

RkT-10 Thermopile Power Probe



- High Damage Threshold
- 100 μ W Sensitivity
- Broad Spectral Response
- Compact Head

The RkT-10 Thermopile Probe measures both continuous wave and average power, 100 μ W to 10 Watts, from the UV to far-IR. The spectrally flat absorber material can withstand average power densities up to 20 kW/cm² and peak pulse power densities of 15 MW/cm². Advanced thermal management techniques allow for a compact probe design that is capable of continuously dissipating 10 W total power.

The RkT-10'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 range of applications for this probe 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. Service and Production technicians will appreciate the RkT-10's fast response time when aligning and calibrating lasers.

The fast 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 the average power by the pulse repetition rate.

*Laser***Probe** inc.

SPECIFICATIONS

Spectral response (see curve)	0.2 - 20 μm
Maximum total power	10 W
Maximum average power density	20 kW/cm ²
Noise equivalent power	100 μW
Calibration accuracy	$\pm 5\%$
Linearity	$\pm 0.5\%$
Detector active area dimensions	16.0 mm (2.0 cm ²)
Full scale ranges	3; 300 mW - 10 W
Head dimensions (dia x depth)	6.0 cm x 3.7 cm (2.4" x 1.5")
Preamplifier dimensions (l x w x h)	8.9 cm x 3.8 cm x 2.5 cm (3.5" x 1.5" x 1.0")
Probe weight (head and preamp)	0.54 kg (1.2 lb)

The RkT-10 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. 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 thermopile detector functions 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 isolating it from fluctuations in the ambient temperature.

The RkT Series Probes consist of the thermopile detector assembly, or "head", and a preamplifier housed in its own enclosure. The preamplifier is attached directly to the probe input connector of the appropriate Laser Probe instrument; the head is then connected to the preamplifier with a BNC cable. The head and preamplifier are calibrated together as a set to insure maximum accuracy and linearity over 5 decades of dynamic range. This also allows the RkT-10 to be used with any Laser Probe instrument without having to enter a responsivity correction factor - the instrument reads the Probe's ID and configures itself accordingly.

The compact size and modular design make the RkT-10 ideal for OEM applications. Incorporate the probe head directly into laser systems, industrial marking and materials processing stations, or dedicated research setups for real-time diagnostics, data logging, and process control. Use the RkT-10 preamplifier to

interface to the head, or feed the head output directly to an A/D card, DVM, or other measuring device.

A removable light baffle and head support stand are provided with the RkT-10. Contact the factory for information regarding other options and accessories.

All RkT Series Probes 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.

