3B SCIENTIFIC® PHYSICS

UV A/B sensor 1000567

Instruction sheet

10/15 Hh

1. Safety instructions

The UV A/B sensor is not suitable for safety-related applications.

- The UV A/B sensor may only be used for educational purposes.

2. Description

Sensor box containing photodiode with built-in optical filter to cut out visible light for measurements in the UVA/UVB spectral regions.

Push-button selection of measurement ranges 70 mW/m², 7 W/m² or 700 W/m², with visible range indicator.

Screw-on aperture cover to accommodate the supplied UG-1 coloured glass insert to be used as a UVA filter.

The sensor box and the selected measurement range are detected automatically by the 3B NET*log*™ unit.

3. Equipment supplied

1 UV A/B sensor with removable aperture cover and UVA filter (SCHOTT UG-1)
1 Stand rod with screw-thread, 120 mm
1 8-pin miniDIN connecting lead, length 600 mm
1 Instruction sheet

4. Technical data

Measurement ranges:	0 to 70 mW/m² 0 to 7 W/m² 0 to 700 W/m²
Sensor type:	Titanium dioxide Schottky diode with built-in filter to cut out visible light
Max. spectral sensitivity:	Typically 21 mA/W
Wavelength for max. spectral sensitivity:	300 nm
Visible light blocking factor:	50
Spectral sensitivity characteristic of UV diode:	See fig. 1
Transmittance characteristic of UVA filter:	See fig. 2

5. Operation

- Place the sensor box close to the experiment.
- Switch on the 3B NET*log*™ unit and connect the UV A/B sensor via the miniDIN cable to one of its two analogue inputs (A or B).
- Wait for the sensor box to be detected automatically.
- Select the appropriate measurement range for the expected UV intensity depending on the light source [e.g., sunlight, UV light for tanning (sun-beds, solaria) or UV disco lights].
- Read the value of the light intensity from the display of the 3B NET*log*™ unit.
- If the measurement range is exceeded, change to the next higher range.
- For transmission measurements, hold the absorber specimen between the light source and the sensor and calculate the ratio of the radiation intensity readings with and without the absorber (the transmission coefficient).

6. Applications

Measuring the UV intensity during the course of a whole day and investigating its dependence on the time of year.
Measuring the UV transmittance (transmission coefficient) of different glass and plastic lenses in sunglasses and normal spectacles.
Comparing the UV transmittance of the windscreen and side windows of a car with regard to possible tanning or sunburn of occupants.
Does wet clothing give better protection from UV radiation than dry clothing?
Quantitative comparison of the radiation protection factors of sun-creams.

7. Sample experiment

Measurements of the UV transmittance (transmission coefficient) of different glass and plastic materials in sunglasses and normal spectacles

Equipment required:

1 3B NET*log*™ @ 230 V	1000540
or	
1 3B NET*log*™ @ 115 V	1000539
1 3B NET*lab*™	1000544
1 UV A/B sensor	1000567

Several different pairs of sunglasses and normal spectacles

Recommendation: Perform the experiment outdoors on a sunny day.

- Switch on the 3B NET*log*™ unit and wait for the sensor box to be detected automatically.
- Select the 700 W/m^2 measurement range on the sensor box.
- Select the program (template) “Ultraviolet radiation” on the 3B NET*log*™ unit.
- Hold the UV A/B sensor in sunlight, without the aperture cover and without the UVA filter, and start the program.
- Choose the “Manual input” mode and record the first of two intensity measurements.
- Hold one lens of the sunglasses in front of the UV A/B sensor at a distance of about 10 cm.
- Now make the second intensity measurement.
- Make a graph of the two measurements to show the effect of the lens (Fig. 3).
- If possible, repeat the experiment with another pair of sunglasses.

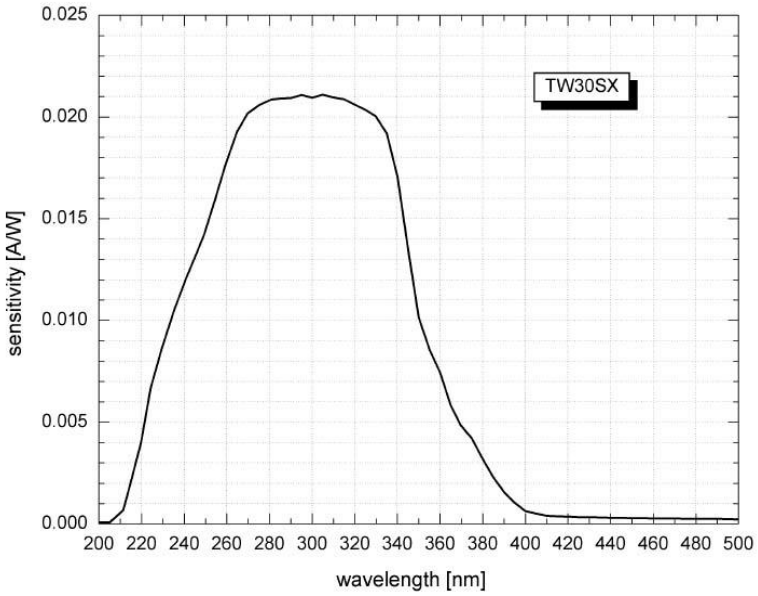

Fig. 1 Spectral sensitivity characteristic of UV diode

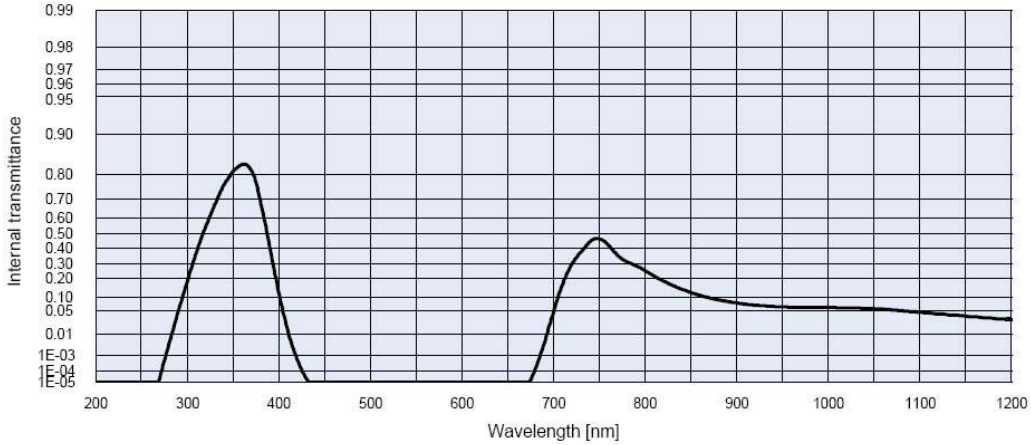

Fig. 2 Transmittance characteristic of UG-1 filter

Fig. 3 Measurements as displayed on screen in 3B NET*lab*™ from above experiment