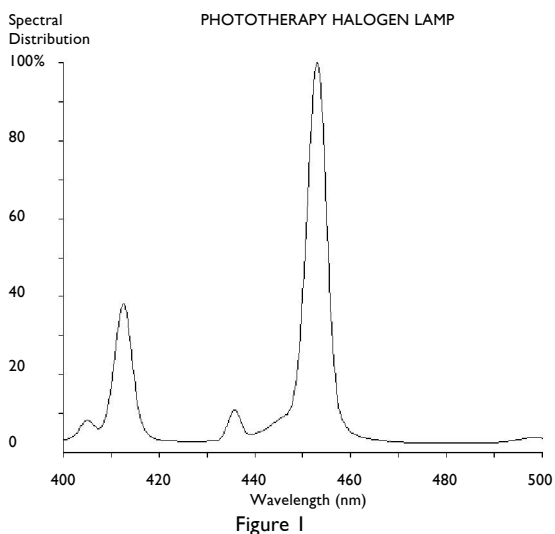


PR450 PHOTOTHERAPY RADIOMETER

The **Macam PR450 portable radiometer** is designed to measure directly the irradiance of blue light used for the treatment of hyperbilirubenemia in newborn babies. The radiometer comprises of a portable battery operated display unit with microprocessor control and a sensor head with a photodiode detector, amplifier/digitiser, glass filter and cosine corrected diffuser input.

OPERATION

The detector is placed in the exposure chamber at a predetermined distance from the lamps, the radiometer display is switched on and Zeroed if necessary. The irradiance can be read directly in Watts per square metre ($W.m^{-2}$) from the LCD display. The display can be locked at the measurement value by pressing the Hold button.



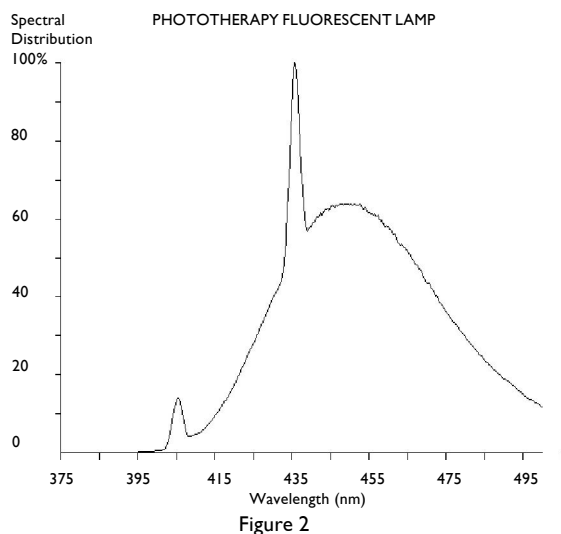
Exposure in Joules per square metre can be calculated by multiplying the irradiance level by the exposure time in seconds.

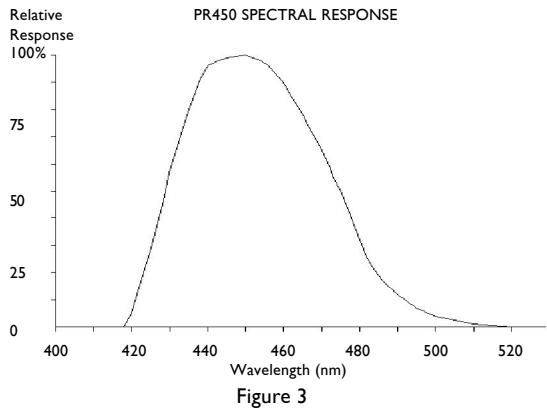
FEATURES

- Easy to operate.
- Direct reading.
- Low noise detector amplifier.
- Response tailored to the absorption of biliruben.
- Accurate cosine angular response.
- Portable.

OPTIONS

- PR453 Recalibration service and certificate.
- PR454 Extension Cable. (3 metres)



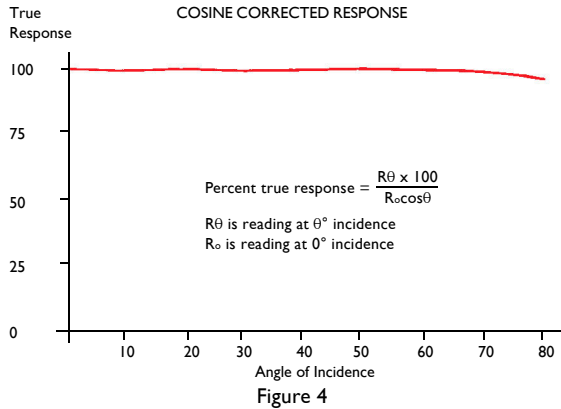


PR450 SPECTRAL RESPONSE

Blue light phototherapy around 450 nm has been shown to be effective in the treatment of hyperbilirubenemia. The Macam PR450 detectors spectral response peaks at 450 nm and is tailored to the absorption curve of biliruben thus giving reliable measurements of the lamp's effectiveness as it ages.

COSINE CORRECTION

Light arriving on a surface comes from all directions and it is necessary to measure the integrated irradiance from all sources in the hemisphere in front of the detector. In these circumstances correct measurements will only be obtained from source if the detector has a receptor following Lambert's Cosine Law. The PR450 detector assembly has a cosine angular response accurate to $\pm 5\%$ to 70° from normal incidence.



SPECIFICATION

The Macam model PR450 phototherapy radiometer comprises of a PR450X display unit with lithium battery, SD221-450 detector with integral amplifier, blue glass filter and cosine diffuser, calibration certificate and CC-4 carrying case.

DISPLAY UNIT

Model:	PR450X
Design:	Portable μ processor controlled meter with $4\frac{1}{2}$ digit LCD display, simple key pad operation, battery powered.
Standard Range:	0 - 199.99 W.m ⁻² (other ranges available on request)
Accuracy:	$\pm 1\%$, ± 1 digit on display.
Keypad Operations:	Power On / Off. Hold display on / off action. Zero stores offset for subtraction from subsequent readings.
Display:	$4\frac{1}{2}$ digit LCD display with 10mm high numerals.
Power Supply:	PP3 Lithium Manganese battery. Operating life 30 to 50 hours. (Use Lithium Manganese batteries for optimum performance.)
Calibration:	PR450 is calibrated with a blue light source and a reference detector traceable to NPL optical metrology standards. Absolute calibration accuracy estimated as $\pm 7\%$.
Dimensions:	80 mm x 45 mm x 150 mm.
Weight:	Approximately 0.3 Kg.

BILIRUBENEMIA DETECTOR

Model:	SD221-450
Design:	GaAsP photodiode with integral detector amplifier and signal to frequency convertor. Aluminium housing with blue glass filter, cosine diffuser and 1m cable.
Linearity:	Better than $\pm 1\%$ across range.
Spectral Response:	Refer to graph. $\lambda_{\text{peak}} @ 450 \pm 5$ nm FWHM = 50 ± 5 nm
Angular Response:	$\pm 5\%$ to 70°
Dimension:	38 mm \varnothing x 39.5 mm high

Data Sheet 146/0101

Macam
PHOTOMETRICS LTD.

**10 KELVIN SQUARE
LIVINGSTON EH54 5PF
SCOTLAND**
Tel: +44 (0)1506 437 391
Fax: +44(0)1506 438 543
E-mail: info@macam.com
Web: www.macam.com