Opsytec Dr. Gröbel

3D UV test chamber BS-05

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dose controller UV-MAT Touch

The 3D UV test chamber BS-05 is a large irradiation chamber for double-sided, 3D irradiation of samples with UV light. A sample plate made of stainless steel or fused silica or a rotating holder for mixing of fluids are available. Like all BS irradiation chambers, the BS-05 offers time- and dose-controlled irradiation of samples with UV and light.

The chamber can be fully equipped for one of the spectral ranges UVC, UVB, or UVA to achieve the highest irradiance. Alternately, the use of two separately controlled lamp groups for different spectral ranges allows for especially flexible operation of the chamber.

The large interior irradiation chamber has a base area of 86 x 65 cm² and a height of 32 cm. The sample chamber operating temperature is about 25°C so that thermal damage to the specimen is avoided. Due to the high uniformity of the irradiation, the samples may be positioned in any order.

For the BS-05 we offer two irradiation controllers, the UV-MAT and the UV-MAT Touch. Both irradiation controllers can control two spectral ranges separately and achieves a consistent dose regardless of lamp aging, contamination or temperature. The dose

Secured front door

is measured with calibrated sensors. For this purpose, the sensor already contains an extremely precise analog-digital converter and a temperature sensor. The memory in the sensor contains all sensor identifications and the calibration history.

The UV-MAT Touch also records the irradiations and can be controlled by the PC. This makes multi-stage irradiations and the documentation of the irradiation possible.

Applications:

- Irradiation of 3D objects
- Double-sided irradiation with superior uniformity

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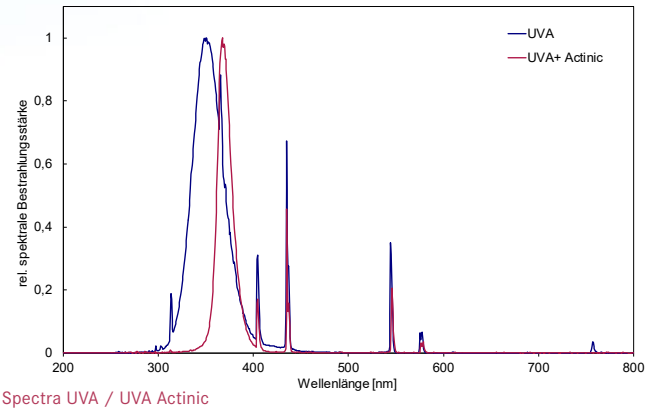
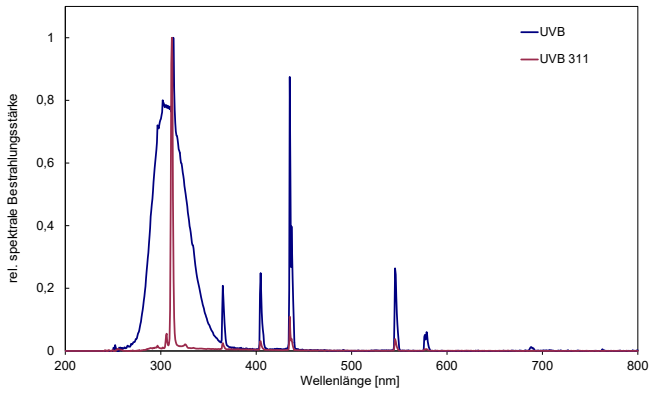
TECHNICAL DATA BS-05

Interior chamber	86 x 65 x 32 cm
sample holder	optional fused silica plate
Dimensions	95 x 87 x 75 cm
Weight	~ 90 kg
Power consumption	900 W
Mains	110 - 230 V_{AC}, 50/60 Hz
Operation temperature	10 to 40 °C
Humidity	< 80% non-condensing
Lamp lifetime	up to 10.000 h
Number of lamps	40
Sample temperature	25 °C +/- 5°C
Spectra ranges	1 Standard, 2-4 optional
Irradiance UVA	10 mW/cm²
Irradiance UVA Actinic	10 mW/cm²
Irradiance UVB	4 mW/cm²
Irradiance UVC	8 mW/cm²
Sample temperature	The cooling uses ambient air
	typically the temperaure of
	the samples is ambient + 5 °C

Listed irradiance values are max values.



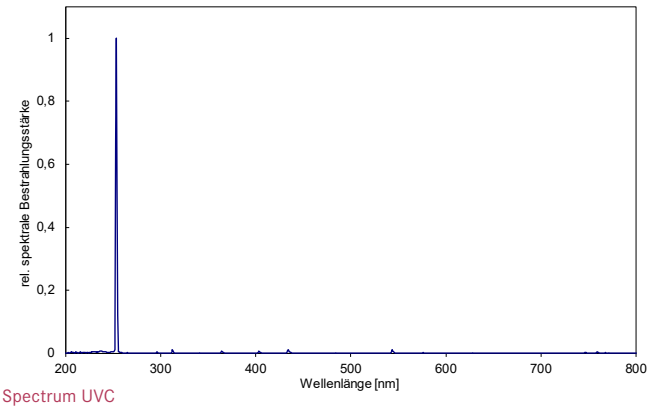
Spectra UVA / UVA Actinic



Spectra UVB / UVB 313

TECHNICAL DATA UV-MAT

Sensor connectors	24 bit, fully digital
Number of sensors	2
Dose range	0 - 1.000.000 J/cm²
Dose resolution	1 mJ/cm²
AD conversion	24 bit
PC interface	USB 2.0
Sensor identification	yes
Dimensions	185 mm x 251 mm x 100 mm
Operation temperature	5 - 60 °C
Spectral ranges	
UVC	200 - 280 nm
UVB	280 - 315 nm
UVA	315 - 400 nm



Spectrum UVC

3D irradiations are easy using BS-05. With interchangeable lamps, the BS-05 is also extremely flexible. For the lamp replacement no tools are required.

TYPICAL TECHNICAL DATA

Calibration uncertainty	4,5 - 7,0% (k=2)
Linearity error	< 1%
Aging / year	< 3%

Our calibrations are available as factory and ISO 17025 calibrations and are traceable to PTB standards.

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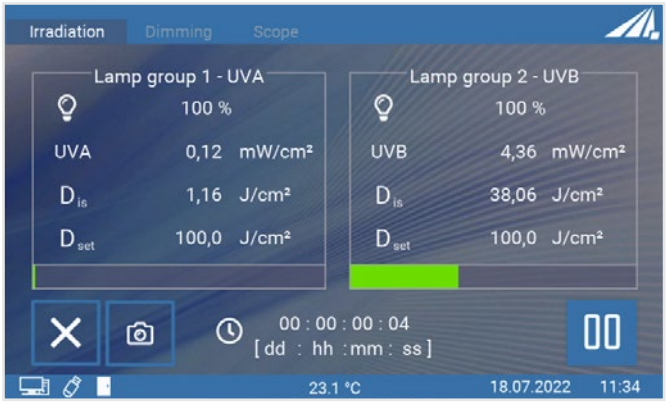
UV-MAT TOUCH

The UV-MAT Touch user interface is a high-resolution capacitive touchscreen. A powerful Cortex ARM processor ensures durability and updateability. This means that new functions can be installed directly on site. The UV-MAT Touch and the PC software are Windows 10/11 compatible.

Numerical and graphical single and multi-channel irradiations, oscillograms and the settings are clearly displayed. The parameterization is done intuitively directly on the UV-MAT Touch and is password protected.



TECHNICAL DATA UV-MAT TOUCH

Display	Capacitive touch display
	5“ WVGA
Display output	Irradiance + dose
	Oscilloscope view
Data recording rate	adjustable: 1 s - 1 h
Recording duration	> 24000 h
Memory interface	1 USB flash drive (up to 32 GB)

TECHNICAL DATA UV-MAT

Display	graphical, 128 x 64 px
	monochrom
Display output	Irradiance + dose
	-
Data export	via USB
Recording duration	-

FEATURES IN DETAIL

Did you know? The UV-MAT and the UV-MAT Touch use the same sensors. Therefore, these can be used on both devices.

The differences are:

	UV-MAT Touch	**UV-MAT**
Display	Capacitive touch display	monochrom, 128 x 64 px
Memory	USB flash drive	-
Number of channels	2	2
Irradiance, dose and temperature measurement	✓	✓
Time and dose controlled irradiations	✓	✓
Recordings of measurements	✓	-
Oscilloscope view	✓	-
Screenshots can be saved on USB flash drive	✓	-
Pause and restart of irradiations	✓	-
Add notes and comments to the irradiation	✓	-
Remote control from PC	✓	-
Irradiation logs	USB flash drive	PC
User control & admin mode	✓	-
Easy firmware upgrades	✓	✓

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INCLUDED ACCESSORIES

The irradiation chamber is modular expandable and thus optimal for different applications.

The following functions are always included:

DOSE CONTROLLER

The irradiation controller UV-MAT continuously measures the irradiance and stops the irradiation at the set target dose.

The dose control UV-MAT Touch offers alternatively all functions of the UV-MAT, but simplifies the operation and documentation of the irradiations.

SENSORS

Calibrated radiometric sensors are available for each spectral range. The integrated diffuser ensures the required cosine correction. Excellent long-term stability is achieved through the use of appropriate materials. The sensors are calibrated with traceability to PTB (the German national test authority); after being calibrated, they are supplied with a factory calibration certificate.

CONTROL AND DIMMING

Two lamp groups can be controlled and dimmed separately.

Example: 4 UVA and 4 UVB lamps.

The lamps are dimmable. The irradiance can be reduced to approx. 30%.

SENSOR HOLDER

The sensor holder fixates one or two radiometer sensors laterally in the irradiance chamber. The sensors are removable for the measurement of the irradiance on the material to be irradiated. That way, the irradiance can be determined at the desired location. Via a factor, the UV-MAT can be adjusted.

LAMPS

We offer the right lamps for different applications. With interchangeable lamps, the BS-02 is extremely flexible. Examples:

UVA-352 is used for the UV aging process with indoor applications and UVB lamps for the acceleraded outdoor applications. UVC is used for the UV disinfection.

TIMER

Alternative to the dose control, we offer a settable timer. This timer is suitable for a simple irradiation between 0,01 s and 9999 h. Timer is included in the standard system.

IRRADIATION LOGS

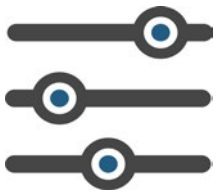
The irradiations can be recorded with a PC.

The UV-MAT Touch also records irradiations on a USB flash drive without a PC.

OPTIONAL ACCESSORIES

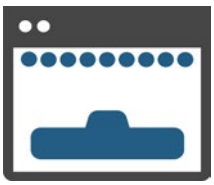
The following functions are optionally available:

ATTENUATOR



Attenuators each reduce the irradiance to approx. 30%. We offer area attenuators and lamp attenuators. Both attenuators reduce the irradiance to 30% each. Use e.g. for the irradiation of cell cultures.

INERT GAS BOX



Working under inert-conditions is possible with our removeable inert gas boxes.

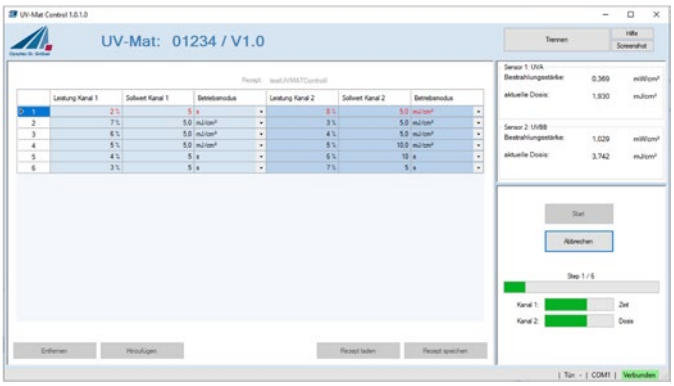
Separate gas inlets and outlets allow the measurement of O2 concentration at gas outlet. Available with top window made of high quality glass for UVA / VIS irradiations or UV fused silica for UVB and UVC irradiations.

PC SOFTWARE FOR UV-MAT TOUCH

Complex, multi-stage irradiations, e.g. a pre-irradiation with UV-A at low irradiance and then a high-intensity UV-C irradiation can be easily and individually parameterized with the remote control option. Up to 30 dose- or time-controlled steps and pauses are possible.

At the same time the irradiation is logged and stored on the PC.

PC connection: USB 2.0



OPTIONS

All irradiation chambers can be equipped with different options.

For example, for cell or virus irradiation and other laboratory applications, the dose control UV-MAT Touch and attenuators are often used to achieve an extremely uniform and reproducible irradiation.

Medical applications benefit from the irradiation documentation, which is automatically controlled remotely.

We would be pleased to support you with your individual configuration of an irradiation chamber.

PART NUMBERS

BS-05	860905
UV-MAT Touch	820930
UV-MAT	820920
PC-Software UV-MAT TOUCH	860901
Radiometric sensors	8144XX
ISO 17025 calibration	17025
Lamps / spare lamps	8608XX
Inert box UVA or UVC	86802-iA / -iC
Attentuator for lamps	870000
Area Attentuator	870001

Our calibrations are available as factory and ISO 17025 calibrations and are traceable to PTB standards. IP65 sensors, further measuring and spectral ranges available. Just ask us!

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