ENERGY DETECTOR

Low energy measurement

Available with integra

PE: PHOTODETECTORS

- Available in 3 sizes:
  - 3 mm Ø
  - 5 mm Ø
  - 10 mm Ø
- 3 choices of absorber for different wavelength ranges:
  - Silicon
  - Germanium
  - InGaAs
- Extremely low noise: as low as 8 fJ

LOWEST NOISE LEVEL OF ALL ENERGY DETECTORS

Available with integra

QE-B: HIGH-SENSITIVITY PYROELECTRIC DETECTORS

Our pyroelectric energy detectors have very low noise levels combined with a large bandwidth. They have everything you need to accurately measure extremely low energy from the DUV to the FIR.

- 8 mm Ø aperture
- 2 choices of absorber:
  - MT: Fast response and high sensitivity
  - BL: Flat spectral response
- Broadband, from the DUV to the FIR
- Very low noise: as low as 50 nJ

MEASURE LOW ENERGY AT ANY WAVELENGTH

MACH 6: MEASURE ALL PULSES UP TO 200 KHZ

- High-speed digital joulemeter:
  Measures EVERY PULSE at 200 kHz
- Capture and store up to 4 million pulses at the maximum repetition rate
- Track missing pulses and pulses below threshold
- Wide energy range: measure from pJ to mJ

200 kHz ENERGY METER

ENERGY DETECTORS

General use energy detectors

New product

Available with integra

QE-MB

Pyroelectric energy meters cover a very wide range, going from nanojoules to several tens of joules per pulse. Our standard absorber offers high damage thresholds and a spectrally flat response, making this series of energy detectors a versatile solution that can cover most of your energy measurement needs.

- Broadband absorber with high damage thresholds
- Available in 6 sizes:

  12 x 12 mm
  25 x 25 mm
  50 x 50 mm
  65 x 65 mm
  95 mm Ø
  NEW 195 mm Ø
- Available with 2 cooling modules:

  Convection (S)
  Heatsink (H)

■ THE WIDEST RANGE OF LASER ENERGY MEASUREMENT

Available with integra

QE-MT: HIGH REPETITION RATES

Designed for pulsed lasers with high repetition rates, these energy detectors feature an improved temporal response to accurately measure pulse-to-pulse energy at high repetition rates up to 10 kHz.

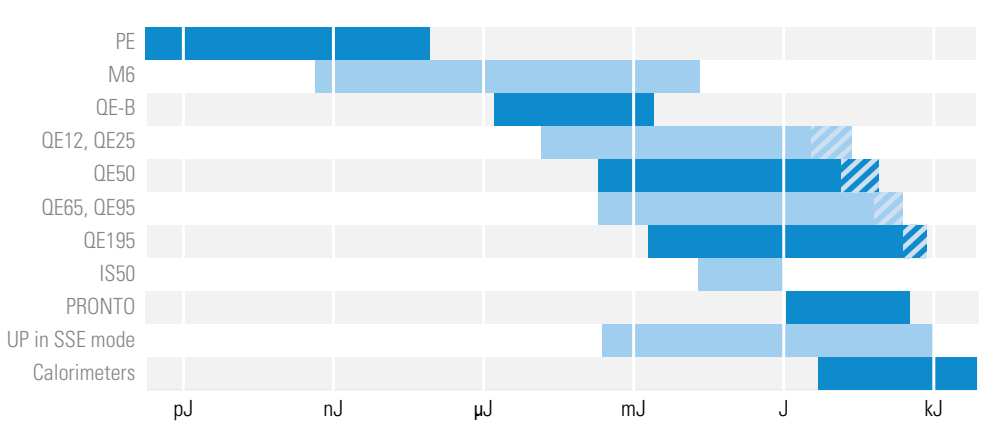
- Fast response, broadband absorber
- Available in 3 sizes:

  12 x 12 mm
  25 x 25 mm
  50 x 50 mm
- Available with 2 cooling modules:

  Convection (S)
  Heatsink (H)

■ UP TO 10 KHZ REPETITION RATE

COMPARISON TABLE - ENERGY MEASUREMENT



	Spectral range	Max rep. rate
PE	Depends on model	1000 Hz
M6	Depends on model	200 000 Hz
QE-B	0.19 - 20 µm	1000 Hz
QE12, QE25	0.19 - 20 µm*	10 000 Hz
QE50	0.19 - 20 µm*	4000 Hz
QE65, QE95	0.19 - 20 µm*	100 Hz
QE195	0.19 - 20 µm*	Contact us
IS50	Contact us	1000 Hz
PRONTO	0.19 - 20 µm	Single-shot
UP in SSE mode	0.19 - 20 µm	Single-shot
Calorimeters	Contact us	Single-shot

* QED models are represented by dashed area and have a limited spectral range: 0.3 - 2.1 µm

ENERGY DETECTORS

QED attenuators

The QED attenuators increase the maximum energy, energy density, average power and average power density that the QE series detectors can handle. They are engineered to typically transmit 30-50 % (at 1064 nm) of the incident radiation to the detector in a near Lambertian pattern (very wide diffusion pattern). Their slide-in casing make them easy to install and remove and they are held securely in place with the use of simple set screws. Since they become part of the detector, it is important to understand how they will affect the calibration.

CALIBRATION OPTIONS

Depending on how you plan to use a QE detector and QED attenuator, different purchasing and calibration options are available.

QE detector with QED attenuator included

Product name contains "-QED"
Ex: QE25LP-S-MB-**QED**-D0

This product is calibrated with the QED attenuator in place. You may remove the attenuator, but your measurements will not be calibrated with this configuration.

QE detector and QED attenuator purchased separately

OR

Product name does not contain "-QED"
Ex: QE25LP-S-MB-D0 and QED-25

Three calibration options are available when you purchase the QE detector and the QED attenuator separately.

	FULL CALIBRATION The detector is fully calibrated both with and without attenuator. This configuration comes with a DB15 adaptor. · QED-CAL-3	**PARTIAL CALIBRATION** The detector is fully calibrated without attenuator, and is calibrated at a single wavelength with the attenuator. · QED-CAL-1	**NO EXTRA CALIBRATION** The QE detector is fully calibrated without attenuator only. You may add the attenuator, but your measurements will not be calibrated with this configuration.
Detector alone	Fully calibrated	Fully calibrated	Fully calibrated
Detector with attenuator	Fully calibrated when using the DB15 adaptor	Calibrated at 1064 nm only	Not calibrated

SPECIFICATIONS

PHYSICAL CHARACTERISTICS	QED-12	QED-25	QED-50	QED-65	QED-95
Spectral range	266 - 2100 nm	266 - 2100 nm	266 - 2100 nm	266 - 2100 nm	266 - 2100 nm
Calibrated spectral range	532 - 2100 nm	308 - 2100 nm	308 - 2100 nm	308 - 2100 nm	308 - 2100 nm
Effective aperture	9 x 9 mm	22 x 22 mm	47 x 47 mm	62 x 62 mm	90 mm Ø
Dimensions	30.5H x 41W x 12.5D mm	44H x 55W x 12.5D mm	69H x 80W x 12.5D mm	85H x 97W x 12.5D mm	115H x 127W x 12.5D mm
For use with	QE12	QE25	QE50	QE65	QE95

ENERGY DETECTORS

High energy detectors

IS50: ENERGY METER FOR HIGH AVERAGE POWER

Custom-built to your specifications, contact us with your laser measurement needs

- Designed for high energy measurements at high repetition rates
- Can handle up to 1000 W average power
- Our proprietary coating offers damage thresholds that are orders of magnitude higher than any other "white" coating on the market.

IDEAL FOR IPL SOURCES: UP TO 350 J

Available with integra blu

THERMOPILES IN SINGLE-SHOT ENERGY MODE

MEASURE ENERGY WITH A POWER DETECTOR

The single-shot energy mode, available with all our thermal power detectors, allows you to measure the energy of single pulses or pulse trains.

SEE "ENERGY MODE" IN THE POWER DETECTOR SPECIFICATIONS

PRONTO-500-IPL

- Compact energy meter for up to 350 J
- 55 mm Ø aperture
- Color touchscreen display
- Rugged device: all-metal body and protective window

IDEAL FOR IPL SOURCES: UP TO 350 J

CUSTOM CALORIMETERS

We work with a wide range of materials from surface coatings to the most robust volume absorbers to provide the best solution for your specific application.

- Outstanding signal-to-noise ratios
- High sensitivity
- Vacuum compatibility
- Attention to detail and workmanship

With over 50 years of experience in thermal-based energy measurement, Gentec-EO is the ideal choice for all your high energy measurement needs.

PE

8 fJ - 150 nJ, our lowest energy measurements

KEY FEATURES

VERY LOW NOISE LEVEL

Take measurements with a noise level as low as 8 fJ (model PE3B-Si only) with the M-LINK, MAESTRO and S-LINK

3 SENSORS AVAILABLE

- PE-B-SI family: 3 and 10 mm Ø silicon sensors for 0.21 to 1.08 µm
- PE5B-GE: 5 mm Ø, germanium sensor for 0.8 to 1.65 µm
- PE3B-IN: 3 mm Ø, InGaAs sensor for 0.9 to 1.7 µm

OUTPUT OPTIONS

SMART INTERFACE

Containing all the calibration data

ANALOG OUTPUT

When used with APM (D) analog power supply

integra ALL-IN-ONE-METER

Connects directly to a PC

Three models available:

- USB output (-INT)
- RS-232 output (-IDR)
- USB with external trigger (-INE)

COMPATIBLE DISPLAYS & PC INTERFACES

MAESTRO

U-LINK

M-LINK

S-LINK

ACCESSORIES

Stand with delrin post

Fiber adaptors & connectors (FC, ST or SMA)

APM (D) analog power supply

Pelican carrying case

Isolation tube

This product cannot be used with DB15 extension cables

PE
Specifications

CE NIST* Traceable WEEE/RoHS COMPLIANT

*Also traceable to NRC-CNRC




	PE3B-SI-D0	PE10B-SI-D0	PE5B-GE-D0	PE3B-IN-D0
MAX MEASURABLE ENERGY*	24 pJ	81 nJ	2.4 nJ	245 pJ
EFFECTIVE APERTURE	3 mm Ø	10 mm Ø	5 mm Ø	3 mm Ø
MEASUREMENT CAPABILITY				
Calibrated spectral range	210 - 1080 nm	210 - 1080 nm	800 - 1650 nm	900 - 1700 nm
Maximum measurable energy*				
With M-LINK	22 pJ at 634 nm	75 nJ at 634 nm	2.2 nJ at 1310 nm	223 pJ at 1310 nm
With S-LINK	24 pJ at 634 nm	81 nJ at 634 nm	2.4 nJ at 1310 nm	245 pJ at 1310 nm
With MAESTRO	20 pJ at 634 nm	69 nJ at 634 nm	2.0 nJ at 1310 nm	200 pJ at 1310 nm
With INTEGRA	24 pJ at 634 nm	81 nJ at 634 nm	2.4 nJ at 1310 nm	245 pJ at 1310 nm
Noise equivalent energy [a]	8 fJ at 634 nm	1.5 pJ at 634 nm	1 pJ at 1310 nm	30 fJ at 1310 nm
Rise time (0-100%)	15 µs	30 µs	25 µs	12 µs
Max repetition rate	1000 Hz	1000 Hz	1000 Hz	1000 Hz
Max pulse width	10 µs	10 µs	10 µs	10 µs
Calibration uncertainty [b]	± 4% [c]	± 18% (210 - 229 nm) ± 8.0% (230 - 254 nm) ± 6.5% (255 - 399 nm) ± 2.5% (400 - 899 nm) ± 4.0% (900 - 1009 nm) ± 7.5% (1010 - 1080 nm)	± 5% (800 - 1049 nm) ± 3.5% (1050 - 1559 nm) ± 7% (1560 - 1629 nm) ± 10% (1630 - 1650 nm)	± 4% [d]
DAMAGE THRESHOLDS				
Max energy density	N/A	5 µJ/cm²	5 µJ/cm²	N/A
Max average power density	N/A	65 mW/cm² at 532 nm	320 mW/cm² at 1064 nm	N/A
PHYSICAL CHARACTERISTICS				
Effective aperture	3 mm Ø	10 mm Ø	5 mm Ø	3 mm Ø
Distance to sensor face	13.7 mm	13.7 mm	10.5 mm	N/A
Sensor	UV-silicon	UV-silicon	Germanium	InGaAs
Dimensions	38.1Ø x 27.4D mm	38.1Ø x 27.4D mm	38.1Ø x 27.4D mm	38.1Ø x 27.4D mm
Weight	91 g	91 g	91 g	91 g
ORDERING INFORMATION				
Available output options	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232
Compatible stand	STAND-D-233 or STAND-D-233-M	STAND-D-233 or STAND-D-233-M	STAND-D-233 or STAND-D-233-M	STAND-D-233 or STAND-D-233-M
Product page				

** See curves (p. 102-103) for maximum energy at other wavelengths*

a. Nominal value. Depends on environmental electromagnetic interference and wavelength.
b. With Gentec-EO display or PC interface.
c. This detector is NIST Traceable at the calibration wavelength of 634 nm. Typical values are used at other wavelengths.
d. This detector is NIST Traceable at the calibration wavelength of 1310 nm. Typical values are used at other wavelengths.

QE-B

50 nJ - 3.6 mJ, ultra-low energy measurements

KEY FEATURES

VERY LOW NOISE LEVELS

Noise levels of a photodetector, but with the high energies of a pyroelectric:

- 50 nJ with the MT coating
- 100 nJ with the BL coating

2 COATINGS AVAILABLE

- BL: Black coating, sensitivity of 900 V/J, readings up to 400 Hz
- MT: Metallic coating, sensitivity of 2400 V/J, readings up to 1000 Hz

OUTPUT OPTIONS

SMART INTERFACE

Containing all the calibration data

ANALOG OUTPUT

When used with APM (D) analog power supply

integra ALL-IN-ONE-METER

Connects directly to a PC

Three models available:

- USB output (-INT)
- RS-232 output (-IDR)
- USB with external trigger (-INE)

COMPATIBLE DISPLAYS & PC INTERFACES

MAESTRO

U-LINK

M-LINK

S-LINK

ACCESSORIES

Stand with delrin post

Fiber adaptors & connectors (FC, ST or SMA)

APM (D) analog power supply

Pelican carrying case

Isolation tube

This product cannot be used with DB15 extension cables

QE-B
Specifications

*Also traceable to NRC-CNRC

	QE8SP-B-BL	QE8SP-B-MT
MAX MEASURABLE ENERGY	3.6 mJ	1.3 mJ
MAX REPETITION FREQUENCY	400 Hz	1000 Hz
EFFECTIVE APERTURE	7.8 X 7.8 mm	7.8 X 7.8 mm
MEASUREMENT CAPABILITY		
Spectral range	0.19 - 20 µm	0.19 - 20 µm
Calibrated spectral range [a]	0.248 - 2.1 µm	0.248 - 2.1 µm
Max measurable energy		
With U-LINK	3.6 mJ	1.3 mJ
With S-LINK	2.9 mJ	1.1 mJ
With MAESTRO	2.5 mJ	0.93 mJ
Noise equivalent energy		
With U-LINK	150 nJ	80 nJ
With S-LINK	100 nJ	50 nJ
With MAESTRO	150 nJ	80 nJ
Max repetition frequency	400 Hz	1000 Hz
Max pulse width	10 µs	10 µs
Risetime (0-100%)	30 µs	30 µs
Calibration uncertainty	± 4.0%	± 4.0%
Repeatability	< 0.5%	< 0.5%
DAMAGE THRESHOLDS		
Maximum average power	0.5 W	0.5 W
Maximum everage power density		
1064 nm, 7 ns, 10 Hz	1 W/cm²	1 W/cm²
Maximum energy density		
1064 nm, 7 ns, 10 Hz	50 mJ/cm²	50 mJ/cm²
PHYSICAL CHARACTERISTICS		
Effective aperture	7.8 x 7.8 mm	7.8 x 7.8 mm
Absorber	Organic black	Metallic
Dimensions	38.1 Ø X 27.4D mm	38.1 Ø X 27.4D mm
Weight	91 g	91 g
ORDERING INFORMATION		
Available output options	DB15, USB or RS-232	DB15, USB or RS-232
Compatible stand	STAND-D-233 or STAND-D-233-M	STAND-D-233 or STAND-D-233-M
Product page		

a. Calibration at 2.1 to 2.5 µm is available on special request.

MACH 6

200 kHz energy meter

KEY FEATURES

- **UP TO 200 kHz PULSE-TO-PULSE**
  Measure EVERY pulse, with no sampling, at high rep rates, up to 200 kHz
- **CAPTURE AND STORE UP TO 4 MILLION PULSES**
  Store 40 seconds of data at 100 kHz
- **TRACK MISSING PULSES AND PULSES BELOW THRESHOLD**
  Know how many pulses were missed or that didn't make the energy threshold with this unique pulse feature
- **SEVERAL HEADS TO CHOOSE FROM**
  Silicon, InGaAs and pyroelectric heads for a broad wavelength and energy range
- **ANALOG MODULE AVAILABLE**
  Use our fast M6 detectors with the APM and an oscilloscope for fast analog energy measurements
- **FULL-SPEED USB 2.0 CONNECTION**
  Ensures high data rate transfer and fast operation
- **USER-FRIENDLY SOFTWARE WITH MANY DIAGNOSTIC FEATURES**
  - Live mode, strip chart, histogram and statistics displays
  - FFT display of pulse energy data for temporal diagnostics
  - Life test mode to automate laser testing

COMPATIBLE DISPLAYS & PC INTERFACES

MACH 6

APM

ACCESSORIES

Stand with delrin post

Additional 9V power supply

USB cable

APM analog power supply (requires adaptor when used with M6 heads)

M6-UV-QED
Relative measurements in UV

Pelican carrying case

MACH 6
Specifications

*Also traceable to NRC-CNRC

	M6-6-SI	M6-6-SI-L	M6-6-IN	M6-6-IN-L	M6-6-PY	M6-12.5-PY
MAX ENERGY[a]	200 µJ	2 µJ	200 µJ	2 µJ	2 mJ	20 mJ
MAX AVERAGE POWER	5 W	5 W	5 W	5 W	5 W	25 W
MAX REP RATE	200 000 Hz	200 000 Hz	200 000 Hz	200 000 Hz	200 000 Hz	200 000 Hz
EFFECTIVE APERTURE	6 mm Ø	6 mm Ø	6 mm Ø	6 mm Ø	6 mm Ø	12.5 mm Ø
MEASUREMENT CAPABILITY						
Spectral range	0.35 - 1.1 µm	0.35 - 1.1 µm	0.9 - 1.6 µm	0.9 - 1.6 µm	0.35 - 2.5 µm	0.35 - 2.5 µm
Max measurable energy [a]	200 µJ	2 µJ	200 µJ	2 µJ	2 mJ	20 mJ
Noise equivalent energy	2 nJ	20 pJ	2 nJ	20 pJ	0.2 µJ	0.2 µJ
Rise time (0-100%)	150 ns	150 ns	150 ns	150 ns	150 ns	150 ns
Max repetition rate	200 000 Hz	200 000 Hz	200 000 Hz	200 000 Hz	200 000 Hz	200 000 Hz
Max pulse width	100 ns	100 ns	100 ns	100 ns	100 ns	100 ns
Calibration uncertainty	± 4%	± 4%	± 4%	± 4%	± 4%	± 4%
Repeatability	± 1%	± 1%	± 1%	± 1%	± 1%	± 1%
DAMAGE THRESHOLDS						
Max average power (60 seconds)	5 W	5 W	5 W	5 W	5 W	25 W
Max energy (at 1064 nm)	200 µJ	2 µJ	200 µJ	2 µJ	20 mJ	20 mJ
PHYSICAL CHARACTERISTICS						
Effective aperture	6 mm Ø	6 mm Ø	6 mm Ø	6 mm Ø	6 mm Ø	12.5 mm Ø
Sensor	Silicon	Silicon	InGaAs	InGaAs	Pyroelectric	Pyroelectric
Dimensions	38.1 Ø x 58.4D mm	38.1 Ø x 58.4D mm	38.1 Ø x 58.4D mm	38.1 Ø x 58.4D mm	38.1 Ø x 58.4D mm	76H x 111W x 76D
Weight (head only)	150 g	150 g	150 g	150 g	150 g	N/A
COMPATIBLE METERS						
PC-based	Mach 6: see detailed specifications on next page					
Analog power supply	APM: see detailed specifications on next page (requires adaptor when used with M6 heads)					
ORDERING INFORMATION						
Compatible stand	STAND-D-233	STAND-D-233	STAND-D-233	STAND-D-233	STAND-D-233	STAND-D-233
Product page						

a. Maximum pulse energy reading will vary with wavelength and probe voltage responsivity (Rv). For more details, please read Application Note 121D-201932 and contact us at info@gentec-eo.com

MACH 6
Specifications

MACH 6 JOULEMETER

Measure every pulse at up to 200 kHz with MACH 6. Measure with 12-bit digital accuracy and capture up to 4 million pulses in real time. Our MACH 6 joulemeter is the only instrument in the world that performs at this speed, and with this precision. It is designed to support our full complement of fast energy probes that include silicon, InGaAs and pyroelectric detectors. Measure from pJ to mJ and from 0.35 to 2.5 µm. Using the M6-Si detector and the M6-UV-QED accessory, you can make relative measurements at 266 nm.

MACH 6
(rear view)

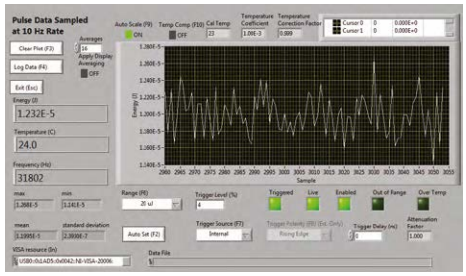
APM analog power supply
(front view)

SPECIFICATIONS & FEATURES

	MACH 6	APM
Compatible detector heads	M6	M6 (with adaptor: P/N C201949), UM-B, QE8, THZ9D and PE detectors
Maximum repetition rate	200 000 Hz	Limited by oscilloscope and detector
Analog output	0 - 3 V	± 4.88 V, BNC
External trigger (TTL)	Optically coupled	None
Internal trigger	2 - 20%	None
Trigger delay	38 - 3825 ns (user-settable)	None
Digital output	USB 2.0	None
Power supply	External, 100/240 VAC 50 - 60 Hz	External, 100/240 VAC 50 - 60 Hz, and 9 V battery (both included)
Product number	202090	201848

INSTRUMENT CONTROL SCREEN

Our powerful LabVIEW application software includes many unique control and diagnostic features. The instrument control screen, shown on the left, is used to set up the operation of the MACH 6, including range, trigger, wavelength, and more. In addition, it is used to set a pulse batch size and to arm the instrument, which starts the data collection. It also gives you access to features like “Autoset”, “Call Live Mode”, “Run Life Test”, “Save Instrument Setup” and the like. These features can be accessed by clicking directly on the feature or pushing the associated function key.

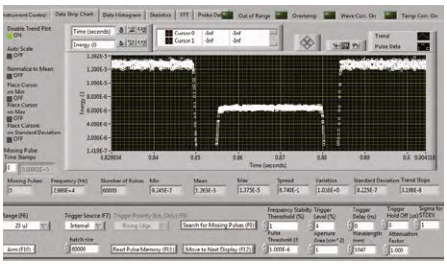


LIVE MODE DISPLAY

The live mode can be accessed from the instrument control screen, or by simply pressing the “F4” function key on your PC. This mode of operation is intended to act like your typical slower digital joulemeter, as it samples the laser pulses at a 10 Hz rate. It provides you with an energy strip chart, live energy reading, statistics and repetition rate. It is a very useful mode when setting up the Mach 6 with your laser. You can select “Auto Set”, where the instrument runs through the ranges and trigger levels until it finds the correct range, or set them manually. When setup is complete, you will exit this screen and return to the “Control” screen where you will select a batch size, arm the instrument and start taking pulse energy data.

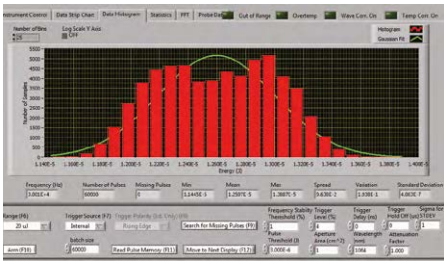
MACH 6
Specifications

*Also traceable to NRC-CNRC



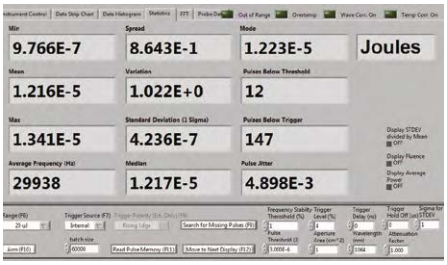
STRIP CHART

The strip chart display provides a quick graphical look at the pulse data batch just collected. The data can be displayed in full scale or in auto scale mode. You can also zoom-in on a portion of the data, like shown in the screen on the left. An ND0.3 filter has been dropped through the beam and you can see the effects on the pulse data collected. You can fit trend and min/max lines to the data. Just below the chart, you will find a complete set of statistics for the batch. At the top of this screen you will see tabs that will take you to the Histogram, Statistics, and FFT (Fast Fourier Transform) displays.



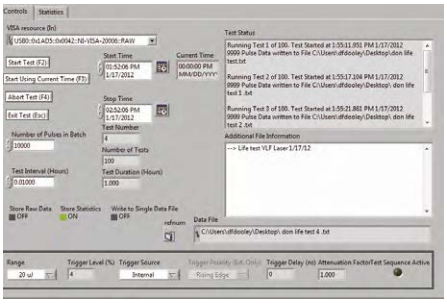
HISTOGRAM

Interested in viewing the statistical distribution of the pulse energy data set? The Histogram screen does this for you and fits a “best Gaussian curve” to the data. It displays complete statistical calculations along the bottom of the graph, along with pulse frequency. Just below the statistics, you will find instrument controls, like range and trigger. You are also given the ability to adjust trigger delay and hold off as needed.



STATISTICS

The statistics display offers a very complete set of useful energy readings and calculated statistics. These include: minimum, maximum, average (mean), standard deviation, spread and variation. Some other very handy features include: windows displaying, average frequency, pulse jitter, pulses below trigger and pulses below threshold (a level set by you). In the screen on the left, you can see that there were 12 pulses below an energy threshold of 3 µW, and 147 missing pulses (or pulses below trigger).



LIFE TEST MODE

Would you like to run a life test on your high repetition rate pulsed laser? How about a periodic test vs. an environmental change like temperature? We have included a great feature to accomplish this. In the life test screen, we give you the ability to select the statistics you want, a start time and date, a stop time and date, the number of pulses and a test interval. You simply identify a file, a place to put the data, and then click on start and walk away! When you come back, you have a data set that tracked the performance of your laser over time, temperature, shock, vibration or anything you chose.

QE12-MB

12 x 12 mm, 0.7 µJ - 3.9 J

KEY FEATURES

MODULAR CONCEPT
Increase the power capability of your detector:
2 different cooling modules

LOW NOISE LEVEL

QED ATTENUATOR AVAILABLE
- Measure up to 5X higher energies
- Available with optional calibration, all wavelengths between 532 & 1064 nm, or single wavelength

HIGH REPETITION RATE OPTIONS
- QE12LP: 300 Hz
- QE12HR: 1000 Hz

TEST TARGET INCLUDED

OUTPUT OPTIONS

SMART INTERFACE
Containing all the calibration data

integra ALL-IN-ONE-METER
Connects directly to a PC
Three models available:
- USB output (-INT)
- RS-232 output (-IDR)
- USB with external trigger (-INE)

COMPATIBLE DISPLAYS & PC INTERFACES


MIRO ALTITUDE


MAESTRO


U-LINK


M-LINK


S-LINK

ACCESSORIES


Stand with delrin post


DB15 to BNC adaptor


QED-12 attenuator


Pelican carrying case

QE12-MB
Specifications

*Also traceable to NRC-CNRC

	QE12LP-S-MB	QE12LP-S-MB-QED	QE12LP-H-MB	QE12LP-H-MB-QED	QE12HR-H-MB	QE12HR-H-MB-QED
MAX MEASURABLE ENERGY [a]	3.9 J	3.9 J	3.9 J	3.9 J	0.85 J	3.9 J
MAX REPETITION FREQUENCY [b]	300 Hz	300 Hz	300 Hz	300 Hz	1 kHz	1 kHz
EFFECTIVE APERTURE	12 x 12 mm	9 x 9 mm	12 x 12 mm	9 x 9 mm	12 x 12 mm	9 x 9 mm
MEASUREMENT CAPABILITY						
Spectral range	0.19 - 20 µm	0.3 - 2.1 µm	0.19 - 20 µm	0.3 - 2.1 µm	0.19 - 20 µm	0.3 - 2.1 µm
Calibrated spectral range [c]	0.248 - 2.1 µm	0.532 - 2.1 µm	0.248 - 2.1 µm	0.532 - 2.1 µm	0.248 - 2.1 µm	0.532 - 2.1 µm
Maximum measurable energy [a]						
1064 nm, 7 ns	0.85 J	3.9 J	0.85 J	3.9 J	0.85 J	3.9 J
266 nm, 7 ns	0.70 J	0.81 J	0.70 J	0.81 J	0.70 J	0.81 J
Noise equivalent energy [d]	0.7 µJ	1.4 µJ	0.7 µJ	1.4 µJ	1.4 µJ	2.8 µJ
Max repetition frequency [b]	300 Hz	300 Hz	300 Hz	300 Hz	1 kHz	1 kHz
Maximum pulse width (typical) [e]	400 µs	400 µs	400 µs	400 µs	40 µs	40 µs
Calibration uncertainty [f]	± 3%	± 3%	± 3%	± 3%	± 3%	± 3%
Repeatability	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
DAMAGE THRESHOLDS						
Maximum average power	3 W	7.5 W	5 W	12.5 W	5 W	12.5 W
Maximum energy density						
1064 nm, 7 ns, single shot	0.6 J/cm²	16 J/cm²	0.6 J/cm²	16 J/cm²	0.6 J/cm²	16 J/cm²
1064 nm, 7 ns, 10 Hz	0.6 J/cm²	8 J/cm²	0.6 J/cm²	8 J/cm²	0.6 J/cm²	8 J/cm²
532 nm, 7 ns, 10 Hz	0.6 J/cm²	6 J/cm²	0.6 J/cm²	6 J/cm²	0.6 J/cm²	6 J/cm²
266 nm, 7 ns, 10 Hz	0.5 J/cm²	1 J/cm²	0.5 J/cm²	1 J/cm²	0.5 J/cm²	1 J/cm²
Maximum average power density [g]	10 W/cm²	600 W/cm²	10 W/cm² [j]	600 W/cm²	10 W/cm²	600 W/cm²
PHYSICAL CHARACTERISTICS						
Effective aperture (with attenuator)	12 x 12 mm	9 x 9 mm	12 x 12 mm	9 x 9 mm	12 x 12 mm	9 x 9 mm
Absorber	MB	QED	MB	QED	MB	QED
Dimensions	36H x 36W x 14D mm	39H x 41W x 19D mm	36H x 36W x 33D mm	39H x 41W x 38D mm	36H x 36W x 33D mm	39H x 41W x 38D mm
Weight	87 g	87 g	117 g	117 g	117 g	117 g
ORDERING INFORMATION						
Available output options	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232
Compatible stand	STAND-D-233	STAND-D-233	STAND-D-233	STAND-D-233	STAND-D-233	STAND-D-233
Product page						

a. Not exceeding maximum average power. Increasing pulse width increases the maximum measurable energy. The maximum measurable energy depends on the display or PC interface used. If your laser is close to the maximum, contact us to check your specifications.
b. With the IDR version, measured values are sampled when the repetition rate is > 200 Hz.
c. Calibration at 2.1 to 2.5 µm is available on special request.
d. Nominal value, actual value depends on electrical noise in the measurement system.
e. Also available on special order: ELP (extra-long pulse) version.
f. Excludes non-linearities.
g. At maximum power.

QE25-MB

25 x 25 mm, 2 µJ - 23 J

KEY FEATURES

MODULAR CONCEPT
Increase the power capability of your detector:
2 different cooling modules

LOW NOISE LEVEL

QED ATTENUATOR AVAILABLE
- Measure up to 5X higher energies
- Available with optional calibration, all wavelengths between 532 & 1064 nm, or single wavelength

HIGH REPETITION RATE OPTIONS
- QE25LP: 300 Hz
- QE25HR: 1000 Hz

TEST TARGET INCLUDED

OUTPUT OPTIONS

SMART INTERFACE
Containing all the calibration data

integra ALL-IN-ONE-METER
Connects directly to a PC
Three models available:
- USB output (-INT)
- RS-232 output (-IDR)
- USB with external trigger (-INE)

COMPATIBLE DISPLAYS & PC INTERFACES

MIRO ALTITUDE

MAESTRO

U-LINK

M-LINK

S-LINK

ACCESSORIES

Stand with delrin post

DB15 to BNC adaptor

QED-25 attenuator

Pelican carrying case

QE25-MB
Specifications

CE NIST* Traceable WEEE/RoHS COMPLIANT

*Also traceable to NRC-CNRC

	QE25LP-S-MB	QE25LP-S-MB-QED	QE25LP-H-MB	QE25LP-H-MB-QED	QE25HR-H-MB	QE25HR-H-MB-QED
MAX MEASURABLE ENERGY [a]	3.8 J	23 J	3.8 J	23 J	3.8 J	23 J
MAX REPETITION FREQUENCY [b]	300 Hz	300 Hz	300 Hz	300 Hz	1 kHz	1 kHz
EFFECTIVE APERTURE	25 x 25 mm	22 x 22 mm	25 x 25 mm	22 x 22 mm	25 x 25 mm	22 x 22 mm
MEASUREMENT CAPABILITY						
Spectral range	0.19 - 20 µm	0.3 - 2.1 µm	0.19 - 20 µm	0.3 - 2.1 µm	0.19 - 20 µm	0.3 - 2.1 µm
Calibrated spectral range[c]	0.248 - 2.1 µm	0.308 - 2.1 µm	0.248 - 2.1 µm	0.308 - 2.1 µm	0.248 - 2.1 µm	0.308 - 2.1 µm
Maximum measurable energy [a]						
1064 nm, 7 ns	3.8 J	23 J	3.8 J	23 J	3.8 J	23 J
266 nm, 7 ns	3.1 J	4.8 J	3.1 J	4.8 J	3.1 J	4.8 J
Noise equivalent energy [d]	4 µJ	8 µJ	4 µJ	8 µJ	10 µJ	20 µJ
Max repetition frequency [b]	300 Hz	300 Hz	300 Hz	300 Hz	1 kHz	1 kHz
Maximum pulse width (typical) [e]	400 µs	400 µs	400 µs	400 µs	40 µs	40 µs
Calibration uncertainty [f]	± 3%	± 3%	± 3%	± 3%	± 3%	± 3%
Repeatability	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
DAMAGE THRESHOLDS						
Maximum average power	5 W	15 W	10 W	30 W	10 W	30 W
Maximum energy density						
1064 nm, 7 ns, single shot	0.6 J/cm²	16 J/cm²	0.6 J/cm²	16 J/cm²	0.6 J/cm²	16 J/cm²
1064 nm, 7 ns, 10 Hz	0.6 J/cm²	8 J/cm²	0.6 J/cm²	8 J/cm²	0.6 J/cm²	8 J/cm²
532 nm, 7 ns, 10 Hz	0.6 J/cm²	6 J/cm²	0.6 J/cm²	6 J/cm²	0.6 J/cm²	6 J/cm²
266 nm, 7 ns, 10 Hz	0.5 J/cm²	1 J/cm²	0.5 J/cm²	1 J/cm²	0.5 J/cm²	1 J/cm²
Maximum average power density [g]	10 W/cm²	600 W/cm²	10 W/cm²	600 W/cm²	10 W/cm²	600 W/cm²
PHYSICAL CHARACTERISTICS						
Effective aperture	25 X 25 mm	22 X 22 mm	25 X 25 mm	22 X 22 mm	25 X 25 mm	22 X 22 mm
Absorber	MB	QED	MB	QED	MB	QED
Dimensions	50H x 50W x 14D mm	53H x 55W x 19D mm	50H x 50W x 53D mm	53H x 55W x 58D mm	50H x 50W x 53D mm	53H x 55W x 58D mm
Weight	120 g	120 g	193 g	193 g	193 g	193 g
ORDERING INFORMATION						
Available output options	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232
Compatible stand	STAND-D-233	STAND-D-233	STAND-D-233	STAND-D-233	STAND-D-233	STAND-D-233
Product page						

a. Not exceeding maximum average power. Increasing pulse width increases the maximum measurable energy. The maximum measurable energy depends on the display or PC interface used. If your laser is close to the maximum, contact us to check your specifications.
b. With the IDR version, measured values are sampled when the repetition rate is > 200 Hz.
c. Calibration at 2.1 to 2.5 µm is available on special request.
d. Nominal value, actual value depends on electrical noise in the measurement system.
e. Also available on special order: ELP (extra-long pulse) version
f. Excludes non-linearities.
g. At maximum power.

T 418.651.8003 | info@gentec-eo.com

QE50-MB

50 x 50 mm, 10 µJ - 85 J

KEY FEATURES

- **MODULAR CONCEPT**
  Increase the power capability of your detector:
  2 different cooling modules
- **LOW NOISE LEVEL**
- **QED ATTENUATOR AVAILABLE**
  - Measure up to 5X higher energies
  - Available with optional calibration, all wavelengths between 532 & 1064 nm, or single wavelength
- **TEST TARGET INCLUDED**

OUTPUT OPTIONS

- **SMART INTERFACE**
  Containing all the calibration data
- **integra ALL-IN-ONE-METER**
  Connects directly to a PC
  Three models available:
  - USB output (-INT)
  - RS-232 output (-IDR)
  - USB with external trigger (-INE)

COMPATIBLE DISPLAYS & PC INTERFACES


MIRO ALTITUDE


MAESTRO


U-LINK

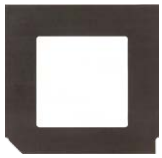

M-LINK


S-LINK

ACCESSORIES


Stand with delrin post


DB15 to BNC adaptor


QED-50 attenuator


Pelican carrying case

QE50-MB
Specifications

CE NIST* Traceable WEEE/RoHS COMPLIANT

*Also traceable to NRC-CNRC




	QE50LP-S-MB	QE50LP-S-MB-QED	QE50LP-H-MB	QE50LP-H-MB-QED
MAX MEASURABLE ENERGY [a]	15 J	85 J	15 J	85 J
MAX REPETITION FREQUENCY	200 Hz	200 Hz	200 Hz	200 Hz
EFFECTIVE APERTURE	50 x 50 mm	47 x 47 mm	50 x 50 mm	47 x 47 mm
MEASUREMENT CAPABILITY				
Spectral range	0.19 - 20 µm	0.3 - 2.1 µm	0.19 - 20 µm	0.3 - 2.1 µm
Calibrated spectral range [b]	0.248 - 2.1 µm	0.308 - 2.1 µm	0.248 - 2.1 µm	0.308 - 2.1 µm
Maximum measurable energy [a]				
1064 nm, 7 ns	15 J	85 J	15 J	85 J
266 nm, 7 ns	12.5 J	22 J	12.5 J	22 J
Noise equivalent energy [c]	10 µJ	20 µJ	10 µJ	20 µJ
Max repetition frequency	200 Hz	200 Hz	200 Hz	200 Hz
Maximum pulse width (typical) [d]	675 µs	675 µs	675 µs	675 µs
Calibration uncertainty [e]	± 3%	± 3%	± 3%	± 3%
Repeatability	< 0.5%	< 0.5%	< 0.5%	< 0.5%
DAMAGE THRESHOLDS				
Maximum average power	10 W	25 W	20 W	45 W
Maximum energy density				
1064 nm, 7 ns, single shot	0.6 J/cm²	16 J/cm²	0.6 J/cm²	16 J/cm²
1064 nm, 7 ns, 10 Hz	0.6 J/cm²	8 J/cm²	0.6 J/cm²	8 J/cm²
532 nm, 7 ns, 10 Hz	0.6 J/cm²	6 J/cm²	0.6 J/cm²	6 J/cm²
266 nm, 7 ns, 10 Hz	0.5 J/cm²	1 J/cm²	0.5 J/cm²	1 J/cm²
Maximum average power density [f]	10 W/cm²	600 W/cm²	10 W/cm²	600 W/cm²
PHYSICAL CHARACTERISTICS				
Effective aperture	50 x 50 mm	47 x 47 mm	50 x 50 mm	47 x 47 mm
Absorber	MB	QED	MB	QED
Dimensions	75H x 75W x 15D mm	78H x 80W x 20D mm	75H x 75W x 44D mm	78H x 80W x 49D mm
Weight	209 g	209 g	338 g	338 g
ORDERING INFORMATION				
Available output options	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232
Compatible stand	STAND-D-233	STAND-D-233	STAND-D-233	STAND-D-233
Product page				

a. Not exceeding maximum average power. Increasing pulse width increases the maximum measurable energy. The maximum measurable energy depends on the display or PC interface used. If your laser is close to the maximum, contact us to check your specifications.
b. Calibration at 2.1 to 2.5 µm is available on special request.
c. Nominal value, actual value depends on electrical noise in the measurement system.
d. Also available on special order: ELP (extra-long pulse) version.
e. Excludes non-linearities.
f. At maximum power.

QE65-MB

65 x 65 mm, 10 µJ - 200 J

KEY FEATURES

MODULAR CONCEPT
Increase the power capability of your detector:
2 different cooling modules

LARGE APERTURE
Effective aperture of 65 x 65 mm

QED ATTENUATOR AVAILABLE
- Measure up to 5X higher energies
- Available with optional calibration, all wavelengths between 532 & 1064 nm, or single wavelength

LOW NOISE LEVEL
10 µJ for the MB coating

TEST TARGET INCLUDED
With the MB models

OUTPUT OPTIONS

SMART INTERFACE
Containing all the calibration data

integra ALL-IN-ONE-METER
Connects directly to a PC
Three models available:
- USB output (-INT)
- RS-232 output (-IDR)
- USB with external trigger (-INE)

COMPATIBLE DISPLAYS & PC INTERFACES


MIRO ALTITUDE


MAESTRO


U-LINK


M-LINK

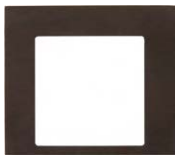

S-LINK

ACCESSORIES


Stand with delrin post (200428, For -S model)


Stand with delrin post (201284, For -H model)


DB15 to BNC adaptor


QED-65 attenuator


Pelican carrying case

QE65-MB
Specifications

CE NIST* Traceable WEEE/RoHS COMPLIANT
*Also traceable to NRC-CNRC

	QE65LP-S-MB	QE65LP-S-MB-QED	QE65LP-H-MB	QE65LP-H-MB-QED	QE65ELP-H-MB
MAX MEASURABLE ENERGY [a]	25 J	200 J	25 J	200 J	50 J
MAX REPETITION FREQUENCY	100 Hz	100 Hz	100 Hz	100 Hz	20 Hz
EFFECTIVE APERTURE	65 x 65 mm	62 x 62 mm	65 x 65 mm	62 x 62 mm	65 x 65 mm
MEASUREMENT CAPABILITY					
Spectral range	0.19 - 20 µm	0.3 - 2.1 µm	0.19 - 20 µm	0.3 - 2.1 µm	0.19 - 20 µm
Calibrated spectral range [b]	0.248 - 2.1 µm	0.308 - 2.1 µm	0.248 - 2.1 µm	0.308 - 2.1 µm	0.248 - 2.1 µm
Maximum measurable energy [a]					
1064 nm, 150 µs	25 J	200 J	25 J	200 J	50 J
1064 nm, 7 ns	25 J	125 J	25 J	125 J	25 J
266 nm, 7 ns	20 J	35 J	20 J	35 J	20 J
Noise equivalent energy [c]	10 µJ	20 µJ	10 µJ	20 µJ	20 µJ
Max repetition frequency	100 Hz	100 Hz	100 Hz	100 Hz	20 Hz
Maximum pulse width (typical) [d]	0.7 ms	0.7 ms	0.7 ms	0.7 ms	5 ms
Calibration uncertainty [e]	± 3%	± 3%	± 3%	± 3%	± 3%
Repeatability	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
DAMAGE THRESHOLDS					
Maximum average power	12 W	30 W	40 W	90 W	40 W
Maximum energy density					
1064 nm, 150 µs, 10 Hz	1.2 J/cm²	14 J/cm²	1.2 J/cm²	14 J/cm²	1.2 J/cm²
1064 nm, 7 ns, single shot	0.6 J/cm²	16 J/cm²	0.6 J/cm²	16 J/cm²	0.6 J/cm²
1064 nm, 7 ns, 10 Hz	0.6 J/cm²	8 J/cm²	0.6 J/cm²	8 J/cm²	0.6 J/cm²
532 nm, 7 ns, 10 Hz	0.6 J/cm²	6 J/cm²	0.6 J/cm²	6 J/cm²	0.6 J/cm²
266 nm, 7 ns, 10 Hz	0.5 J/cm²	1 J/cm²	0.5 J/cm²	1 J/cm²	0.5 J/cm²
Maximum average power density [f]	10 W/cm²	600 W/cm²	10 W/cm² [h]	600 W/cm²	10 W/cm²
PHYSICAL CHARACTERISTICS					
Effective aperture	65 x 65 mm	62 x 62 mm	65 x 65 mm	62 x 62 mm	65 x 65 mm
Absorber	MB	QED	MB	QED	MB
Dimensions	92H x 92W x 20D mm	95H x 97W x 25D mm	92H x 92W x 99D mm	95H x 97W x 104D mm	92H x 92W x 99D mm
Weight	440 g	440 g	900 g	900 g	900 g
ORDERING INFORMATION					
Available output options	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232
Compatible stand	STAND-D-233	STAND-D-233	STAND-D-443	STAND-D-443	STAND-D-443
Product page					

a. Not exceeding maximum average power. Increasing pulse width increases the maximum measurable energy. The maximum measurable energy depends on the display or PC interface used. If your laser is close to the maximum, contact us to check your specifications.
b. Calibration at 2.1 to 2.5 µm is available on special request.
c. Nominal value, actual value depends on electrical noise in the measurement system.
d. Also available on special order: ELP (extra-long pulse) version.
e. Excludes non-linearities.
f. At maximum power.

QE95-MB

95 mm Ø, 15 µJ - 250 J

KEY FEATURES

- **MODULAR CONCEPT**
  Increase the power capability of your detector:
  2 different cooling modules
- **EXTRA LARGE APERTURE**
  Effective aperture of 95 mm Ø
- **QED ATTENUATOR AVAILABLE**
  - Measure up to 5X higher energies
  - Available with optional calibration, all wavelengths between 532 & 1064 nm, or single wavelength
- **LOW NOISE LEVEL**
- **TEST TARGET INCLUDED**

OUTPUT OPTIONS

- **SMART INTERFACE**
  Containing all the calibration data
- **integra ALL-IN-ONE-METER**
  Connects directly to a PC
  Three models available:
  - USB output (-INT)
  - RS-232 output (-IDR)
  - USB with external trigger (-INE)

COMPATIBLE DISPLAYS & PC INTERFACES


MIRO ALTITUDE


MAESTRO


U-LINK


M-LINK

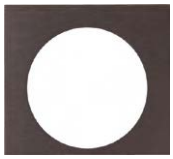

S-LINK

ACCESSORIES


Stand with delrin post (200428, For -S model)


Stand with delrin post (201284, For -H model)


DB15 to BNC adaptor

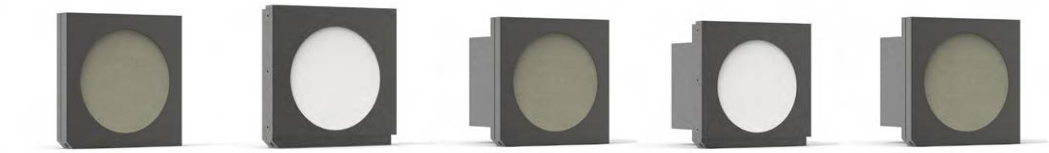

QED-95 attenuator


Pelican carrying case

QE95-MB
Specifications

CE NIST* Traceable WEEE/RoHS COMPLIANT

*Also traceable to NRC-CNRC



	QE95LP-S-MB	QE95LP-S-MB-QED	QE95LP-H-MB	QE95LP-H-MB-QED	QE95ELP-H-MB
MAX MEASURABLE ENERGY [a]	35 J	250 J	35 J	250 J	70 J
MAX REPETITION FREQUENCY	40 Hz	40 Hz	40 Hz	40 Hz	10 Hz
EFFECTIVE APERTURE	95 mm Ø	90 mm Ø	95 mm Ø	90 mm Ø	95 mm Ø
MEASUREMENT CAPABILITY					
Spectral range	0.19 - 20 µm	0.3 - 2.1 µm	0.19 - 20 µm	0.3 - 2.1 µm	0.19 - 20 µm
Calibrated spectral range [b]	0.248 - 2.1 µm	0.308 - 2.1 µm	0.248 - 2.1 µm	0.308 - 2.1 µm	0.248 - 2.1 µm
Maximum measurable energy [a]					
1064 nm, 150 µs	35 J	250 J	35 J	250 J	70 J
1064 nm, 7 ns	35 J	150 J	35 J	150 J	35 J
266 nm, 7 ns	30 J	50 J	30 J	50 J	30 J
Noise equivalent energy [c]	15 µJ	30 µJ	15 µJ	30 µJ	30 µJ
Max repetition frequency	40 Hz	40 Hz	40 Hz	40 Hz	10 Hz
Maximum pulse width (typical) [d]	1.5 ms	1.5 ms	1.5 ms	1.5 ms	5 ms
Calibration uncertainty [e]	± 3%	± 3%	± 3%	± 3%	± 3%
Repeatability	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
DAMAGE THRESHOLDS					
Maximum average power	20 W	45 W	40 W	90 W	40 W
Maximum energy density					
1064 nm, 150 µs, 10 Hz	1.2 J/cm²	14 J/cm²	1.2 J/cm²	14 J/cm²	1.2 J/cm²
1064 nm, 7 ns, single shot	0.6 J/cm²	16 J/cm²	0.6 J/cm²	16 J/cm²	0.6 J/cm²
1064 nm, 7 ns, 10 Hz	0.6 J/cm²	8 J/cm²	0.6 J/cm²	8 J/cm²	0.6 J/cm²
532 nm, 7 ns, 10 Hz	0.6 J/cm²	6 J/cm²	0.6 J/cm²	6 J/cm²	0.6 J/cm²
266 nm, 7 ns, 10 Hz	0.5 J/cm²	1 J/cm²	0.5 J/cm²	1 J/cm²	0.5 J/cm²
Maximum average power density [f]	10 W/cm²	600 W/cm²	10 W/cm² [h]	600 W/cm²	10 W/cm²
PHYSICAL CHARACTERISTICS					
Effective aperture	95 mm Ø	90 mm Ø	95 mm Ø	90 mm Ø	95 mm Ø
Absorber	MB	QED	MB	QED	MB
Dimensions	122H x 122W x 20D mm	125H x 127W x 25D mm	122H x 122W x 99D mm	125H x 127W x 104D mm	122H x 122W x 99D mm
Weight	0.78 kg	0.78 kg	1.2 kg	1.2 kg	1.2 kg
ORDERING INFORMATION					
Available output options	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232
Compatible stand	STAND-D-233	STAND-D-233	STAND-D-443	STAND-D-443	STAND-D-443
Product page					

a. Not exceeding maximum average power. Increasing pulse width increases the maximum measurable energy. The maximum measurable energy depends on the display or PC interface used. If your laser is close to the maximum, contact us to check your specifications.
b. Calibration at 2.1 to 2.5 µm is available on special request.
c. Nominal value, actual value depends on electrical noise in the measurement system.
d. Also available on special order: ELP (extra-long pulse) version.
e. Excludes non-linearities.
f. At maximum power.

QE195-MB

The largest pyroelectric energy detector on the market

New product

KEY FEATURES

- **CUSTOM-BUILT**
  Contact us with your requirements for a version tailored to your needs
- **MODULAR CONCEPT**
  Increase the power capability of your detector:
  2 different cooling modules
- **EXTRA LARGE APERTURE**
  Effective aperture of 195 mm Ø
- **QED ATTENUATOR AVAILABLE**
  - Measure up to 5X higher energies
  - Available with optional calibration, all wavelengths between 532 & 1064 nm, or single wavelength
- **LOW NOISE LEVEL**
- **TEST TARGET INCLUDED**

OUTPUT OPTIONS

- **SMART INTERFACE**
  Containing all the calibration data
- **integra ALL-IN-ONE-METER**
  Connects directly to a PC
  Three models available:
  - USB output (-INT)
  - RS-232 output (-IDR)
  - USB with external trigger (-INE)

COMPATIBLE DISPLAYS & PC INTERFACES

MIRO ALTITUDE

MAESTRO

U-LINK

M-LINK

S-LINK

ACCESSORIES

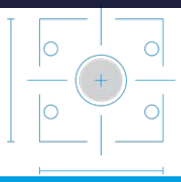
Stand with delrin post

DB15 to BNC adaptor

Pelican carrying case

QE195-MB
Specifications

*Also traceable to NRC-CNRC



	QE195, CUSTOM CAPABILITIES	QE195-QED, CUSTOM CAPABILITIES
MAX MEASURABLE ENERGY [a]	Up to 250 J	Up to 700 J
MAX REPETITION FREQUENCY	Up to 200 Hz	Up to 200 Hz
EFFECTIVE APERTURE	195 mm Ø	185 mm Ø
MEASUREMENT CAPABILITY		
Spectral range	0.19 - 20 µm	0.3 - 2.1 µm
Calibrated spectral range [b]	0.248 - 2.1 µm	0.308 - 2.1 µm
Maximum measurable energy [a]		
1064 nm, 150 µs	Up to 250 J	Up to 700 J
1064 nm, 7 ns	Up to 125 J	Up to 400 J
Noise equivalent energy [c]	As low as 100 µJ	As low as 200 µJ
Max repetition frequency	Up to 200 Hz	Up to 200 Hz
Maximum pulse width (typical) [d]	Up to 5 ms	Up to 5 ms
Calibration uncertainty [e]	± 3 %	± 3 %
Repeatability	< ± 0.5 %	< ± 0.5 %
DAMAGE THRESHOLDS		
Maximum average power	Up to 150 W	Up to 350 W
Maximum energy density		
1064 nm, 150 µs, 10 Hz	1.2 J/cm²	14 J/cm²
1064 nm, 7 ns, single shot	0.6 J/cm²	16 J/cm²
1064 nm, 7 ns, 10 Hz	0.6 J/cm²	8 J/cm²
266 nm, 7 ns, 10 Hz	0.5 J/cm²	1 J/cm²
Maximum average power density [f]	10 W/cm²	600 W/cm²
PHYSICAL CHARACTERISTICS		
Effective aperture	195 mm Ø	185 mm Ø
Absorber	MB or MT	QED
Dimensions	229H x 229W x 24D mm (thicker with heatsink)	229H x 229W x 27D mm (thicker with heatsink)
Weight	3 - 5 kg	3 - 6 kg
Cooling	Convection or heatsink	Convection or heatsink
ORDERING INFORMATION		
Available output options	DB15, USB or RS-232	DB15, USB or RS-232
Compatible stand	STAND-D-443	STAND-D-443
Product page		

** These products are custom-built. Contact us with your requirements for a version tailored to your needs.*

a. Not exceeding maximum average power. Increasing pulse width increases the maximum measurable energy. The maximum measurable energy depends on the display or PC interface used. If your laser is close to the maximum, contact us to check your specifications.
b. Calibration at 2.1 to 2.5 µm is available on special request.
c. Nominal value, actual value depends on electrical noise in the measurement system.
d. Excludes non-linearities.
e. At 12 W.

QE12-MT

12 x 12 mm, 0.7 µJ - 3.9 J, tuned for high repetition rates

KEY FEATURES

- **MODULAR CONCEPT**
  Increase the power capability of your detector:
  2 different cooling modules
- **LOW NOISE LEVEL**
- **NEW MODELS FOR HIGH REPETITION RATES**
  The QE12HR models are tuned for short pulses with high repetition rates (up to 10 kHz)

OUTPUT OPTIONS

- **SMART DB15 CONNECTOR**
  Contains all the calibration data
- *integra* **ALL-IN-ONE-METER**
  Connects directly to a PC
  Three models available:
  - USB output (-INT)
  - RS-232 output (-IDR)
  - USB with external trigger (-INE)

COMPATIBLE DISPLAYS & PC INTERFACES


MIRO ALTITUDE


MAESTRO


U-LINK


M-LINK


S-LINK

ACCESSORIES


Stand with delrin post


DB15 to BNC adaptor


QED-12 attenuator


Pelican carrying case

QE12-MT
Specifications

*Also traceable to NRC-CNRC



	QE12SP-S-MT-D0	QE12SP-H-MT-D0	QE12HR-H-MT-D0
MAX MEASURABLE ENERGY [a]	0.70 J	0.70 J	0.70 J
MAX REPETITION FREQUENCY [b,c]	6 kHz	6 kHz	10 kHz
APERTURE	12 x 12 mm	12 x 12 mm	12 x 12 mm
MEASUREMENT CAPABILITY			
Spectral range	0.19 - 20 µm	0.19 - 20 µm	0.19 - 20 µm
Calibrated spectral range [d]	0.248 - 2.1 µm	0.248 - 2.1 µm	0.248 - 2.1 µm
Maximum measurable energy [a]			
1064 nm, 7 ns	0.70 J	0.70 J	0.70 J
266 nm, 7 ns	0.10 J	0.10 J	0.10 J
Noise equivalent energy [e]	0.8 µJ	0.8 µJ	1 µJ
Max repetition frequency [b,c]	6 kHz	6 kHz	10 kHz
Maximum pulse width (typical)	10 µs	10 µs	4 µs
Calibration uncertainty [f]	± 3%	± 3%	± 3%
Repeatability	< 0.5%	< 0.5%	< 0.5%
DAMAGE THRESHOLDS			
Maximum average power	3 W	5 W	5W
Maximum energy density			
1064 nm, 7 ns, single shot	0.50 J/cm²	0.50 J/cm²	0.50 J/cm²
1064 nm, 7 ns, 10 Hz	0.50 J/cm²	0.50 J/cm²	0.50 J/cm²
532 nm, 7 ns, 10 Hz	0.07 J/cm²	0.07 J/cm²	0.07 J/cm²
266 nm, 7 ns, 10 Hz	0.07 J/cm²	0.07 J/cm²	0.07 J/cm²
Maximum average power density [g]	10 W/cm²	10 W/cm²	10 W/cm²
PHYSICAL CHARACTERISTICS			
Effective aperture	12 x 12 mm	12 x 12 mm	12 x 12 mm
Absorber	MT	MT	MT
Dimensions	36H x 36W x 14D mm	36H x 36W x 33D mm	36H x 36W x 33D mm
Weight	87 g	117 g	117 g
ORDERING INFORMATION			
Available output options	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232
Compatible stand	STAND-D-233	STAND-D-233	STAND-D-233
Product page			

a. Not exceeding maximum average power. Increasing pulse width increases the maximum measurable energy. The maximum measurable energy depends on the display or PC interface used. If your laser is close to the maximum, contact us to check your specifications.
b. With the IDR version, measured values are sampled when the repetition rate is > 200 Hz.
c. Maximum 5.2 kHz with INT version.
d. Calibration at 2.1 to 2.5 µm is available on special request.
e. Nominal value, actual value depends on electrical noise in the measurement system.
f. Excludes non-linearities.
g. At maximum power.

QE25-MT

25 x 25 mm, 2 µJ - 23 J, tuned for high repetition rates

KEY FEATURES

- **MODULAR CONCEPT**
  Increase the power capability of your detector:
  2 different cooling modules
- **LOW NOISE LEVEL**
- **NEW MODELS FOR HIGH REPETITION RATES**
  The QE25HR models are tuned for short pulses with high repetition rates (up to 10 kHz)

OUTPUT OPTIONS

- **SMART DB15 CONNECTOR**
  Contains all the calibration data
- *integra* **ALL-IN-ONE-METER**
  Connects directly to a PC
  Three models available:
  - USB output (-INT)
  - RS-232 output (-IDR)
  - USB with external trigger (-INE)

COMPATIBLE DISPLAYS & PC INTERFACES


MIRO ALTITUDE


MAESTRO


U-LINK


M-LINK


S-LINK

ACCESSORIES


Stand with delrin post


DB15 to BNC adaptor

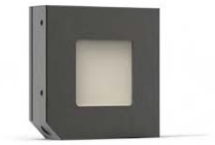

QED-25 attenuator


Pelican carrying case

QE25-MT
Specifications

CE NIST* Traceable WEEE/RoHS COMPLIANT

*Also traceable to NRC-CNRC



	QE25SP-S-MT-D0	QE25SP-H-MT-D0	QE25HR-H-MT-D0
MAX MEASURABLE ENERGY [a]	3.0 J	3.0 J	3.0 J
MAX REPETITION FREQUENCY [b,c]	6 kHz	6 kHz	10 kHz
EFFECTIVE APERTURE	25 x 25 mm	25 x 25 mm	25 x 25 mm
MEASUREMENT CAPABILITY			
Spectral range	0.19 - 20 µm	0.19 - 20 µm	0.19 - 20 µm
Calibrated spectral range [d]	0.248 - 2.1 µm	0.248 - 2.1 µm	0.248 - 2.1 µm
Maximum measurable energy [a]			
1064 nm, 7 ns	3.0 J	3.0 J	3.0 J
266 nm, 7 ns	0.44 J	0.44 J	0.44 J
Noise equivalent energy [e]	2 µJ	2 µJ	3 µJ
Max repetition frequency [b,c]	6 kHz	6 kHz	10 kHz
Maximum pulse width (typical)	10 µs	10 µs	4 µs
Calibration uncertainty [f]	± 3%	± 3%	± 3%
Repeatability	< 0.5%	< 0.5%	< 0.5%
DAMAGE THRESHOLDS			
Maximum average power	5 W	10 W	10W
Maximum energy density			
1064 nm, 7 ns, single shot	0.50 J/cm²	0.50 J/cm²	0.50 J/cm²
1064 nm, 7 ns, 10 Hz	0.50 J/cm²	0.50 J/cm²	0.50 J/cm²
532 nm, 7 ns, 10 Hz	0.07 J/cm²	0.07 J/cm²	0.07 J/cm²
266 nm, 7 ns, 10 Hz	0.07 J/cm²	0.07 J/cm²	0.07 J/cm²
Maximum average power density [g]	10 W/cm²	10 W/cm²	10 W/cm²
PHYSICAL CHARACTERISTICS			
Effective aperture	25 x 25 mm	25 x 25 mm	25 x 25 mm
Absorber	MT	MT	MT
Dimensions	50H x 50W x 14D mm	50H x 50W x 53D mm	50H x 50W x 53D mm
Weight	193 g	193 g	193 g
ORDERING INFORMATION			
Available output options	DB15, USB or RS-232	DB15, USB or RS-232	DB15, USB or RS-232
Compatible stand	STAND-D-233	STAND-D-233	STAND-D-233
Product page			

a. Not exceeding maximum average power. Increasing pulse width increases the maximum measurable energy. The maximum measurable energy depends on the display or PC interface used. If your laser is close to the maximum, contact us to check your specifications.
b. With the IDR version, measured values are sampled when the repetition rate is > 200 Hz.
c. Maximum 5.2 kHz with INT version.
d. Calibration at 2.1 to 2.5 µm is available on special request.
e. Nominal value, actual value depends on electrical noise in the measurement system.
f. Excludes non-linearities.
g. At maximum power.

QE50-MT

50 x 50 mm, 10 µJ - 85 J

KEY FEATURES

- **MODULAR CONCEPT**
  Increase the power capability of your detector:
  2 different cooling modules
- **LOW NOISE LEVEL**
- **QED ATTENUATOR AVAILABLE**
  Measure up to 5X higher energies
  Available with optional calibration, all wavelengths between 532 & 1064 nm, or single wavelength
- **HIGH REPETITION RATE**
  Measure each pulse at up to 4000 Hz

OUTPUT OPTIONS

- **SMART DB15 CONNECTOR**
  Contains all the calibration data
- *integra* **ALL-IN-ONE-METER**
  Connects directly to a PC
  Three models available:
  - USB output (-INT)
  - RS-232 output (-IDR)
  - USB with external trigger (-INE)

COMPATIBLE DISPLAYS & PC INTERFACES


MIRO ALTITUDE


MAESTRO


U-LINK

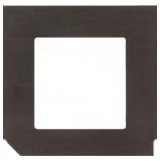

M-LINK


S-LINK

ACCESSORIES

Stand with delrin post


DB15 to BNC adaptor


QED-50 attenuator


Pelican carrying case

QE50-MT
Specifications

*Also traceable to NRC-CNRC

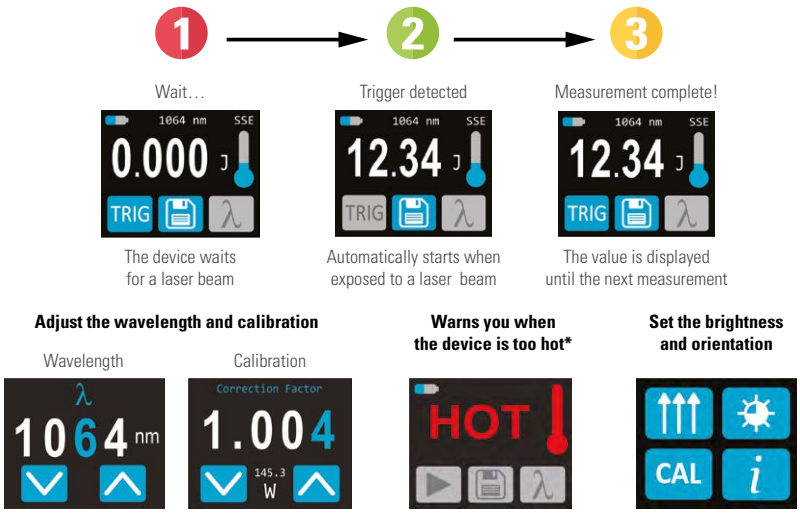
	QE50SP-S-MT-D0	QE50SP-H-MT-D0
MAX MEASURABLE ENERGY [a]	13 J	13 J
MAX REPETITION FREQUENCY [b,c]	4000 Hz	4000 Hz
EFFECTIVE APERTURE	50 x 50 mm	50 x 50 mm
MEASUREMENT CAPABILITY		
Spectral range	0.19 - 20 µm	0.19 - 20 µm
Calibrated spectral range [d]	0.248 - 2.1 µm	0.248 - 2.1 µm
Maximum measurable energy [a]		
1064 nm, 7 ns	13 J	13 J
266 nm, 7 ns	1.8 J	1.8 J
Noise equivalent energy [e]	10 µJ	10 µJ
Max repetition frequency [b,c]	4000 Hz	4000 Hz
Maximum pulse width (typical)	10 µs	10 µs
Calibration uncertainty [f]	± 3%	± 3%
Repeatability	< 0.5%	< 0.5%
DAMAGE THRESHOLDS		
Maximum average power	10W	20W
Maximum energy density		
1064 nm, 7 ns, single shot	0.50 J/cm²	0.50 J/cm²
1064 nm, 7 ns, 10 Hz	0.50 J/cm²	0.50 J/cm2
532 nm, 7 ns, 10 Hz	0.07 J/cm²	0.07 J/cm²
266 nm, 7 ns, 10 Hz	0.07 J/cm²	0.07 J/cm²
Maximum average power density [g]	10 W/cm²	10 W/cm²
PHYSICAL CHARACTERISTICS		
Effective aperture	50 x 50 mm	50 x 50 mm
Absorber	MB	MB
Dimensions	75H x 75W x 15D mm	75H x 75W x 44D mm
Weight	209 g	338 g
ORDERING INFORMATION		
Available output options	DB15, USB or RS-232	DB15, USB or RS-232
Compatible stand	STAND-D-233	STAND-D-233
Product page		

a. Not exceeding maximum average power. Increasing pulse width increases the maximum measurable energy. The maximum measurable energy depends on the display or PC interface used. If your laser is close to the maximum, contact us to check your specifications.
b. With the IDR version, measured values are sampled when the repetition rate is > 200 Hz.
c. Maximum 5.2 kHz with INT version.
d. Calibration at 2.1 to 2.5 µm is available on special request.
e. Nominal value, actual value depends on electrical noise in the measurement system.
f. Excludes non-linearities.
g. At maximum power.

PRONTO-500-IPL

Portable laser probe for IPL sources, 2 - 350 J per pulse

USER INTERFACE (SSE MODE)



* Device may get hot, it is not recommended for handheld use when making a measurement

KEY FEATURES

HIGH ENERGY PER PULSE
Accurate readings up to 350 J/pulse!

EASY TO USE
The touchscreen color LCD allows for a friendly user interface. You can make a measurement with just the touch of a button!

DATA LOGGING
Save your data to the internal memory and then transfer them to your PC over the USB connection.

LARGE APERTURE
55 mm Ø aperture to accommodate large beams

RUGGED
- All-metal body
- High damage thresholds

PROTECTIVE WINDOW
- For measurements with gel-coupled IPL heads.
- Protects the absorber, easy to clean

SERIAL COMMANDS
Serial commands are available to let you take full control of your PRONTO from your PC.

ACCESSORIES

Stand with steel post

Pelican carrying case

PRONTO-500-IPL

Specifications

*Also traceable to NRC-CNRC

	PRONTO-500-IPL
MAX PULSE ENERGY (SINGLE SHOT)	350 J
EFFECTIVE APERTURE	55 mm Ø
APERTURE TYPE	Full aperture with protective window
MEASUREMENT CAPABILITY	
Spectral range	0.19 - 2.5 µm
Calibrated spectral range	1064 nm
Energy range	2 - 350 J
Noise equivalent energy	500 mJ
Minimum repetition period	15 s (= time between measurements)
Maximum pulse width	433 ms
Accuracy	± 5%
DAMAGE THRESHOLDS	
Maximum average power density	45 kW/cm² (1064 nm, 10 W, CW)
Pulsed laser damage threshold	175 J/cm² (10 ms pulses)
Maximum allowable absorber temperature	65 °C
GENERAL SPECIFICATIONS	
Display type	Touchscreen color LCD
Display size	28.0 x 35.0 mm (128 x 160 pixels)
Data storage	50 000 pts
Battery type	Rechargeable Li-ion
Battery life	17 hours or 4 200 measurements (with brightness set at 25%)
Battery recharge via	USB port
PHYSICAL CHARACTERISTICS	
Effective aperture	55 mm Ø
Dimensions (sensor head)	88W x 88L x 32D mm (194L with handle)
Dimensions (monitor)	41W x 136L x 16D mm
Weight	930 g
ORDERING INFORMATION	
Compatible stand	STAND-S-443
Product page	

CALORIMETERS

Measuring the highest energy laser beams

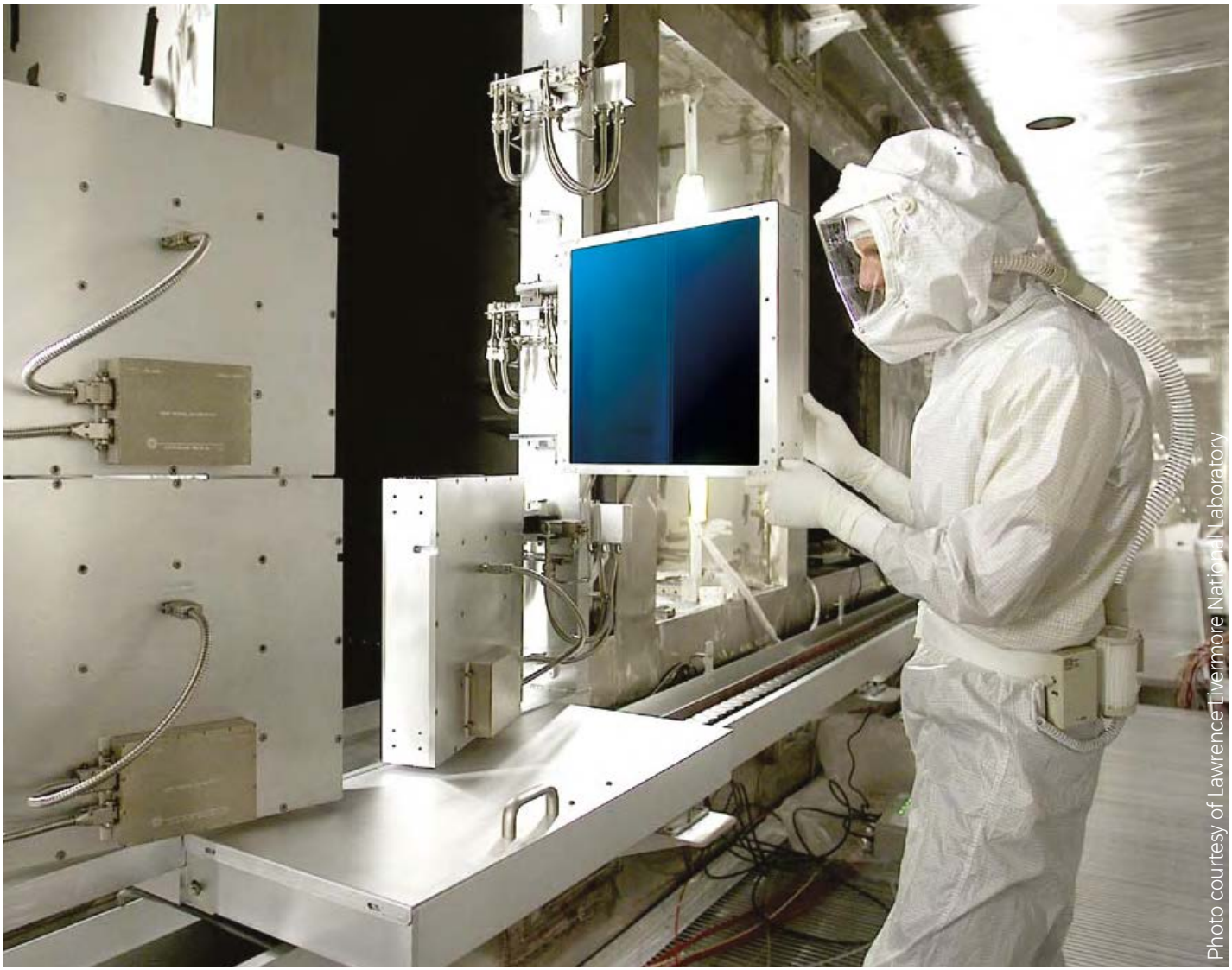


Photo courtesy of Lawrence Livermore National Laboratory

A Gentec-EO calorimeter is the only reliable solution available for the largest and highest energy laser beams. Through cooperation with several leading research facilities around the world, Gentec-EO has become the expert in manufacturing, calibrating and servicing calorimeters for use in high energy inertial confinement fusion calorimetric measurement.

STATE-OF -THE-ART

We work with a wide range of materials from surface coatings to the most robust volume absorbers to provide the best solution for your specific application.

- OUTSTANDING SIGNAL-TO-NOISE RATIO
- HIGH SENSITIVITY
- VACUUM COMPATIBILITY
- ATTENTION TO DETAILS AND WORKMANSHIP

With over 50 years of experience in thermal-based energy measurement, Gentec-EO is the ideal choice for all your high energy measurement needs.

ACCURATE

Using NIST traceable sources and proven calibration techniques, your Gentec-EO calorimeter is always the most accurate large aperture measurement device on the market.

With calibration uncertainties of ± 3 %, and repeatabilities better than ± 2 % even for very large beams, Gentec-EO offers the very best solution for extreme energy measurements.

CUSTOMIZED

We have designed calorimeters for 16 kJ beams with apertures as large as 420 x 427 mm, and able to withstand pulse energy densities of more than 15 J/cm^2.

We have also provided smaller, highly-sensitive calorimeters for beam energies as low as 50 mJ for the most delicate applications.

Our calorimeters range from 190 nm to 20 microns. Moreover, we are happy to push these limits even further. We work with a wide range of materials from surface coatings to the most robust volume absorbers to provide the best solution for your specific application.

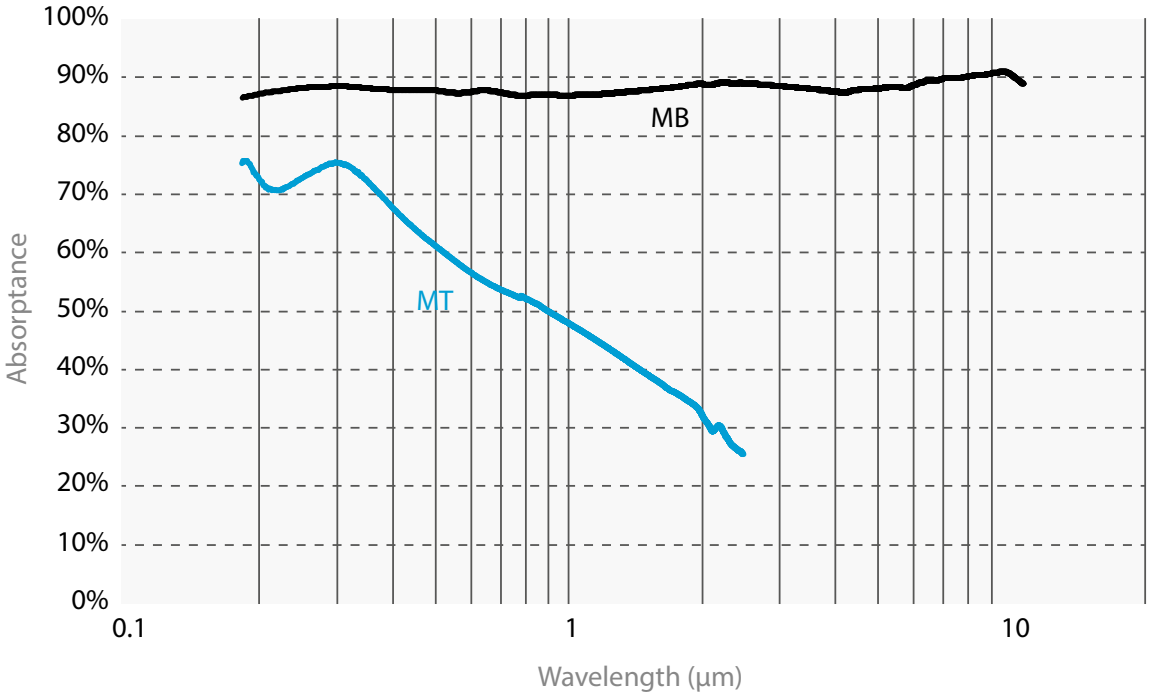
EXAMPLES OF CUSTOM CALORIMETERS

	SPECTRAL RANGE	PULSE WIDTH	MINIMUM ENERGY	MAXIMUM ENERGY*
RECTANGULAR APERTURES				
427 mm x 420 mm	355 nm to 1064 nm	fs to ms	~100 J	~5000 J
230 mm x 230 mm	355 nm to 1064 nm	fs to ms	~30 J	~1500 J
160 mm x 160 mm	355 nm to 1064 nm	fs to ms	~10 J	~750 J
120 mm x 120 mm	355 nm to 1064 nm	fs to ms	~5 J	~400 J
110 mm x 110 mm	355 nm to 1064 nm	fs to ms	~5 J	~350 J
CIRCULAR APERTURES				
310 mm Ø	355 nm to 1064 nm	fs to ms	~40 J	~2000 J
150 mm Ø	355 nm to 1064 nm	fs to ms	~5 J	~500 J

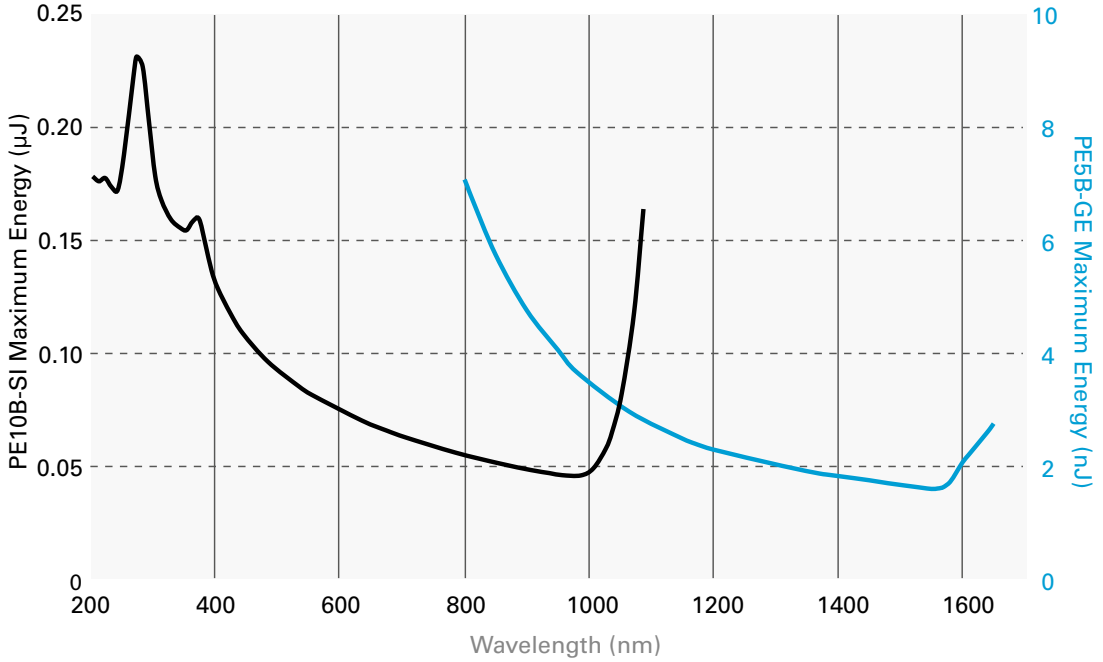
** For nanosecond pulses at 1064 nm. Maximum measurable energy depends on pulse width and wavelength. It generally decreases for shorter wavelengths and/or shorter pulse widths.*

ABSORPTION CURVES

QE-MT & QE-MB

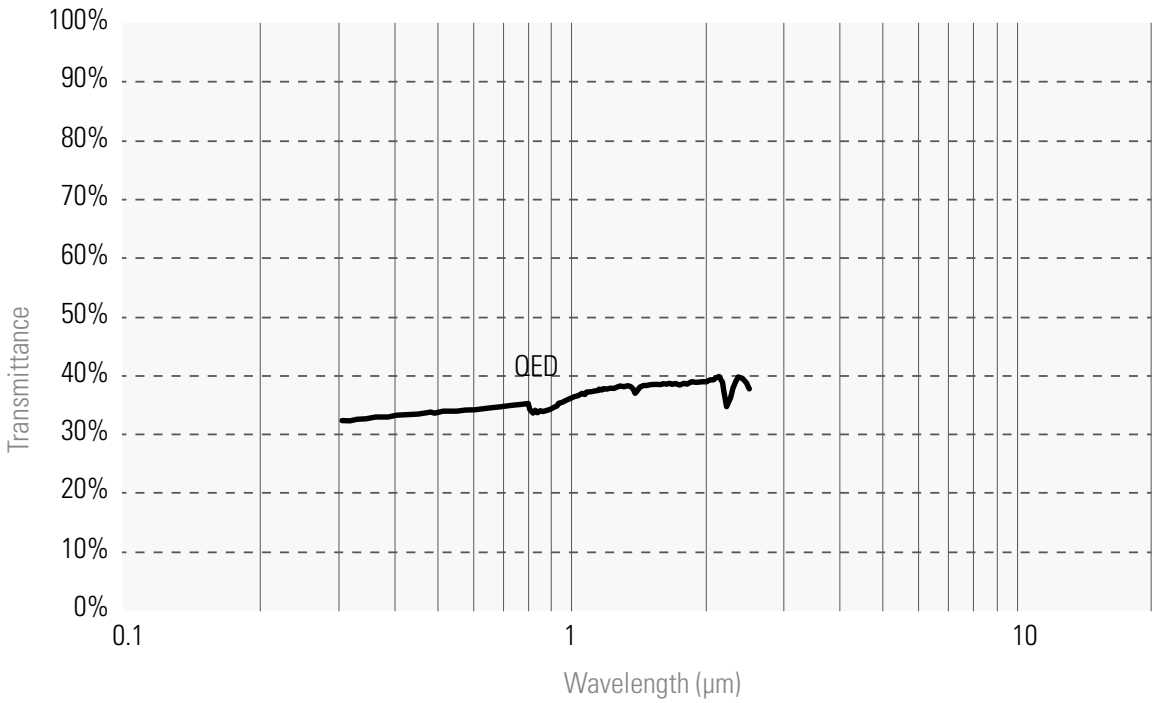


PE maximum energy



ABSORPTION CURVES

QED attenuators



QE-B & UM-B