IRRADIAN
Light Measurement Systems & Calibration

PR203 Phototherapy Radiometer

Designed to measure directly from multiple types of blue light source for use in the treatment of hyperbilirubinaemia in newborn babies.

Helping you measure!

PR203 RADIOMETER

The Irradian portable phototherapy radiometer (*model PR203*) is designed specifically to measure the spectral irradiance from multiple blue light sources which are used for the treatment of hyperbilirubinaemia in new born babies. The radiometer comprises of a hand held, battery operated, illuminated display unit, a small detector and a connecting cable. The detector is carefully constructed to give an optical response that closely matches the absorption curve of bilirubin; that prevents the measurement of non-therapeutic light and that allows accurate measurements of three different types of light sources, where ever they are placed with respect to the radiometer. The sensor used in the detector is a silicon photodiode which performs with excellent linearity and long term stability.

OPERATION

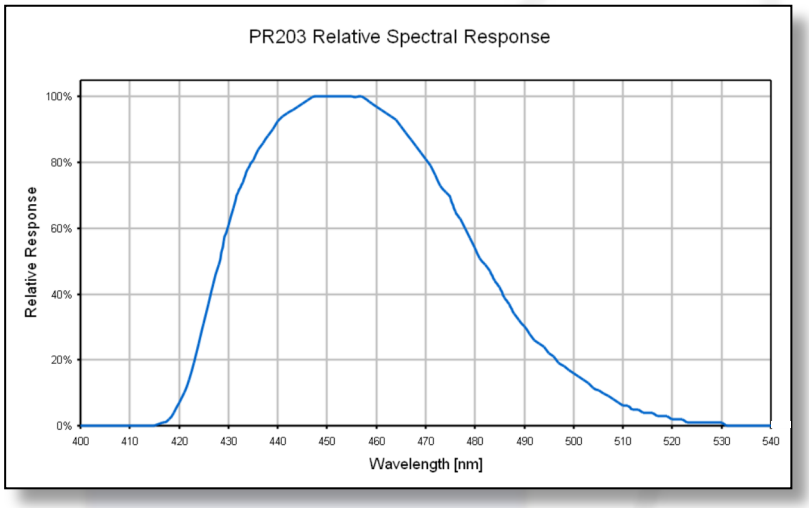
The detector is placed in the exposure chamber or incubator at a predetermined distance from the lamps. The radiometer display is switched on and zeroed using the supplied blanking cap. The appropriate light source setting is selected on the front panel and the spectral irradiance of the source is read directly in units of µW/cm²/nm. The data on the display can be locked at the measurement value, and a special function mode allows easy determination of the *Average*, *Maximum* and *Minimum* stored values. Dosage or exposure in units of µJ/cm²/nm can also be read using the *Integrate* function. Remote meter operation is possible using an optional computer interface cable.

FEATURES

- Compact and robust.
- Direct reading of incandescent, fluorescent & LED phototherapy sources.
- Low noise, high accuracy detector amplifier.
- Response tailored to the absorption of bilirubin.
- Accurate detector directional response.
- Four decades of auto-ranging sensitivity.

OPTIONS

- Calibration service.
- Computer interface cable.
- Detector extension cable.
- User reference handbook.



SPECIFICATION

The Irradian digital phototherapy radiometer comprises of a microprocessor controlled display unit with battery, detector with integral amplifier, blue glass filter and cosine diffuser, calibration certificate, user guide, blanking cap and carrying case.

DISPLAY UNIT

Model:	PR203
Design:	Portable microprocessor controlled meter with backlit 4½ digit LCD, auto or manual ranging, simple keypad operation, battery powered. Optional RS232 remote operation.
Ranges:	Four discrete ranges; 0 - 19.999, 0 - 199.99, 0 - 1999.9, 0 - 19999 µW/cm²/nm
Accuracy:	± 1%, ± 1 digit on display.
Keypad Operations:	*Power* on / off action, *Zero* stores offset for subtraction from subsequent readings, *Manual* or auto ranging gain control, *Average, Maximum, Minimum* and *Integrate* functions.
Display:	4½ digit LCD, 10 mm high numerals.
Power Supply:	PP3 battery. Operating life 30 to 50 hours.
Calibration:	The PR203 is separately calibrated against three different light type sources; incandescent, fluorescent and LED using a spectroradiometric calibration technique over the spectral range 425 nm - 475 nm† traceable to NPL optical metrology standards. Absolute calibration accuracy ± 7.5%
Dimensions:	80 mm x 45 mm x 150 mm
Weight:	Approximately 0.4 kg

DETECTOR

Model:	DET203450
Design:	GaAsP photodiode with integral amplifier and signal to frequency converter. Aluminium housing with blue glass filters, cosine diffuser and 1.0 m cable.
Linearity:	Better than ± 1% through ranges.
Spectral Response:	Refer to figure above. λ_{peak} @ 450 ± 5 nm FWHM = 53 ± 5 nm
Angular Response:	Cosine error ≤ ± 5% to 70° from normal incidence.
Dimensions:	38 mm Ø x 39.5 mm high.

† Official Journal of the American Academy of Pediatrics: Management of hyperbilirubinemia in the newborn infant 35 or more weeks of gestation. Subcommittee on Hyperbilirubinemia, *Pediatrics* 2004;114;297-316.

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IRRADIAN Ltd.

9 Elphinstone Road
Tranent
East Lothian
Scotland EH33 2LG

Telephone: +44 (0)1875 898-083
Facsimile: +44 (0)1875 616-528
E-mail: info@irradian.co.uk
Web: www.irradian.co.uk