

Laser Pulse Energy Detectors

919E SERIES

919E Series pyroelectric pulse energy detectors use innovative, patented technology which facilitates accurate and repeatable laser measurements of pulses over an extensive range of laser pulses.

Features

NIST Traceable Calibration

All the detectors come with a DB15 connector and internal EEPROM for storing factory calibration data, making them directly compatible with Newport's 843-R, 843-R-USB, and the all new 1919-R Optical Power and Energy Meters.

Photodiode Pulse Energy Detector Measures Down to 1 nJ Pulses

919E-20U-10-20K is a photodiode energy detector for low energies with a 10mm aperture. This model is one of the most sensitive calibrated energy detector available in market. It can measure energies from 1nJ up to 15µJ. It's noise floor is approximately 50 pJ. It can operate at repetition rates up to 20 kHz and covers the spectral range from 0.19 - 1.1µm.

Sensor Size Up to 46 mm

When the diffuser is not in use, the active diameter of Model 919E-30-46-10K is as large as 46 mm. The active diameter is 33 mm even when the diffuser is mounted. In addition, two additional models feature 35 mm diameter.

Model	Description
919E-0.1-12-250	Pyroelectric Energy Sensor, 0.15-3, 10.6 µm, 10mJ, 250 Hz
919E-0.1-12-25K	Pyroelectric Energy Sensor, 0.15 -12 µm, 10mJ, 25 kHz
919E-10-20-250	Pyroelectric Energy Sensor, Diffuser, 0.24 -2.2 µm, 10 J, 250 Hz
919E-10-24-10K	Pyroelectric Energy Sensor, 0.15-3 µm, 10 J, 10 kHz
919E-10-35-10K	Pyroelectric Energy Sensor, Diffuser, 0.19-2.2, 2.94 µm, 10 J, 10 kHz
919E-10-35-250	Pyroelectric Energy Sensor, Diffuser, 0.19-2.2, 2.94 µm, 10 J, 250 Hz
919E-200U-8-25K	Pyroelectric Energy Sensor, 0.15 -12µm, 200 µJ, 25 kHz
919E-20U-10-20K	Si Photodiode Energy Sensor, 0.19 -1.1 µm, 15 µJ, 20 kHz
919E-30-46-10K	Pyroelectric Energy Sensor, Diffuser, 0.532, 1.064, 2.1 and 2.94 µm, 30 J, 10 kHz



- Up to 46 mm aperture
- Up to 30 J pulse energy measurement
- Photodiode energy detectors for measurement down to 1 nJ
- Metallic coating pyroelectric detectors for high rep rates
- BF coating pyroelectric detectors for highest damage threshold
- Measure lasers with pulse widths up to 20 ms

High Sensitivity for Low Pulse Energy

In addition to Model 919E-20U-10-20K, three additional models are introduced for low pulse measurements up to 10 mJ pulses. Model 919E-200U-8-25K is the most sensitive pyroelectric sensor, capable of measuring as low as 1 uJ via a broad spectral range of 0.15 to 12 µm. Choose between 919E-0.1-12-25 and 919E-0.1-12-250, depending on the pulse rep rate of the laser source.

High Laser Repetition Rate Up to 25 kHz

The 919E series sensors can reliably measure energy pulses up to 25 kHz laser repetition rate. Select high pulse energy detectors can measure up to 10 kHz rep rate. When connected to our brand new 1919-R Handheld Power & Energy Meter, pulse energy of every pulse up to 6 kHz can be logged.

High Energy Level up to 30 J

We also offer five models that can handle high pulse energy. Model 919E-30-46-10K, especially, can handle up to 30 Joules by utilizing a calibrated diffuser with a high damage threshold.

Pyroelectric Energy Sensors - up to 10 mJ

Model	919E-20U-10-20K	919E-200U-8-25K	919E-0.1-12-25K	919E-0.1-12-250
Absorber Type	Si Photodiode with Attenuator	Metallic	Metallic	BF
Spectral Range (μm)	0.19 to 1.1	0.15 to 12	0.15 to 12	0.15 to 3, 10.6
Active Diameter (mm)	10	8	12	12
Surface Reflectivity (% Approx.)	50	50	50	20
Calibration Uncertainty (+/-%) ^(a)	5	3	3	3
Energy Scales (μJ)	0.02 - 20	0.2 - 200 μJ (for < 2 μsec pulses) 2 - 200 μJ (for 2 - 20 μsec pulses)	2 μJ - 10 mJ (for < 1 μsec pulses) 20 μJ - 10 mJ (for 1 - 30 μsec pulses)	20 μJ - 10 mJ (for < 1 msec pulses) 200 μJ - 10 mJ (for 1 - 5 msec pulses)
Minimum Measureable Energy (μJ) ^{(b)(c)}	1 nJ at 900 nm	0.1	1.0	7 μJ for < 1 msec pulses 20 μJ for 1 - 5 msec pulses
Max Pulse Width (μs)	5 μsec	20 μsec with < 10 kHz rep rate	30 μsec with < 5 kHz rep rate	5 msec with < 50 Hz rep rate
Maximum Repetition Rate	20 kHz	25 kHz with < 1 μsec pulse	25 kHz with < 1 μsec pulse	250 Hz with < 1 msec pulse
Damage Threshold (J/cm ²)	0.1	0.1 J/cm ² for pulses < 100 nsec 0.2 J/cm ² for 1 μsec pulses 3 J/cm ² for 300 μsec pulses	0.1 J/cm ² for pulses < 100 nsec 0.2 J/cm ² for 1 μsec pulses 3 J/cm ² for 300 μsec pulses	0.8 J/cm ² for pulses < 100 nsec 1 J/cm ² for 1 μsec pulses 2 J/cm ² for 300 μsec pulses
Maximum Average Power (W)	50	2	2	3
Power Density, Maximum Average (W/cm ²)	50	30	50	50
Dimensions (mm)	Ø62 x 22	Ø62 x 21	Ø62 x 21	Ø62 x 21
Weight (kg)	0.25	0.25	0.25	0.25

Pyroelectric Energy Sensors - up to 30 J

Model	919E-10-24-10K	919E-10-20-250	919E-10-35-10K	919E-10-35-250	919E-30-46-10K
Absorber Type	Metallic	BF with Diffuser	Metallic with Diffuser	BF with Diffuser	Metallic (sensitive)
Spectral Range (μm)	0.15 to 3	0.24 to 2.2	0.19 to 2.2, 2.94	0.24 to 2.2	0.19 to 3 (0.4 - 3 μm with diffuser)
Active Diameter (mm)	24	20	35	35	46 mm (33 mm with diffuser)
Surface Reflectivity (% Approx.)	50	50	25	25	50 (25 % with diffuser)
Calibration U*ncertainty (+/-%) ^(a)	3	4	4	4	3 (4 % with diffuser)
Energy Scales (μJ)	200 μJ - 10 J (for < 30 μsec pulses) 2 mJ - 10 J (for 30 μsec - 5 msec pulses)	2 mJ - 10 J (for < 2 msec pulses) 20 mJ - 10 J (for 2 - 20 msec pulses)	200 μJ - 10 J (for < 30 μsec pulses) 2 mJ - 10 J (for 30 μsec - 1 msec pulses) 20 mJ - 10 J (for 1 - 5 msec pulses)	2 mJ - 10 J (for < 2 msec pulses) 20 mJ - 10 J (for 2 - 20 msec pulses)	Without diffuser: 200 μJ - 10 J (for < 30 μsec pulses) 2 mJ - 10 J (for 30 μsec - 5 msec pulses) With diffuser: 600 μJ - 30 J (for < 30 μsec pulses) 6 mJ - 30 J (for 30 μsec - 5 msec pulses)
Minimum Measureable Energy (μJ) ^{(b)(c)}	10 μJ for < 30 μsec pulses 100 μJ for 30 μsec - 5 msec pulses	100 μJ for < 1 msec pulses 200 μJ for 1 - 10 msec pulses 300 μJ for 10 - 20 msec pulses	20 μJ for < 30 μsec pulses 120 μJ for 30 μsec - 1 msec pulses 200 μJ for 1 - 5 msec pulses	200 μJ for < 1 msec pulses 400 μJ for 1 - 2 msec pulses 800 μJ for 2 - 20 msec pulses	50 μJ for < 30 μsec pulses 300 μJ for 30 - 500 μsec pulses 500 μJ for 0.5 - 5 msec pulses
Max Pulse Width (μs)	5 msec with < 100 Hz rep rate	20 msec with < 20 Hz rep rate	5 msec with < 100 Hz rep rate	20 msec with < 20 Hz rep rate	5 msec with < 100 Hz rep rate
Maximum Repetition Rate	10 kHz with < 2 μsec pulse	250 Hz with < 1 msec pulse	10 kHz with < 2 μsec pulse	250 Hz with < 1 msec pulse	10 kHz with < 2 μsec pulse
Damage Threshold (J/cm ²)	0.1 J/cm ² for pulses < 100 nsec 0.2 J/cm ² for 1 μsec pulses 2 J/cm ² for 300 μsec pulses	3 J/cm ² for pulses < 100 nsec 5 J/cm ² for 1 μsec pulses 25 J/cm ² for 300 μsec pulses	1 J/cm ² for pulses < 100 nsec 2 J/cm ² for 1 μsec pulses 20 J/cm ² for 300 μsec pulses	4 J/cm ² for pulses < 100 nsec 8 J/cm ² for 1 μsec pulses 30 J/cm ² for 300 μsec pulses	Without diffuser: 0.1 J/cm ² for pulses < 100 nsec 0.2 J/cm ² for 1 μsec pulses 2 J/cm ² for 300 μsec pulses With diffuser: 1.5 J/cm ² for pulses < 100 nsec 3 J/cm ² for 1 μsec pulses 20 J/cm ² for 300 μsec pulses
Maximum Average Power (W)	15	20	25	25	40
Power Density, Maximum Average (W/cm ²)	20	120	100	200	500 (20 W/cm ² without diffuser)
Dimensions (mm)	Ø62 x 21	Ø62 x 28.5	Ø62 x 35	Ø62 x 35	Ø62 x 28.5
Weight (kg)	0.25	0.25	0.25	0.25	0.25

Compatible Power Meters



Economical Handheld Laser Power Meter, 843-R



High Performance Handheld Optical Power Meter, 1919-R



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