PowerMax-Pro Sensors

100 mW to 150W

PowerMax-Pro (Patent #9,012,848) represents a dramatic technological advancement in laser power sensing that combines the broad wavelength sensitivity, dynamic range and laser damage resistance of a thermopile with the response speed of a semiconductor photodiode.

Coherent has invented a novel, thin-film technology to create a device which rapidly senses thermal changes due to incident laser energy. Unlike traditional thermopile detectors, in these new PowerMax-Pro sensors, heat flows vertically through a film which is only microns thick, rather than radially to the edge of the device over a distance of several centimeters. The result is a measurement response time below 10 µs, as compared to over 1 second for traditional thermopiles. Plus, these detectors can operate over a spectral range as broad as 400 nm to 11 µm, and incorporate a large 30 mm x 30 mm active area.

The high response speed of PowerMax-Pro sensors is particularly advantageous in commercial applications, where it enables CW laser power and pulsed laser energy to be sampled much more frequently, resulting in increased throughput and improved process control. And, their broad spectral response and large active area make these detectors useful with virtually all commercial, scientific, and medical lasers operating in the visible, near infrared and far infrared, including CO2 lasers at 10.6 µm.

FEATURES

- Measures power in tens of microseconds
- High power up to 150W for HD models and 200W for BB models
- Supports lasers from Visible to Far-IR wavelengths
- Capable of tracing the individual pulse shape of modulated and long pulse lasers
- Large 30 x 30 mm active area

APPLICATIONS

- Laser Processing including Cutting, Drilling, and Welding
- Medical Systems including Long Pulse Aesthetic applications
- Diode LIV Testing - increase resolution and shorten test time
- Scientific and Engineering
- Production and QA Testing

COHERENT®
Superior Reliability & Performance

SPECIFICATIONS	PowerMax-Pro 150 BB	PowerMax-Pro 150 HD	PowerMax-Pro 150 BB Nano[1]	PowerMax-Pro 150 HD Nano[1]
Wavelength Range[2]	400 nm to 11 µm	400 nm to 1100 nm; 9 µm to 11 µm	400 nm to 11 µm	400 nm to 1100 nm; 9 µm to 11 µm
Power Range Water-cooled[3] Air-cooled (65W max air-cooled, 5 min.)	100 mW to 150W 100 mW to 17W			
Maximum Peak Power (W) (use for >1 µsec pulses up to CW)	170	170	200[4]	200[4]
Maximum Intermittent Power (W) (<5 min.)	65 (air-cooled)			
Noise Equivalent Power (mW) Standard Mode High Speed Mode Snapshot Mode	<1 <4 <9			
Maximum Power Density (kW/cm^2)	0.2 (150W)			
Maximum Peak Power Density (kW/cm^2)	14			
Maximum Energy Density (mJ/cm^2)	33 (10 ns; 1064 nm)			
Rise & Fall Time (µs)	≤50	≤10	≤350	≤350
Detector Coating	BB	HD	BB	HD
Active Area (mm)	30 x 30			
Minimum Beam Size (mm)	2.0 (1.0 mm - up to 3% error)			
Calibration Uncertainty (%) (k=2)	±2			
Power Linearity (%)	±3			
Spectral Compensation Accuracy (%)	±3			
Spatial Uniformity (%) (center 75% of aperture; 2.5 mm beam)	±5			
Calibration Wavelength (nm)	810			
Cooling Method	Water/Air (intermittent)			
Cable Type	DB25			
Cable Length	2.5m (8.2 ft.)			
Part Number	1323849	1266709	1325550	1325549

1 Choose a "Nano" model PowerMax-Pro sensor when measuring the average power of industrial short pulsed (nanosecond and picosecond) lasers. The amplifier in the "Nano" is adjusted to account for the high peak impulse powers associated with those types of lasers. Lasers of this type within the Coherent portfolio include the Matrix QS, Avia NX, Flare NX, Helios (the regular "HD" models are not appropriate for these short pulsed, high energy lasers).

2 Contact Coherent for 355nm usage guidelines.

3 Water flow rate for water-cooled sensors must be >0.5 GPM (>2 LPM).

4 For pulses shorter than 1 µsec, use the maximum pulse energy density and average power specifications instead of peak power.

SPECIFICATIONS	PowerMax-Pro 150F BB	PowerMax-Pro 150F HD	PowerMax-Pro 150F Nano[1]
Wavelength Range[2]	400 nm to 11 µm	400 nm to 1100 nm; 9 µm to 11 µm	400 nm to 1100 nm; 9 µm to 11 µm
Power Range Water-cooled[3] Air-cooled (65W max air-cooled, 5 min.)		 – 100 mW to 150W	
Maximum Peak Power (W) (use for >1 µsec pulses up to CW)	170	170	200[4]
Maximum Intermittent Power (W) (<5 min.)		150 (maximum)	
Noise Equivalent Power (mW) Standard Mode High Speed Mode Snapshot Mode		 <1 <4 <9	
Maximum Power Density (kW/cm^2)		0.2 (150W)	
Maximum Peak Power Density (kW/cm^2)		14	
Maximum Energy Density (mJ/cm^2)		33 (10 ns; 1064 nm)	
Rise & Fall Time (µs)	≤50	≤10	≤350
Detector Coating	BB	HD	HD
Active Area (mm)		30 x 30	
Minimum Beam Size (mm)		2.0 (1.0 mm - up to 3% error)	
Calibration Uncertainty (%) (k=2)		±2	
Power Linearity (%)		±3	
Spectral Compensation Accuracy (%)		±3	
Spatial Uniformity (%) (center 75% of aperture; 2.5 mm beam)		±5	
Calibration Wavelength (nm)		810	
Cooling Method		Fan	
Cable Type		DB25	
Cable Length		2.5m (8.2 ft.)	
Part Number	1323848	1266708	1331019

[1] Choose a "Nano" model PowerMax-Pro sensor when measuring the average power of industrial short pulsed (nanosecond and picosecond) lasers. The amplifier in the "Nano" is adjusted to account for the high peak impulse powers associated with those types of lasers. Lasers of this type within the Coherent portfolio include the Matrix QS, Avia NX, Flare NX, Helios (the regular "HD" models are not appropriate for these short pulsed, high energy lasers).

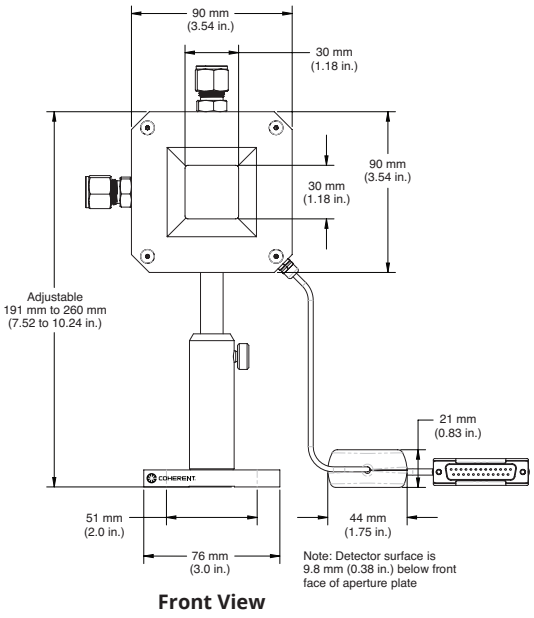
[2] Contact Coherent for 355nm usage guidelines.

[3] Water flow rate for water-cooled sensors must be >0.5 GPM (>2 LPM).

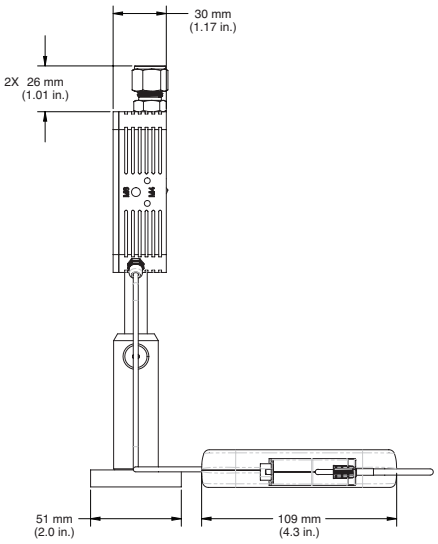
[4] For pulses shorter than 1 µsec, use the maximum pulse energy density and average power specifications instead of peak power.

MECHANICAL SPECIFICATIONS

Pro 150 HD and BB

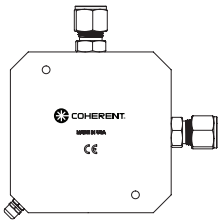


Front View

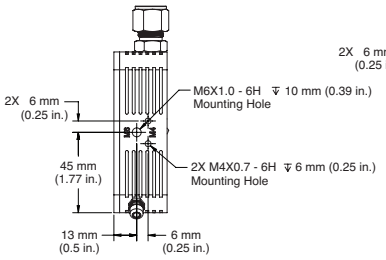


Side View

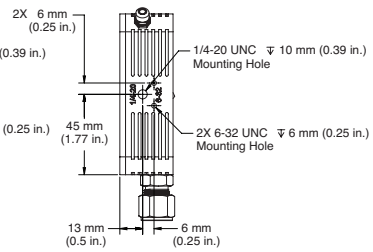
Rear View



Side View

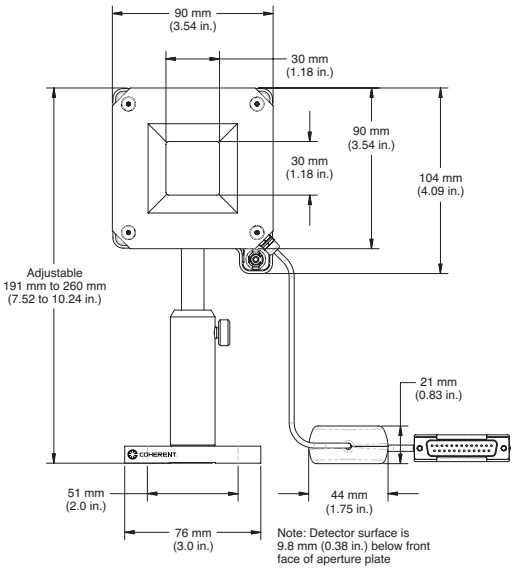


Bottom View

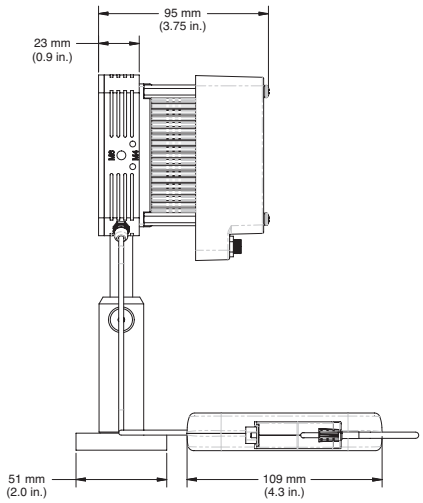


MECHANICAL SPECIFICATIONS

Pro 150F HD and BB

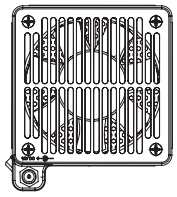


Front View

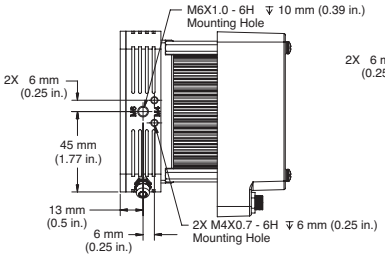


Side View

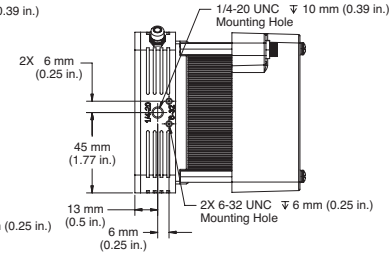
Rear View



Side View



Bottom View



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