

Pyroelectric, Photodiode and RP Heads for Repetitive Energy Measurements



Pyroelectric and Photodiode Heads



RP Heads

Pyroelectric and Photodiode Heads for Repetitive Pulses

Ophir pyroelectric meters use innovative, patented technology which facilitates accurate and repeatable measurements over an extensive range of conditions. Ophir's pyroelectric meters exclusive features are:

Accuracy

- Accuracy completely independent of pulse rate, duration or history.
- Built-in wavelength correction.

Performance

- Pulse rate to 5000Hz (PE10).
- Energy measurement to 10pJ (PD10-pJ).
- High damage threshold.
- Diffuser models for high energy YAG / Holmium / Erbium lasers.
- Diffuser is removable.
- Metallic and broadband coatings.
- Wide dynamic range.

Versatility

- Measurements of very long and very short pulses (e.g. excimer and holmium) with same head.
- **Nova, Nova II** and **Laserstar** displays with Smart Connector, compatible with all Ophir Thermopile and Photodiode heads. Measurement from nW to KW, μ J to 200J with appropriate heads
- **Nova** and **Laserstar** displays show average power, frequency, average energy, exposure, energy bar graph and more.
- **Nova II** and **Laserstar** displays allow on-board storage and transmission of every pulse to >1500Hz.

RP Heads

The use of Ophir RP (Repetitive Pulse) models together with the Laserstar display allows you to measure energy of repetitively pulsed lasers with a high degree of accuracy. The innovative principle of the RP (patented) combines highly accurate measurement of average power using a thermal head, with measurements of relative pulse energy using a photodiode that provides the energy per pulse. This innovation allows RP to measure powers and energies only a thermal head is able to measure with measurement of repetitive pulse energy. You can also measure at repetition rates never before available.

The RP also gives you a wealth of information about your laser. Along with pulse energy it provides data about average power, frequency, minimum and maximum values, missing pulses, time jitter and standard deviation. The display of pulse energies can be either numerical or in graphs. Up to 50,000 points, of data can be stored on-board in nonvolatile memory and can be sent either offline or online to PC.

The RP heads have a separate fast photodiode to measure temporal pulse shape. When the BNC output is connected to a fast scope, the pulse shape is displayed with ns resolution.

The RP also does everything a standard Ophir thermal head can do such as power measurement, single shot energy and laser power tuning.

RP Heads

30A-P-RP

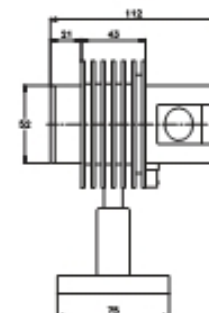
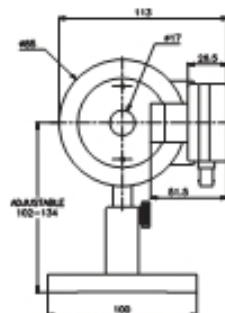
**CW & Single Pulse Measurements 30mW - 30W
up to 15000Hz pulse rate, up to 200ms pulse width**

Recommended Use: Q switched and general pulsed lasers

Special Features: 30W average power, temporal pulse shape

Absorber:	P type		
Spectral Range for Power:	0.19 - 6 μ m		
Spectral Range for Energy:	0.19 - 1.1 μ m		
Aperture:	\varnothing 17mm		
Digital Power Scales:	30W/3W		
Maximum Average Power Density:	50W/cm ²		
Power Noise Level:	3mW		
Power Accuracy:	\pm 3%		
Stabilization Time:	6s		
Energy Scales:	3J to 30mJ		
Energy Accuracy:	\pm 5% for energies >30% of full scale		
Minimum Energy:	50 μ J in repetitive mode, 30mJ in single shot mode		
Minimum Average Power:	30mW		
Maximum Pulse Width:	200ms		
Maximum Energy Density and Repetition Rate:	Pulse width	J/cm ²	Max Rep Rate
	<10 μ s	1	15KHz
	0.5ms	1	1.4KHz
	5ms	1	150Hz
	100ms	1	7Hz
Pulse Shape Photodiode Response Time:	6ns		
Approx. Peak Voltage into 50 Ω	0.5V for 10MW peak power at 1064nm		
System/Display Specifications when used with Laserstar Display			
Function	Specification		
Frequency Measurement Accuracy:	\pm 0.01%		
Statistics Displayed:	Min, Max, Std Dev, Jitter, Missing points		
Data Memory Capacity (nonvolatile):	50,000 points		
Computer Interface:	RS232 Standard, GPIB Optional		
Maximum Data Acquisition Rate:	Sample to 15KHz, every pulse to 280 Hz		
Max. Real Time Data Transfer to PC:	100Hz with GPIB		

30A-P-RP



Laser Power & Energy

Heads

Displays

Beam Profile Wavelength

Integrated Systems

OEM Products

Ordering information		
Item	Description	Ophir P/N
30A-P-RP	RP power/energy meter for powers to 30W, energies to 3J and rep rates to 15,000Hz	1Z02913

FL250A- RP

**CW & Single Pulse Measurements 100mW - 250W,
up to 15000Hz pulse rate, up to 200ms pulse width**

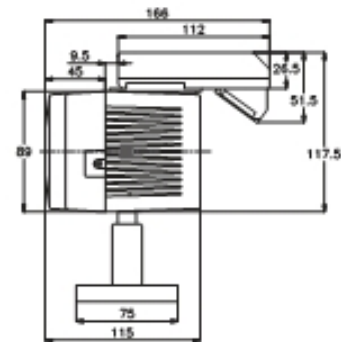
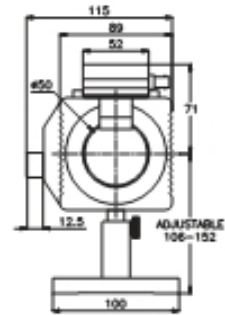
Recommended Use: Large aperture pulsed lasers

Special Features: 250W average power, temporal pulse shape

Absorber:	Broadband		
Spectral Range for Power:	0.19 - 6 μ m		
Spectral Range for Energy:	0.19 - 1.1 μ m		
Aperture:	\varnothing 50mm		
Digital Power Scales:	250W / 30W		
Maximum Average Power Density:	8KW/cm ²		
Power Noise Level:	10mW		
Power Accuracy:	\pm 3%		
Stabilization Time:	6s		
Energy Scales:	100J to 3mJ		
Energy Accuracy:	\pm 5% for energies >30% of full scale		
Minimum Energy:	100 μ J in repetitive mode, 50mJ in single shot mode		
Minimum Average Power:	100mW		
Maximum Pulse Width:	200ms		
Maximum Energy Density and Repetition Rate:	Pulse width	J/cm ²	Max Rep Rate
	<10 μ s	0.3	15KHz
	0.5ms	5	1.4KHz
	5ms	20	150Hz
	100ms	400	7Hz
Pulse Shape Photodiode Response Time:	1 μ s		
Approximate peak voltage into 50 Ω	~0.2V for 10MW peak power at 248nm		
Cooling:	Fan		
System/Display Specifications when used with Laserstar Display			
Function	Specification		
Frequency Measurement Accuracy:	\pm 0.01%		
Statistics Displayed:	Min, Max, Std Dev		
Data Memory Capacity (nonvolatile):	50,000 points		
Computer Interface:	RS232 Standard, GPIB Optional		
Maximum Data Acquisition Rate:	Sample to 15KHz, every pulse to 280 Hz		
Max. Real Time Data Transfer to PC:	100Hz with GPIB		



FL250A-RP



Ordering information		
Item	Description	Ophir P/N
FL205A-RP	RP power/energy meter for powers to 250W, energies to 100J and large apertures. For spectral range 0.19-1.1 μ m. Good for diode lasers and metal vapor lasers.	1Z02906

L1500W-LP-RP

**CW & Pulse Measurements 10W - 1500W,
up to 1500Hz pulse rate, up to 200 ms pulse width**

Recommended Use: Industrial YAG lasers

Special Features: High power and energy density and large aperture

Spectral Range:	0.6 - 1.1 μ m																						
Absorber:	LP high damage threshold absorber																						
Aperture:	\varnothing 50mm																						
Digital Power Scales:	1500W/300W																						
Maximum Average Power Density:	6KW/cm ²																						
Power Noise Level:	0.7W																						
Power Accuracy:	\pm 5%																						
Stabilization Time:	8s																						
Energy Scales:	100J to 1J																						
Energy Accuracy:	\pm 5% for energies > 30% of full scale																						
Minimum Energy:	150mJ in repetitive mode, 500mJ in single shot																						
Minimum Average Power:	10W																						
Maximum Pulse Width:	200ms																						
Maximum Energy Density and Repetition Rate:	<table border="1"> <thead> <tr> <th>RP:</th> <th>Pulse width</th> <th>J/cm²</th> <th>Max Repetition Rate</th> </tr> </thead> <tbody> <tr> <td></td> <td><10μs</td> <td>0.1</td> <td>15KHz</td> </tr> <tr> <td></td> <td>0.5ms</td> <td>20</td> <td>1.4KHz</td> </tr> <tr> <td></td> <td>5ms</td> <td>120</td> <td>150Hz</td> </tr> <tr> <td></td> <td>100ms</td> <td>900</td> <td>7Hz</td> </tr> </tbody> </table>			RP:	Pulse width	J/cm ²	Max Repetition Rate		<10 μ s	0.1	15KHz		0.5ms	20	1.4KHz		5ms	120	150Hz		100ms	900	7Hz
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L1500W-LP-RP

Laser Power & Energy

Heads

Displays

Beam Profile Wavelength

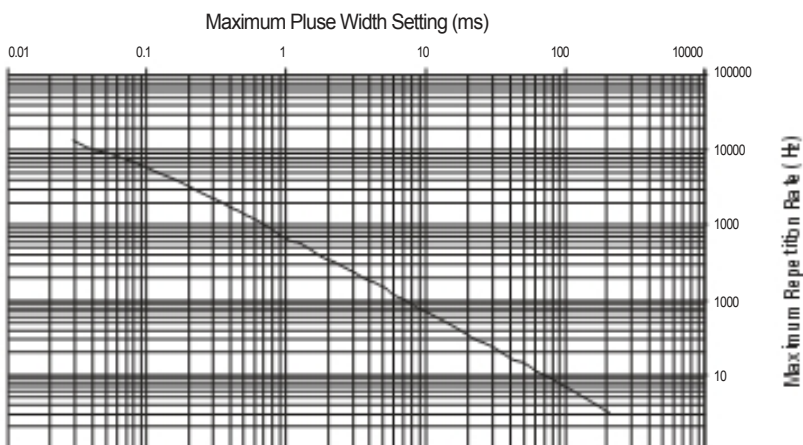
Integrated Systems

OEM Products

Ordering Information

Item	Description	Ophir P/N
L1500W-LP-RP	RP power/energy meter for industrial YAG and other long pulse lasers, for powers up to 1500W and energies to 100J.	1Z02907

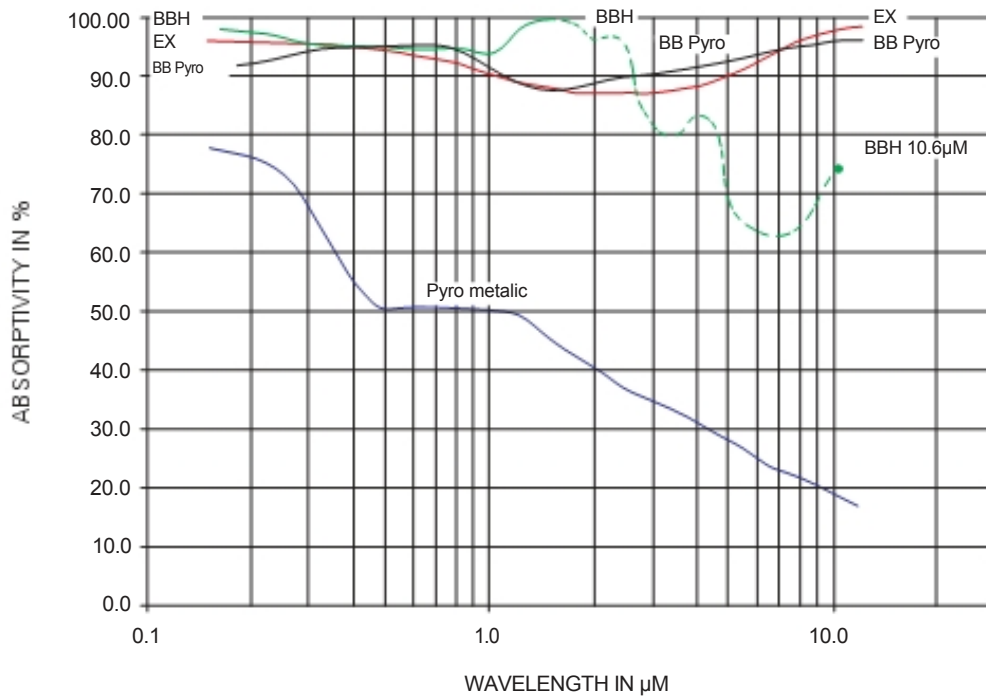
Maximum Laser Repetition Rate for a Given Pulse Width Setting for RP Heads



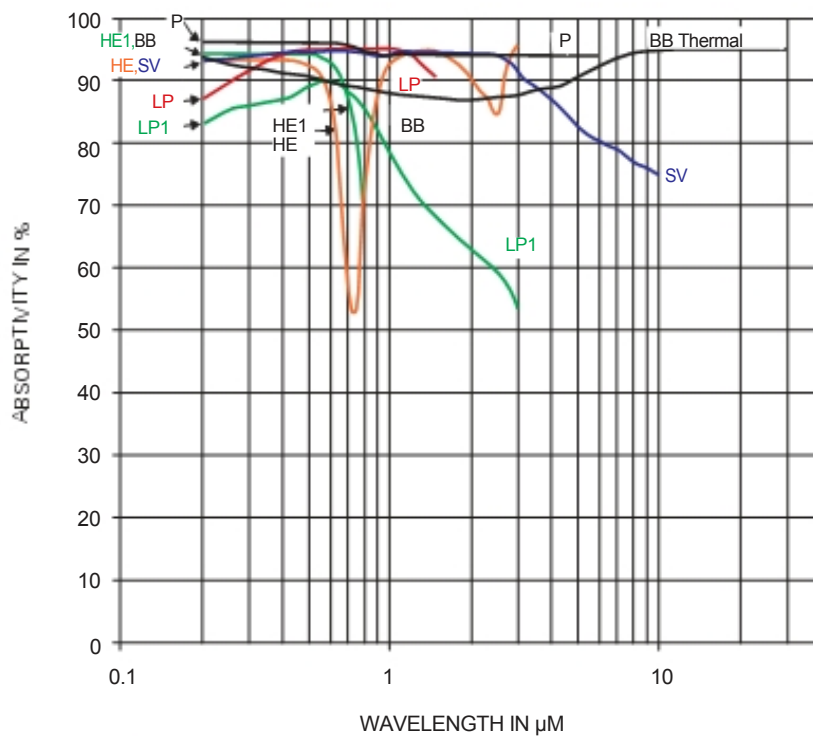
Spectral Graphs & Absorption

Approximate Spectral Absorption of Absorbers

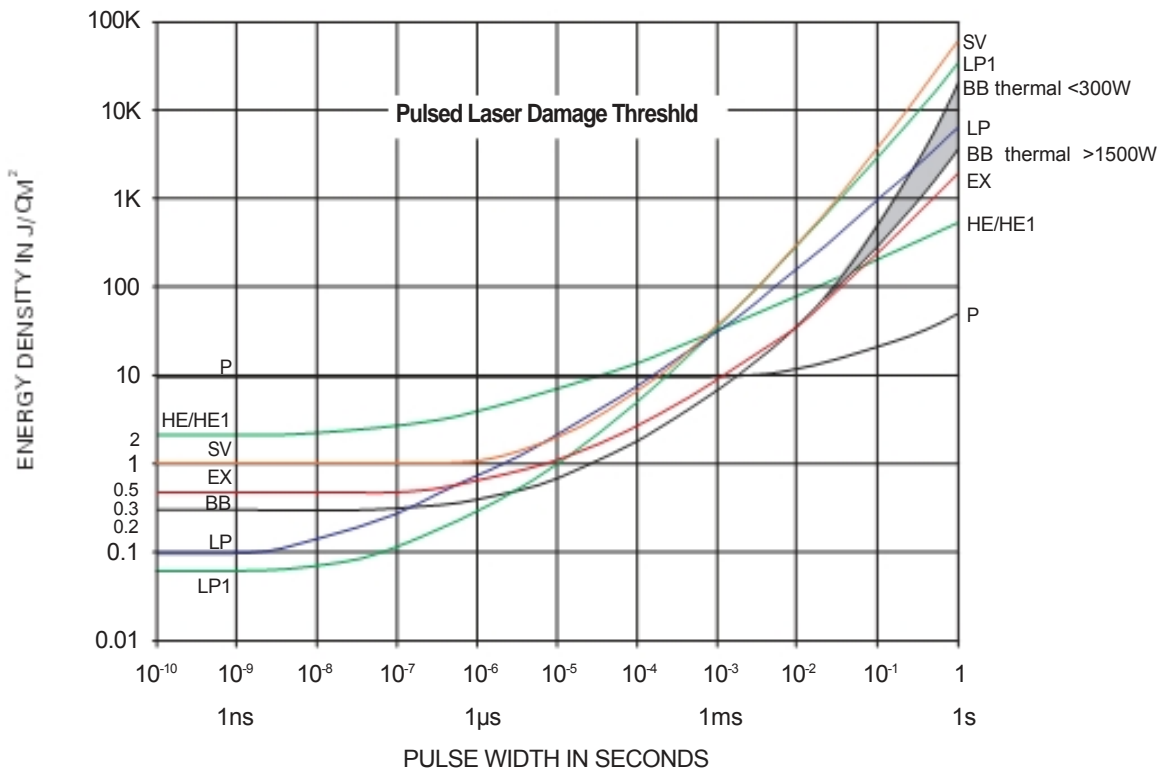
Pyroelectric and Excimer Heads



Thermal Heads



Thermal Heads



Pyroelectric Heads

