

RjP-637 Pyroelectric Energy Probe



- **Unique Cavity Detector Design**
- **μJ Sensitivity**
- **Measure Energy up to 500 Hz**
- **$\pm 1\%$ Wavelength Response**

The unique cavity, or light-trap, detector assembly used in the RjP-637 Pyroelectric Energy Probe is a nearly perfect absorber, yielding a flatter spectral response and greater sensitivity than a conventional pyroelectric detector of comparable size. Its tremendous versatility - μJ to J, UV to Far-IR, single-shot to 500 Hz - makes it the right probe for almost any application.

The extremely wide spectral response makes this probe the ideal measurement tool for broadband sources like flashlamps, or for diffractive/dispersive instruments like monochromators. Cover the full spectral range of Ti:Sapphire, Dye, OPOs, and other tunable laser sources without having to worry about wavelength correction factors. The RjP-637 is equally adept at measuring Nd:YAG, Er:YAG, Nd:YLF, Excimer, Nitrogen, Copper Vapor, and CO_2 lasers.

Besides being a versatile research instrument the RjP-637 is an excellent energy transfer standard. Use calibrated neutral density filters to extend its dynamic range to match both low-energy semiconductor probes and high-energy calorimeter probes. Use it to calibrate ophthalmic and surgical lasers. Perform real-time analysis of LIDAR, rangefinder, and fire control systems. Or monitor the source laser in laser ablation, laser-induced fluorescence, and non-linear optics experiments.

The RjP-637 can be used to measure total energy (Joules) or fluence (J/cm^2). Underfilling the detector aperture so the whole beam strikes the detector measures the total pulse energy. Because the detector aperture is machined to 1.0 cm^2 with a high degree of precision, flooding the aperture with a uniform beam directly gives fluence measurements.

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SPECIFICATIONS

Spectral response	0.18 - 20 μm
Maximum total energy	1.0 J
Maximum energy density	1.0 J/cm ²
Max. peak pulse power density (30 ns pulse)	1.0 MW/cm ²
Max. average power density	5.0 W/cm ²
Minimum detectable energy	250 nJ
Maximum pulse rep rate (RjP-636)	500 (200) Hz
Maximum pulse width (RjP-636)	50 (200) μsec
Calibration accuracy	$\pm 5\%$
Linearity	$\pm 0.5\%$
Detector active area	1.0 cm ²
Full scale ranges	6; 30 μJ - 1J
Probe dimensions (dia x depth)	7.7 cm x 9.9 cm (3.0" x 3.9")
Probe weight	0.8 kg (1.8 lb)

In a conventional flat detector photons incident on its surface have only one point of contact, at which they are either absorbed or reflected away. However, the geometry of the RjP-637 cavity detector insures that virtually all of the photons that are not absorbed at the initial contact point will be reflected further into the cavity, where they contact the detector surface again and again. This "light-trap" configuration produces almost total light absorption, resulting in an extremely broad, flat wavelength response.

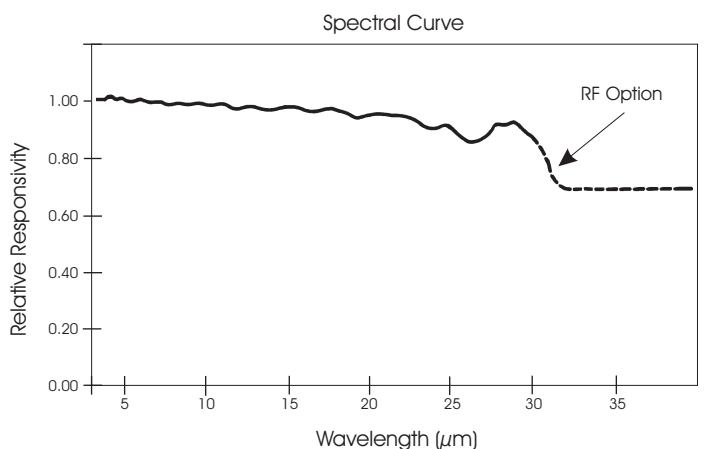
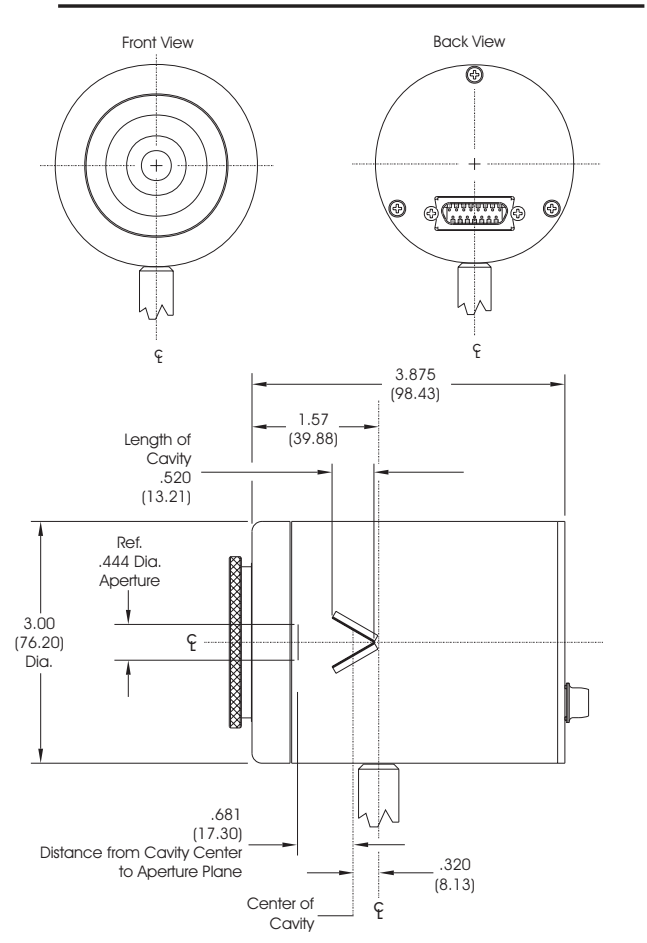
The RjP-637 is configured to measure up to 500 Hz, with a maximum pulse width of 50 μs . However, the preamplifier can be modified to increase the maximum pulse width to 200 μs , with a maximum pulse repetition rate of 200 Hz. This version is given the model number RjP-636. Consult the factory for additional details.

The RjP-600 Series probes have the detector assembly and preamplifier in a common housing. This minimizes the signal path between the detector and preamplifier and surrounds them with a continuous Faraday cage, giving optimal EMI/RFI immunity.

The front of the RjP-637 is threaded to accept accessories. A 25 mm diameter filter holder is included with the Probe. A standard 1/4-20 threaded hole is provided for mounting the probe to an optics bench. The probe is black anodized to reduce unwanted back-reflection.

There are many options and accessories available for the RjP-600 Series probes, including various size filter holders, probe extension cables, and the kTA-141 support stand. These options and accessories are detailed in a separate data sheet.

All RjP-600 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 019801js