

QED-150 Calibration Standard



We offer a calibration standard which proves ideal for comparing the calibrations of fiberoptic detectors and power meters, or for measuring the absolute output of lasers and other fiberoptic sources.

The QED device incorporates three, large area photodetectors that operate with total internal quantum efficiency. Therefore, the photocurrent they produce approaches the theoretical maximum. Light incompletely absorbed by the first detector is reflected to the next—in a path that totals five surfaces. The result is virtually complete absorption. The photodetectors are connected electrically in parallel to sum the total generated photocurrent. One of the detectors that deflects the beam 45° is rotated 90° in order to eliminate polarization sensitivity.

The Model QED-150 provides greater than 99.5% quantum efficiency from 600-900 nanometers, i.e., a calibration accuracy within 0.5% of absolute. It makes use of high-quality, large area, planar diffused silicon photodiodes. These are operated in the photovoltaic mode (no bias voltage is required), to combine ultra-low noise with high-sensitivity.

Responsivity, the ratio of output current to input radiation, may be calculated on the basis of one electron of photocurrent per incident photon as:

$$R = \frac{QE \times \lambda}{1239.5}$$

where R is expressed in amperes/watt, λ in nanometers, and QE is the quantum efficiency. The relationship is derived from known physical constants—the elementary electron charge, Plank's constant, and the speed of light.

The instrument comes with a wooden storage case and a Model 1802 BNC cable. These standards will operate with any UDT Instruments fiberoptic power meter. The QED-150 is protected under US patent 4,498,012.

Specifications	QED-150
Wavelength Range	600 -900 nm
Quantum Efficiency	> 99.5%
Accuracy	-0.5%
Input Power Range	1.0 nW - 0.5 mW
Maximum Dark Current	< 20 pA
Effective Aperture	6.86 mm
Field of View	7°
Dimensions	69.3 x 63.5 x 69.8