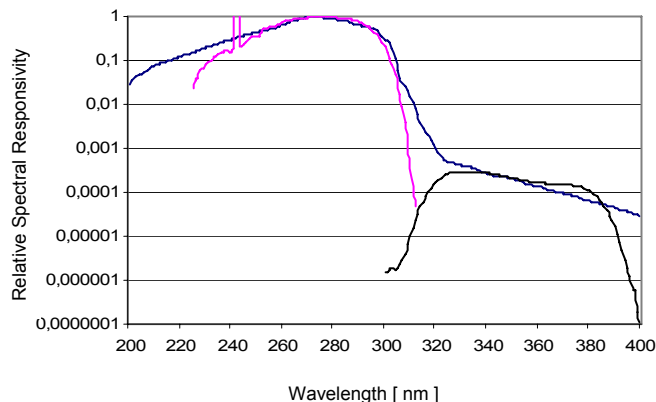


## XD-45-HUV UV-Hazard Detector Head



The XD-45-HUV irradiance detector is specially designed for the evaluation of light exposure hazard values for artificial light sources. The three sensor design of this unique device covers the requirements for skin and eye risk assessment. The ICNIRP spectral sensitivity required for skin and eye risk evaluation is formed using two filtered sensors. This prevents the typical cross-talk between the UV-A, UV-B and UV-C spectral ranges of a single sensor solution. A third sensor for the evaluation of the UV-A<sub>315-400nm</sub> human eye risk is integrated. For measurements of eye dependent irradiance values a front adapter is supplied to limit the detector field-of-view to 80 degrees. Calibration of the detector ICNIRP ( $W/m^2$ ) and UV-A ( $W/m^2$ ) sensitivity is done by Gigahertz-Optik GmbH calibration laboratory for optical radiation measurements quantities.



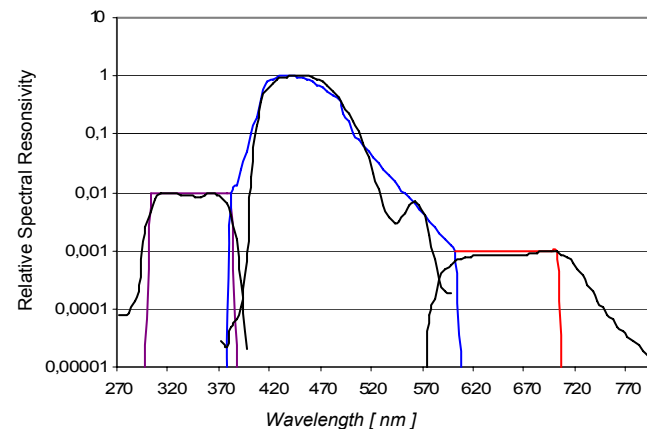
$S_{UV}(\lambda)$  EN62471 Spectrum

Typical UV-CB and UV-A Sensor Responsivity Spectrum

## XD-45-HB BLUE-Light Hazard Detector Head



The XD-45-HB irradiance detector is specially designed for the evaluation of Blue light exposure hazard values for artificial light sources. The four sensor design of this unique device covers the requirements for eye risk assessment. The Blue Light Hazard spectral sensitivity needed for eye risk evaluation is formed by three filtered sensors for the BLUE<sub>UA300-400</sub>, BLUE<sub>400-600</sub> and BLUE<sub>RED600-700</sub> spectral ranges. The EN 62471 conformal B( $\lambda$ ) detector is useful for evaluation of all kinds of light sources that contain UV-A and deep red light components. Also, a V( $\lambda$ ) photometric sensor for the evaluation of illuminance in lx is integrated to establish the 500lx reference distance protocol for the illuminance and/or radiance. All four filtered sensors are mounted behind the 20mm diameter cosine diffuser. Calibration of the B( $\lambda$ ) ( $W/m^2$ ) and  $E_v$  (lx) detector sensitivity is done by the Gigahertz-Optik GmbH calibration laboratory for optical radiation measurements quantities.



Legend: Blue line = B( $\lambda$ ) EN62471; Magenta line = XD-45HB B( $\lambda$ ); Black line = Three Cell B( $\lambda$ ) Spectral Sensitivities

Three Cell B( $\lambda$ ) Spectral Sensitivities

## X1<sub>3</sub> Handheld Meter

To support light hazard measurements in the ultraviolet, blue and visible spectral range Gigahertz-Optik offers different detector heads each in multiple sensor design. The Gigahertz-Optik X1<sub>3</sub> (X-One-Three) Optometer was designed as the read-out meter for these multi-cell detectors. The key features of the X1<sub>3</sub> optometer are:

- Four channel electronics
- Wide dynamic range amplifier
- Low noise for 0.1pA resolution
- Auto ranging gain control
- Range dependent gain calibration with DKD traceability
- Four column alphanumeric display
- Powerful microprocessor operation
- Simple to use menu supported operation
- Ergonomic hand-held meter design
- Battery or USB power operation
- USB interface



## P-9801 High Speed Data-logger Meter



The Gigahertz-Optik P-9801 Optometer is one of the most powerful lightmeter electronic available. Combined with the XD-45 detectors it enables irradiance measurements of flashed or modulated light sources for UV and BLUE light hazard assessment purpose. The key features of the P-9801 optometer are:

- Eight parallel channel electronics with wide dynamic range amplifier and low noise for 0.1pA resolution
- Auto ranging gain control with range dependent gain calibration with DKD traceability
- Very powerful microprocessor operation with large data storage memory and RS232 and IEEE488 interfaces
- Data-logger, Peak-power and Pulse-energy Measurement mode
- PC Software

Gigahertz-Optik GmbH is a world class manufacturer of innovative UV-VIS-NIR optical radiation measurement instrumentation for specification critical industrial, medical and research application. Light gauges for transmission, reflection and fluorescence support material testing in service and production. Calibration standards supports customers on-site comparison of light detection and imaging sensors. Traceable calibrations are the basic reference to ensure quality for all light measurement instruments and calibration standards. The Gigahertz-Optik calibration laboratory for optical radiation quantities provides the most extensive range of calibrations available from industrial suppliers. For the measurement *spectral responsivity* and *spectral irradiance* Gigahertz-Optik is accredited by the Deutscher Kalibrierdienst (DKD) as calibration laboratory according to ISO/IEC 17025 since 1993 with registration number DKD-K-10601.

**Product and Services**

- Light and Luminous Color Meter
- Light Analyzer for Lamp and LED Testing  
Goniophotometer
- UV Radiometer, UV Germicidal Light Meter  
UV Hazard Light Meter
- Light Transmission Spectrophotometer
- Integrating Spheres for Light Measurements
- Integrating Spheres for Reflection and Transmission
- Integrating Sphere Measurement Systems
- Integrating Sphere Light Sources
- Optical Diffuse Material (OP.DI.MA.)
- Barium Sulfate Paint
- Standard, OEM and Custom Made Product Service
- Calibration Standards & Calibration Laboratory

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Optical radiation of artificial light sources effects photobiology reaction to human skin and eye with risk for hazard if limit values are overdue. Equipment safety are international agreed producer requests such us classification, design criteria and warning labels, whereas safety at workplaces are national requests for the health protection of employees including exposition limiting values, threat analysis and precautionary measures. **Equipment Safety:** Fundamental demands on equipment regarding safety and health protection are part of the equipment and product safety law (GPSG). Manufacturer and importer of technical tools and consumer products must ensure that their products are made or qualified in that way that no risk for user and third party exist. The three European Standards Organization (CEN, CENELEC<sup>1</sup>) and ETSI) develop product standards and technical specification which guidelines enable the general product safety requirements. Products made or qualified by this standards will be CE labeled and must be accepted by the member states. The GSPG Low Voltage Equipment states that manufacturer and importer must inform the user about the risk of its products following the CIE S009:2002 or IEC 62471:2006 or EN 62471:2008 standards. **Safety on workplaces:** Following the European Parliament and Council 2006/25/EC guideline employer have to ensure the observing of exposure limit values. The guideline defining the minimum requirements which may be more restricted by member states. It enable a flexible risk evaluation under various condition and situations. IEC 62471:2006 accepted us EN 62471:2008 within the low voltage directive (2006/95/EC) describes the exposure limit values as well as the measurement methodology. The standard also describes suitable measurement instruments. The **reference light meter** for hazard classification is the double monochromator spectral radiometer. But because of its high cost and complicate operation the expert committee members involved in writing DIN EN 62471 recognized this limitation and recommends spectral broadband (spectral integrating or filtered detector) light meters with some restrictions as an alternative measurement method. Gigahertz-Optik GmbH is a manufacturer of high-end integral photometers and radiometers since 1992 featuring Irradiance meters with ICNIRP and ACGIH UV and Blue Light Hazard sensitivity. To support the 2006/25/EG and DIN EN 62471 standards measurement demands new light meter for the evaluation of hazard exposure has been developed to support the needs of lamp distributors, light source systems and luminare manufacturers, institutional and industrial safety engineers, hygienists and others responsible for these routine and periodical measurements.

Measurement of Light  
Measurement with Light

**Lightmeter**  
for Assessment of  
Light Emission and Light Exposure

- Measurements of Light Exposure Values for Workplace safety in Reference to the Directive 2006/25/EC
- Measurements of Light Emission Values for EN 62471 Product Classification of the Photobiological Safety of Lamps and Lamp Systems
- Outline DIN EN14225-1 Measurements
- Precise Multi-cell Detectors for Ultraviolet and Blue Light Hazard Irradiance Measurements
- X13 Meter for Assessment of CW Operated Light Sources
- P-9801 Meter for Assessment of Flashed or Variable Operated Light Sources

