

Germicidal UV radiation measurement solutions

UVC Radiometers for low pressure Hg, UV LEDs, excimer lamps



Mobile UV radiometer with separate measuring device and detector for measuring the irradiance and dose of germicidal mercury lamps.

X1-1-UV-3725

With its X1-1-UV-3725 UVC radiometer Gigahertz Optik supplies the perfect hand-held measuring device to obtain high-precision measurements of low-pressure mercury lamp based installations. A very wide dynamic range from $0.002 \mu\text{W} / \text{cm}^2$ to $2000 \text{ mW} / \text{cm}^2$ enables testing in accordance with international safety standards as well as ensuring an effective germicidal dose is achieved. The device offers an excellent cosine response and an 80-degree f.o.v. accessory is available for photobiological safety assessments.

X1-1-UV-3726

For UVC LED based systems the model X1-1-UV-3726 is recommended as it incorporates calibration factors at LED centre wavelengths 260 nm-290 nm. It also includes a calibration factor for low pressure Hg lamps (254 nm). The detector's flat spectral responsivity ensures lowest measurement uncertainty irrespective of the precise wavelength of UV LEDs which inevitably varies according to operating conditions and manufacturing tolerances.



Mobile UV radiometer with separate measuring device and detector for measuring irradiance and dose of germicidal Hg lamps and UV-C LEDs.

X1-1-UV-3727

For far-UV germicidal sources such as excimer lamps (222nm), model X1-1-UV-3727 should be selected. It measures irradiance in the range from 200 nm to 300 nm and is calibrated for use with excimer lamps (222nm), low-pressure mercury lamps (254nm), and for all UVC LEDs with wavelength dependent calibration factors given in 5 nm increments 250 nm to 300 nm. All of the UV-37xx series detectors are specially designed for radiometric measurement tasks in the UV spectral region and have been proven in industrial and scientific use over many years.



X1-1-UV-3727 Radiometer - precise measurement of UVC irradiance and dose of germicidal lamps.

Each UVC radiometer is calibrated in our own DIN EN ISO / IEC 17025: 2018 accredited laboratory (DAkkS-certified).
The safe and effective use of germicidal UVC light sources can be guaranteed using the Gigahertz-Optik range of UVC radiometers.



Member of the BERGHOF GROUP

With its innovative and high-quality products as well as application solutions, Gigahertz Optik GmbH enjoys a high regard from its international customers within the field of optical radiation measurement technology. As a manufacturer, Gigahertz Optik GmbH offers standard and custom-made solutions. Regular investments in new technologies ensure that Gigahertz Optik is able to offer modern measuring solutions to its customers in industry and science.

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UV MEASUREMENT SOLUTIONS

Accurate, fast, convenient.

THIS BROCHURE GIVES AN OVERVIEW OF:

Gigahertz Optik GmbH product range for measuring ultraviolet radiation accurately and conveniently across many UV applications.

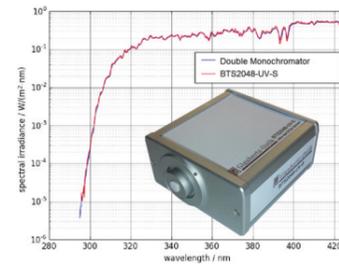
Innovative UV Measurement Technology

The measurement of ultraviolet radiation places particularly high demands on the design of measuring instruments. Gigahertz Optik GmbH offers a comprehensive product range for measuring ultraviolet radiation accurately and conveniently across many applications of UV light.

BTS2048-UV-S Reference UV Spectroradiometer

Despite their size, complexity and slow scanning, double monochromators have traditionally been the preferred reference instrument for many UV spectroradiometry applications primarily due to their high stray light suppression capabilities. The innovative BTS2048-UV-S is a compact spectroradiometer that incorporates smart filter techniques to match the stray light rejection and wide dynamic range of such systems. The Gigahertz-Optik BiTech Sensor combines the particular properties of a photodiode with those of a back-thinned CCD diode array. Through bilateral correction the BiTec Sensor ensures

precise radiometric and spectroradiometric measurement values over a large dynamic range (> 9 decades). Covering the 200 nm - 430 nm spectral range with 0.8 nm optical bandwidth, the BTS2048-UV-S is the ideal contemporary solution for high quality UV spectroradiometry applications.



Comparison of UV solar irradiance measurement with BTS2048-UV-S and a double monochromator. Demonstrates similar scattered light rejection but with much reduced measurement time.

BTS2048-UV UV Spectroradiometer

The BTS2048-UV is a versatile high-end UV array spectroradiometer whose high linearity enables extremely fast measurements. The fully linearized 2048 pixel back-thinned CCD with thermoelectric cooling offers a very wide dynamic range thanks to its integration times from 2 μ s to 60 s. This enables precise measurements of UV LEDs over a broad intensity range. The BTS2048-UV couples directly to Gigahertz-Optik integrating spheres eliminating the need for fibre coupling and thereby reducing measurement uncertainties. The many years of experience and its well-

equipped DAkkS calibration laboratory (D-K-15047-01-00) enable Gigahertz-Optik to offer traceable calibrations down to 200 nm.



Both the BTS2048-UV-S and BTS2048-UV can be directly coupled to integrating spheres eliminating the need for fibres.

RCH-116 UV LED Curing Radiometer

The high intensity UV radiation used for UV curing processes places special demands on the radiometers used to measure them. Conventional UV irradiance detectors cannot tolerate the associated high temperatures and exhibit drift and instability over time and use. Gigahertz-Optik has developed the RCH-Series detectors based on an integrating element called RADIN that is able to withstand these high temperatures and high UV radiation. The RADIN element is exposed to the UV signal while the active detector is housed away from the irradiated zone and coupled to the RADIN input optic by either a solid or flexible fiber light guide. The RCH-116 detector head is specially designed for high power LED light sources in the wavelength range from 365 nm

to 440 nm. It offers a relatively flat (radiometric) spectral responsivity to minimize measurement uncertainty if any shift in LED wavelength occurs. It is calibrated at typical LED wavelengths 365 nm, 375 nm, 385 nm, 395 nm, 405 nm and 430 nm at Gigahertz-Optik's calibration laboratory.



The X1-1 radiometer with RCH-116-4 detector is ideal for the measurement of high power LEDs in the UV-A and blue light range. The device accurately measures irradiance up to 40,000 mW/cm²

X1-3 Photobiological Safety Optometer

The X1-3 Optometer is designed specifically for the evaluation health risks due to exposure to UV and blue light for workplace safety and product classification. It is offered with UV and blue light hazard detectors which conform to the latest photobiological safety standards such as IEC EN 62471 and EU directive 2006/25/EC. The XD-45-HUV irradiance detector incorporates a unique three sensor design that covers the requirements for skin and eye risk assessment to UV radiation. Two filtered sensors enable the accurate representation of the required actinic UV function and the third provides the necessary UV-A response.



The X1-3 light hazard meter is used in conjunction with both the XD-45-HUV UV Hazard Detector and the XD-45-HB Blue Light Hazard Detector.

X1-4 Erythema + UV-C Optometer

The X1-4 Erythema UV meter and the XD-45-ERYC detector head were developed for compliance and safety testing of sun tanning equipment in accordance with EU regulations and product standards (i.e. EN 60335-2-27 and DIN 5050-1). The XD-45-ERYC is a multi-detector based sensor that accurately implements the required erythema effective irradiance function along with a separate UV-C detector. Erythema effective irradiance is determined over UV-A and UV-B wavelength regions 250 nm - 320 nm (UV-B) and 320 nm - 400 nm (UV-A). The total UV-A plus UV-B effective

irradiance must not be in excess of 0.3 W/m². Additionally, the un-weighted irradiance 250 nm - 280 nm must not exceed 0.003 W/m².



The X1-4 UV erythema meter is used in conjunction with the XD-45-ERYC detector to enable the on-site testing of sun tanning equipment.

BTS256-UV Mobile UV spectroradiometer

The BTS256-UV Series spectroradiometers measure the spectral irradiance, in W/cm²/nm, from which the integrated irradiance over any waveband within the 200 - 525 nm wavelength range can be determined.

This accurate measurement of UV spectral irradiance enables the optimization of all UV curing processes, but is particularly beneficial for LED based systems, as it allows the best matching of UV sources to a particular photoinitiator.

With the BTS256-UV-2 variant, the sensor is attached directly to the meter and as such, it is ideal for use on conveyor belt systems.



BTS256-UV-4 hand-held measuring device with flexible detector head.