

The Quanta series detectors are a big step forward in laser pulse energy measurement for Gentec-EO and for you. They provide a unique combination of high damage resistance and higher speed. They also offer very good linearity with power and a versatile mounting system.

## QE50

The 50 mm aperture is designed for large beams and high energy laser beams. Beams that are too intense for the QE25 can be expanded onto the large aperture. It has one of the best damage thresholds of any energy detector of its class. The short pulse QE50-SP-MT gives you repetition rates up to 4000 Hz with pulse lengths up to 10  $\mu$ s. The short pulse QE50-SP-MB gives you repetition rates up to 500 Hz with pulse lengths up to 225  $\mu$ s. The long pulse QE50-LP-MB is for users who need more pulse width than repetition rate. Also available on special orders, the QE50-ELP-MB for measurement of Extra Long Pulses up to 9 msec, custom-tuned for repetition rate, sensitivity, and pulse width. The QE50 with heatsink (H) is good for higher average powers. You can read most of our Quanta detectors with our SOLO PE and DUO monitors as well as with an oscilloscope.

## Versatile Mechanics

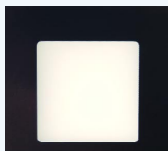
The square aperture is ideal for Excimer lasers. Our versatile mounting system also lets you mount the square in a diamond configuration. This will let you fit Excimer beams a bit larger than 50 mm. It is also useful for more conveniently positioning the cable for some applications. In addition, the thin package is ideal for OEM installations.

## Attenuators

To extend the performance of the QE50 to higher pulse energies you can select one of our attenuators. They fit easily over the QE50 and are held in place by 2 small set screws. For UV applications choose the **QEAS-50**. This combination attenuator/diffuser works between 190 nm and 2500 nm with a damage threshold of 1 J/cm<sup>2</sup> at 266 nm (7 ns at 10 Hz). Transmission varies from 15 to 30% depending on wavelength. This lets you extend the maximum pulse energy by a factor of 6 in the UV. For the highest damage threshold at the longer wavelengths though you will prefer the QEA-50.

The **QEA-50** is designed for visible and IR wavelengths, between 400 nm and 2500 nm. It transmits 15 to 25% of the incoming pulse letting you extend the energy range of your QE50 by a factor of 5.

Damage thresholds are 5 J/cm<sup>2</sup> in the visible and 7 J/cm<sup>2</sup> in the Near IR (7 ns at 10 Hz). Damage threshold increases with pulse length. For example, it is 85 J/cm<sup>2</sup> for 150  $\mu$ s pulses (1064 nm at 10Hz).



QEA-50



QE50-LP-S-MB

QE50-SP-S-MB

# ENERGY DETECTORS

Large Aperture (50 x 50 mm)

- High Damage Thresholds
- Durable
- Versatile
- Broad Band
- Full NIST-Traceability
- Smart Interface



# QUANTA SERIES QE-50 SPECIFICATIONS

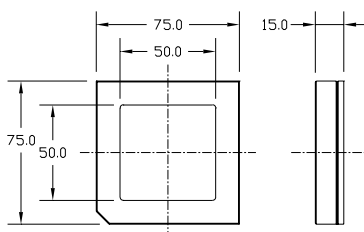
## TYPICAL LASERS

- Large beam size
- High pulse energy
- Pulsed gas lasers
- CO<sub>2</sub>
- Excimer
- Er :YAG ; Ho :YAG
- Nd : YAG
- Ruby

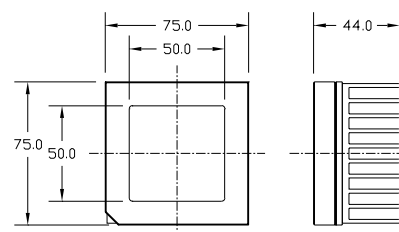
## COMMON APPLICATIONS

- Laser marking
- Lithography
- Soldering
- Drilling
- Dermatology
- Medical systems
- Urology
- Cardiac surgery
- Cancer treatment
- Orthopedics

## QE50



## QE50-Heatsink



All dimensions in mm

## SP-S-MB

## SP-H-MB

## LP-S-MB

## LP-H-MB

## SP-S-MT

## SP-H-MT

## MEASUREMENT CAPABILITY

Spectral range	0.19 -20 μm	0.19 -20 μm	0.19 -20 μm	0.19 -20 μm	0.19 -2.5 μm	0.19 -2.5 μm
<b>Maximum Measurable Energy</b>						
7 ns pulse, 1.064 μm <sup>a</sup>	15 J	15 J	15 J	15 J	6.25 J	6.25 J
With QEA attenuator	75 J	75 J	75 J	75 J	22 J	22 J
266 nm , 7 ns, 10 Hz	12.5 J	12.5 J	12.5 J	12.5 J	1.25 J	1.25 J
With QEAS attenuator	22 J	22 J	22 J	22 J	4.4 J	4.4 J
<b>Minimum Measurable Energy<sup>b</sup></b>	300 μJ with amplifier/ 1.2 mJ with SOLO or DUO alone				200 μJ	200 μJ
<b>Noise Equivalent Energy</b>	15 μJ with amplifier/ 60 μJ with SOLO or DUO alone				10 μJ	10 μJ
<b>Sensitivity<sup>c,d</sup></b>	3 V/J	3 V/J	3 V/J	3 V/J	4 V/J	4 V/J
<b>Max Repetition Frequency</b>	500 Hz	500 Hz	200 Hz	200 Hz	4000 Hz <sup>f</sup>	4000 Hz <sup>f</sup>
<b>Maximum Pulse Width (typical)</b>	225 μs	225 μs	675 μs*	675 μs*	10 μs <sup>f</sup>	10 μs <sup>f</sup>
<b>Rise Time (typical 0-100%)</b>	300 μs	300 μs	900 μs*	900 μs*	15 μs <sup>f</sup>	15 μs <sup>f</sup>
<b>Calibration Uncertainty<sup>e,9</sup></b>	±3%	±3%	±3%	±3%	±3%	±3%
<b>Repeatability (precision)</b>	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%

## DAMAGE THRESHOLDS

<b>Maximum Average Power<sup>e</sup></b>	10 W	20 W	10 W	20 W	10 W	20 W
With QEA or QEAS attenuator	25 W	45 W	25 W	45 W	25 W	45 W
<b>Maximum Energy Density</b>						
1.064 μm, 7 ns, 10 Hz	0.6 J/cm <sup>2</sup>	0.6 J/cm <sup>2</sup>	0.6 J/cm <sup>2</sup>	0.6 J/cm <sup>2</sup>	0.25 J/cm <sup>2</sup>	0.25 J/cm <sup>2</sup>
With QEA attenuator	7 J/cm <sup>2</sup>	7 J/cm <sup>2</sup>	7 J/cm <sup>2</sup>	7 J/cm <sup>2</sup>	1 J/cm <sup>2</sup>	1 J/cm <sup>2</sup>
With QEAS attenuator	4 J/cm <sup>2</sup>	4 J/cm <sup>2</sup>	4 J/cm <sup>2</sup>	4 J/cm <sup>2</sup>	1 J/cm <sup>2</sup>	1 J/cm <sup>2</sup>
532 nm, 7 ns, 10 Hz	0.6 J/cm <sup>2</sup>	0.6 J/cm <sup>2</sup>	0.6 J/cm <sup>2</sup>	0.6 J/cm <sup>2</sup>	0.05 J/cm <sup>2</sup>	0.05 J/cm <sup>2</sup>
With QEA attenuator	5 J/cm <sup>2</sup>	5 J/cm <sup>2</sup>	5 J/cm <sup>2</sup>	5 J/cm <sup>2</sup>	0.25 J/cm <sup>2</sup>	0.25 J/cm <sup>2</sup>
With QEAS attenuator	4 J/cm <sup>2</sup>	4 J/cm <sup>2</sup>	4 J/cm <sup>2</sup>	4 J/cm <sup>2</sup>	0.25 J/cm <sup>2</sup>	0.25 J/cm <sup>2</sup>
266 nm, 7 ns, 10 Hz	0.5 J/cm <sup>2</sup>	0.5 J/cm <sup>2</sup>	0.5 J/cm <sup>2</sup>	0.5 J/cm <sup>2</sup>	0.05 J/cm <sup>2</sup>	0.05 J/cm <sup>2</sup>
With QEAS attenuator	1 J/cm <sup>2</sup>	1 J/cm <sup>2</sup>	1 J/cm <sup>2</sup>	1 J/cm <sup>2</sup>	0.2 J/cm <sup>2</sup>	0.2 J/cm <sup>2</sup>

## PHYSICAL CHARACTERISTICS

<b>Effective aperture</b>	50 x 50 mm (47 x 47 mm with QEA or QEAS)					
<b>Absorber</b>	MB: Multi-Band	MB: Multi-Band	MB: Multi-Band	MB: Multi-Band	MT: Metallic	MT: Metallic
<b>Dimensions</b>	75 (H) x 75 (W) x 15 (D) mm or 44 (D) mm with heatsink					
<b>Weight (with Heatsink)</b>	0.209 (0.338) kg					
<b>Effective Area (with QEA-QEAS)</b>	25 (22.09) cm <sup>2</sup>					

\*Also available on special order: The Extra Long Pulse Series QE50-ELP-MB for pulse widths up to 9 msec, custom-tuned for rep. rate, sensitivity, and pulse width.

- a. Increasing pulse width increases the maximum measurable energy.  
 b. Nominal value, actual value depends on electrical noise in the measurement system.  
 c. Load: 1 MΩ and ≤ 130 pF.  
 d. Maximum output voltage = sensitivity x maximum energy

- e. Not including linearity with power.  
 f. For use with an oscilloscope ONLY.  
 g. Change in calibration with dose: 1% change with 432 000 J/cm<sup>2</sup>, 864 000 J/cm<sup>2</sup> with QEAS.

Specifications subject to change without notice



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