals by the owner/operator. For better tracking, the implementation of the instructions and training should be recorded.

6.5 Personal protective equipment

The purpose of personal protective equipment is to protect personnel from hazards that could affect their safety or health at work.

When carrying out various activities on and with the system, personnel must wear personal protective equipment. This is repeatedly referred to in the individual chapters of this manual. The personal protective equipment is explained below:

6.5.1.1 Protective gloves

Protective gloves are used to protect the hands from visible and/or invisible radiation, friction, abrasions, punctures and deep injuries.

6.5.1.2 Safety goggles

Safety goggles are used to protect the eyes from visible and/or invisible light.

Safety spectacles and storage boxes can be ordered from Opsytec Dr. Gröbel GmbH, Am Hardtwald 6-8, 76275 Ettlingen, Germany or UVEX AREITSSSCHUTZ GMBH, Würzburger Str. 181 - 189, 90766 Fürth, Germany:

Protective eyewear part number: 9169065

Storage box part number: 9957502

⚠ CAUTION

Use eye protection when working with the light source in the danger zone.

⚠ CAUTION

Keep the safety goggles protected at the place of use when not in use.

6.5.1.3 Safety shoes

Safety shoes are worn as protection against heavy parts that could fall and against slipping on slippery surfaces.

7 Safety instructions and residual risk

7.1 General

The system is state of the art and has been built in accordance with recognized safety regulations. Nevertheless, its use may pose risks to the lives and limbs of operating and repair personnel (service personnel) or third parties, or impairments to the machine. Only operate the system if its safety devices are in perfect condition. Faults that impair its safety must be rectified immediately.

The following safety information must be strictly adhered to in order to avoid damage to the machine and personal injury!

<table>
<tr><td rowspan="2">  </td><td>⚠ WARNING</td></tr>
<tr><td>Risk of injury if personnel do not read the operating manual!
Read the operating manual completely before commissioning and operation. Read all safety information and instructions. Failure to observe the safety information and instructions may result in electric shock and/or serious injury.</td></tr>
</table>

7.2 Safety instructions in relation to normal operation

DANGER

Danger to life

There is a danger to life if the system is operated with defective or missing safety devices.

- The system should only be operated if all safety devices and safety-related installations are present and in working order. The operator of the machine is obliged to check the safety devices regularly for proper function before starting production.

WARNING

Risk of fire

Extremely high irradiance is achieved inside the irradiation chamber, which can ignite flammable materials with permanent radiation. Do not place any flammable material directly under the lamp and pay attention to the irradiation time and material temperature.

WARNING

Risk of injury from UV radiation

The BSM-03 is equipped with a high-performance UV unit. To protect the operating personnel, the system must not be operated without an external cover.

WARNING

Risk from UV radiation and intense visible light

The system is equipped with a UV lamp. There is a risk of photochemical damage to the eye, retinal damage and erythema. The operating personnel must be suitably trained.

Always wear face protection, safety goggles and protective gloves when working with the BSM-03.

To protect the operating personnel: Never look directly at the UV lamp and do not expose your skin to UV radiation for long periods.

Note: In the event of a malfunction, the UV lamp / UV lamps may be on, even if the BSM-03 / control unit does not indicate this. Before carrying out any work on the system, check that the UV lamp / UV lamps are switched off.

DANGER

Risk of poisoning

When using an ozone-generating lamp, the exhaust air may be enriched with ozone. Ozone is harmful to health if it is absorbed through the lungs for long periods and in high concentrations. Therefore, always avoid breathing in ozone.

- Suitable extraction and treatment of the exhaust air must be ensured so that the permissible ozone workplace concentration (MAK value) is not exceeded.

WARNING

Risk of injury when touching hot surfaces

The maximum lamp temperature can reach >1100°C. There is a risk of burns if you touch it. Allow the lamp to cool down before removing it (>30 min).

The lamp, shutter and lamp unit become hot (>200°C) during operation.

Chamber interior becomes hot during operation (>60°C).

- Do not touch the shutter, the lamp or the lamp unit and do not move them by hand.
- Wear protective gloves

CAUTION

Risk of damage

Skin grease and dirt are absorbent in the UV and visible spectral range.

- Avoid leaving fingerprints on the optical components, sensor surfaces, lamp and reflectors. If necessary, the components must be carefully cleaned with isopropanol.

CAUTION

Risk of damage

The system heats up during operation. The system may only be used if compressed air is available at the system.

- Ensure that compressed air is connected and available.
- Ensure that there is sufficient air circulation at the installation site.
- Fans and access openings must not be covered.

CAUTION

	Risk of damage The mercury medium-pressure heaters used in the system cannot be re-ignited while still hot. For this purpose, a cooling time of at least 30 minutes must be observed after switching off the radiators before re-ignition. Re-ignition attempts when the lamp is hot can damage the system or parts of it.

A brightness of at least 300 lux must be provided for activities in normal operation.

Access to the machine is only permitted to operating personnel and authorized personnel.

Only instructed operating personnel are permitted to operate the machine.

It is not permitted to remove or deactivate protective devices while the system is in operation.

If a protective device or equipment fails or becomes faulty, this must be reported immediately to the plant supervisor. They will then decide on the further procedure.

7.3 Radiation safety

	**⚠ WARNING** **Risk of eye injuries** The system is equipped with an intensive UV lamp. There is a risk of photochemical damage to the eye, retinal damage and erythema. The operating personnel must be suitably trained. To protect operating personnel, do not look into the UV lamp and do not expose skin to UV radiation for long periods. Note: In the event of a malfunction, the UV lamps may be on even if the radiation chamber / control unit does not indicate this. Before carrying out any work on the system, check that the UV lamps are switched off.

7.4 Safety instructions in relation to service and repair work

⚠ WARNING

Risk of injury from UV radiation

The BSM-03 is equipped with a high-performance UV unit. To protect the operating personnel, the system must not be operated without an external cover.

⚠ WARNING

Risk of injury! High weight!

Always carry the radiation chamber with two people.

⚠ DANGER

Risk of poisoning

When using an ozone-generating lamp, the exhaust air may be enriched with ozone. Ozone is harmful to health if it is absorbed through the lungs for long periods and in high concentrations. Therefore, always avoid breathing in ozone.

- Suitable extraction and treatment of the exhaust air must be ensured so that the permissible ozone workplace concentration (MAK value) is not exceeded.

⚠ WARNING

Risk of injury when touching live parts

Before opening the irradiation chamber, disconnect all components from the supply voltage and check that no voltage is present.

⚠ WARNING

Risk of injury!

The maximum lamp temperature can reach > 1000 °C. There is a risk of skin burns on contact. Allow the lamp to cool down before removing it (> 30 min).

⚠ CAUTION

Risk of damage

- Switch off the system before connecting / disconnecting accessories, sensors or similar. The accessories may be damaged due to the operating voltage of the system.
- Unplugging and plugging in signal cables during operation is strictly prohibited!

⚠ CAUTION

Risk of damage

Skin grease and dirt are absorbent in the UV and visible spectral range.

- Avoid leaving fingerprints on the optical components, sensor surfaces, lamp and reflectors. If necessary, the components must be carefully cleaned with isopropanol.

Service, repair and cleaning work may only be carried out by authorized and specially trained technicians. The system must be de-energized and secured before any major work (including cleaning) is carried out.)

Carry out the prescribed adjustment, service and inspection work in accordance with the instructions. If you require further information or if specific problems arise that are not covered in sufficient detail in this manual, please request the necessary information from the manufacturer.

Only qualified electricians may carry out work on the electrical system.

Safety devices may only be removed during service and repairs if the system has been switched off beforehand and brought into a safe state.

Important safety installations may no longer function during service and maintenance work. This type of work therefore requires particular caution.

8 Description of the system and overview of functions

The BSM-03 is a robust irradiation chamber for time- or dose-controlled UV irradiation of liquid samples according to the colimated beam principle. An ozone-free medium-pressure lamp with an output of 1 kW is installed in the BSM-03.

As a special irradiation chamber, the BSM-03 contains a colimated beam device:

- Lamp unit with built-in medium-pressure emitter, approx. 1 kW, ozone-free
- Protective housing (irradiation chamber)
- Irradiation area for customer-side Petri dish and customer-side magnetic stirrer
- Reference sensor incl. holder for dose-controlled operation
- Grid plate with screw threads for easy measurement of the irradiation field
- Leveling feet for level compensation (spirit level available as an accessory)
- UV-MAT Touch
- Monitored door
- Pneumatic, automated panel shutter
- Total operating hours counter
- Connection for an additional RMD sensor
- PC software, based on UV-MAT Control:

    Data storage with adjustable path

    Raw data + short report per pdf

    Windows users in short report

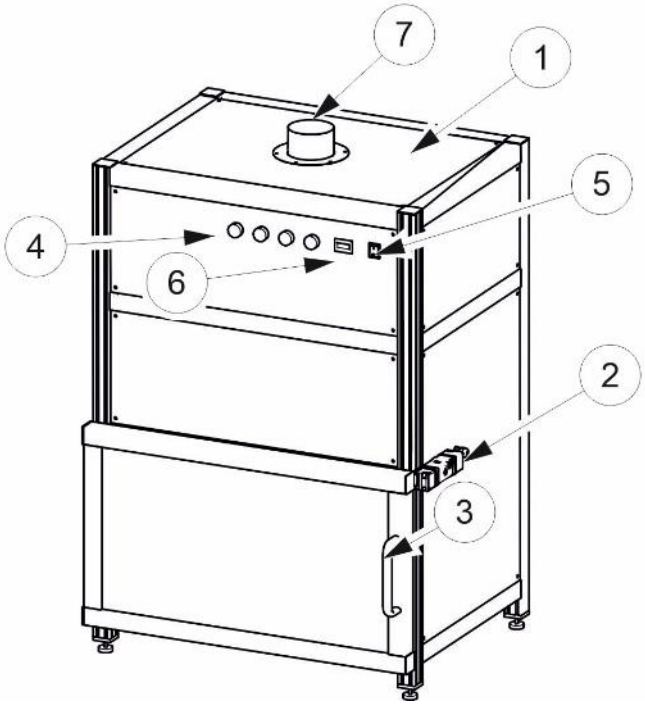
    Simple PW protection with 2 user levels)

    Sampling can be entered

The internal shutter is controlled by the UV-MAT for an exact dose, so that a reproducible exposure is achieved even with medium-pressure lamps. With an irradiance of a few mW/cm², the required dose is typically achieved within a few seconds to 2 minutes.

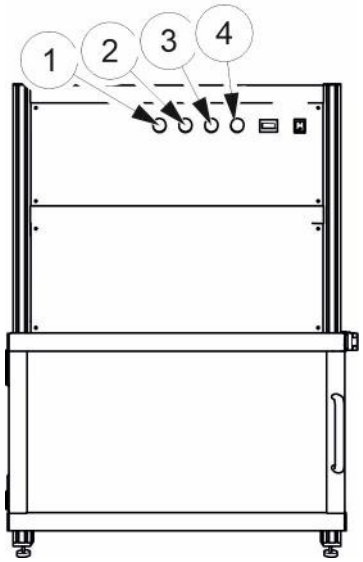
The curing chamber can be opened for loading and unloading when the lamp is active. The shutter is monitored and closed by a safety circuit so that no UV radiation is emitted outside the chamber.

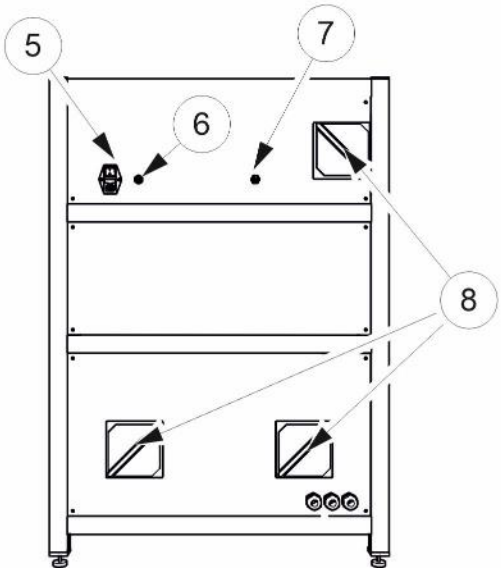
The components at a glance:



Pos.	Designation	Pos.	Designation
1	Irradiation chamber	**2**	Door lock
3	Front door	**4**	Status lights
5	Lamp on switch	**6**	Operating hours counter
7	Air outlet for lamp cooling		

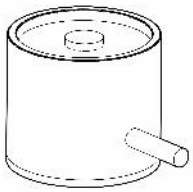
Side view and ventilation concept:





Pos.	Designation	Pos.	Designation
1	Shutter closed indicator light	**2**	Shutter open indicator light
3	Control light Lamp on	**4**	Burn-in indicator light
5	Mains connection / mains switch	**6**	UV-MAT connection
7	Compressed air connection	**8**	Air inlet

(1)

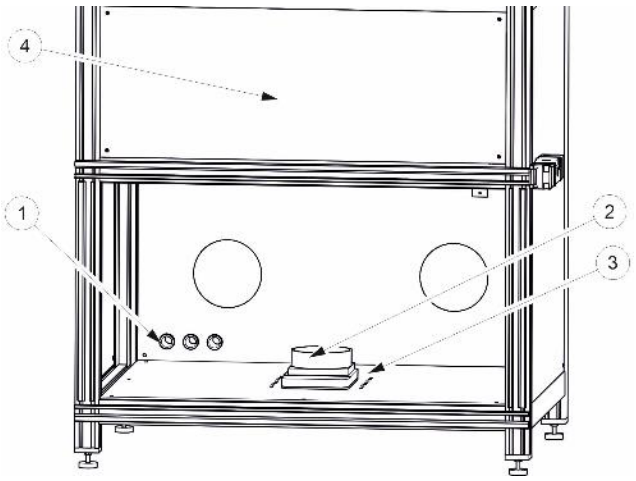


(2)

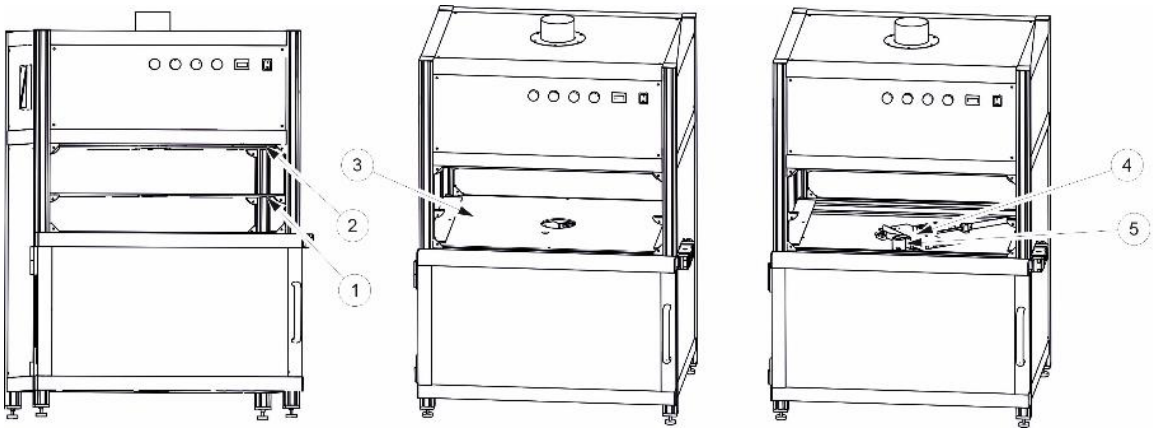
Pos.	Designation	Pos.	Designation
1	UV-MAT	**2**	Sensor

The UV-MAT contains the power supply, the microcontroller system with display and keypad as well as the output controllers. The sensor is connected to the back of the UV-MAT.

The sensors are adapted to the lamp, e.g. UVC sensors for mercury medium pressure lamps. The sensors are cosine-corrected. Due to the excellent cosine correction, it is possible to measure from one side.



Pos.	Designation	Pos.	Designation
1	Cable bushings	**2**	Stirring unit / Petri dish
3	Grid support / sensor holder	**4**	Shutter room cover



Pos.	Designation	Pos.	Designation
1	Medium aperture diaphragm	**2**	Upper aperture diaphragm
3	Lower aperture diaphragm	**4**	Shutter
5	Sensor, built-in		

The following components are supplied:

- Irradiation chamber with pneumatic shutter and fan
- UV lamp, pre-installed
- UV-MAT
- 1 built-in sensor
- 1 sensor holder for the sample chamber

- Mains cable
- this documentation

For ease of description, the above components are collectively referred to as a system.

The following components are required by the customer:

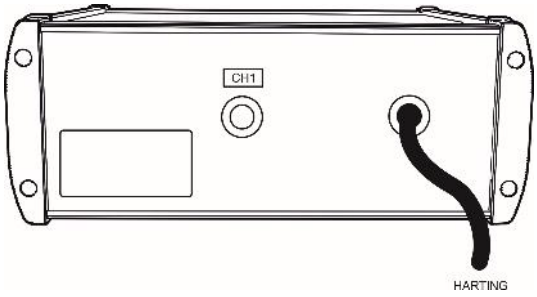
- Exhaust air hose with a minimum length of 1.5 m and a bend if an ozone-free lamp is used
- If an ozone-generating lamp is used, appropriate treatment of the exhaust air must also be ensured so that the permissible ozone concentration at the workplace (MAK value) is not exceeded.

9 Commissioning

Unpack all components and remove the packaging materials.

	**⚠ WARNING**
	Risk of injury! High weight! Always carry the radiation chamber with two people.

- The BSM-03 is supplied with a pre-assembled lamp. You do not need to install the lamp.
- Connect compressed air for the shutter to the rear of the irradiation chamber.
- Connect an exhaust air hose to the air outlet.
- The BSM-03 uses a ventilation system. Make sure that the air air inlets are not covered.
- Connect the external UV-MAT to the BSM-03.



- The UVC sensor is already installed in the shutter level. This UVC sensor is connected to channel 1.
- The built-in UVC sensor has a chamber factor that compensates for the position of the sensor compared to the position of the Petri dish. The chamber factor is documented in the enclosed product specification. The chamber factor for the UVC sensor is preset. This is indicative, as the position of the Petri dish can change.
- The 2nd sensor is optional. Guide the sensor cable through the cable gland on the back of the radiation chamber. The "EXT" sensor is connected to channel 2. Connect the sensor to the UV-MAT.
- The 2nd EXT sensor has a chamber factor of 1, which should be placed at the location of the Petri dish.
- The chamber factor for the external sensor is preset (default setting = 1,000).
- Connect the BSM-03 to the supply voltage.
- Switch the system on using the switch on the back of the BSM-03
- Switch on the lamp using the switch on the front of the BSM-03
- The BSM-03 is completely controlled with UV-MAT.

9.1 Switching the lamp on / off

The lamp is ignited when it is switched on using the switch on the front. This can take up to 2 minutes. If the ignition process is successful, the "Ignition" display goes out.

When the lamp is switched off at the switch on the front, the lamp is switched off and the after-ventilation to cool the lamp begins. This takes approx. 1-2 minutes.

The system can now be switched off using the switch on the back.

9.2 Power setting 0..100%

This function is not available.

10 Operation with a UV-Mat Touch

The UV-Mat Touch is characterized by its capacitive touch display and extended functions.

The display can be operated with a finger. The display is not suitable for other objects, such as a ballpoint pen.

The UV-MAT has two operating modes:

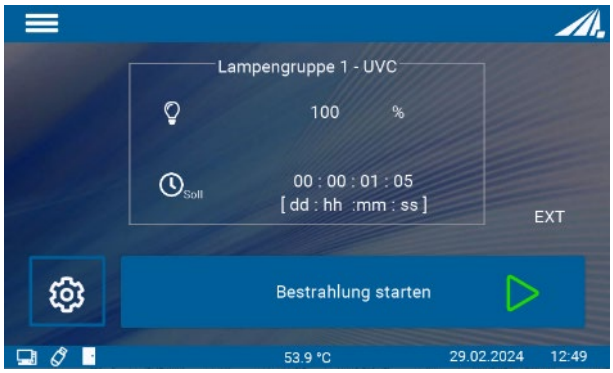
- Dose-controlled
- Time-controlled (no sensor is required)

The menu items in the main menu are dependent on the settings, i.e. the menu items "Dimming" and "Irradiation time" are only displayed if the respective mode has been selected.

10.1 Switch on / Switch off

After starting the device via the irradiation chamber switch, the logo and some information about the system appear on the display.

The main screen appears after approx. 3 seconds. Irradiation is started from here.



When switching on for the first time, the date and time should be checked and set if necessary.

The operating mode and the set power are saved permanently.
After a restart, the last operating mode is selected (exception: settings).

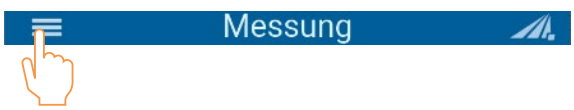
10.2 Introduction to the user interface

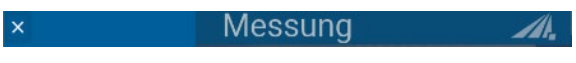
The UV-MAT Touch has an intuitive user interface. All values relevant to the measurement are displayed in the center of the screen. The various measurement screen menus are explained in the following chapter.

The main screen contains information about the settings. Irradiation is started from here.

This area shows the current settings of the individual lamps.

The **main menu** opens by clicking on the menu symbol at the top left or the cogwheel symbol**.** The menu closes either by clicking the [x] symbol, by clicking outside the menu or automatically after 5 seconds.





The various measurement screen menus are explained in the following chapter.
The symbols mean:

Icon	Function

	Menu
	Settings menu
	Start irradiation
	USB connection to a PC
	USB stick inserted
	Sensor temperature
	Sensor designation
	Sensor channel
	Sensor error
	Irradiation chamber door is closed
	Irradiation chamber door is open
	Date & time display
	Opens a numerical input window
	The lock symbol appears when the GUI is locked for the condition.
	Measured value recording running / stopped
	The battery symbol indicates that the real-time battery of the device is exhausted.
	Cancel and return to the main menu
	Saves a screenshot

10.3 Setting the setpoints

There are essentially two setting options:

Operating mode: Time or dose-controlled

10.3.1 Operating mode

There are two operating modes to control the duration of irradiation. One is via the time and the other via the dose. In dose-controlled mode, irradiation is stopped automatically when the target dose is reached.

In time-controlled operation (timer), the irradiation time is controlled. Only the irradiation time is shown on the display. No sensor is required for time-controlled irradiation, so that the irradiation chamber can continue to be used during recalibration of the sensor, for example.

In dose-controlled mode, irradiation is controlled automatically and stops when the desired dose is reached. Please note that a sensor must be connected.

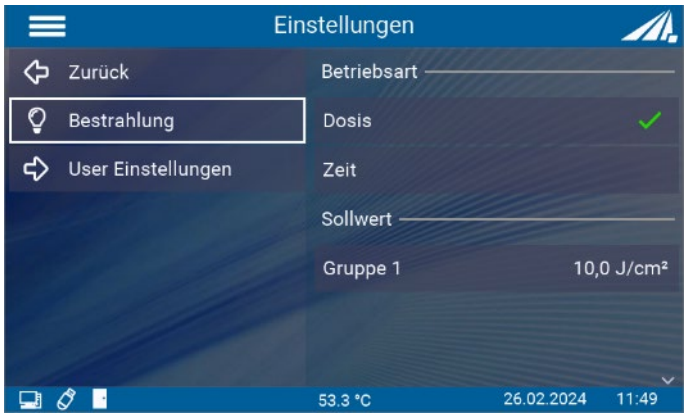
In time-controlled mode, the irradiation time is only controlled by a timer. A sensor is not required.

The irradiation time can be selected individually for both channels.

Both operating modes can be found in the Irradiation menu item. The desired operating mode can be selected here by pressing a button.

10.3.1.1 Dose operating mode

In dose-controlled mode, irradiation is stopped automatically when the target dose is reached.

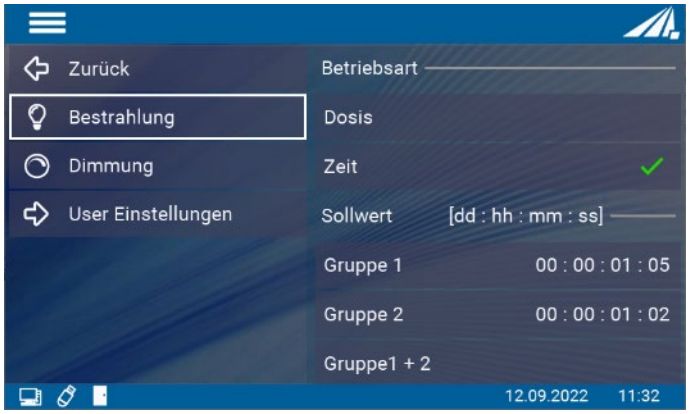


10.3.1.2 Time operating mode

In time-controlled operation, you can set the duration of the radiation:

To do this, select the "Time setting" menu item. If "Time setting" is not displayed, please first select "Time-controlled" in the "Operating mode" menu.

In time-controlled mode, the irradiation time is only controlled by a timer. The display shows the irradiation time and, if a sensor is connected, the irradiation intensity. A sensor is not required for timer mode.



10.4 During the irradiation

The UV-MAT Touch includes various measurement screens to cover the different measurement requirements. Two different views can be selected during irradiation. These are: Irradiation and Scope. These can be selected via the tabs. Alternatively, the display can be changed by swiping to the right and left.

The symbols mean:

Displays the set power

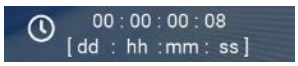
Displays the inserted sensor and the current irradiance

Displays the current dose

Displays the target time. Irradiation is ended after this time.

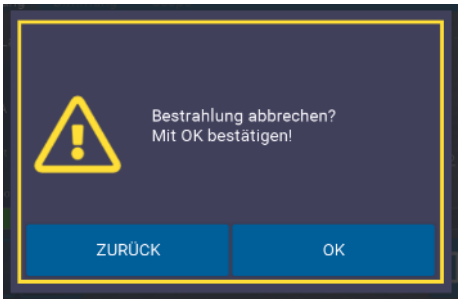
If a maximum dose has been set, the target dose is set. When the dose is reached, the irradiation is stopped.

The progress bar shows the current progress

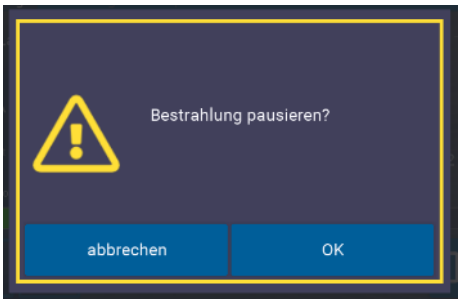


Displays the current irradiation time

Irradiation is canceled. Cancellation must be confirmed again.



Irradiation is paused. The pause must be confirmed again.

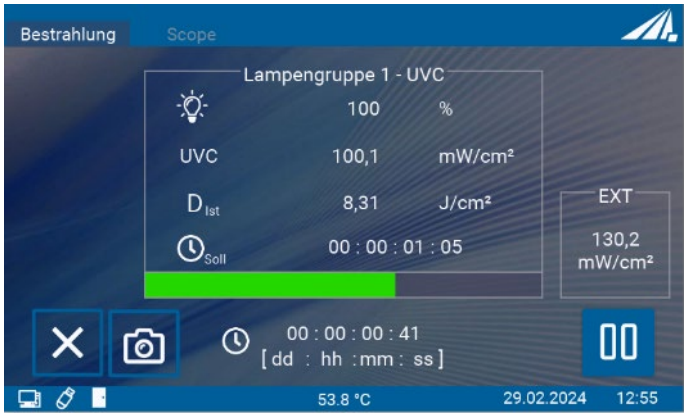


After the radiation has been paused, an orange frame appears around the display.

The shutter is closed, the dose or time is paused, the door can now be opened.

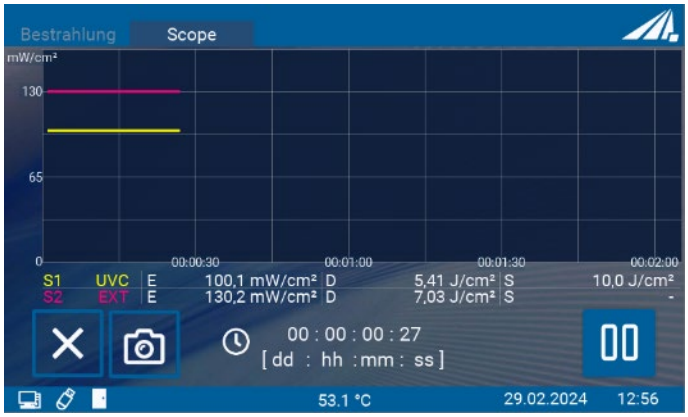
10.4.1 Display irradiation

The various settings are shown in this display. In this example, a time is specified after which the irradiation is ended. If a maximum dose is set, only the should and is display changes.



10.4.2 Scope display

This display is used to graphically show the progress of the irradiation.



The symbols mean:

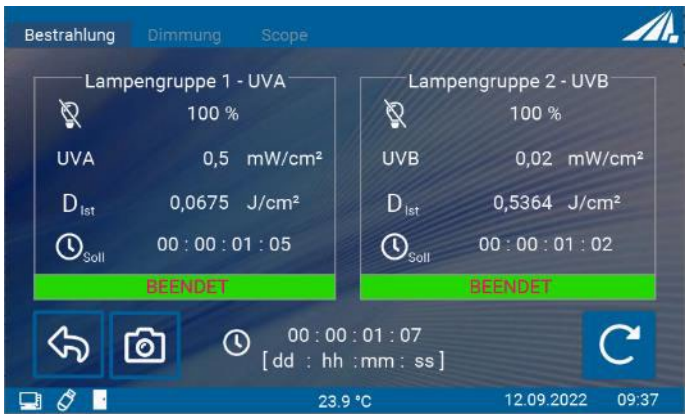
Display of the sensor

10.5 After the radiation

The end of the irradiation is indicated by the full green progress bar and the display "FINISHED".

The current values can now be read off.

It is also possible to restart irradiation with the same settings or return to the main screen.



Back to the main screen

Restart irradiation with the same values

10.6 Data recording

Measurement data can either be recorded on a USB stick or output via USB.

The measurement data files are saved as CSV files. CSV stands for comma-separated-values. A CSV file saves tabular data (numbers and text) in plain text. CSV is a simple file format that is supported by many programs and can be opened with a spreadsheet program such as Microsoft Excel or OpenOffice.org Calc.

The content of the lines is explained below using a file excerpt:

```
RMD data file
www.opsytec.de
```

```
[RMD Info]
RMD Touch 5
Firmware1       .0.0518
Series N.       00101
Type            814405
Manu.date11     .01.2021
```

Information about the measuring device used

```
[Measurement information]
Measurement     modeTiming
time interval           60 s
Averaging               0.25s
File name               210413\130217.csv
Decimal separator       , [comma]
```

The settings used for data recording.

```
[CH1 Info]
Sensor type1fach        ,     LUX,     RM-Digital
Sensor
Type                    814461
Serial number           00135
Calibration date10      .05.2019
unit                    klx
Wavelength range380     - 780 nm
Measuring range0-2000   klx

[CH2 Info]
Sensor type1fach        ,     UV-C,    RM-Digital
Sensor
Type                    814410
Serial number           00115
```

Information about the sensors used.

```
Calibration date10    .05.2019
unit                  W/cm2
Wavelength range200   - 280 nm
Measuring range0-2000 mW/cm2
***File        open***01.01.  201909:42:28
*********************************Measurements *********************************
       Date [DD.MM.YYYY]     Time [HH:MM:SS]       CH1: LUX [klx] CH2: UVC [W/cm2]      Dose
CH1: LUX [klxs]       Dose CH2: UVC [J/cm2] Temp. CH1 [°C] Temp. CH2 [°C]
       01.01.  201909:42:     280,    33900,  339022, 422,6
       01.01.  201909:43:     280,    3400,   679022, 522,6
       01.01.  201909:44:     280,    3401,   019022, 522,6
       01.01.  201909:45:     280,    33901,  358022, 422,6
       01.01.  201909:46:     280,    33901,  697022, 522,6
       01.01.  201909:47:     280,    33902,  036022, 522,6
       01.01.  201909:48:     280,    33902,  375022, 522,6

***File closed***     01.01.201909   :49:27
```

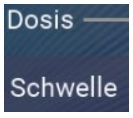
10.7 User settings

You can access the "User settings" area via the cogwheel symbol or via the main menu. Various system settings can be made here.

10.7.1 Sensors and chamber factors

Various settings for the sensors can be made in the Sensors menu item.

The unit of irradiance can be changed here.



The irradiation dose is automatically added up if it is higher than the threshold irradiance. This minimizes possible small offset errors.

The chamber factor is used to calculate and output the irradiance at a different position (than the sensor position).

Further chamber factors (for sensors that are not connected) can be seen here.

The chamber factor is used to calculate and output the irradiance at a different position (than the sensor position). This means that the displayed irradiance is the same even if the measurement is taken at the lateral sensor position.

The chamber factor has already been determined and preset by the manufacturer. See the technical documentation in the appendix.

This setting should be tested with different sample sizes / sample heights. The initial setting was made in the center, approx. 35 mm above the sample level (chamber floor).

The built-in UVC sensor has a chamber factor that compensates for the position of the sensor compared to the position of the Petri dish. The chamber factor is documented in the enclosed product specification. The chamber factor for the UVC sensor is preset. This is indicative, as the position of the Petri dish can change.

The chamber factor for the external sensor is preset (default setting = 1,000).

The display value of the sensor corresponds to the calibrated sensor measured value multiplied by the chamber factor. The chamber factor does not need to be calibrated as it only compensates for the geometry. The chamber factor must be adjusted if the geometry is changed.

If you want to use the irradiance at any position, proceed as follows:

- Set the sensor factor for the EXT sensor to: 1.0000
- Measure the irradiance at (desired) position 1 with the EXT sensor.
- Measure the irradiance at the sensor position with the UVC sensor.
- Divide the irradiance at position 1 by the irradiance at the sensor position. The result is the sensor factor for the UVC sensor at channel 1.
- Set the sensor factor.

You can add a digit using the ◁ button.

- Repeat the setting if you are using several sensors.

10.7.2 Language

This menu item allows you to switch the system language between German and English and to switch the decimal separator used between comma and period. The thousands separator also changes in the same way as the decimal separator.

10.7.3 Time

The RMD Touch has a real-time clock. You can set the real-time clock in the "Date / Time" menu.

The real-time clock is set automatically by connecting the device to the PC software or can be set in the Time menu. It may be necessary to set the time after a firmware update or after resetting to factory settings, for example.

Note

The real-time clock is temporarily supported by an internal battery. Leave the mains cable plugged in to conserve the battery.

Check the settings after a leap day / leap second or after changing the summer/winter time.

10.7.4 Menu/display

The screen brightness can be set here.

It is also possible to select a password to lock various areas of the settings menu.

No password protection, all menus are active

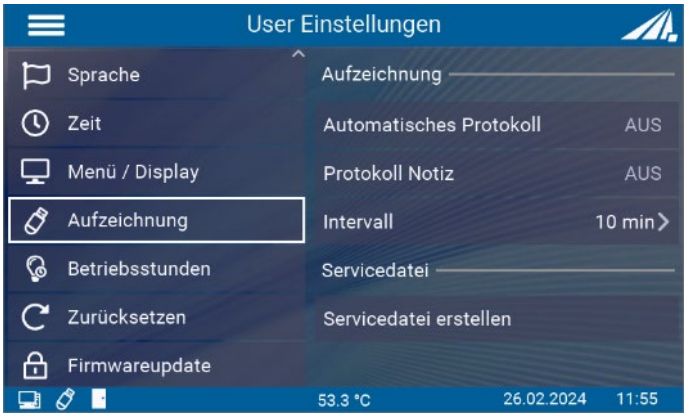
All settings are password-protected

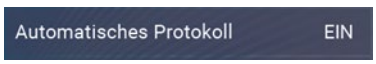
Only the "User menu" is password-protected. Irradiation and dimming can be changed.

The password is: 7243

10.7.5 Recording

The UV-Mat Touch can create an irradiation protocol.
There are various setting options here.





A protocol is created for each irradiation and saved on the USB stick

If on and automatic protocol is on, a note can be typed in before each irradiation

Measured values are saved at the set interval

A service file can also be created here, which supports troubleshooting by the manufacturer

10.7.6 Operating hours

The operating hours of the lamp can be reset in this menu item.
This is necessary when the lamps are replaced with new ones.

10.7.7 Reset

By confirming, the device is reset to its original settings and restarted. The time must then be set again. The switch responds with a long click.

10.7.8 Firmware update

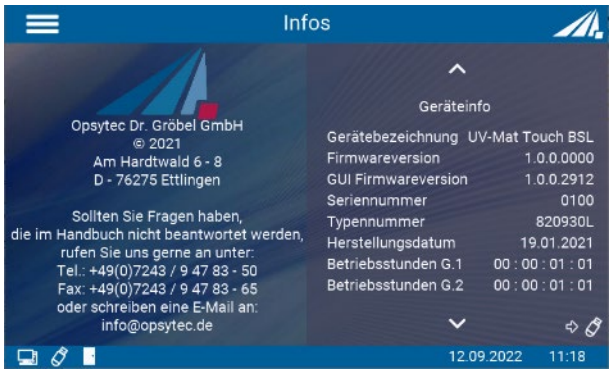
The firmware of the device can be updated using a Windows PC.

Please contact the manufacturer.

10.8 Information on

Sensor-specific and device-specific information can be called up under the Information menu item. Only connected sensors are visible in the menu.

Display of sensor information. If no sensor is connected, this menu item is not displayed.



Display of information via the UV-MAT Touch.

11 USB logging* and REMOTE operation*

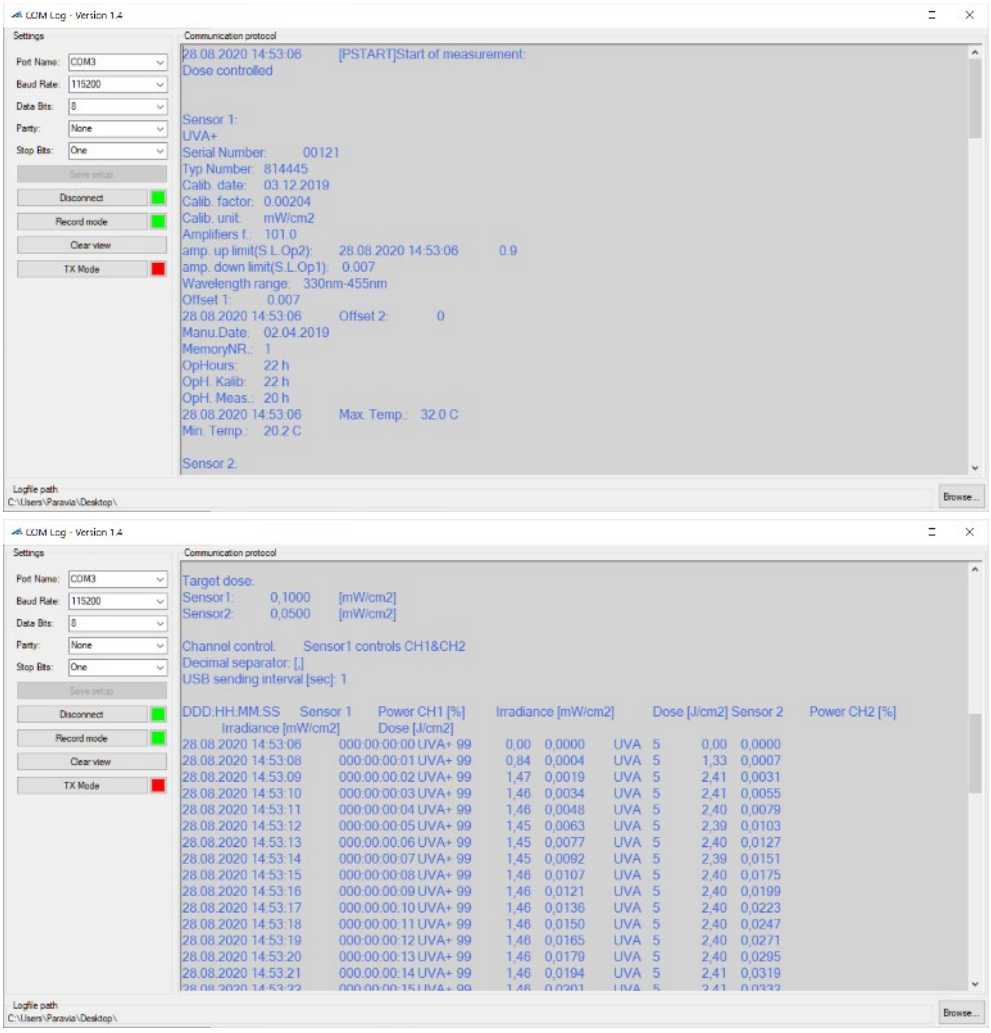
The UV-MAT automatically transfers all data when USB is set to active. Communication takes place as ASCII communication.

Communication is available after initialization.
Depending on the version, initialization may take a few seconds.

Definitions:

- Baud rate: 115200 baud
- Parity: None
- Data bits: 8
- Stop bit: 1

With the USB active setting, the UV-MAT sends status information at regular intervals, e.g. every second. The following software provides an example of the data acquisition functions:



To install the software, please proceed as follows:

1.) If necessary, disconnect the UV-MAT from the PC.

2.) Start the installation with "setup.exe" in the master data of the software CD. Follow the instructions of the installation program.

The driver installation is automatically executed as a virtual COM port.

3.) Once the installation is complete, connect the UV-MAT to the PC. The UV-MAT is integrated as a virtual serial interface. The driver installation is carried out automatically under Windows 7.

Establish a connection with the PC :

Connect the UV-MAT to the PC and switch it on. The message "REMOTE" appears on the screen.

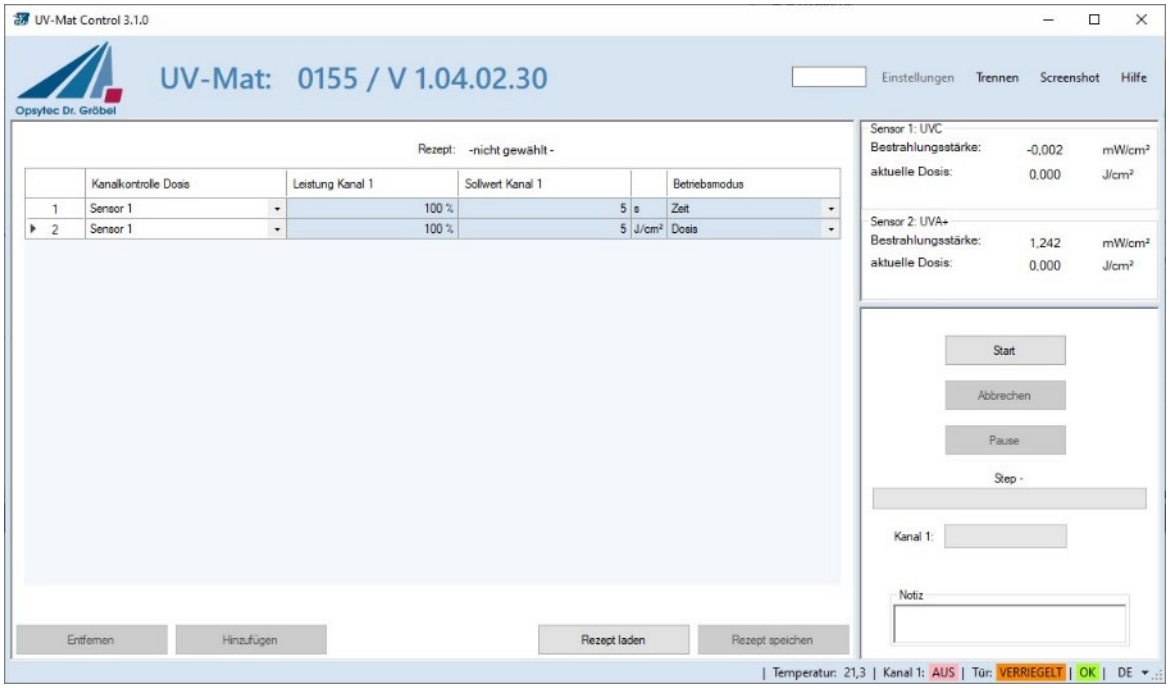
Once the UV-MAT is connected to the PC, it does not respond to every keystroke. Disconnect the connection with the PC and the UV-MAT will continue to work autonomously.

12 Software - UV-MAT Control for UV-MAT Touch*

The "UV-MAT Control" software is used to control the irradiation chamber with UV-MAT TOUCH using a PC. The software makes it possible to:

- Switching lamp channels on and off
- Change the power (of the lamp channels)
- Use a timer for the lamp channels
- Use one dose for the lamp channels
- Save and load settings as presets (on the software side)

The software is divided into several areas. At the bottom of the software is a status bar with various notifications.



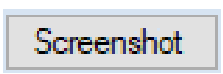
The functions are described below:

Above

Displays the serial number of the connected UV-MAT

Connects or disconnects the UV-MAT from the PC and displays the connection status:

- Connected→ disconnects the connection to the UV-MAT
- Not connected→ connects the UV-MAT



Creates / saves a screenshot to document the irradiation

For further information

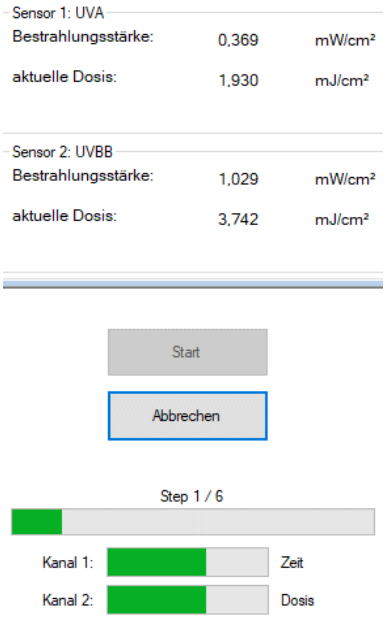
Device control

The left-hand area of the software is used for control and monitoring. An overview table with all outputs, times and dose values for the channels is displayed here.

	Kanalkontrolle Dosis	Leistung Kanal 1	Sollwert Kanal 1		Betriebsmodus
1	Sensor 1	100 %	5	s	Zeit
2	Sensor 1	100 %	5	J/cm²	Dosis

The table is used to select the channels, to display the currently set power intensity and to display the channel status.

On the right-hand side there are various control functions for the irradiation together with the start / cancel button.



The progress of the process is displayed in the table:

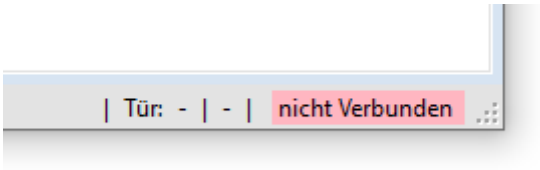
	Leistung Kanal 1	Sollwert Kanal 1	Betriebsmodus	Leistung Kanal 2	Sollwert Kanal 2	Betriebsmodus
1	2 %	5	s	8 %	5,0	mJ/cm²
2	7 %	5,0	mJ/cm²	3 %	5,0	mJ/cm²
3	6 %	5,0	mJ/cm²	4 %	5,0	mJ/cm²
4	5 %	5,0	mJ/cm²	5 %	10,0	mJ/cm²
5	4 %	5	s	6 %	10	s
6	3 %	5	s	7 %	5	s

The process step is defined in the table. Example:
Channel 1 2% power for 5 s, channel 2 8% power for a dose of 5 mJ/cm²

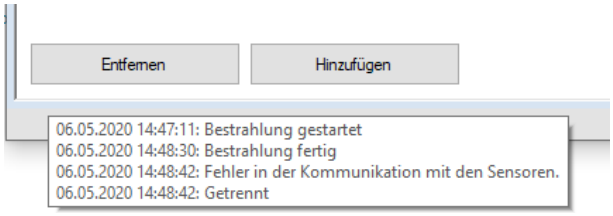
Software taskbar

At the bottom of the software is a bar with various functions: The right-hand area of the bar is used to display errors and messages

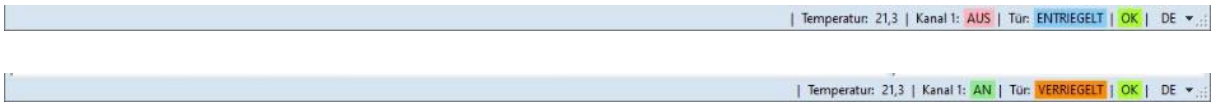
Errors and messages appear in the display for 3 seconds, errors are highlighted in red. The last ten messages are displayed here when the mouse pointer is hovered over.



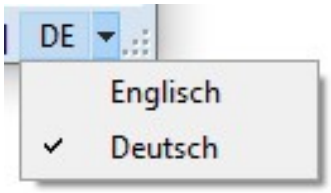
The left-hand area is used to display congestion messages



The status of the radiation chamber is displayed on the right. Example:



The language can also be changed:



Working with the software

Make sure that the UV-MAT is connected to the PC and the BS-03 is switched on. Please note that the device must be in remote mode so that REMOTE is shown on the display.

The UV-Mat connects automatically when the software is opened.

Press Start to start the irradiation with the set sequence.

Pressing Cancel cancels the irradiation with the set sequence.

Pause interrupts the radiation.

Here you can remove steps by selecting a line or insert new steps.

Preset" / "recipes" can be loaded and saved here

Presets:

Presets are saved as a *.csv file and can also be viewed in an editor if necessary. Example:

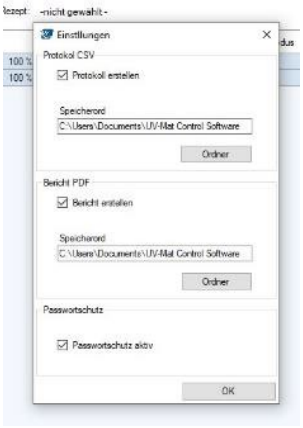
```
testUVMATControll.csv
Date (dd.mm.yyyy); 29.48.2020
Software version number; 1.0.0.0
Number of Steps; 6

*****************************
power channel 1; setpoint channel 1; operating mode 1; power channel
2; setpoint channel 2; operating mode 2;
*****************************
2;5;s;8;5;mJ/cm²;
3;5;s;7;5;s;
4;5;s;6;10;s;
5;5;mJ/cm²;5;10;mJ/cm²;
6;5;mJ/cm²;4;5;mJ/cm²;
7;5;mJ/cm²;3;5;mJ/cm²;
*****************************
```

Settings:

Settings can be password-protected. The PIN is identical to the device PIN on the UV-MAT, see technical data.

If necessary, enter the PIN:

In the settings, it is possible to have an irradiation protocol saved automatically and to specify the path for this. The radiation protocol can also be saved as a PDF report.



13 Maintenance

⚠ WARNING

Risk of injury from UV radiation

The BSM-03 is equipped with a high-performance UV unit. To protect the operating personnel, the **system must not** be **operated without an external cover.**

13.1 Lamp replacement

The useful life of UV medium-pressure lamps depends on the system design and the operating mode (ON/OFF switching cycles, cooling, contamination).

Frequent switching on/off of the BSM-03 can lead to a shorter service life.

The UV lamp must be replaced if it no longer ignites or the curing performance is no longer achieved.

Before opening the system or working on or in the system, disconnect it from the mains and check that it is de-energized.

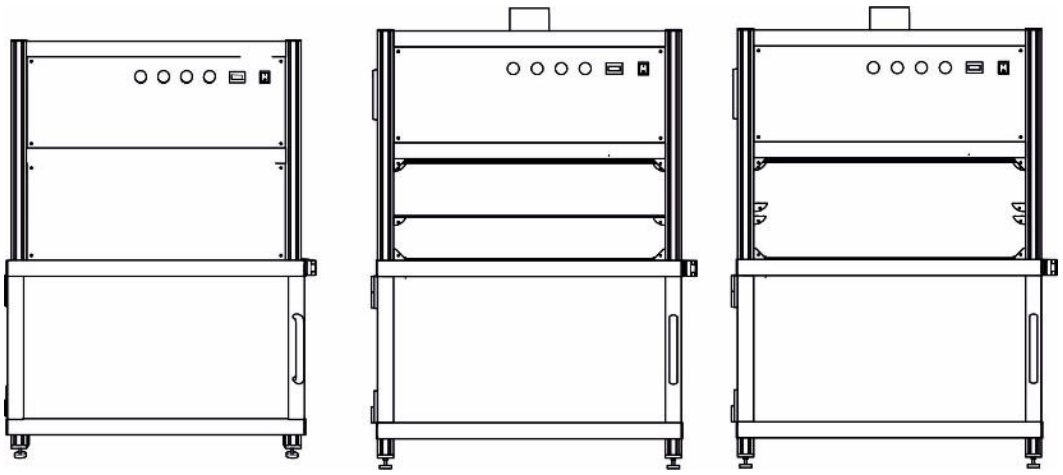
⚠ WARNING

Risk of injury when touching live parts

Before opening the irradiation chamber, disconnect all components from the supply voltage and check that no voltage is present.

The BSM-03 is equipped with removable UV mirrors in the irradiation chamber for lamp replacement. Proceed as follows:

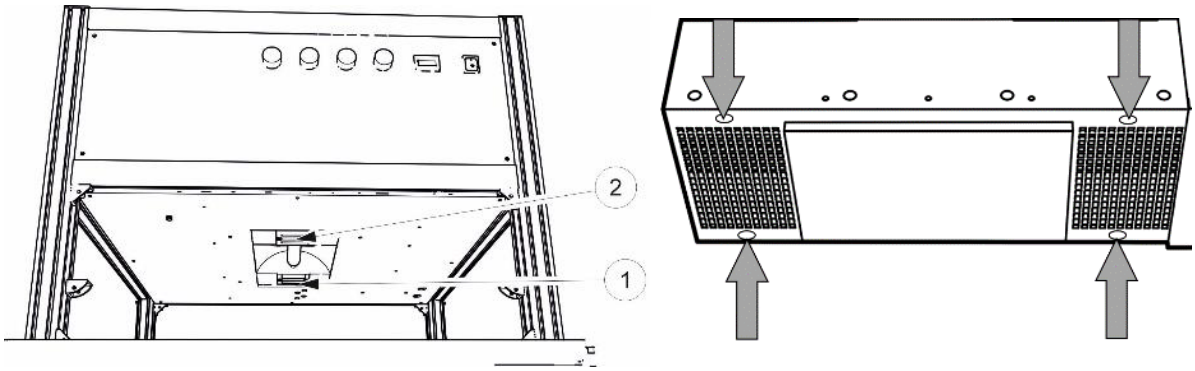
1. Disconnect the system from the mains and check that there is no voltage.
2. Disconnect the compressed air supply.
3. Remove the shutter chamber cover (4) from the irradiation chamber. To do this, four screws must be removed.



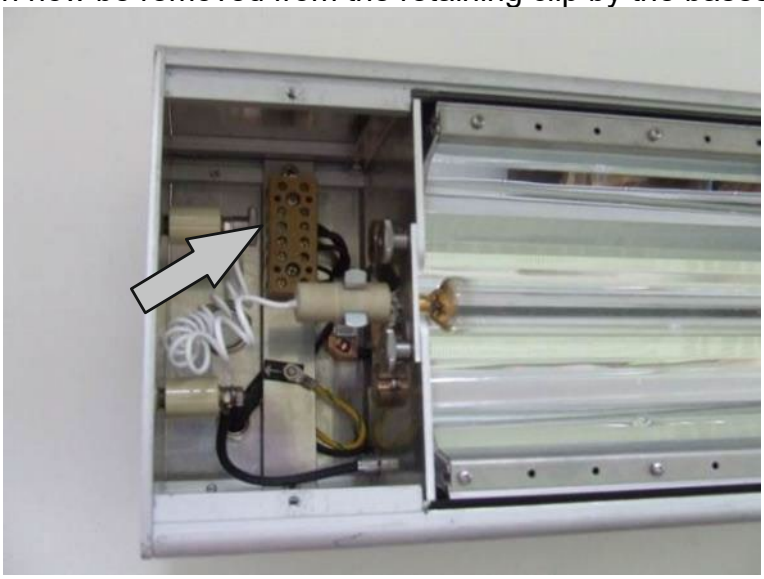
4. Loosen the center aperture diaphragm and remove it. To do this, unscrew the aperture diaphragm itself from below
5. Loosen the upper aperture diaphragm at the side screws / bracket and carefully slide it downwards. Now remove this too.

Skin grease and dirt are absorbent in the UV spectral range. Fingerprints on the reflectors should therefore be avoided. Fingerprints on the reflectors must be thoroughly cleaned with acetone and isopropanol, as the reflectors may otherwise overheat locally.

6. Loosen the four screws on the ventilation plates (1) and (2) and remove them.



7. Remove the knurled nuts on the left and right electrical connections.
8. The lamp can now be removed from the retaining clip by the bases.



9. Loosen the knurled nuts on the securing bracket and fold it away.

10. Carefully remove the old spotlight from the spring steel clips.

11. Insert the new spotlight.

12. Close the safety bar.

13. Connect the cable.

14. Replace the ventilation plates in the radiation chamber and secure them with the screws.

15. Replace the upper aperture diaphragm, carefully push it upwards and screw it back on.

16. Replace the center aperture diaphragm and screw it tight.

17. Replace the shutter chamber cover (4) of the radiation chamber. To do this, four screws must be tightened.

	**⚠ WARNING**
	Risk of injury from UV radiation The BSM-03 is equipped with a high-performance UV unit. To protect the operating personnel, the system must not be operated without an external cover.

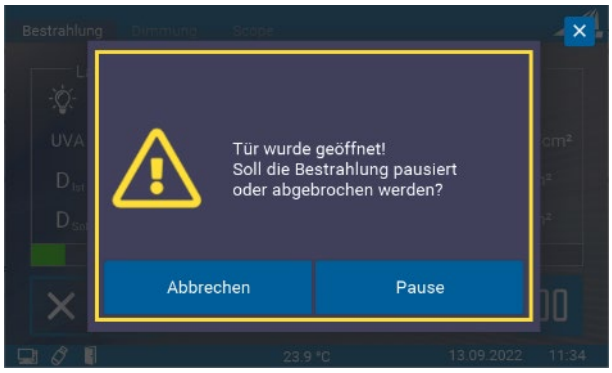
18. Restore the compressed air supply.

19. Reconnect the BSM-03 to the mains supply.

20. See Resetting the operating hours of the lamp on the UV-MAT.

14 Troubleshooting

The UV-MAT issues various error messages. You can react to them in different ways.

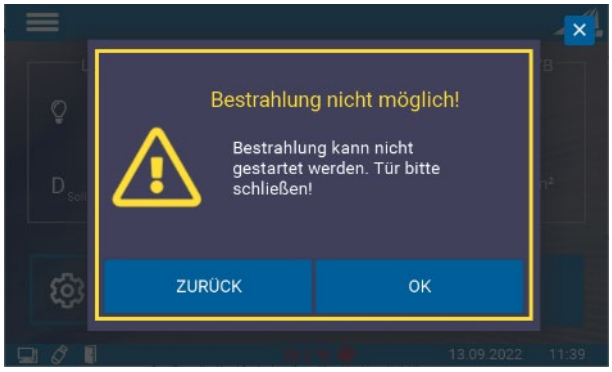


The door was opened during irradiation.

Irradiation is automatically interrupted and the shutter is closed.

Cancel: Irradiation is canceled and the control unit returns to the main screen.

Pause: Irradiation is paused and can be resumed when the door is closed.



An attempt was made to start irradiation although the door is still open.

Back: Control returns to the main menu

OK: Irradiation is started when the door is closed.

The following instructions and error messages are intended for the user. The information should help to ensure proper operation. Possible reasons and remedies are given.

Error / Error message	Reason	Remedy
Shutter does not open / close	Compressed air not connected	Check compressed air line
Lamp goes out in standby mode	Lamp temperature too low	Reduce the air volume using a throttle valve
Lamp ages prematurely	Lamp temperature too low	Check the lamp temperature Reduce the air volume using a throttle valve
Lamp goes out during operation or continuous operation	Lamp temperature is too high, overtemperature switch triggers	Check the air cooling, Are the supply air openings (chamber floor) freely accessible? Is the exhaust air accessible? Suction active? Increase the air volume

The following faults in the TEP lamp control gear can be read off the lamp on indicator light and burn-in indicator light:

	Status 1 green / Status 2 red	Diagnosis	Condition	Remark

Normal	LED green on	Control voltage >1.0V	Target performance achieved	
	LED green flashing slowly	Activation voltage < 0.9V	TEP ready to switch on	
Warning	LED green & red on	Activation voltage >1.0V, but target power not reached	Spotlight voltage too low, increased current	Burn-in
	LED green & red flashing quickly	Risk of overheating	Device remains switched on	
	LED red flashing slowly	Ignition attempt unsuccessful	No output voltage Waiting state	Wait for 3x ignition attempt
Error	LED red / green & red alternately flashing quickly	Mains voltage <190V	Device switched off Error	Reset due to mains disconnection
	LED red / green & red alternately flashing slowly	Overtemperature >80°C	Device switched off Error	Reset due to mains disconnection
	LED red flashing slowly	Output circuit open	Device switched off internally, emitter error	Reset due to mains disconnection
	LED red flashing quickly	Short circuit in the output circuit	Device switched off	Reset due to mains disconnection
	LED red on	Earth fault in the output circuit	Device switched off	Reset due to mains disconnection
	LED red / green alternately flashing quickly	Internal device error	Device malfunctioning or defective	Switch off the appliance, 30 sec. wait + switch on again. If error not gone, is Device defective, replace.

15 Technical data

General data	
Ambient temperature	+15 to 30 °C
Storage temperature	+5 to +60 °C
Air humidity	<80%, non-condensing
Body type	Desktop unit
Irradiation chamber dimensions	approx. 120 x 62cm x 73 (L x D x H)
Weight	80 kg
Cooling	Exhaust air cooling, 1 x DN 100, up to 200 m³/h
Noise emission	Lpa < 70 dB at the workplace in normal operation according to DIN 45635 T. 19

Mounting position, minimum distances	
Body position	horizontal
Minimum distances, top	4 cm
Minimum clearances, lateral	4 cm

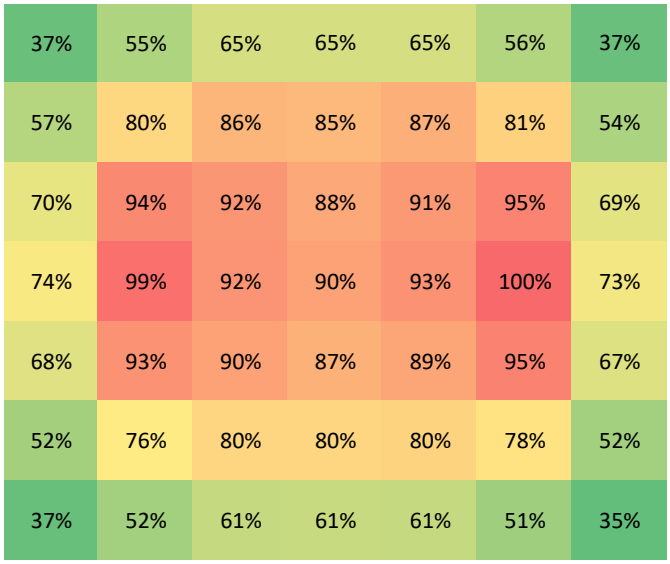
Connections	
Operating voltage and frequency	3 x 230/400 VAC, 50/60 Hz
Connector	CEE 400 V 16 A
Power factor	approx. 0.90 at max. power
Maximum input power	approx. 1200 W
UV-MAT connection	connector on the rear
Lamp control gear used	9931147
Manufacturer	Nedap

UV lamps / lamps	
Manufacturer	UV-Technik Speziallampen GmbH
Type	MPL PHG 1000 B 22/230
Article no.	705 10444 0000
Rated power	1.000 W
Length	230 mm
Piston diameter	22.5 mm
Ozone generation	no
Main mission	UVC
Useful life	1500 h, typical

Nominal distance, lower edge of lamp to upper edge of solution	631 mm

Operating temperatures below 600°C affect the service life of the lamp.
Operating temperatures above 1070°C endanger the lamp.

Irradiation distribution, typical
Relative radiation distribution on the irradiated surface, grid = floor grid = approx. 2.5 cm



Operation	
On-off switch / mains switch	Mains switch on the back
Lamp On-Off	On/off switch on the front
Operation	via external UV-Mat Touch control unit

Gas connection	
Compressed air, pressure	0.13 - 0.5 MPa
Compressed air, connection	6 mm

UV-MAT Touch	
Dimensions, approx.	250 x 185 x 100 mm³ (L x W x H)
Weight	2.6 kg
Operating voltage and frequency	DC 24V (via irradiation chamber)
Operating temperature	0 - 30°C
Storage temperature	0 - 60°C
Air humidity	< 80%, non-condensing
Dose calculation	For all irradiance levels >

	0.1 mW/cm² to avoid offset errors
Maximum housing temperature	< 60 °C
PIN	
CODE	7243

USB / hardware software requirements	
PC requirements	min Intel CORE i3, 2 GB Ram, >40 Gb HDD
Operating system	Windows 10 with .NET Framework > 4.0

Mounting position, minimum distances, UV-MAT	
Body position	Desktop unit, horizontal
Minimum distances, top	2 cm
Minimum clearances, lateral	2 cm

TECHNICAL DATA SENSORS (TYPICAL)	
Measuring range	0 - 1 W/cm²
Resolution	0.001 mW/cm²
Dose measuring range	0 - 100 MJ/cm²
Illuminance meas.	0 - 500,000 lx
Dynamic range	up to 10^7
AD conversion	24 bit
Temperature sensor	integrated
Dimensions	Ø 40 mm, h 35 mm
Optical surface	Ø 6 mm
Weight	160 g
Connection cable	2 m
Operating temperature	0 to 40 °C
Storage temperature	-20 to 60 °C
Air humidity	<80%, non-condensing

The technical data for special versions may vary and can be found in the appendices to the special versions.

Spectral ranges of the sensors	
UVC	200 - 280 nm
UVB	280 - 315 nm
UVA	315 - 400 nm
UVA+	330 - 455 nm

UVBB (broadband)	230 - 400 nm

16 Spare parts

Please contact us for replacement orders:

Opsytec Dr. Gröbel GmbH
Am Hardtwald 6-8
76275 Ettlingen
Germany
Phone +49 - 7243 - 94 783 - 50
Fax +49 - 7243 - 94 783 - 65

Visit us on the Internet: www.opsytec.de

17 Declaration of conformity

CE

Manufacturer:	Company name: Opsytec Dr. Gröbel GmbH Street: Am Hardtwald 6-8 Place: 76275 Ettlingen Country: Germany
Authorized person for compiling the technical documentation:	Company name: Opsytec Dr. Gröbel GmbH Street: Am Hardtwald 6-8 Place: 76275 Ettlingen Country: Germany
Product:	Irradiation chamber with UV lamp, UV dose controller UV-MAT Touch and sensor(s)
Type designation:	BSM-03 Special version CBD Device
Type number:	760 001 XXXX, 860 930 XXXX 814 4XX XXXX

The manufacturer hereby declares that we have developed, designed and produced the above-mentioned product(s) under our sole responsibility and that the product complies with the following standard(s) or directive(s) in this declaration:

2014/35/EU
"Directive of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits (Low Voltage Directive)".

2014/30/EU
"Directive of the European Parliament and of the Council on electromagnetic compatibility (EMC Directive, recast)"

2015/863/EU "Directive of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment (ROHS Directive III)"

Ettlingen, 27.02.2024

signed. Dr. Mark Paravia

This document was created electronically and is valid without a signature.