

# RjP-495 Germanium Energy Probe



- **Large Area Germanium Energy Probe**
- **Ideal for Eye-Safe Laser Applications**
- **Measure Energy Per Pulse at 200 Hz**
- **pJ Sensitivity at 1.5  $\mu\text{m}$**

The RjP-495 Germanium Probe is designed specifically for mid-IR, pulsed energy measurements. The large size (13 mm diameter) detector is ideal for measuring total energy and fluence of eye-safe laser sources. Picojoule sensitivity, 200 Hz speed, and room temperature operation make it the probe of choice for mid-IR energy measurements.

Many pulsed lasers fall within the RjP-495's measurement range, including Nd:YAG, Er:YAG, Ti:Sapphire, Optical Parametric Oscillators, and laser diodes. Flashlamps, arc lamps, and other non-laser sources can be measured as well. All the major fiber optic wavelengths are covered, allowing the RjP-495 to test and calibrate fiber power meters, loss test sets, and other fiber test instrumentation.

Take the RjP-495 probe and Rm-3700 Universal Radiometer to the test range to characterize the far-field performance of eye-safe laser rangefinders, target designators, and fire control systems. Couple it with a Pyroelectric probe and the Rm-6600 Dual Channel Universal Radiometer to radiometrically measure the transmission of laser goggles, filters, and other optical components over 6 decades of dynamic range. Other applications include Raman spectroscopy, non-linear optical materials, and laser induced fluorescence studies.

The compact size and modular design make the 400 Series ideal for OEM applications as well. Incorporate the detector and preamplifier into mid-IR lasers, LIDAR systems, or fire-control systems for real-time diagnostics, output stabilization, and process control.

**LaserProbe** inc.

**SPECIFICATIONS**

Spectral response (see curve)	0.8 - 1.8 $\mu\text{m}$
Maximum total energy	3 $\mu\text{J}$
Maximum energy density	25 $\mu\text{J}/\text{cm}^2$
Max. peak pulse power density (30 ns pulse)	100 $\text{mW}/\text{cm}^2$
Max. average power density	10 $\text{mW}/\text{cm}^2$
Minimum detectable energy	10 $\mu\text{J}$
Maximum pulse rep rate	200 Hz
Maximum pulse width	200 $\mu\text{s}$
Calibration accuracy	$\pm 5\%$
Linearity	$\pm 0.5\%$
Detector active area dimensions	13 mm (1.3 $\text{cm}^2$ )
Full scale ranges	6: 30 $\mu\text{J}$ - 3 $\mu\text{J}$
Head dimensions (dia x depth)	6.0 cm x 4.6 cm (2.4" x 1.8")
Preamplifier dimensions (l x w x h)	11.5 cm x 7.7 cm x 5.1 cm (4.5" x 3.0" x 2.0")
Probe weight (head and preamp)	0.5 kg (1.0 lb)

Germanium has advantages over the other semiconductor detectors for certain applications. For example, it is nearly as sensitive as silicon at 1064 nm, and its spectral response in the region about 1064 nm is much flatter. Therefore small fluctuations in source wavelength have far less impact on the measured energy. Germanium covers the same wavelength range as InGaAs, and the larger detector active area allows for measuring higher pulse energy levels. Below 1.5  $\mu\text{m}$  the temperature coefficient of Germanium is also comparable to that of InGaAs, resulting in accurate measurements without the need for temperature stabilization.

As a member of the 400 Series Probe family, the RjP-495 uses the same detector housing and preamplifier enclosure as all other 400 Series probes. In addition, most 400 Series probes are designed so the detector plane is the same distance from the mounting post plane, allowing for easy interchange of probes in an experiment.

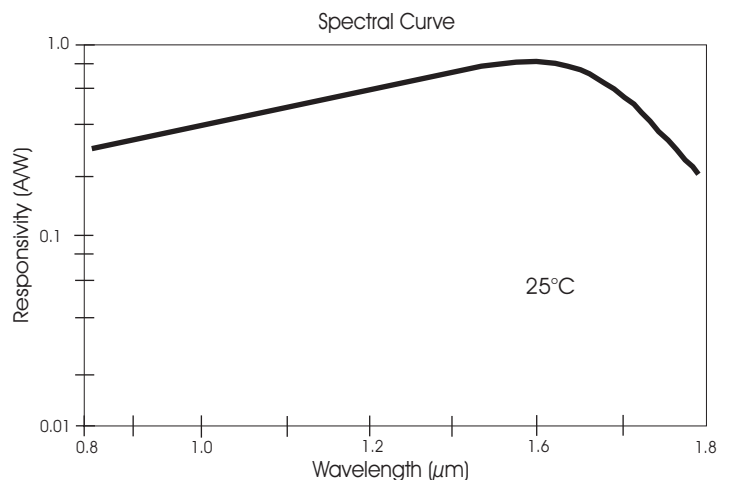
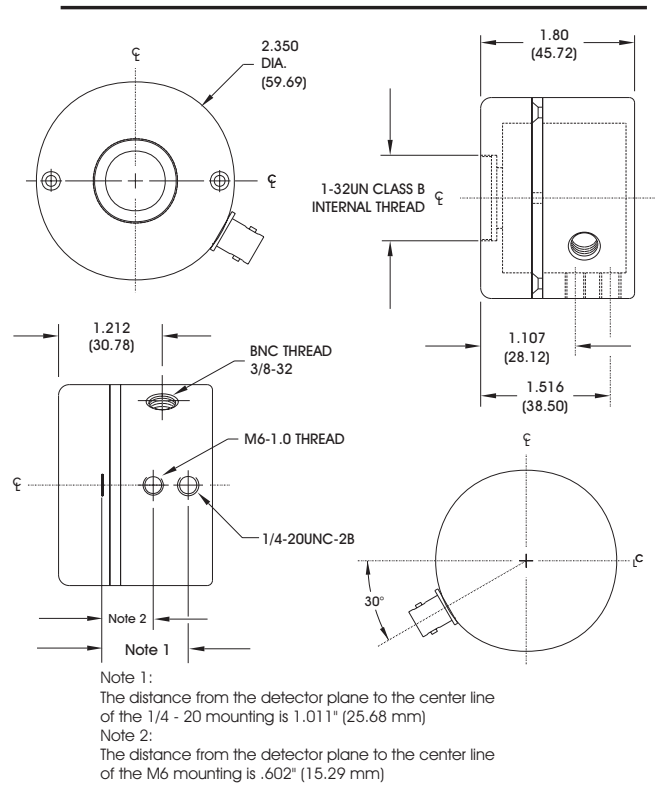
The compact 400 Series detector housing measures 2.35" in diameter by 1.8" deep. The side-mounted BNC connector requires no additional clearance in the beam path. Standard metric and English mounting holes and a 1" (25 mm) filter holder facilitate use, while the black anodized finish reduces unwanted back-reflection.

A separate enclosure houses the preamplifier. Probe parameters, including wavelength correction factors and calibration date, are stored in memory for access by Laser Probe's Universal Radiometers. Carefully

designed gain stages insure excellent linearity and S/N ratio over 6 decades of dynamic range.

There are many options and accessories available for the RjP-400 Series probes, including a precision aperture, light baffle, and the kTA-141 support stand. The options and accessories are detailed in a separate data sheet.

All 400 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.



As a result of our ongoing commitment to product improvement specifications are subject to change without notice. REV 029811js