

Rk-3100 Laser Power Meter



- **100 μ W Sensitivity**
- **Fast Response Time**
- **High Damage Threshold**
- **Compact Head**

LaserProbe inc.

The Rk-3100 Power Meter consists of a thermopile detector assembly ("head") and a large, backlit analog display. The compact head embodies all the best features of thermal detectors - large active area, μ W sensitivity, broad spectral response, and high damage threshold. The analog meter is designed to provide a fast, smooth display of the optical power, ideal for aligning optics and peaking laser output.

The range of applications for this power meter is enormous. Use it to measure ophthalmic, surgical, and dentistry lasers. Monitor low power industrial lasers for marking, engraving, and resistor trimming. The broadband wavelength response lends itself to combustion, solar simulation, and spectroscopy applications. UV sterilization, germicidal, and lithography process control are possible. Field service technicians will appreciate the fast system response for aligning and calibrating lasers.

The Rk-3100's wide spectral response covers all the major laser wavelengths, from Excimer and Nitrogen in the UV, through Argon, Dye, and doubled Nd:YAG in the visible, to Nd:YLF, Holmium, and CO₂ in the IR. It accurately measures broadband sources like Xenon lamps and blackbodies as well.

The fast system response allows for accurate average power measurement of sources pulsed or chopped at 5 Hz or more. If the pulse repetition rate is known the average pulse energy in Joules can be obtained by dividing it into the measured average power.

The Rk-3100 head uses a thermopile detector with a unique black absorber coating that offers both a broad, flat spectral response and tremendous power handling capability - even focused beams can be measured without damaging the detector.

SPECIFICATIONS

Spectral response (see curve)	0.2 - 20 μm
Maximum total power	10 W
Max. average power density	20 kW/cm ²
Noise equivalent power	100 μW
Calibration accuracy	$\pm 5\%$
Linearity	$\pm 0.5\%$
Response Time (10-90%)	< 2 sec
Detector active area dimensions	16.0 mm (2.0 cm ²)
Full scale ranges	8; 3 mW to 10 W
Head dimensions (dia x depth)	6.0 cm x 3.7 cm (2.4" x 1.5")
Meter dimensions (h x w x d)	9.0 cm x 19.2 cm x 22.1 cm (3.6" x 7.6" x 8.7")
System weight (head and readout)	2.3 kg (5.0 lb)

The compact, convection-cooled heat sink assembly features a side-mounted BNC connector, standard 1/4-20 mounting hole, and a black anodize finish to reduce unwanted back-reflection.

The Rk-3100 operates by generating a voltage proportional to the difference in temperature between the detector surface (target) and heat sink (ambient). Thermally insulating the heatsink can improve accuracy and stability when measuring low power levels, by buffering it against fluctuations in the ambient temperature.

The Rk-3100 Power Meter features an oversized, backlit, dual-scale analog display. System response time is less than 2 seconds, resulting in smooth, real-time needle movement - none of the frustrating lag and overshoot associated with other meters that make it difficult to tweak a laser system.

Front panel controls include the Zero Adjust knob and Range Select knob. The Zero Adjust allows for compensation of unwanted background radiation, and to a lesser extent, wavelength responsivity of the detector. The Range Select knob selects the appropriate full scale range for the incident power level.

Rear panel features include the universal power entry module (90-240 VAC, 50-60 Hz input), Probe BNC, and Analog Out BNC. The Analog Output is 0-1 VDC, with 1 Volt corresponding to full scale for the selected range. Collapsible feet allow the viewing angle to be optimized to the experimental setup.

A removable light baffle is provided with the Rk-3100. Contact the factory for information regarding other options and accessories.

All Rk-3000 Series instruments are provided with a certificate of calibration showing traceability to the National Institute of Standards and Technology (NIST) and compliance with MIL-45662 and ANSI-Z540 Sections 7-18.

