



### ES245C

### Description

The ES245C is a pyroelectric sensor that permits independent of the wavelength of the incidence radiation, the direct transformation of a radiation energy pulse into a voltage pulse. The ES245C sensor head is built strictly on a coaxial basis and is therefore extremely insensitive to interference from electromagnetic radiation like from a pulsed gas laser.

The ES245C has an aperture diameter of 45 mm, for best performance it is recommended to choose a sensor with an area slightly larger than the beams cross section. The active sensor area is coated with a very durable ceramic absorber layer that makes this sensor the right choice for pulse lasers with high peak power density like Excimer, CO<sub>2</sub>, TEA and Nd-YAG. The ceramic coating is not spectrally flat like a black coating. An EPROM located in the BNC to DE-9 mating adapter will store the spectral response calibration parameter required to provide an accurate energy reading over the full wavelength operating range.

The ES245C housing includes an 8-32 threaded mounting hole to accommodate posts and post holders. For electrical insulation of the sensor a metric and an imperial post adapter is included.

The ES245C can directly connect to an Oscilloscope with 1 M $\Omega$  input resistance via the BNC connector. To accommodate higher repetition rates, the load resistance can be reduced, a calibration value for a 100 k $\Omega$  resistor is given with the sensor certificate of calibration.

### Specifications

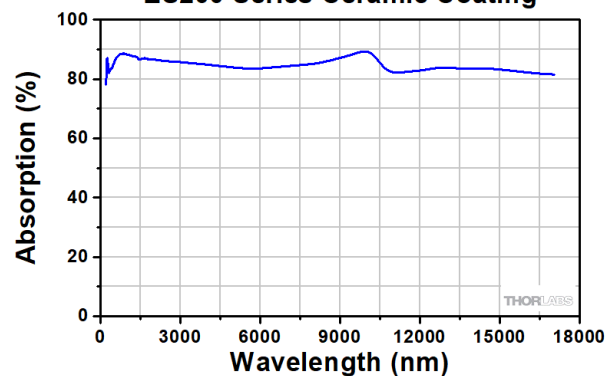
Technical Specifications	
Energy Range	1 mJ - 15 J
Resolution	50 $\mu$ J
Wavelength Range	185 nm - 25 $\mu$ m <sup>a</sup>
Max. Repetition Rate (@ 1 M $\Omega$ Load Resistor)	30 Hz
Application	Energy Measurement from Short Pulsed Lasers with High Peak Power Density and Pulse Length from sub-ns up to ms
Detector Type	Pyroelectric Sensor
Coating	Black Broadband
Detector Size (Active Area)	$\varnothing$ 45 mm (1.77")
Distance Frontface to Detector	2 mm (0.08")
Measurement Uncertainty	+/- 5% @ 185 nm - 25 $\mu$ m
Linearity	+/- 1%
Max. Average Power	10 W
Max. Power Density	65 MW/cm <sup>2</sup> (7 ns Pulse @ 355 nm) <sup>b</sup>
Max. Pulse Energy Density	0.45 J/cm <sup>2</sup> (7 ns Pulse @ 355 nm) <sup>b</sup>
Thermal Time Constant	20 ms
Cooling	Convection
Sensor Dimensions	$\varnothing$ 75 x 21 mm <sup>2</sup>
Connector Cable Length	1.5 m
Connector	BNC Male / DE-9p Male, Adapter Included
Post	#8-32 Mounting Thread, Insulation Adapters for Metric and Imperial Posts Included

## Technical Specifications

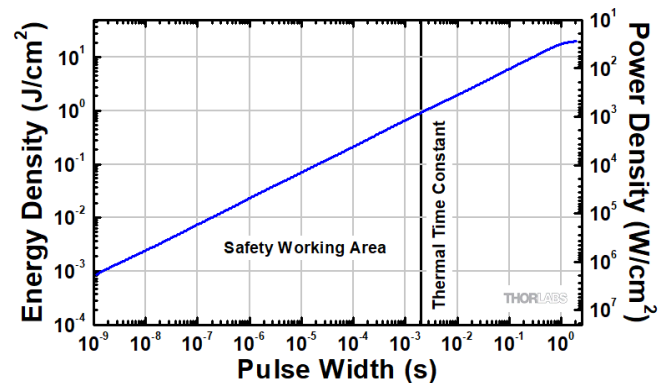
Weight	0.32 kg
Compatible Consoles	PM100D, PM400, PM320E
Compatible Interfaces	PM103, PM103A, PM103U, PM100USB
a. With Wavelength Correction b. See Chart	

## Typical Performance Plots

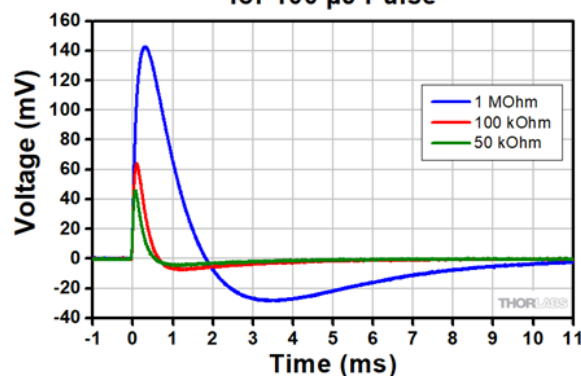
ES200 Series Ceramic Coating



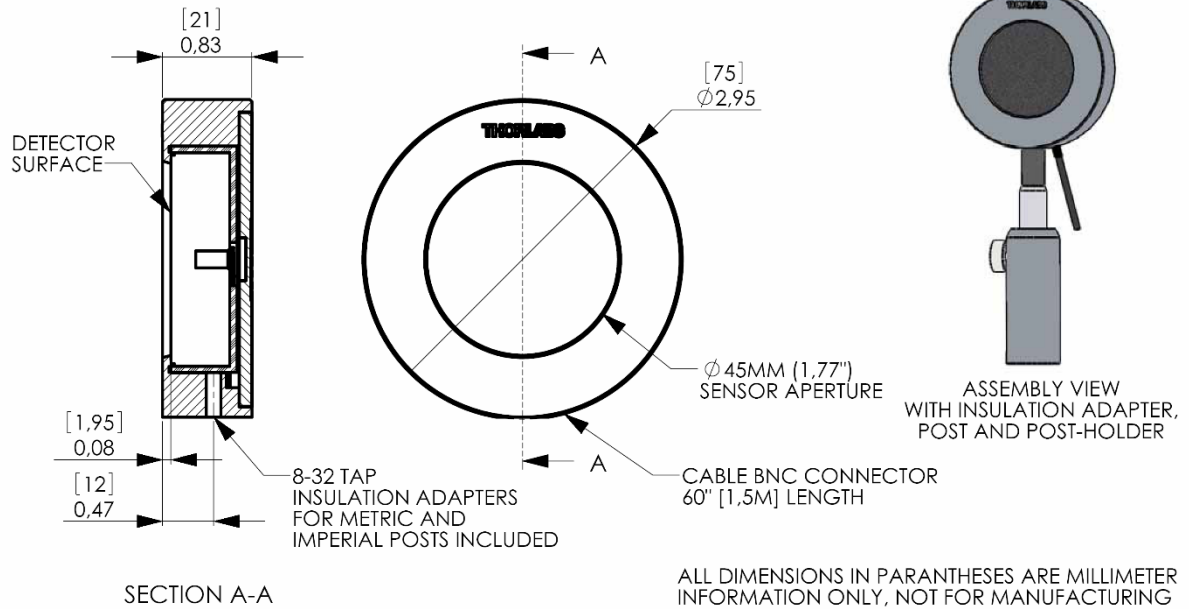
Pulse Energy Ratings and Damage Thresholds



Response for Different Load Resistors for 100  $\mu$ J Pulse



## Drawings



### BNC Male / DE-9 Male Adapter



## *Available Accessories*

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The ES245C is compatible to the Thorlabs imperial and metric post and post-holder series.

## *Cleaning and Maintenance*

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There are no serviceable parts in the ES245C head. The housing may be cleaned by wiping with a soft damp cloth. The sensor on the pyroelectric heads cannot be cleaned. Gently blow off any debris using compressed air. If any scratches or other signs of damage remain on the sensor area, contact Thorlabs service department for repair or replacement. If you suspect a problem with your ES245C please call Thorlabs and an engineer will be happy to assist you.

As long as the sensor has not been exposed to excessive optical power, the calibration should be very stable over long periods of time (well over a year). However, the detector should be calibrated once a year to ensure accuracy.

