High-Sensitivity Optical Power Sensors

10 nW to 50 mW, CW

Model OP-2/LM-2

Features

- **Si, Ge photodiodes**
- **Spectral range: 250 nm to 1800 nm**
- **Fiber-optic connector (optional, see page 63)**
- **1000:1 attenuator for measurement to 5W (optional, see page 62)**

These high-sensitivity semiconductor sensors are ideal for CW laser measurements in the nW to low mW level. They typically saturate in the 10 to 50 mW level, depending upon the model. For linear operation up to a maximum of 5 Watts, an optional 1000:1 attenuator is used. Light shield is removable.

OP-2 models are compatible with FieldMate, FieldMaxII and LabMax meters. LM-2 models are directly compatible with LabMax meters.

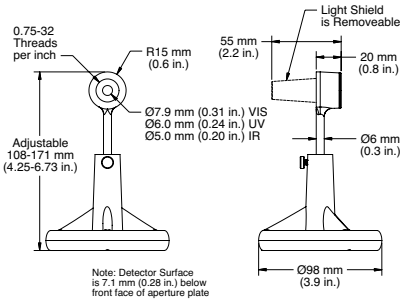
Device Specifications

**C24

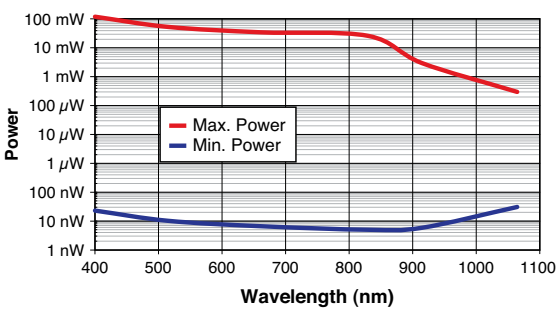
Model	OP-2/LM-2 UV	OP-2/LM-2 VIS	OP-2/LM-2 IR
Detector Material	Silicon		Germanium
Wavelength Range (µm)	0.25 to 0.4	0.4 to 1.06	0.8 to 1.80/0.8 to 1.5[1]
Power Range	10 nW to 30 mW	10 nW to 30 mW[2]	10 nW to 10 mW
Resolution (nW)		1	
Max. Power Density	0.3 W/cm²	1.0 W/cm²	0.5 W/cm²
Active Area Diameter (mm)	6	7.9	5
Calibration Uncertainty (%)(k=2)	±8	±5	±4.5
Calibration Wavelength (nm)	Monochromator calibration across wavelength range		
Cooling Method	Air-cooled		
Connector Type	OP DB-25/LM DB-25		
Cable Length (m)	1.8		
Part Number			
OP-2	1098401	1098313**	1098416**
LM-2	1098390	1098298**	1098342

[1] OP-2 IR and LM-2 IR have different spectral ranges.
[2] Power range is wavelength dependent. See chart below.
** C24 Quick Ship program: eligible for next business day shipment.

OP-2 UV/OP-2 VIS/OP-2 IR
LM-2 UV/LM-2 VIS/LM-2 IR



Measurable Power vs. Wavelength
OP-2 VIS and LM-2 VIS



Accessories

1000:1 Attenuator

Fiber-Optic Connector Adapters

Power and Energy Measurement Solutions

Sensor Technologies

Thermopile

PM Model Thermopiles

LM Model Thermopiles

Thermopile sensors are a great all-purpose technology suitable for many lasers. They are used for measuring CW laser power, average power in pulsed lasers, and are often used to integrate the energy of long pulses.

Thermopile sensors absorb incident laser radiation and convert it into heat. This heat ultimately flows to a heat sink that is held at ambient temperature by either convection-cooling or water-cooling. The temperature difference between the absorber and the heat sink is converted into an electrical signal by a thermocouple junction.

Thermopiles operate across a wide range of input powers, and unlike a semiconductor sensor they will not saturate. The spectral range is dependent upon the coating applied to absorb the laser energy. The coating used on many thermopiles is broadband in nature and is relatively flat from the ultraviolet through the infrared. These sensors have natural response times on the order of several seconds for a low power sensor and up to one minute for a kilowatt sensor. When combined with a Coherent meter a speed-up algorithm provides a much faster response – on the order of seconds for most sensors.

Coherent has two lines of thermopile sensors. The "LM Model" line utilizes a unique thermopile disk in which the thermocouples are split into four quadrants, allowing the sensors to provide beam position information in addition to power measurement. The "PM Model" line incorporates traditional thermopile disks that provide power measurement.

Quad Positioning Enabled

Semiconductor/Optical

Semiconductor sensors convert incident photons into current that can be measured by our instruments. The photodiodes used in these types of sensors offer high sensitivity and low noise, enabling them to detect very low light levels. Attenuating filters must be used when operating above the milliwatt level because they saturate above approximately 1W/cm^2.

Photodiodes are also convenient for tuning and peaking lasers due to their fast response time. The spectral range is more limited than our other sensor technologies. These devices are also referred to as optical sensors. Semiconductor/optical sensors are limited to measuring CW laser power.

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