Manufacturing the future.



LASERPOINT

THE POINT OF DIFFERENCE IN PHOTONICS

CATALOG2022

THE CHOICE OF ACCURACY IN LASER MEASUREMENT

ABOUT LASER POINT

Laser Point is located in Italy and operates since 1986 in the laser market as manufacturer of laser measurement systems. It is an independent company, constantly focussed on innovation to always provide customers with the smartest solutions for laser monitoring.

Laser Point employs a highly skilled staff of physicists, engineers and technicians with solid experience in laser technologies, laser diagnostics and laser process monitoring.

Proprietary technologies cover a wide range of markets and applications, including industrial laser applications, monitoring of laser sources, monitoring of laser systems, medical laser applications, laboratory power monitoring.

Laser Point has developed many proprietary and patented technologies that allow to withstand the power density typical of high brightness lasers and multi-kW lasers and to measure ultrafast pulsed lasers with pulse durations down to femtoseconds.

Laser Point designs and manufactures power and energy measurement instruments from low power (µW) up to multi-kW. All sensors are supplied with calibration certificates traceable to NIST/PTB international standards.

Laser Point quality management system is certified according to ISO9001-2015 standard.

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Selecting a meter for the application

Laser Point solutions are characterized by a flexible approach to laser measurements: different sensor meters are available, allowing reading measurements on a stand-alone portable instrument, on PC

		
PLUS2	**PC-LINK**	**PcPlug V3**
Ordering Code: **PLUS2**	**Ordering Code:** **PC-LINK**	**Ordering Code:** **sensor heads code**
Connectivity: DB15 To Head; USB to PC.	Connectivity: DB15 to Head; USB to PC.	Connectivity: USB or RS232 to PC
Meter for all thermal sensors and power probe (FIT-H), (including Blink FR up to 6Hz rep. rate) and Photodiode Sensors.	Meter for all thermal sensors and FIT-H. Blink FR and photodiodes are not supported.	Meter Integrated head for all thermal sensors and power probe (FIT-H), (including Blink FR up to 6Hz rep. rate) and Photodiode Sensors.
Plus2 is a handheld, lightweight, touch- screen Meter designed to measure the optical power/energy of lasers and other light sources. It features a 4.3" color touch screen display and an intuitive and ergonomic Graphical User Interface which allow exploiting all its characteristics by just few touches. It's powered by a USB rechargeable Lithium battery for a run time up to 15 hrs. Plus2 offers a configurable Analogue Output and easy Data Saving.	PC-LINK is a smart "sensor head to PC" interface that converts any PC or laptop into a powerful instrument which measures, analyses and records power and energy from a thermal sensor head. PC-LINK is supplied with user-friendly communication software for single channel PC-LINK provides a full statistical analysis without the need of any display. Software includes many mathematical functions.	The PC Plug Meter Integrated series of sensors has been specifically developed for all those applications that do not require a display but where readings can be analyzed and displayed on the now ubiquitous computer. The RS-232 version is the most convenient platform to have power measurement integrated inside laser processing systems. The PC Plug USB sensors get their supply power from the USB connection while the only requirement for RS-232 version is a +12VDC input.

	
PULSE CONTROLLER	High Speed Meter (HSM)
Ordering Code: HSM-1000-PC	Ordering code: HSM-1000
Connectivity: HS connector to Head; Ethernet to PC	Connectivity: HS connector to Head; Ethernet to PC
Pulse Controller (PC) for Blink HS.	High Speed Meter (HSM) for Blink HS.
PULSE CONTROLLER is a special version of High Speed Meter (HSM-1000-PC) specifically developed: to detect in real time and display on a PC, any laser missing pulse or any laser pulse below a user specified energy threshold; to display on a PC and perform statistics on many laser parameters such as pulse energy, power, repetition rate, peak energy.	HSM is a High Speed Meter specifically developed to connect High Speed Sensor Blink HS to PC via Ethernet, to acquire and display data of laser pulse trains and perform statistics on many laser parameters as energy, power, repetition rate, peak power. HSM can sample data with a sampling rate up to 500 Msamples/s to provide a precise energy measurement of each single ultrashort pulse up to 1 MHz repetition rate.

- PLUS 2



Plus 2 is a handheld, lightweight, touch screen meter designed to measure the optical power/energy of lasers and other light sources.

The Plus2 meter is compatible with all released Laser Point thermal sensors (including Blink FR up to 6Hz rep. rate) and photodiode sensors. It features a 4.3" color touch screen display and an intuitive and ergonomic Graphical User Interface which allow to easily exploiting all its characteristics. The instrument is powered by a rechargeable lithium battery for a run time of up to 15 hrs.

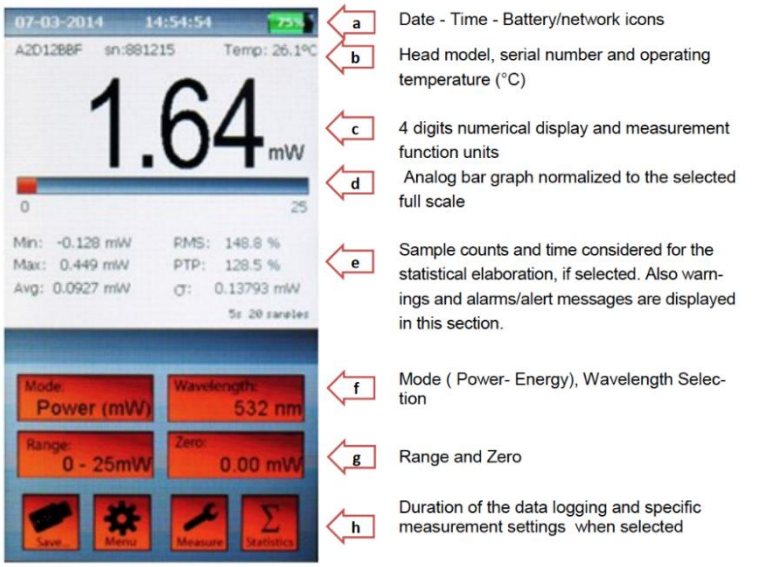
Among its features, the Plus 2 offers a configurable Analogue Output and easy Data Saving.

Wavelengths can be selected opening the "edit lambda" window where a set of most popular laser wavelengths are displayed. The measurement full scale or range can be adjusted according to user's needs by touching the "Range" screen button and scrolling to choose the range option.

The "Mode" screen button easily switches from Power measurement mode to Energy measurement mode; measurement units are shown according to sensor head type and expected range.

The Plus 2 can measure the single shot or the integral energy of a burst of 2 or more pulses.

To avoid unwanted contribution of thermal noise or background radiation to the measured pulse energy, the instrument has been designed not to respond to pulses below a preset energy threshold.



Measures in Power mode can be displayed as Irradiance (W/cm²), as well as measures in Energy mode can be displayed as Fluence (J/cm²) by inserting the beam Shape (Radius for a circular shape, Width and Height for rectangular shape) on "Measure Settings". Three processing options are available:

-**Continuous**: statistical elaboration is carried out on a continuous data collection basis.

-**Repeated**: the data are repeatedly collected and elaborated within a user's defined time period.

-**Single**: the data are collected and elaborated only once within a user's defined time period.

By inserting the USB memory key into the port on Plus 2 left side and touching the "Save" button the Data Logging window is open. A selection of both the desired data to be saved (Values, statistics or both) and Sample Rate (between 0.5 s and 99 s) together with the acquisition mode can be done. Display off time can be set from 1 to 30 minutes and after a certain time of inactivity Plus 2 turns off.

"90° Full Screen" option switches the screen to a 90° turned full screen high visibility / high contrast display showing only the measurement value and related units.

Ordering Code	PLUS2
Power Mode	
Power Range	100 nW – 10 kW
Resolution	0.01% - 0.1% of Full Scale
Energy Mode	
Energy Range	1 mJ – 1 kJ
Resolution	0.01% - 0.1% of Full Scale
Pulse repetition rate Range	Single shot - 6 Hz (a)
Power Probe Mode (FIT-H)	
Power Range	100 mW – 10 kW
Resolution	0.5 ‰ (a)
General Operating Characteristics	
Detector Compatibility	Thermal sensors, OEM thermal sensors, FIT-H power probes, Photodiodes Blink FR
Storage Temperature Range	-20 / +70 °C
Operating Temperature Range	+5 / +40 °C
Relative Humidity Range	10 – 70 %
PC connectivity	USB
Sensor Head connectivity	DB15
Selectable Wavelengths	1 nm resolution (b)
Dimensions	170 H x 100 W x 36-50 D (mm)
Weight	380 g
Display	4.3" TFT LCD high brightness; 480 x 272 resolution; resistive touch screen; 96 H x 55 W (mm)
Battery	Built in rechargeable Li-Pol; 3.7 V, 3700 mAh
Battery charge time	7-8 hours if not working; 15-20 hours if working
Battery run time	>9 hours in normal operations; >15 hours in stand-by display mode
Supplied battery charger	Input 100/240 Vac; 50/100 Hz; 5 Vdc; 1A; Charging current: 0.5 A; (Plus2 may be charged through a PC USB port)
Electronics characteristics	
ADC sampling rate	64 Hz – 192 Hz (c)
ADC resolution	23 bit
Electrical accuracy	± 0.5 %
Analog Output	0.025 – 2 V (with 16 bit resolution; 0.0015% resolution)
Analog Output Accuracy	± 0.1%; ± 2 mV relative to display
Notes	
	a) for Blink FR b) available wavelength range is sensor head dependent c) sampling frequency is sensor head dependent

- PC-LINK



To work with PC-LINK is very easy: it is sufficient to install the software, connect the sensor heads to PC-LINK unit and these latter to the USB port of a PC. No other operation and external power source are needed.

This sophisticated monitor is "plug and play" with all thermal heads and FIT-H power probes. The advanced features of PC-LINK together with the fact that it is very compact and has low weight, make this monitor an ideal partner for service applications, laboratory or OEM use offering the convenience, flexibility and value of computer-based operations; PC-LINK is in fact the ideal candidate for use in laser machines, in particular when associated to FIT-H (Fast Integrative Thermopile Heads) family of OEM power probes, that work up to 6KW without the need of water cooling.

The use of PC-LINK is straightforward: the unit will recognize the power/energy head as soon as it is plugged-in; furthermore, the PC-LINK will use its acceleration circuitry to insure a fast response and will use the calibration data stored in the DB15 connector of each head to provide the most accurate power/energy measurement.

One feature offers the possibility to access to the "User Calibration Factor" (UCF) and there is also X10 gain to enhance measurement flexibility (e.g. low power measurements to 20µW resolution).

Software allows measuring and analyzing data with full statistical functions (Min., Max., mean and standard deviation). Data from each detector can be logged simultaneously to file.

The "Power mode" allows measurements of laser powers with direct display of their actual values. The screen also shows the evolution of power over time allowing stability measurements as long as several hours (up to 12 h depending on the PC).

The "FIT mode" provides values of laser power by an automatic measurement cycle with Laser Point's Fit-H power probes; this family of detectors is used for accurate, yet once in a while readings and whenever simple power checks instead of long term measurements are needed.

The "Energy mode" allows the measurement of single shot energy.

Laser tuning function is used to achieve a high resolution tweaking of your laser; an analogue needle shows the direction of tuning: in the middle of the tuning display a box shows the current measured power, while the maximum value reached during the tuning procedure is kept in a second box of the screen.

.Ordering Code	PC-LINK
.Power Mode	
Power Range	1mW – 10kW
Resolution	0.5 ‰ (a)
Energy Mode	
Energy Range	1 mJ – 300J
Resolution	0.5 ‰ (a)
Pulse repetition rate Range	Single Shot
Power Probe Mode (FIT-H)	
Power Range	100 mW – 10 kW
Resolution	0.5 ‰ (a)
General Operating Characteristics	
Detector Compatibility	Thermal sensors, OEM thermal sensors, OEM FIT-H power probes
Storage Temperature Range	-10 / +60 °C
Operating Temperature Range	+5 / +45 °C
Relative Humidity Range	20 / 80%
PC connectivity	USB
Sensor Head connectivity	DB15
Selectable Wavelengths	6
Dimensions	113 L x 56 W x35 H (mm)
Weight	106 g
Display	N.A.
Battery	N.A.
Battery charge time	N.A.
Battery run time	N.A.
Supplied battery charger	N.A.
Electronics characteristics	
ADC sampling rate	64 Hz
ADC resolution	16 bit
Electrical accuracy	± 0.5 %
Analog Output	N.A.
Analog Output Accuracy	N.A.
Notes	
	a) For any Full Scale

- PC-PLUG



The PC-PLUG series of sensor heads has been specifically developed for all those applications that do not require a display but when readings can be analyzed and displayed on the now ubiquitous computer.

With simple "plug and play" functionality, integrated meter and at a lower cost, the PC PLUG sensors have all the power and sophistication of signal processing and software of the traditional PLUS 2 meter.

The PC-PLUG series has two different connectivity options: USB (option U) or RS-232 (option R).

The PC-PLUG series with USB connectivity gets its power supply from the PC through the USB port while the only requirement for PC-PLUG series with RS-232 connectivity is a + 12VDC input.

The PC-PLUG sensors have been primarily developed for applications that need a power measurement station on board of machines; these instruments are also the perfect monitoring tool for other industrial applications such as laser burn-in or long-term reliability testing.

The PC-PLUG is also the best choice for service engineers and technicians who always travel with a laptop computer, because they will no longer need to carry separate instruments and additional weight.

Finally, thanks to their lower cost and smaller size, these sensors can be also successfully integrated in more standard laboratory applications that already use computer controlled instrumentation.

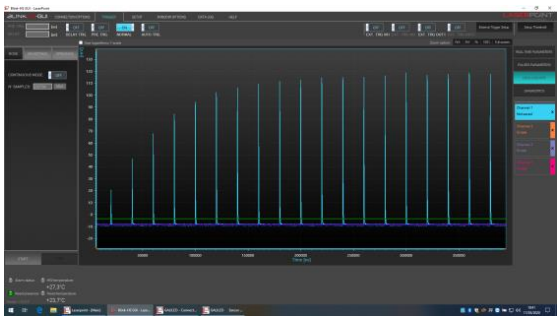
.Ordering Code	PC-Plug sensor heads code
.Power Mode	
Power Range	100 nW – 10 kW
Resolution	0.01% - 0.1% of Full Scale
Energy Mode	
Energy Range	1 mJ – 1 kJ
Resolution	0.01% - 0.1% of Full Scale
Pulse repetition rate Range	Single shot - 6 Hz (a)
Power Probe Mode (FIT-H)	
Power Range	100 mW – 10 kW
Resolution	0.5 ‰ (a)
General Operating Characteristics	
Detector Compatibility	Thermal sensors, OEM thermal sensors, FIT-H power probes, Photodiodes Blink FR
Storage Temperature Range	-20 / +70 °C
Operating Temperature Range	+5 / +40 °C
Relative Humidity Range	10 – 70 %
PC connectivity	USB / RS-232
Sensor Head connectivity	N.A.
Selectable Wavelengths	1 nm resolution (b)
Dimensions	78 x 26.4 x 14.6 mm
Weight	26 g
Display	N.A.
Battery	N.A.
Battery charge time	N.A.
Battery run time	N.A.
Supplied battery charger	N.A.
Electronics characteristics	
ADC sampling rate	64 Hz – 192 Hz (c)
ADC resolution	23 bit
Electrical accuracy	± 0.5%
Analog Output	N.A.
Analog Output Accuracy	N.A.
Notes	
	a) for Blink FR b) available wavelength range is sensor head dependent c) sampling frequency is sensor head dependent

- **High Speed Meter (HSM-1000)**

HSM is a High Speed Meter specifically developed to connect High Speed Sensor Blink HS to PC via Ethernet, to acquire and display data of laser pulse trains and perform statistics on many laser parameters such as energy, power, repetition rate, peak energy.



HSM is able to sample data with a sampling rate up to 500 Msamples/s to provide a precise energy measurement of each single ultrashort pulse up to 1 MHz repetition rate. It is suitable for ultrashort pulsed lasers down to femtosecond pulse duration.



Oscilloscope Mode



Real Time Parameter

HSM can work according to two different modes, the "Oscilloscope mode" allowing to display on the PC the acquired laser pulse train and the "Real Time Parameters" where the user can monitor the behavior of many different parameters of the acquired laser pulse train such as the energy of each pulse, power, repetition rat and peak power. A user friendly Graphic User Interface (Blink-HS-GUI) is supplied with HSM to easily display data on PC using the two modes. External power supply for HSM is 12 V with 2 A maximum current. Blink HS sensor is connected to HSM via a specific microwave cable supplied with the sensor. Measurement resolution of HSM (%, full scale) is 0.1% with measurement accuracy of +- 1%. Trigger IN and trigger OUT SMA connectors are available on the HSM front panel to allow triggering of HSM measurements from an external trigger source or to provide an internal trigger signal respectively.

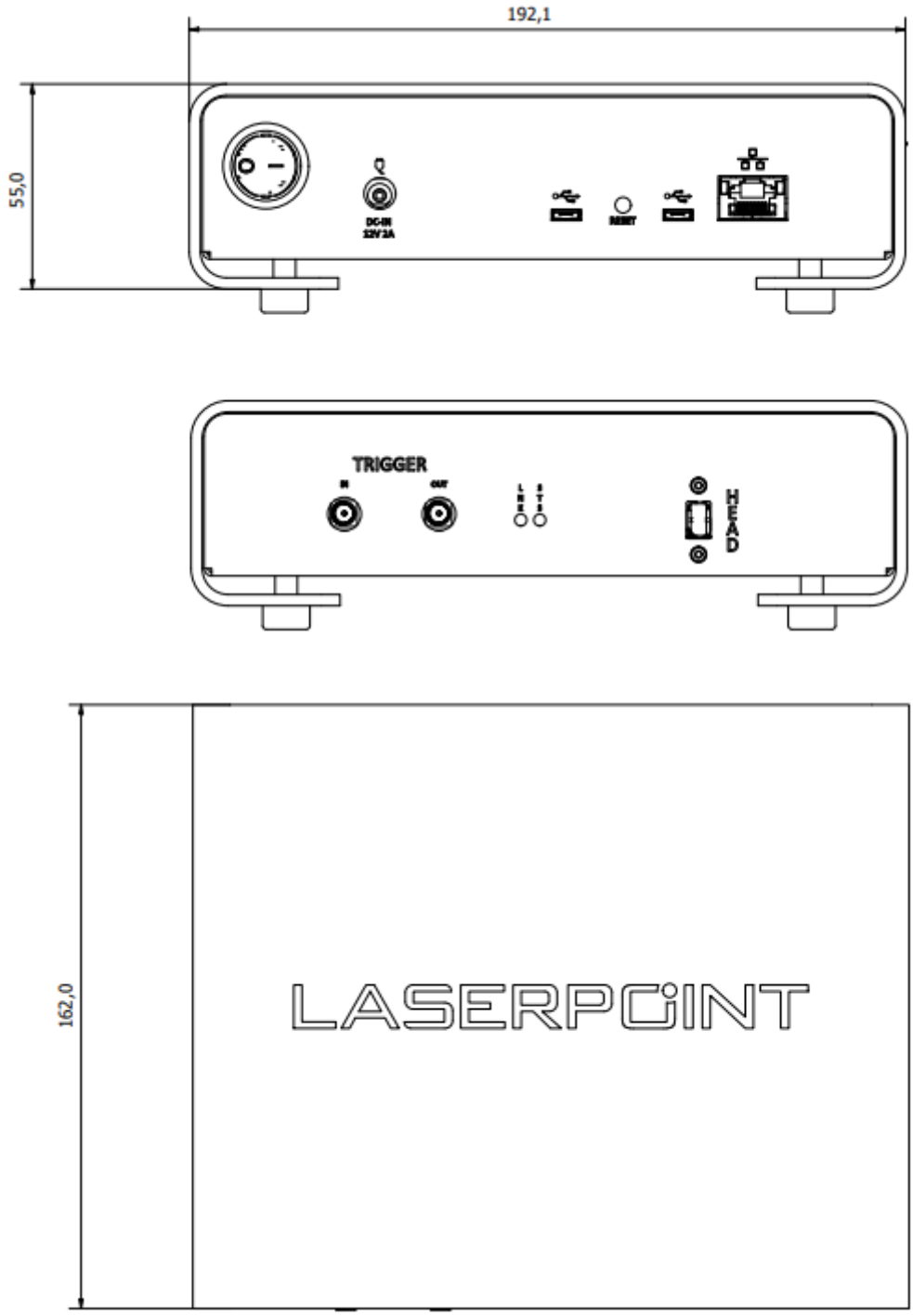


Rear Panel with Trigger IN and OUT



Front Panel with Ethernet port

.Ordering Code	HSM-1000
.Power Mode	
Power Range	20 W
Resolution	0.1% of Full Scale
Energy Mode	
Energy Range	1 µJ – 10 mJ
Resolution	0.1 % of Full Scale
Pulse repetition rate Range	1 kHz – 1 MHz
Power Probe Mode (FIT-H)	
Power Range	N.A.
Resolution	N.A.
General Operating Characteristics	
Detector Compatibility	BLINK HS
Storage Temperature Range	-20 / +70 °C
Operating Temperature Range	+5 / +40 °C
Relative Humidity Range	20 / 80 %
PC connectivity	Ethernet 100/1 G
Sensor Head connectivity	Hirose IX - High Speed connector
Selectable Wavelengths	Up to 16 wavelengths
Dimensions	192.1 L x 162.0 W x 55.0 H (mm)
Weight	740 g
Display	N.A.
Battery	N.A.
Battery charge time	N.A.
Battery run time	N.A.
Electronics characteristics	12V 24W AC/DC Power Supply
Electronics characteristics	
ADC sampling rate	500 Msamples/s
ADC resolution	14 bit
Notes	
	a) For any Full Scale


192,1
55,0
DC-IN
12V 3A
TRIGGER
IN
OUT
LINE
LTI
HEAD
162,0
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- Pulse Controller (HSM-1000-PC)

  HSM-1000-PC is a High Speed Meter with dedicated "Pulse Controller" Software specifically developed to detect in real time any Laser Missing Pulse or any Laser Pulse below a user specified threshold.

  HSM-1000-PC can work according to **three different modes**; a "snapshot" modes, i.e. the "*Oscilloscope Mode*" allowing to display on the PC the acquired laser pulse traces (over 1 ms span).
  In "*real time*" mode ("Real Time Parameters") the user can monitor the behavior of main parameters of the acquired laser pulse train such as the average energy/pulse and average repetition rate (all those parameters integrated over 1 ms).

  The two modes described above are, nevertheless, ancillary modes to the "*Missing Pulses*" mode, that is the main operation mode of the system that can perform the following 2 functions:

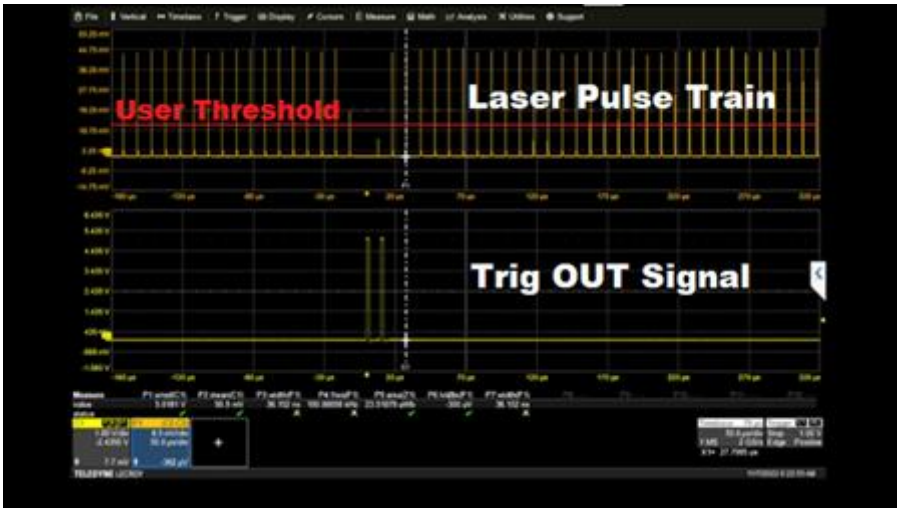
  - detection of **every Missing Pulse**, i.e. any laser pulse (or no pulse) that has not sufficient energy to trigger the acquisition (< "Trigger Start") of the HSM Meter.
  - detection of **every low energy pulse**, i.e. pulse that has a detected energy below user specified threshold, "Threshold Low"

  Trigger IN and Trigger OUT, SMA connectors, are available on HSM-1000-PC front panel.

  The user can select between two kind of reference electrical signal input to the HSM-1000-PC Trigger IN, according to the operation mode of the Laser Under Test:

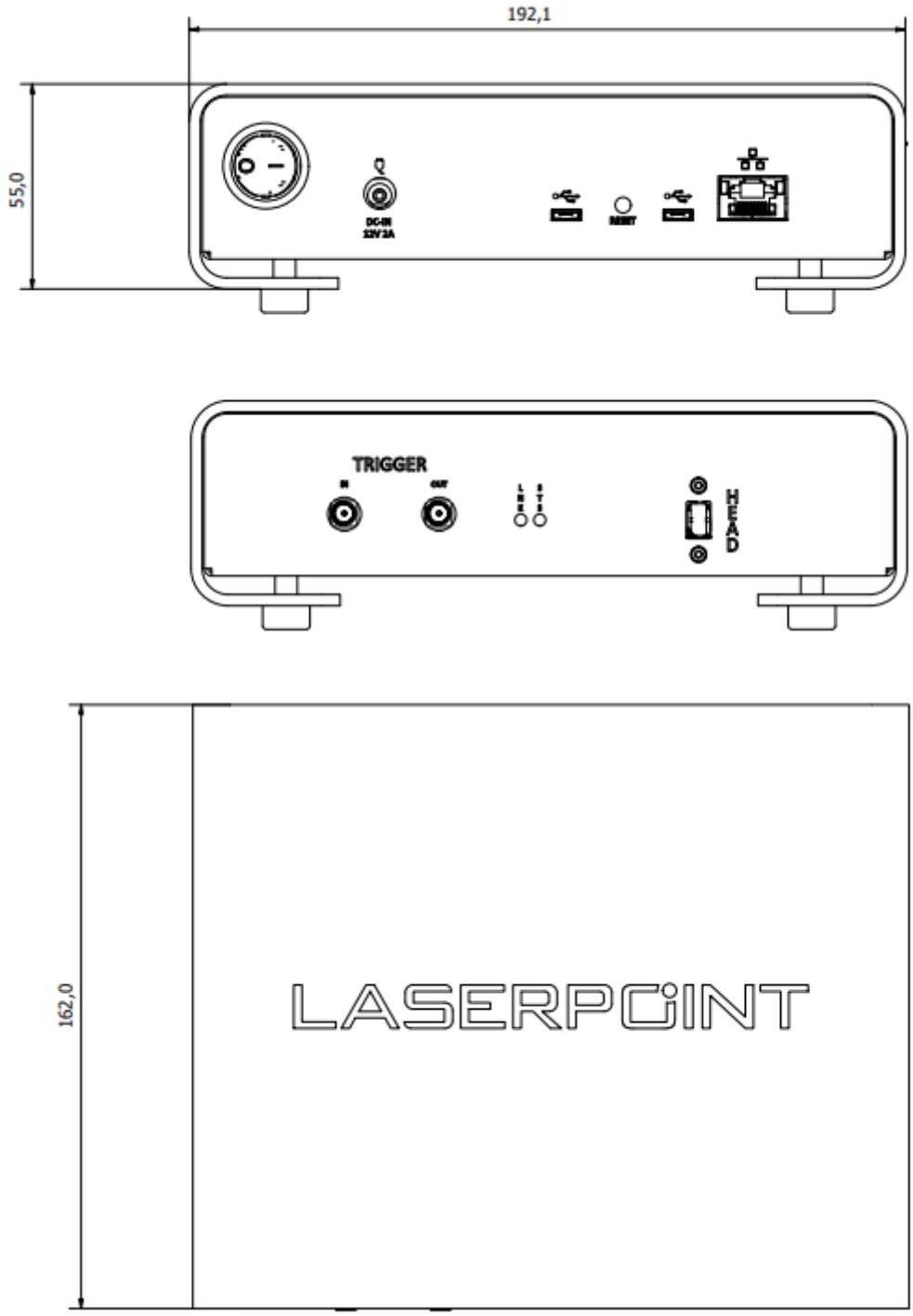
  - **Sync signal:** the HSM-1000-PC performs a comparison between a pulsed TTL electrical signal received by HSM-1000-PC @ Trigger IN from Laser Under Test and pulse detection by Blink HS sensor head.
  - **Gate signal**: the HSM-1000-PC performs a comparison between expected pulse train at pre-defined repetition rate and pulse detection by HS sensor head: the comparison starts at Gate signal high received by HSM-1000-PC @ Trigger IN and ends at Gate signal low received by HSM-1000-PC @ Trigger IN.

  At Trigger OUT SMA connector a real time TTL alarm signal is delivered at the occurrence of any Missing Pulse or pulse whose energy is below user defined energy threshold, as shown in the following figure:



  Pulse Controller can work together with any of the Blink High Speed Sensor.

Ordering Code	HSM-1000-PC
SENSOR COMPATIBILITY	
Sensor Models:	BLINK HS series (BM-xxx ...)
ENERGY/POWER MEASUREMENT	
Measurement Resolution	0.1 % of Full Scale
ADC resolution	14 bit
Pulse repetition rate Range	1 kHz – 800 kHz
Input Range	-850 / 0 / +850 mV
CONNECTIVITY	
PC connectivity	Ethernet 100/1 G (cable Included)
Trigger IN	1 channel – SMA connector – optoisolated
Trigger OUT	1 channel – SMA connector - optoisolated
Sensor Head connectivity	Hirose IX - High Speed connector (cable Included)
Power Supply Port	12V 24W AC/DC (PSU Included)
MEASUREMENT SETTINGS:	
Selectable Wavelengths	Up to 16 wavelengths
Selectable laser type:	femtosecond, picosecond, nanosecond, microsecond, millisecond
Selectable Gains:	/10, /5, x1, x5, x10
Trigger:	Internal and external trigger user selectable. Trigger IN: input signal for Missing Pulses Mode of operation. Trigger OUT: missing pulse or low energy pulse alarms output
MISUREMENT FUNCTIONS – PULSE CONTROLLER SOFTWARE	
Oscilloscope mode (ancillary)	Single or repeated scan of sensor response trace, max 1 ms display window (selectable)
Real Time Mode (ancillary)	Continuous measurement of 1 ms averaged measurement of: Energy, Frequency. Plot refresh rate 2 Hz.
Missing Pulses Mode	Detection of every Missing Pulse, and detection of every low energy pulse, based on comparison of: Sync or Gate input signal @ Trigger IN (user selectable) and Blink HS sensor head signals generated by the laser pulses
Data Export:	Chart data (csv) LOG of missing pulses and low energy events (.csv)
MECHANINCAL SPECS	
Dimensions	182 L x 162 W x 57 H (mm)
Weight	740 g
OPERATING CONDITIONS:	
Storage Temperature Range	-20 / +70 °C
Operating Temperature Range	+5 / +40 °C
Relative Humidity Range	20 / 80 %


192,1
55,0
DC-IN
12V 3A
TRIGGER
IN
OUT
LINE
LTD
HEAD
162,0
LASERPOINT

Software

- Galileo Software

GALILEO is a step forward in simplification and easy to use of measurement instruments: a single software compatible with all Laser Point readout electronics, which makes any laptop a true power and energy meter. Galileo can in fact read and display data from any Laser Point Meter (PLUS2, PC-Plug series, PC-link).

A completely new graphic interface has been developed to be user friendly, intuitive and ready to use. Users can start their measurement process within a few mouse clicks and be immediately ready for measurement.

Galileo has been enriched with new useful functions:

- a visualizer of logged data (useful to load logged data in a trend graph for further analysis)
- a function to monitor whether process parameters remain within a preset range (it keeps under control a laser process and generates alarms whenever the measured values are outside the prefixed limits)
- automatic software update over the internet.
- new functions for the trend graph, like zoom, auto-sizing and three displaying modes for time flow.
- managing of up to 4 different sensors heads
- Power and energy density based on user defined laser beam size.



Using the processing power of PCs, Galileo gathers data at high speed from the readout electronic and displays information in a smooth and fast way.

All settings related to a specific head will be stored on the PC in use: in this way the same settings can be reloaded each time the sensor is connected to the same PC.

On top to the main window of Galileo a tab control hosts all the relevant functions for setting up measurements in few mouse clicks. A large, highly visible, area is used to show measured data, depending on the selected mode for display (Digital, Trend, Analog).

Galileo can manage up to 4 different sensor heads arranging its windows in different ways for the most efficient visualization.

Measurement Mode: enables the selection between Power, Energy or FIT (power probe) modes of measurement and to display power data in Watt or in Joule.

Full Scale Range: enables the selection of up to four different full scale ranges (depending on the electronics) to increase the measurement resolution.

Lambda: Sets the wavelength for the sensor in use.

The "Wavelength Selection" page shows a table with the most popular wavelengths which are stored in the EEPROM of the head. Should the sensor head be used at other wavelengths not shown in the list, those can be chosen with 1 nm resolution on the box "Edit nm".

Display Mode: gives access to three different display modes of power measured data, namely:

1) Digital Display: shows the instantaneous value of measured power; the coloured bar represents the measured value as a fraction of full scale.
2) Trend Display (Power Mode):
   shows both laser power evolution (Y axis) as a function of time (X axis) and the instantaneous value of the measured function. Statistical information is visible in the upper part of the display. Various controls are available in the bottom to customize the display of measured data.
   Trend display in Energy and FIT (Power Probe) modes:
   the display becomes a histogram-like graph where the energy or power of each measure is represented as a vertical bar; the last measured value is also digitally shown. The statistical information is available in the upper part of the display.
3) Analogue Display:
   shows the instantaneous value of measured power both by a needle-like representation and in digital form.
   The "Start Tuning" key activates the tuning function for optical alignments: the MAX and MIN values reached during the operation will be updated.

Statistics & Logging: the tab hosts controls for elaboration of measured data, like data-logging or statistics.
Data Logging: saves measured data on a ".txt" file that can be open and managed using external programs (like Excel).
Snap Shot: saves a screen shot as an image file.
Statistics: provides statistical data on measured values:
Type: are available three options for acquisition and elaboration of statistical data:
-Continuous: data acquisition and elaboration are continuously made.
-Repeated: data are repeatedly collected and elaborated within a user's defined time period.
-Single: data are collected and elaborated over a single run within a user's defined time period.
Whether operators need to work using values shown as power or energy density (W/cm2 or J/cm2), the beam area will be automatically calculated after the insertion of beam shape parameters.

Gain and Smoothing:

Multiply Factor is a useful tool to multiply the measured values by a correction factor (it can be >1 or <1). For example, when a power meter is behind a beam splitter to monitor a laser beam, the full power can be reconstructed multiplying the signal by a factor that takes into account the beam splitter attenuation.
The sensor's natural response time can be used as it is (Natural) or can be Accelerated: in this case an internal algorithm on the instrument will speed the response time by several factors (it depends on the head type).

- Communication Protocols for System Integrators

  Besides their use as standalone laser measurement meters, Laser Point devices (PLUS2, PC-LINK, PC-PLUG series with USB or RS-232 option) can also be used through a COM object control. This allows system integrators or anyone willing to write his own software, to integrate Laser Point measurement capabilities into their systems.
  Laser Point drivers are compatible and certified for Windows XP, Windows 7 (32-bit and 64-bit), Windows 8 Desktop (32-bit and 64-bit), Windows 8.1 and Windows 10.
  When drivers are installed on PC, a COM port and a USB device are added to the operating system.
  Laser Point USB devices are compatible with USB 1.1, USB 2.0 and USB 3.0. Power is provided via USB connection.
  The communication between PC and electronics is managed by a FTDI chip and is based on ASCII host commands.
  FTDI DLL commands have to be used to identify the Laser Point electronics and open the communication. Once communication has been correctly open, commands will be sent to retrieve information on sensor features (like available wavelengths, head name, etc.) and measured data (measured power or measured energy).
  Communication protocol for PC-LINK, PLUS2, and PC-PLUG are available to download from the Laser Point website www.laserpoint.eu

- Giotto Software

“GIOTTO” is the user-friendly Graphics User Interface (GUI) supplied with High Speed Meter (HSM-1000) specifically developed:

to acquire data of laser pulse trains measured by any High Speed Sensor of Blink HS family;

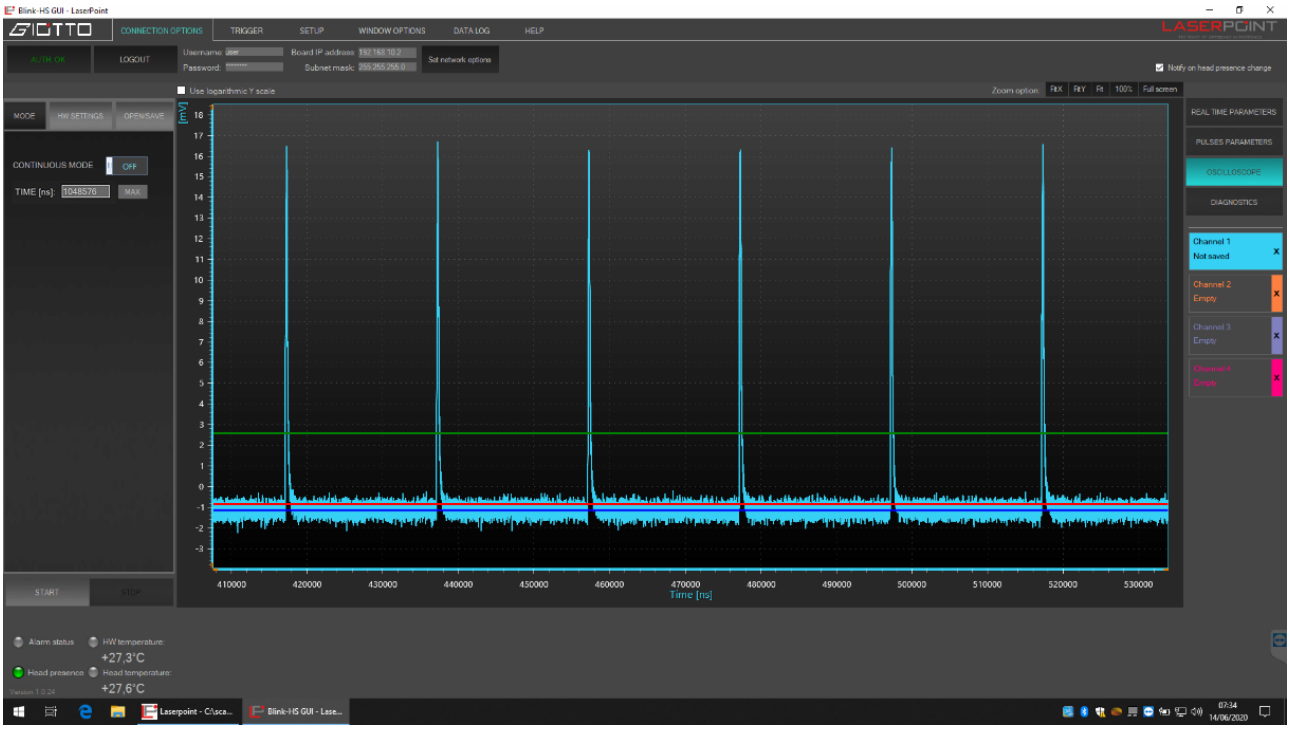
to display on a PC and perform statistics on many laser parameters such as energy, power, repetition rate, peak energy.

The Blink HS sensor is connected to the High Speed Meter HSM-1000 with a microwave cable (provided with HSM-1000 Meter) and HSM-1000 Meter is then connected to the PC with an Ethernet cable.

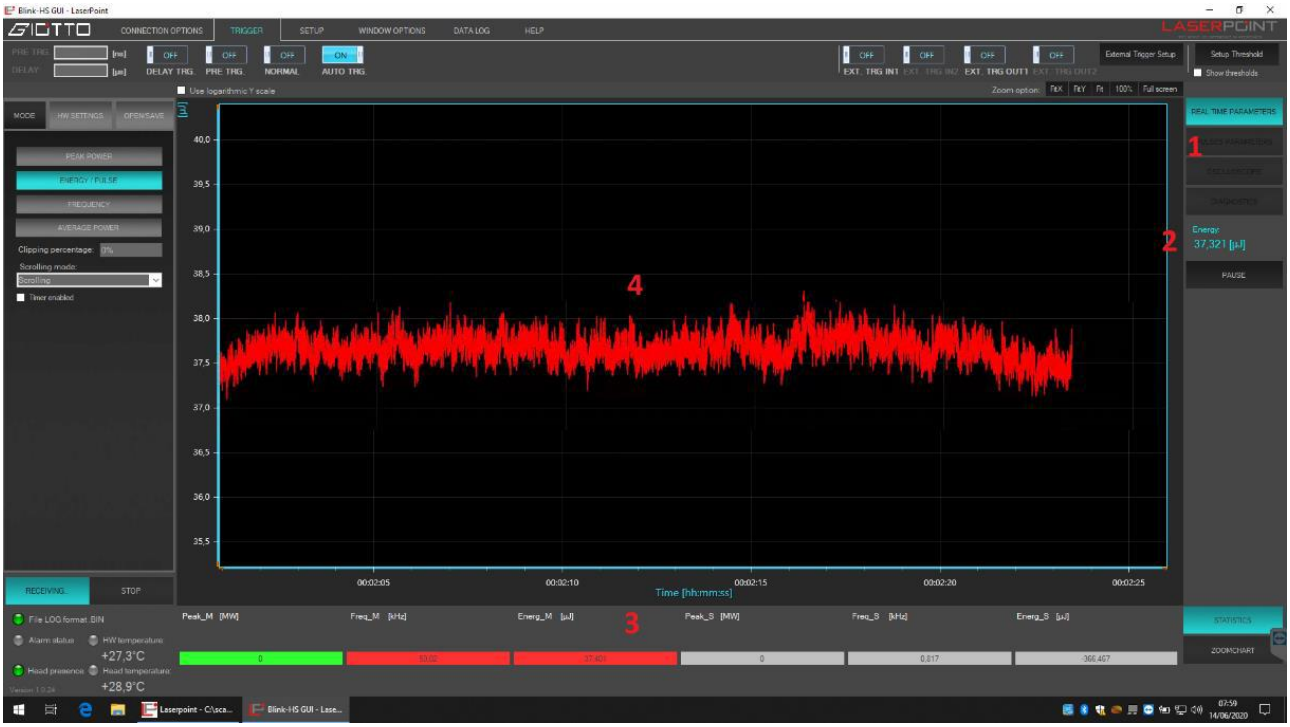
GIOTTO allows to perform automatic setup of all measurement setting to make the acquisition easy to be performed by the user.

HSM-1000 Meter can work according to 3 different modes using GIOTTO interface:

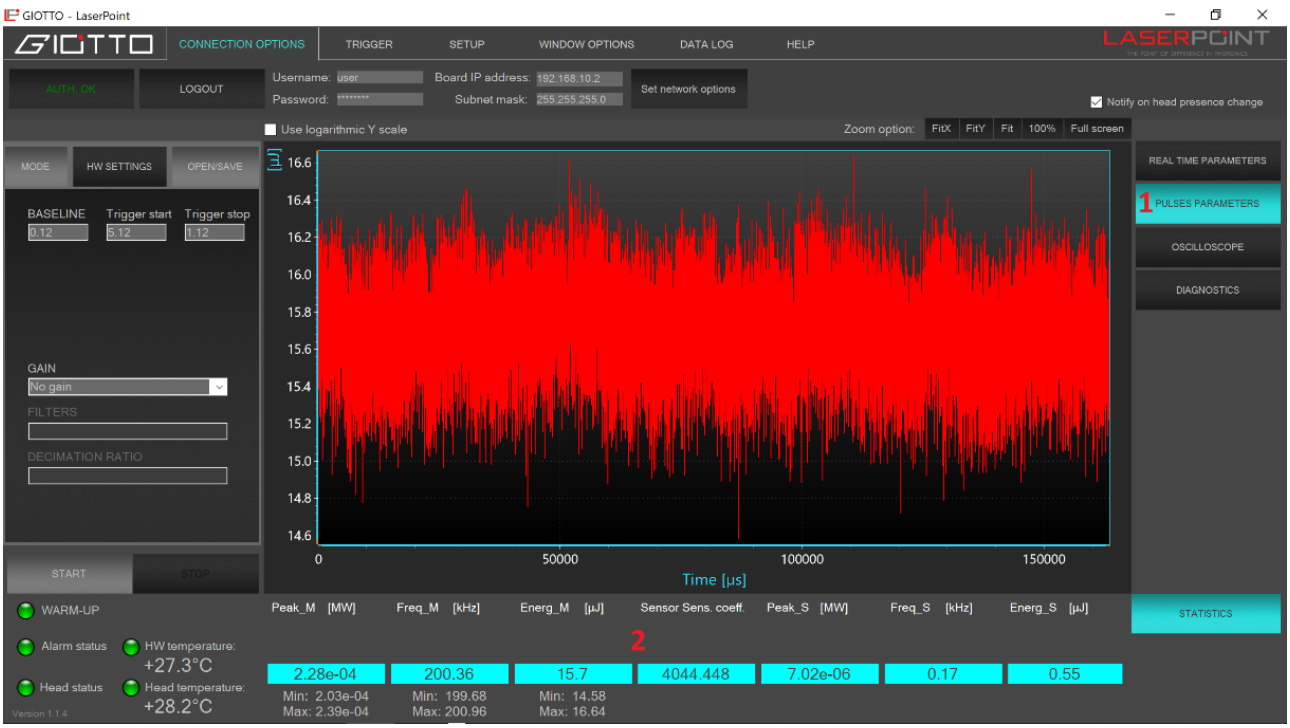
the “**Oscilloscope**” mode allowing to display on the PC the acquired laser pulse train



the “**Real Time Parameters**” mode allowing to display on the PC the <u>averaged value over 1ms</u> of many different parameters calculated from the acquired laser pulse train such as energy of each pulse, power, repetition rate and peak power

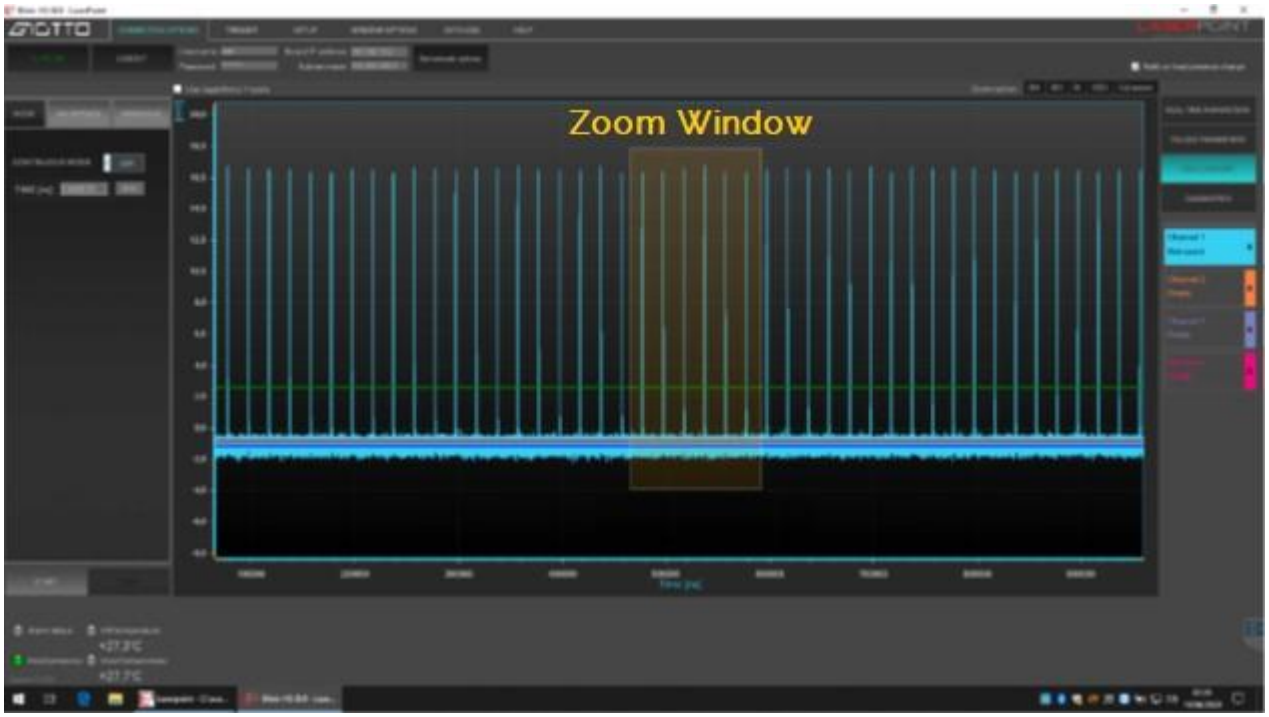


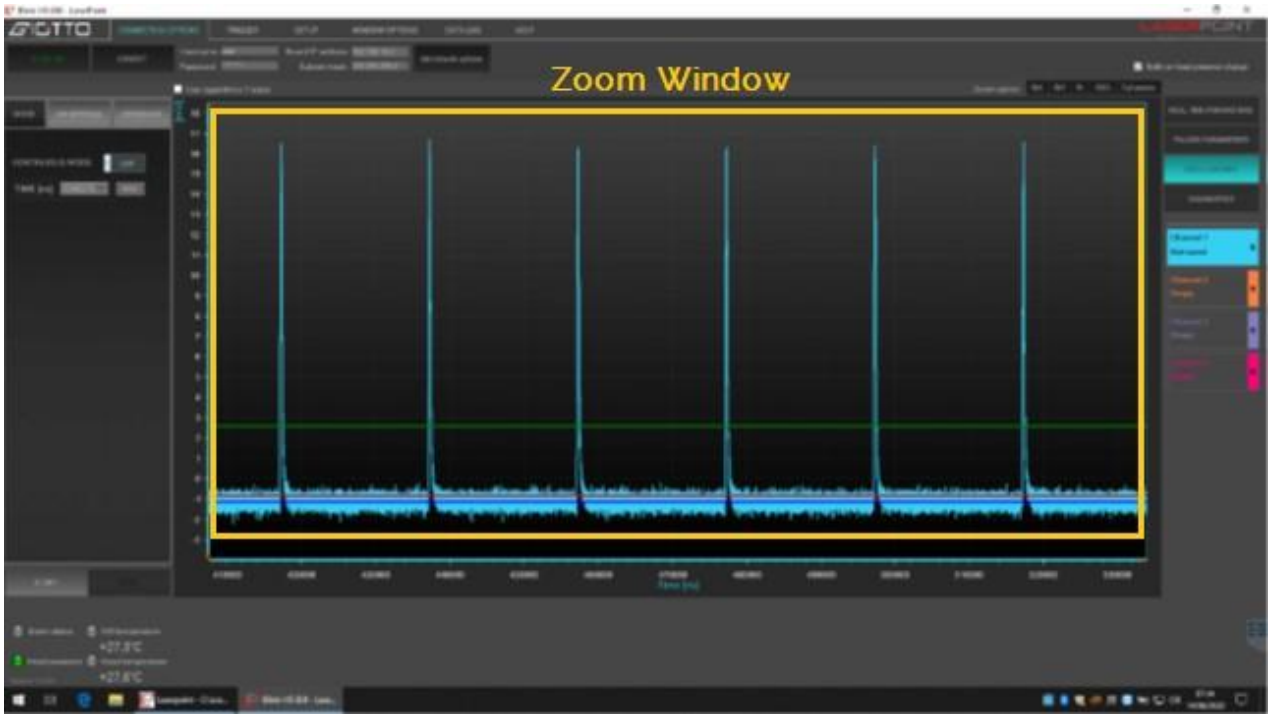
the “**Pulses Parameters**” mode allowing to display on the PC, energy, peak power of each pulse over the 32766 acquired pulses. Power and repetition rate of the pulse train are then calculated as average value over the 32766



For “Pulses Parameter” modes, GIOTTO allows the user to define upper and lower thresholds for any of the 4 parameters (pulse energy, peak energy, repetition rate, power) showing when the measured value is out of the user defined range.

Graphical zooming of the acquired data over the 3 modes can be performed using a zoom window defined by the user or an automatic zoom.



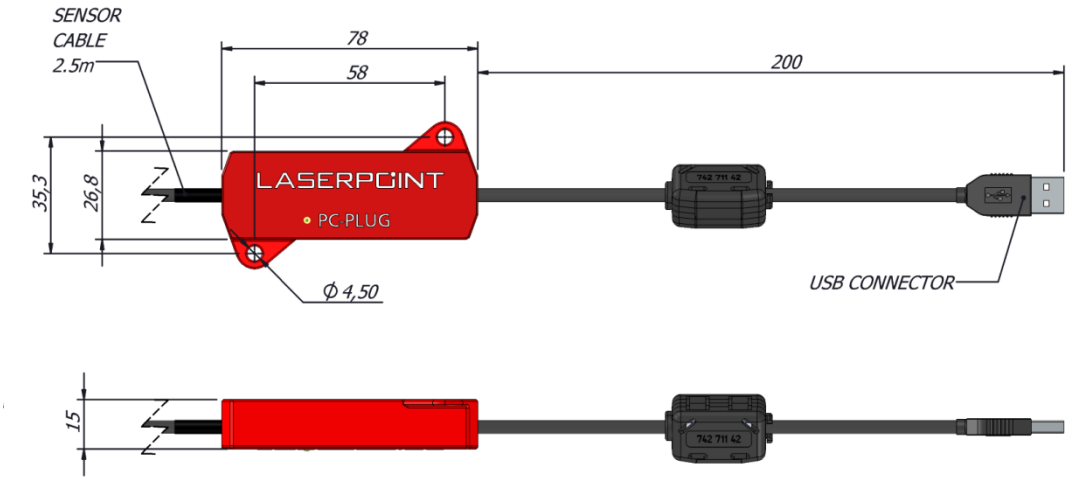


Following acquisition stop, the user can save the acquired data in csv file format or save chart image in png format.

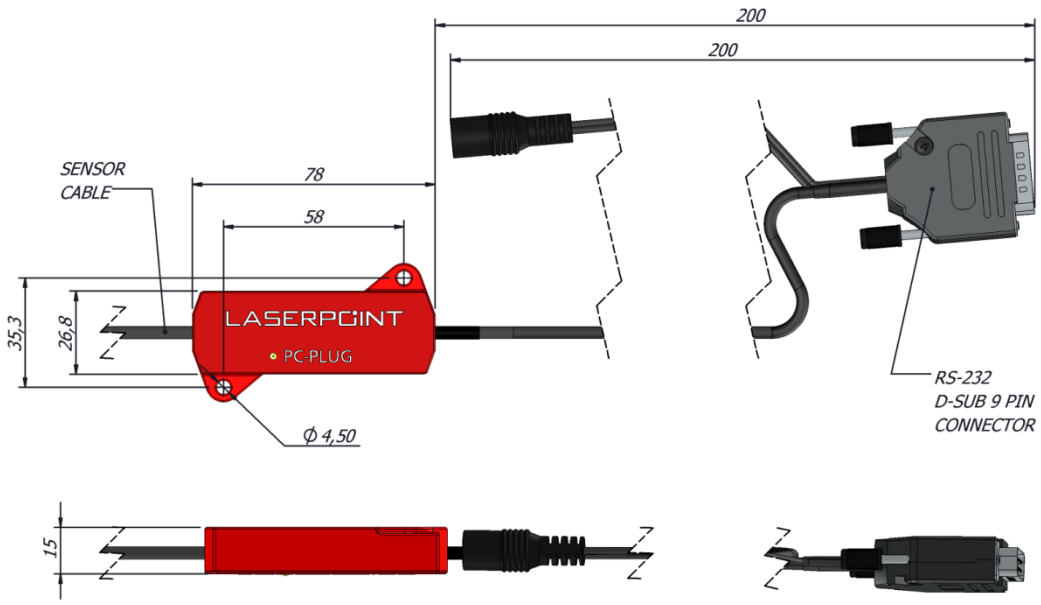
PC-PLUG connectivity options

Two types of connectivity for PC-Plug option are available to connect the sensor head to PC or to OEM system.

- USB connectivity (PC-Plug U option)



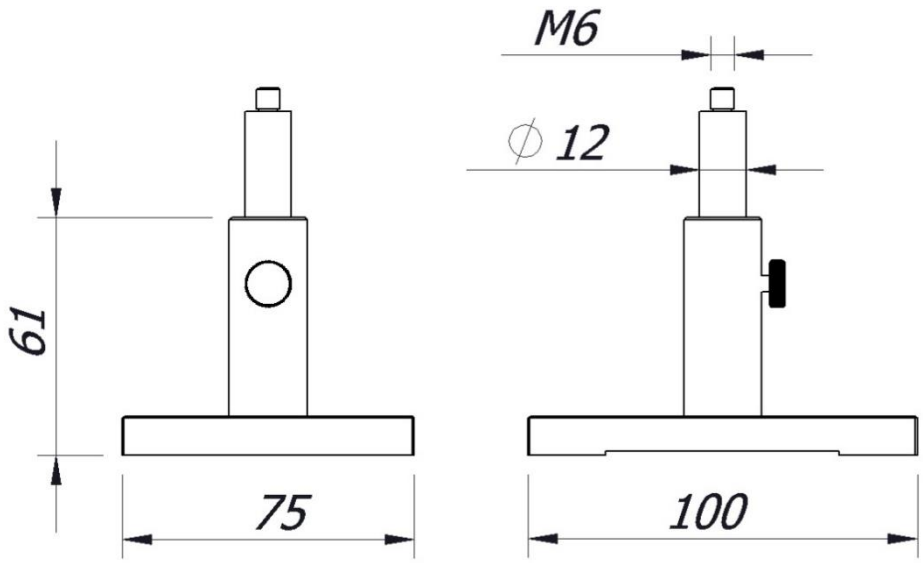
- RS-232 connectivity (PC-Plug R option)



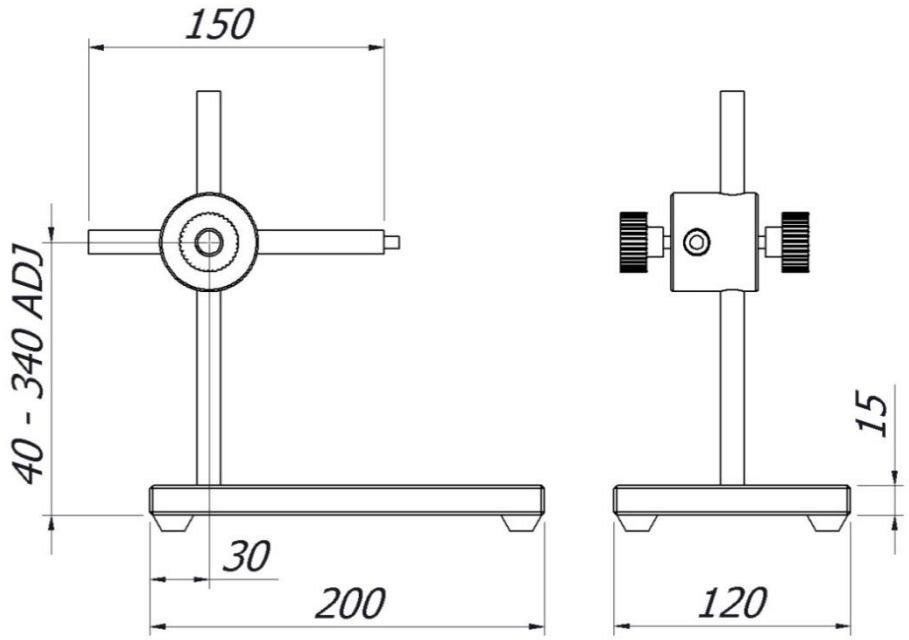
Duty Stand options

Two types of duty stand have been designed to be used with measurement heads according to the size of the head itself to allow a stable and safe mounting of the head on the stand.
Light Duty Stand is provided with all measurement heads up to 600W while Heavy Duty Stand is used for higher power.

Light Duty Stand



Heavy Duty Stand



High Speed Thermal Sensor – Blink Series

Blink is a new family of sensors, patent pending, which enables unprecedented lower response times compared to traditional thermopile detectors, while maintaining broadband operation.
Blink can be used in all industrial, medical and laboratory applications requiring performing accurate measurements of power or energy of pulsed laser up to femtosecond pulse duration and up to 1 MHz Repetition rate.
Blink family comes in two variants, **Blink FR** (Fast Response) and **Blink HS** (High Speed).

BLINK FR: Fast Response Sensor

BLINK FR is a new generation of fast response laser sensors (patent pending), based on a technology that enables to reach high speeds unreachable with standard thermopile detectors. BLINK FR sensors are based on a proprietary technology which enables natural response times of 90 ms (typ.) while still keeping broadband spectral range, power density capability and direct high-power operation up to 60W of comparable thermopile detectors. The response time is a key parameter for laser detectors when a faster response is required because several phenomena like pointing stability, fast drifts, and instabilities can only be monitored if the detector responds very quickly. However, traditional fast detectors cannot withstand high powers (as in the case of all photodetectors) or, vice-versa, when detectors can withstand the power, they are typically slow (as it happens with thermopile sensors or Peltier devices). Photodetectors can respond to pulses < 1ns, but they can only withstand few mW of direct laser power and their advantage of a fast response is, in most of applications, spoiled by standard readout electronics which curb the response time to 0.1-0.2s. On the other hand, thermopile detectors are inherently slow: their natural response times range from > 1s to several tens of seconds, depending on the maximum power rating. Those natural response times can be reduced by electronics circuits and speed-up algorithms, but cannot be lower than 800ms-1 s, and only in the case of very low power heads. BLINK FR sensors, differently from thermopile sensors, offer an unreached natural (without any acceleration by additional electronics) response time down to 90 ms (typ.). This is a game changing feature for laser power measurement because it paves the way to a number of applications that were not possible before.

BLINK FR



Broadband Calibration Range
(250-1100 nm and 10.6 µm)

Natural Response Time (0-90%): 90 ms (typ.)

Max. Rep. Rate: 5Hz

HOW TO ORDER:

Select Ordering Code without any option for DB15 head connectivity to Plus2 Meter;
Add connectivity option "U" to the Ordering Code for USB connectivity (PC-PLUG series);
Add connectivity option "R" to the Ordering Code for RS-232 connectivity (PC-PLUG series).

Ordering Code	Power Range	Energy Range	Max Energy Density	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
BL-A- 5W-16-K	25 mW - 5W	20 mJ – 5 J	1 J/cm2	16x 16 mm	0.2 – 25 µm	K	Convection	DB15
BL-A- 8W-16-K	25 mW - 8W	20 mJ – 5 J	1 J/cm2	16x 16 mm	0.2 – 25 µm	K	Convection	DB15
BL-A-25W-16-K	25 mW - 25W	20 mJ – 5 J	1 J/cm2	16x 16 mm	0.2 – 25 µm	K	Forced Air	DB15
BL-W-50W-16-K	30 mW - 50W	20 mJ – 5 J	1 J/cm2	16x 16 mm	0.2 – 25 µm	K	Water	DB15
BL-A-5W-12-A	50 mW - 5 W	50 mJ – 10 J	10 J/cm2	12 x 12 mm	0.5 – 1.1 µm	A	Convection	DB15
BL-A-10W-12-A	50 mW - 10 W	50 mJ – 10 J	10 J/cm2	12 x 12 mm	0.5 – 1.1 µm	A	Convection	DB15
BL-A-50W-12-A	100 mW - 50 W	50 mJ – 10 J	10 J/cm2	12 x 12 mm	0.5 – 1.1 µm	A	Forced Air	DB15
BL-W-100W-12-A	100 mW - 100 W	50 mJ – 10 J	10 J/cm2	12 x 12 mm	0.5 – 1.1 µm	A	Water	DB15

Fast Response Thermal Sensors

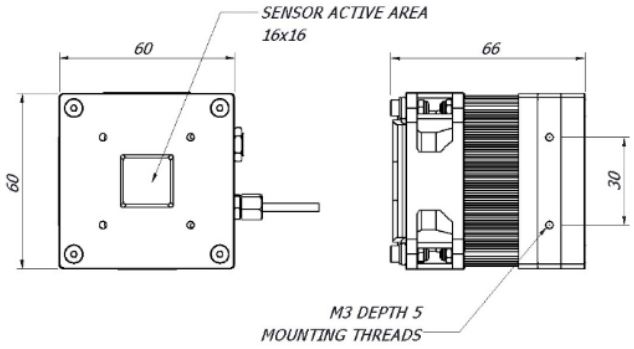
Range: 25 mW to 50 W; Max Density Energy: 1 J/cm2



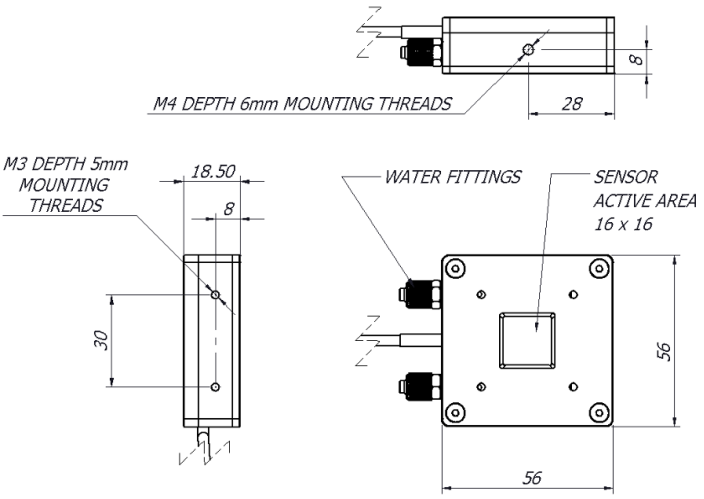


Ordering Code	BL-A-5W-16-K	BL-A-8W-16-K	BL-A-25W-16-K	BL-W-50W-16-K
Power Mode				
Max. Average Power	5 W	8 W	25 W	50 W
Max. Intermittent Power (1)	25 W	25 W	N.A.	N.A.
Min. Power	25 mW	25 mW	25 mW	30 mW
Noise Equivalent Power (NEP)	1 mW	1 mW	1 mW	1.5 mW
Natural Response Time (0-90%)	Typ. 90 ms (min. 50 ms – max. 120 ms)	Typ. 90 ms (min. 50 ms – max. 120 ms)	Typ. 90 ms (min. 50 ms – max. 120 ms)	Typ. 90ms (min. 50 ms – max. 120 ms)
Power Calibration Uncertainty	± 3%	± 3%	± 3%	± 3%
Power Linearity (2)	± 3%	± 3%	± 3%	± 5%
Spatial uniformity (3)	± 3%	± 3%	± 3%	± 3%
Energy Mode				
Max. Energy	5 J	5 J	5 J	5 J
Min. Energy	20 mJ	20 mJ	20 mJ	25 mJ
Max repetition rate	5 Hz	5 Hz	5 Hz	5 Hz
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	16 x 16 mm	16 x 16 mm	16 x 16 mm	16 x 16 mm
Type	K	K	K	K
Absorber Spectral Range	0.2 - 25 µm	0.2 - 25 µm	0.2 - 25 µm	0.2 - 25 µm
Calibration Spectral Range	0.25 - 1.1 µm; 10.6 µm	0.25 - 1.1 µm; 10.6 µm	0.25 - 1.1 µm; 10.6 µm	0.25 - 1.1 µm; 10.6 µm
Max Power Density (4)	1.5 kW/cm² (a)	1.5 kW/cm² (a)	1.5 kW/cm² (a)	1.5 kW/cm²
Max energy density (J/cm²)	10ns pulse width: 1	10ns pulse width: 1	10ns pulse width: 1	10ns pulse width: 1
General Characteristics				
Cooling	Passive (b)	Convection (b)	Forced Air (b)	Water (a)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	N.A.
Weight	140 g	240 g	380 g	130 g
Dimension	60 x 60 x 16.1 mm	60 x 60 x 41.2 mm	60 x 60 x 66 mm	56 x 56 x 18.5 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes				
(1) max 2 sec exposure, max 20% duty cycle. (2) Detector centrally irradiated @50% of useful surface. (3) 3mm beam diameter, scanning 80% of active area (4) Damage thresholds depend on power level.	(a) Measured at 1064 nm, 2 W. (b) Recommended ambient temperature: 10 - 30 °C	(a) Measured at 1064 nm, 2 W. (b) Recommended ambient temperature: 10 -30 °C	(a) Measured at 1064 nm, 5 W. (b) Recommended ambient temperature: 10 -35 °C	(a) Measured at 1064 nm, 10 W. (b) Water min. 1 l/min, max. 4 l/min (@ 10 - 25 °C); Admissible rate of water temperature variation < 1 °C/min

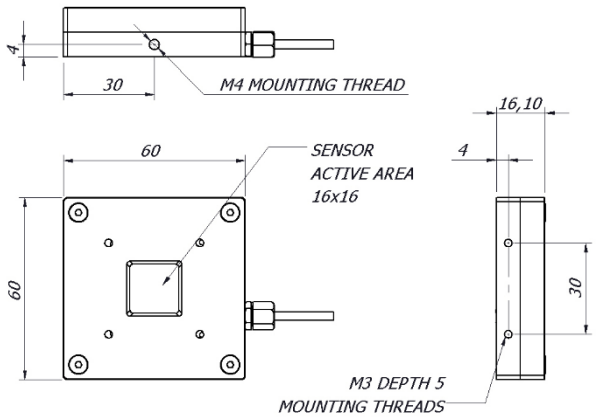
LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS



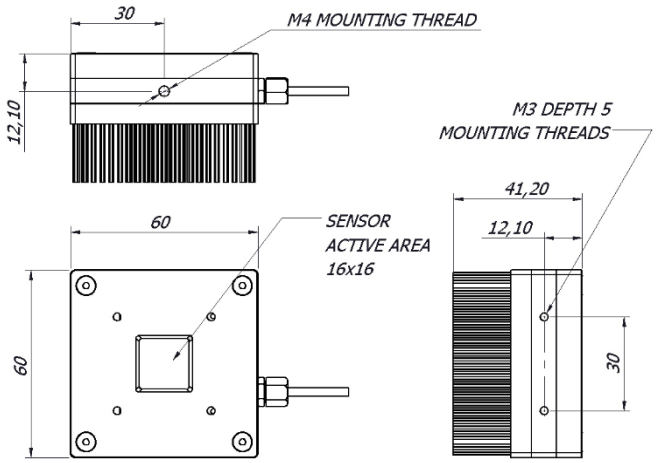
BL-A-25W-16-K



BL-W-50W-16-K



BL-A-5W-16-K



BL-A-8W-16-K

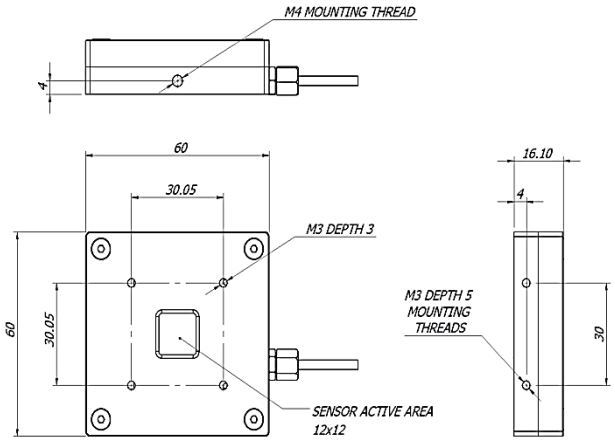
LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

Fast Response Thermal Sensors

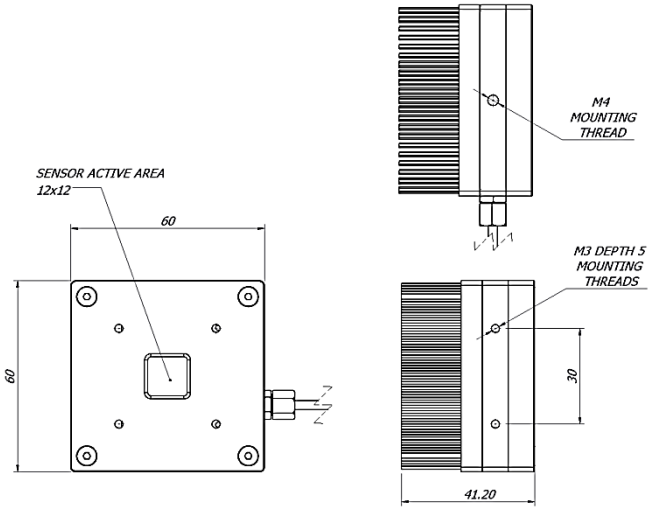
Range: 50 mW to 100 W; Max Density Energy: 10 J/cm2

Ordering Code	BL-A-5W-12-A	BL-A-10W-12-A	BL-A-50W-12-A	BL-W-100W-12-A
Power Mode				
Max. Average Power	5 W	10 W	50 W	100 W
Max. Intermittent Power (1)	50 W	50 W	60 W	120 W
Min. Power	50 mW	50 mW	100 mW	100 mW
Noise Equivalent Power (NEP)	4 mW	4 mW	4 mW	4 mW
Natural Response Time (0-90%)	Typ. 90 ms (min. 50 ms – max. 120 ms)	Typ. 90 ms (min. 50 ms – max. 120 ms)	Typ. 90 ms (min. 50 ms – max. 120 ms)	Typ. 90ms (min. 50 ms – max. 120 ms)
Power Calibration Uncertainty	± 3%	± 3%	± 3%	± 3%
Power Linearity	± 3%	± 3%	± 3%	± 3%
Spatial uniformity (2)	± 3%	± 3%	± 3%	± 3%
Energy Mode				
Max. Energy	10 J	10 J	10 J	10 J
Min. Energy	50 mJ	50 mJ	50 mJ	50 mJ
Max repetition rate	5 Hz	5 Hz	5 Hz	5 Hz
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	12 x 12 mm	12 x 12 mm	12 x 12 mm	12 x 12 mm
Type	A	A	A	A
Absorber Spectral Range	0.5 – 1.1 µm	0.5 – 1.1 µm	0.5 – 1.1 µm	0.5 – 1.1 µm
Calibration Spectral Range	0.532 µm; 1.07 µm	0.532 µm; 1.07 µm	0.532 µm; 1.07 µm	0.532 µm; 1.07 µm
Max Power Density	10 kW/cm² (a)	10 kW/cm² (a)	10 kW/cm² (a)	5 kW/cm² (a)
Max energy density (J/cm2)	10ns pulse width: 10	10ns pulse width: 10	10ns pulse width: 10	10ns pulse width: 10
General Characteristics				
Cooling	Convection (b)	Convection (b)	Forced Air (b)	Water (b)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	N.A.
Weight	140 g	240 g	380 g	240 g
Dimension	60 x 60 x 16.1 mm	60 x 60 x 41.2 mm	60 x 60 x 66.5 mm	56 x 56 x 18.5 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes				
(1) max 2 sec exposure, max 10% duty cycle (2) over 8x8mm central area	(a) Measured at 1064 nm, 5 W. (b) Recommended ambient temperature: 10 - 30 °C	(a) Measured at 1064 nm, 10 W. (b) Recommended ambient temperature: 10 -30 °C	(a) Measured at 1064 nm, 50 W. (b) Recommended ambient temperature: 10 -35 °C	(a) Measured at 1064 nm, 100 W. (b) Water min. 1 l/min, max. 4 l/min (@ 10 - 25 °C); Admissible rate of water temperature variation < 1 °C/min

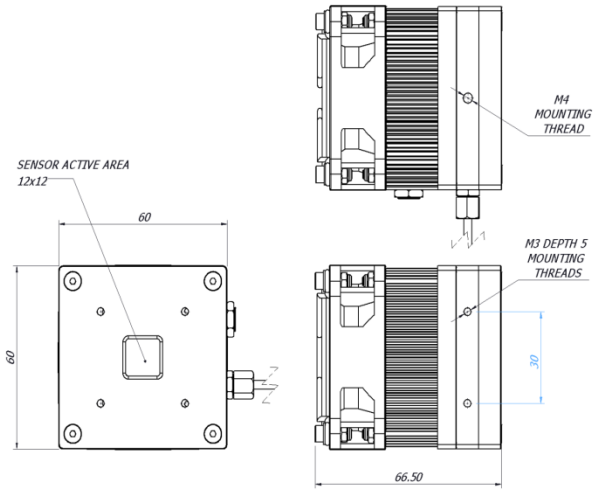
LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS



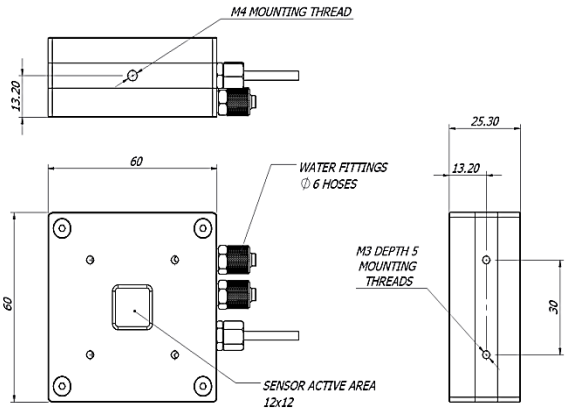
BL-A-5W-12-A



BL-A-10W-12-A



BL-A-50W-12-A



BL-W-100W-12-A

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

BLINK FR: Amplified Fast Response Sensor

BLINK FR head can be provided with an amplified analog output (0-5V) for OEM applications requiring integration into machines or laser sources. Two models are currently available, one for measures up to 50W, the other up to 20W. Both units maintain the benefits of the standard Blink FR head, such as the fast response time (typ. 70ms), broadband operation and high-power handling capability, OEM applications requiring a fast feedback on power levels or fluctuations can benefit from the exceptional properties of the Blink FR technology.

BLINK FR

ANALOG AMPLIFIED HEAD



Broadband Calibration Range
(250-1100 nm and 10.6 µm)

Natural Response Time (0-90%): 70 ms (typ.)

Max. Rep. Rate: 5 Hz

HOW TO ORDER:

Select Ordering Code without any option for bare wires head connectivity;
No other connectivity option is available.

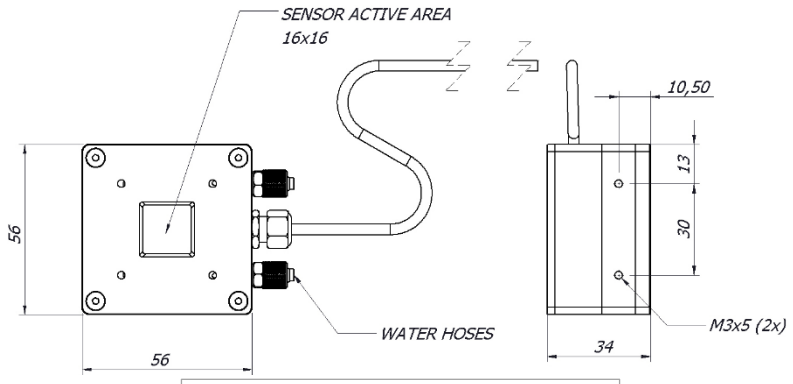
Ordering code	Power Range	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
BAL-W-20W-16-K	25 mW - 20 W	16 x 16 mm	0.2 - 25 µm	K	Water	Bare wire
BAL-W-50W-16-K	50 mW - 50 W	16 x 16 mm	0.2 - 25 µm	K	Water	Bare wire

Fast Response Amplified Thermal Sensors

Range: 25 mW to 50 W



Ordering Code	BAL-W-20W-16-K	BAL-W-50W-16-K
Power Mode		
Max. Average Power	20 W	50 W
Min. Power	25 mW	50 mW
Response time (0-90%)	Typ. 70 ms (min. 50 ms, max. 90 ms)	Typ. 70 ms (min. 50 ms, max. 90 ms)
Power Calibration Uncertainty	± 3%	± 3%
Power Linearity	± 5%	± 5%
Absorber Specs		
Aperture	16 mm x 16 mm	16 mm x 16 mm
Type	K	K
Absorber Spectral Range	0.2 - 25 µm	0.2 - 25 µm
Calibration Spectral Range	0.25 - 1.1 µm; 10.6 µm	0.25 - 1.1 µm; 10.6 µm
Max Power Density (1)	1.5 kW/cm²	1.5 kW/cm²
Max Energy Density J/cm² (2)	1 J/cm²	1 J/cm²
Amplifier Specs		
Amplifier Input Voltage	±7 to ±12 VDC, or 14 to 24 VDC floating	±7 to ±12 VDC, or 14 to 24 VDC floating
Output Voltage @ Full Scale	5 V	5 V
Min Detectable Voltage	5 mV	5 mV
Sensitivity	250 mV/W	100 mV/W
General Characteristics		
Cooling	Water (a)	Water (a)
Weight	300 g	300 g
Dimension	56 x 56 x 34 mm	56 x 56 x 34 mm
Cable length - connector	1.5 m	1.5 m
Notes		
(1). Measured at 1064nm, 10W, Damage thresholds also depend on power level. (2). 10 ns @ 1064nm	(a) Water min. 1 l/min, max. 4 l/min (@ 15 - 30 °C); Admissible rate of water temperature variation < 1 °C/min	



BAL-W-20W-16-K BAL-W-50W-16-K

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

BLINK HS: High Speed Sensor

BLINK HS is the latest Laser Point's achievement specifically developed to measure ultrafast lasers with pulse duration down to femtoseconds. It is the ultimate solution for whatever application requiring: accurate energy measurements for ultrafast pulsed lasers, monitoring of fast manufacturing processes in production lines and detection of fast instabilities in ultrafast lasers. BLINK HS patent pending technology, based on thermopile design, makes this product the fastest laser power and energy sensor currently available in the market. This technology allows combining the high response speed of a photodiode with the broadband and high-power operation of a thermopile. Laser applications requiring high speed measurements can take advantage of the sub-microsecond response time; this BLINK HS feature allows measuring the energy of each pulse emitted by laser sources with repetition rates up to 1 MHz, pulse durations down to fs and average power up to 20W, specifications that cannot be present all together in pyroelectric or photodiode sensors. Moreover, its high damage threshold and efficient water cooling allow withstanding energies up to 10mJ. BLINK HS can be deployed by laser manufactures to detect fast instabilities in laser sources as well as by system integrators to monitor fast processes in production lines. Combining all advantages present in photodiodes, pyroelectric and thermal detectors, BLINK HS is a very versatile product, suited to measure most of the laser sources commercially available, whatever the emitting wavelength (UV-VIS-IR). High speed electronics is also available with a sampling rate up to 500 Msample/s to provide a precise energy measurement of each single ultrashort pulse.

BLINK HS



Broadband Operation
(250-1100 nm and 10.6 µm)

Pulse Energy Measurement
(up to 1 MHz)

Max. Rep. Rate: 1 MHz

Suitable for ultrashort pulsed lasers up to femtosecond

Blink HS sensor is provided as a "Standard" version able to measure pulse energy down to 10 µJ and as "High Sensitivity" Enhanced version to measure Pulse Energy down to 0.25 µJ.

Blink High Speed - ENH (Enhanced) is a measurement **system** made by the High Speed sensor Blink HS and its High Speed Meter (HSM-1000), specifically developed for ultrafast lasers with low energy per pulse, down to 0.25J. Such a low energy, combined with the high repetition rate, requires a dedicated signal amplification and an accurate calibration procedure, performed on the complete Enhanced system. The Enhanced system is supplied with Giotto Software, a user-friendly GUI that allows working at different Gain levels, necessary for accurately measure low energy values.

HOW TO ORDER:

Select Ordering Code without any option for Hirose IX head connectivity.
No other connectivity option is available.

STANDARD VERSION (Min measurable pulse energy: 10 µJ)

Ordering Code	Power Range	Energy Range	Max Energy Density	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
BM-A-5W-14-T	1 mW - 5 W	10 µJ – 10 mJ	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Convection	Hirose IX to HSM
BM-A-8W-14-T	1 mW - 8 W	10 µJ – 10 mJ	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Convection	Hirose IX to HSM
BM-A-15W-14-T	1 mW - 15 W	10 µJ – 10 mJ	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Forced Air	Hirose IX to HSM
BM-W-20W-14-T	1 mW - 20 W	10 µJ – 10 mJ	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Water	Hirose IX to HSM
BM-A-5W-10-B	3 mW - 5 W	30 µJ – 20 mJ	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Convection	Hirose IX to HSM
BM-A-10W-10-B	3 mW - 10 W	30 µJ – 20 mJ	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Convection	Hirose IX to HSM
BM-A-25W-10-B	3 mW - 25 W	30 µJ – 20 mJ	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Forced Air	Hirose IX to HSM
BM-W-50W-10-B	3 mW - 50 W	30 µJ – 20 mJ	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Water	Hirose IX to HSM

HIGH SENSITIVITY VERSION (Min measurable pulse energy: 0.25 µJ)

- **Amplified BLINK HS**
  Amplified Blink HS sensors has been developed to measure lower energies, down to 1µJ.
  This is achieved thanks to a built-in amplifier, allowing for a larger sensitivity.

Ordering Code	Power Range	Energy Range	Max Energy Density	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
BM-A-5W-14-TX	1 mW - 5W	1 µJ – 40 µJ (*) 40 µJ – 1000 µJ (**)	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Convection	Hirose IX to HSM
BM-A-8W-14-TX	1 mW - 8W	1 µJ – 40 µJ (*) 40 µJ – 1000 µJ (**)	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Convection	Hirose IX to HSM
BM-A-15W-14-TX	1 mW - 15W	1 µJ – 40 µJ (*) 40 µJ – 1000 µJ (**)	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Forced Air	Hirose IX to HSM
BM-W-20W-14-TX	1 mW - 20W	1 µJ – 40 µJ (*) 40 µJ – 1000 µJ (**)	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Water	Hirose IX to HSM

- **BLINK HS-ENH (Enhanced)**
  Enhanced Blink HS sensors has been developed to measure lower energies, down to 0.25µJ.

Ordering Code	Power Range	Energy Range	Max Energy Density	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
BM-A-5W-14-T-ENH	1 mW - 5 W	1 µJ – 10 mJ	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Convection	Hirose IX to HSM
BM-A-8W-14-T-ENH	1 mW - 8 W	1 µJ – 10 mJ	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Convection	Hirose IX to HSM
BM-A-15W-14-T-ENH	1 mW - 15 W	1 µJ – 10 mJ	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Forced Air	Hirose IX to HSM
BM-W-20W-14-T-ENH	1 mW - 20 W	1 µJ – 10 mJ	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Water	Hirose IX to HSM
BM-A-5W-10-B-ENH	3 mW - 5 W	3 µJ – 20 mJ	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Convection	Hirose IX to HSM
BM-A-10W-10-B-ENH	3 mW - 10 W	3 µJ – 20 mJ	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Convection	Hirose IX to HSM
BM-A-25W-10-B-ENH	3 mW - 25 W	3 µJ – 20 mJ	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Forced Air	Hirose IX to HSM
BM-W-50W-10-B-ENH	3 mW - 50 W	3 µJ – 20 mJ	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Water	Hirose IX to HSM
BM-A-5W-14-TX-ENH	1 mW - 5W	0.25 µJ – 40 mJ (*); 20 µJ -1000 µJ (**)	35 mJ/cm2	14 x 14 mm	0.2 – 11 µm	T	Convection	Hirose IX to HSM
BM-A-8W-14- TX-ENH	1 mW - 8W	0.25 µJ – 40 mJ (*); 20 µJ -1000 µJ (**)	35 mJ/cm2	14 x 14 mm	0.2 – 11 µm	T	Convection	Hirose IX to HSM
BM-A-15W-14- TX-ENH	1 mW - 15W	0.25 µJ – 40 mJ (*); 20 µJ -1000 µJ (**)	35 mJ/cm2	14 x 14 mm	0.2 – 11 µm	T	Forced Air	Hirose IX to HSM
BM-W-20W-14- TX-ENH	1 mW - 20W	0.25 µJ – 40 mJ (*); 20 µJ -1000 µJ (**)	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Water	Hirose IX to HSM

(*): wavelength 1064nm, pulse duration < 10 ns
(**) wavelength 1064nm, pulse duration = 10 ms

High Speed Thermal Sensors
STANDARD VERSION
min Pulse Energy: 10 µJ

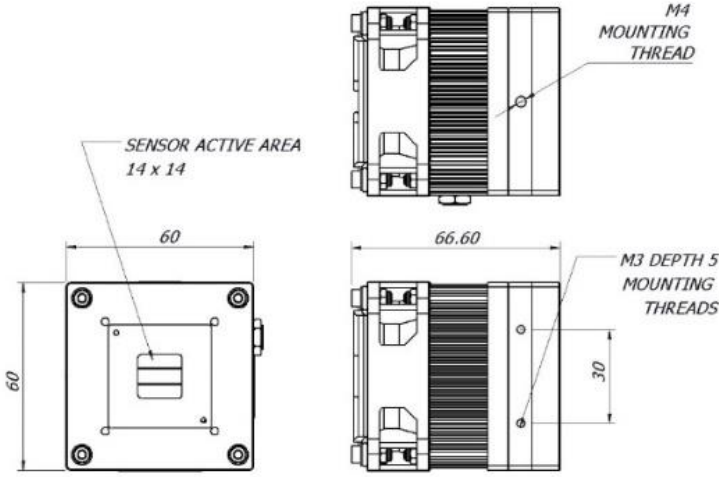
Range: 1 mW to 20 W; Max Energy Density: 35 mJ/cm²



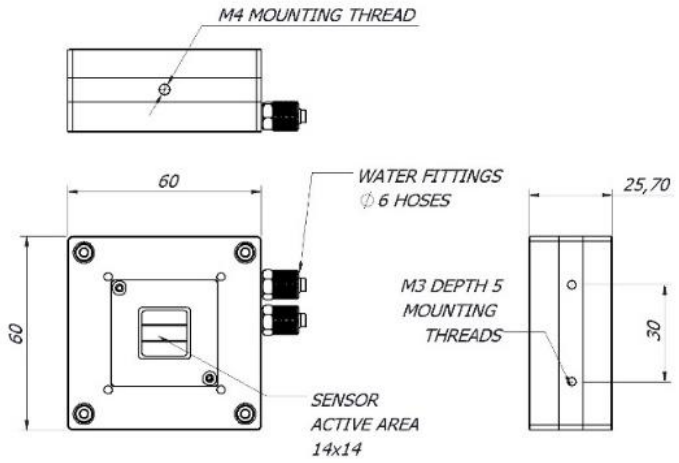


Ordering Code	BM-A-5W-14-T	BM-A-8W-14-T	BM-A-15W-14-T	BM-W-20W-14-T
Power Mode				
Max. Average Power	5 W	8 W	15 W	20 W
Max. Average Power (1)	15 W	15 W	20 W	20 W
Power Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Energy Mode				
Max. Energy	10 mJ	10 mJ	10 mJ	10 mJ
Min. Energy	10 µJ	10 µJ	10 µJ	10 µJ
Max repetition rate	1 MHz	1 MHz	1 MHz	1 MHz
Energy Resolution	0.25 µJ	0.25 µJ	0.25 µJ	0.25 µJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	14 x 14 mm	14 x 14 mm	14 x 14 mm	14 x 14 mm
Type	T	T	T	T
Spatial Uniformity (2)	± 5%	± 5%	± 5%	± 5%
Absorber Spectral Range	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm
Calibration Spectral Range	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)
Max Power Density (3)	0.1 kW / cm²	0.1 kW / cm²	0.1 kW / cm²	0.1 kW / cm²
Max Energy Density (J/cm²) (4)	35 mJ/cm²	35 mJ/cm²	35 mJ/cm²	35 (mJ /cm²)
General Characteristics				
Cooling	Convection (c)	Convection (c)	Forced Air (c)	Water (c)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	40 °C
Weight	130 g	240 g	380 g	1.70 g
Dimension	60x60x16.5 mm	60x60x41.6 mm	60 x 60 x 66 mm	60 x 60 x 25.7 mm
Cable length	2.0 m	2.0 m	2.0 m	2.0 m
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes				
(1) max 2 sec exposure, max 20% duty cycle. (2) 3mm beam diameter, scanning 80% of active area (3) Damage thresholds also depend on power level. (4) Single shot	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Recommended ambient temperature: 10 -30 °C	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Recommended ambient temperature: 10 -30 °C	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Recommended ambient temperature: 10 -35 °C	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Water Min. 1 l/min, Max 4 l/min (@ 10-25 °C). Admissible rate of water temperature variation < 1 °C/min.

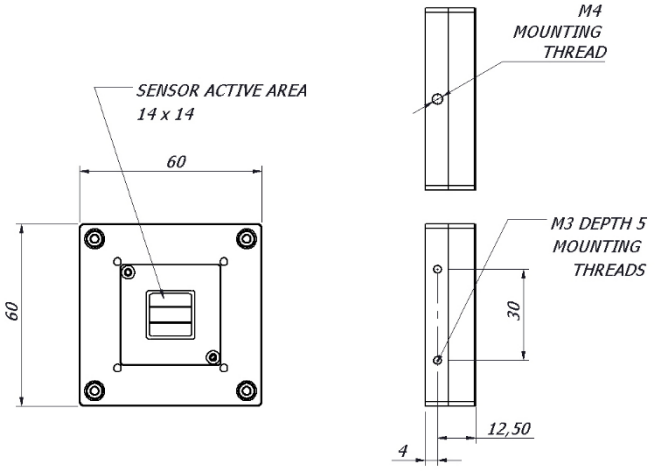
LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS



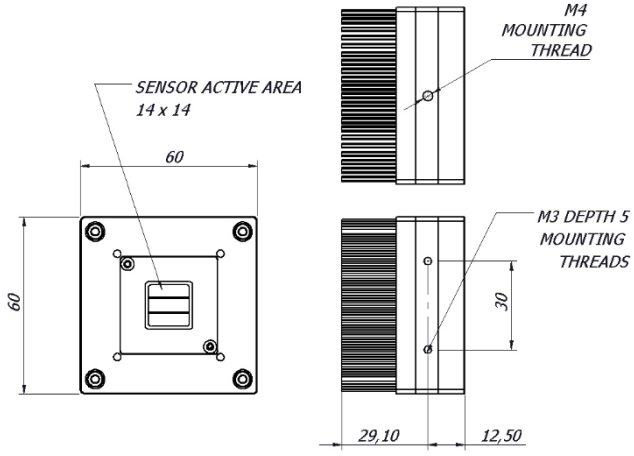
BM-A-15W-14-T



BM-W-20W-14-T



BM-A-5W-14-T



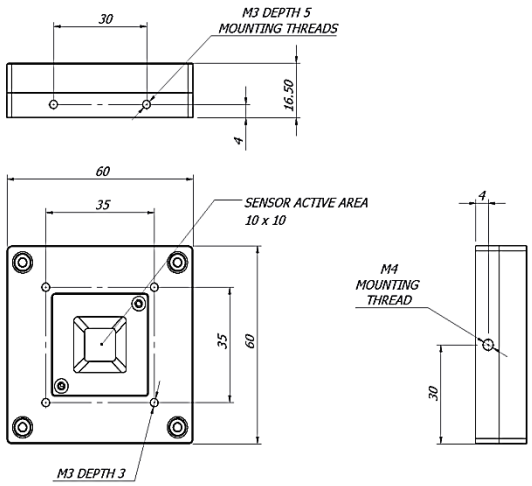
BM-W-8W-14-T

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

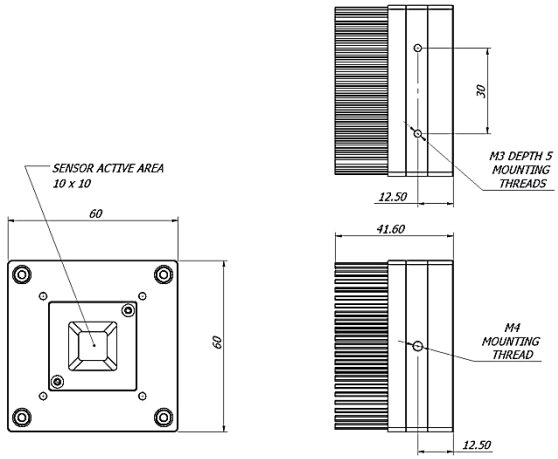
High Speed Thermal Sensors
STANDARD VERSION
min Pulse Energy: 10 µJ
Range: 3 mW to 50 W; Max Energy Density: 120 mJ/cm²

Ordering Code	BM-A-5W-10-B	BM-A-10W-10-B	BM-A-25W-10-B	BM-W-50W-10-B
Power Mode				
Max. Average Power	5 W	10 W	25 W	50 W
Max. Average Power (1)	25 W	25 W	35 W	60 W
Power Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Energy Mode				
Max. Energy	20 mJ	20 mJ	20 mJ	20 mJ
Min. Energy	30 µJ	30 µJ	30 µJ	30 µJ
Max repetition rate	1 MHz	1 MHz	1 MHz	1 MHz
Energy Resolution	0.5 µJ	0.5 µJ	0.5 µJ	0.5 µJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	10 x 10 mm	10 x 10 mm	10 x 10 mm	10 x 10 mm
Type	B	B	B	B
Spatial Uniformity (2)	± 5%	± 5%	± 5%	± 5%
Absorber Spectral Range	0.5 – 1.1 µm	0.5 – 1.1 µm	0.5 – 1.1 µm	0.5 – 1.1 µm
Calibration Spectral Range	0.532 µm, 1.07 µm	0.532 µm, 1.07 µm	0.532 µm, 1.07 µm	0.532 µm, 1.07 µm
Max Power Density (3)	5 kW / cm²	5 kW / cm²	5 kW / cm²	5 kW / cm²
Max Energy Density (J/cm²) (4)	120 mJ/cm²	120 mJ/cm²	120 mJ/cm²	120 (mJ /cm²)
General Characteristics				
Cooling	Convection (a)	Convection (a)	Forced Air (a)	Water (a)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	40 °C
Weight	130 g	240 g	380 g	1.70 g
Dimension	60x60x16.5 mm	60x60x41.6 mm	60 x 60 x 66 mm	60 x 60 x 25.7 mm
Cable length	2.0 m	2.0 m	2.0 m	2.0 m
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes				
(1) max 2 sec exposure, max 20% duty cycle. (2) Laser beam over 6x6 mm central area (3) Damage threshold also depends on power level (4) Single shot	(a) Recommended ambient temperature: 10 -30 °C	(a) Recommended ambient temperature: 10 -30 °C	(a) Recommended ambient temperature: 10 -35 °C	(a) Water Min. 1 l/min, Max 4 l/min (@ 10-25 °C). Admissible rate of water temperature variation < 1 °C/min.

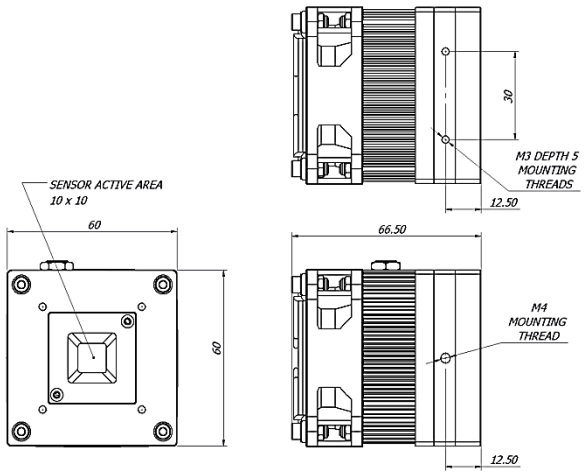
LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS



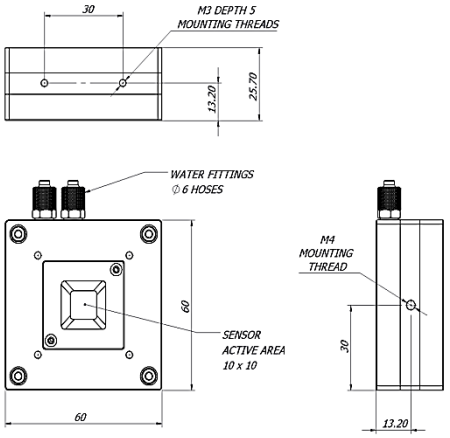
BM-A-5W-10-B



BM-A-10W-10-B



BM-A-25W-10-B



BM-W-50W-10-B

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

High Speed Thermal Sensors
HIGH SENSITIVITY – AMPLIFIED VERSION
min Pulse Energy: 1 µJ

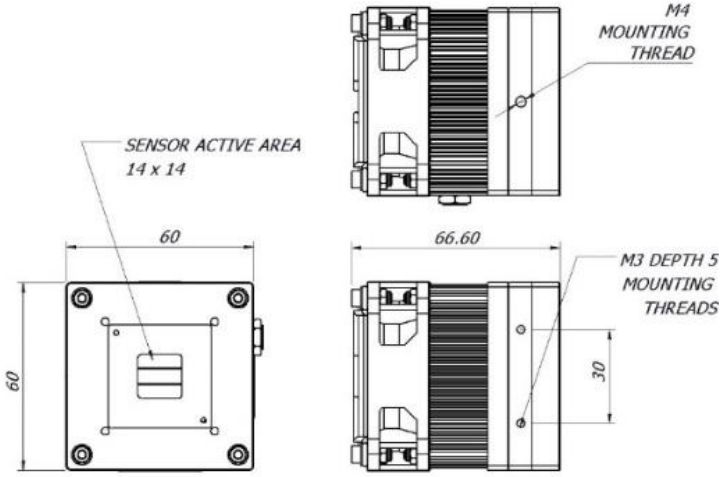
Range: 1 mW to 20 W; Max Energy Density: 35 mJ/cm2



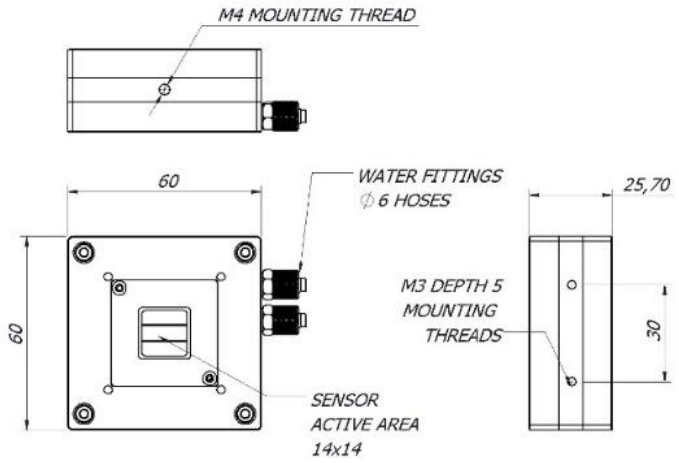


Ordering Code	BM-A-5W-14-T	BM-A-8W-14-T	BM-A-15W-14-T	BM-W-20W-14-T
Power Mode				
Max. Average Power	5 W	8 W	15 W	20 W
Max. Average Power (1)	15 W	15 W	20W	25W
Power Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Energy Mode				
ax. Energy	40 µJ (a) 1000 µJ (b)	40 µJ (a) 1000 µJ (b)	40 µJ (a) 1000 µJ (b)	40 µJ (a) 1000 µJ (b)
Min. Energy	1 µJ (a) 40 µJ (b)	1 µJ (a) 40 µJ (b)	1 µJ (a) 40 µJ (b)	1 µJ (a) 40 µJ (b)
Max repetition rate	1 MHz	1 MHz	1 MHz	1 MHz
Energy Resolution	0.01 µJ	0.01 µJ	0.01 µJ	0.01 µJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	14 x 14 mm	14 x 14 mm	14 x 14 mm	14 x 14 mm
Type	T	T	T	T
Spatial Uniformity (2)	± 5 %	± 5 %	± 5 %	± 5 %
Min. Beam diameter	3 mm	3 mm	3 mm	3 mm
Absorber Spectral Range	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm
Calibration Spectral Range	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)
Max Power Density (3)	0.1 kW/cm^2	0.1 kW/cm^2	0.1 kW/cm^2	0.1 kW/cm^2
Max Energy Density (4)	35 mJ/cm^2	35 mJ/cm^2	35 mJ/cm^2	35 mJ/cm^2
General Characteristics				
Cooling	Passive (e)	Convection (e)	Forced Air (e)	Water (e)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	40 °C
Weight	130 g	240 g	380 g	1.70 g
Dimensions	60x60x16.5 mm	60x60x41.6 mm	60 x 60 x 66 mm	60 x 60 x 25.7 mm
Cable length	2 m	2 m	2 m	2 m
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes				
(1) max 2 sec exposure, max 20% duty cycle. (2) 3mm beam diameter, scanning 80% of active area (3) Damage thresholds also depend on power level. (4) Single shot	(a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). 10.6 µm sensor reflectivity 70% (d). Others wavelength on request (e). Recommended ambient temperature: 10 -30 °C	(a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). 10.6 µm sensor reflectivity 70% (d). Others wavelength on request (e). Recommended ambient temperature: 10 -30 °C	a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). 10.6 µm sensor reflectivity 70% (d). Others wavelength on request (e). Recommended ambient temperature: 10 -35 °C	(a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). 10.6 µm sensor reflectivity 70% (d). Others wavelength on request (e). Water Min. 1 l/min, Max 4 l/min (@ 10-25 °C). Admissible rate of water temperature variation < 1 °C/min

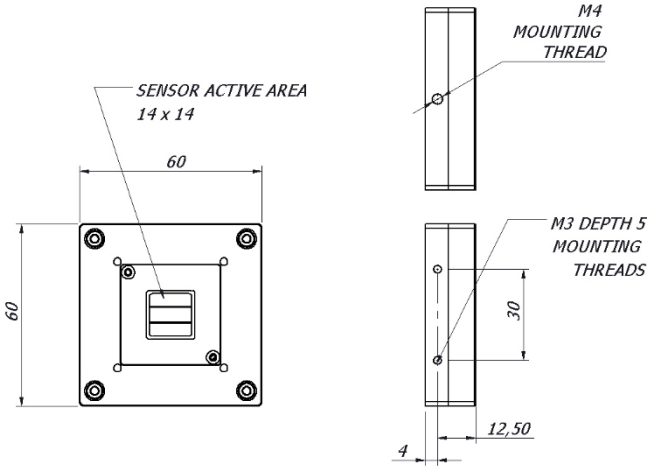
LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS



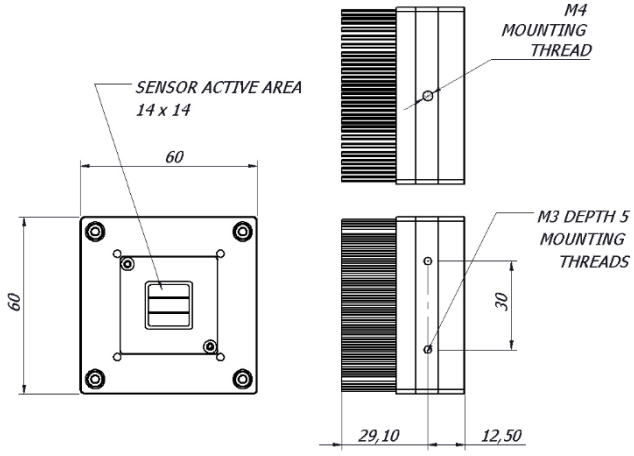
BM-A-15W-14-TX



BM-W-20W-14-TX



BM-A-5W-14-TX



BM-W-8W-14-TX

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

High Speed Enhanced System
HIGH SENSITIVITY – ENHANCED VERSION
min Pulse Energy: 1 µJ

Range: 1 mW to 20 W; Max Energy Density: 35 mJ/cm2



Power Mode	BM-A-5W-14-T-ENH	BM-A-8W-14-T-ENH	BM-A-15W-14-T-ENH	BM-W-20W-14-T-ENH
Max. Average Power	5 W	8 W	15 W	20 W
Max. Average Power (1)	15 W	15 W	20 W	20 W
Power Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Energy Mode				
Max. Energy	10 mJ	10 mJ	10 mJ	10 mJ
Min. Energy	1 µJ	1 µJ	1 µJ	1 µJ
Max repetition rate	1 MHz	1 MHz	1 MHz	1 MHz
Energy Resolution	0.05 µJ	0.05 µJ	0.05 µJ	0.05 µJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Sensor Absorber Specs				
Aperture	14 x 14 mm	14 x 14 mm	14 x 14 mm	14 x 14 mm
Type	T	T	T	T
Spatial Uniformity (2)	± 5%	± 5%	± 5%	± 5%
Absorber Spectral Range	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm
Calibration Spectral Range	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)
Max Power Density (3)	0.1 kW / cm^2	0.1 kW / cm^2	0.1 kW / cm^2	0.1 kW / cm^2
Max Energy Density (J/cm^2) (4)	35 mJ/cm^2	35 mJ/cm^2	35 mJ/cm^2	35 (mJ /cm^2)
Sensor General Characteristics				
Cooling	Convection (c)	Convection (c)	Forced Air (c)	Water (c)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	40 °C
Weight	130 g	240 g	380 g	1.70 g
Dimension	60x60x16.5 mm	60x60x41.6 mm	60 x 60 x 66 mm	60 x 60 x 25.7 mm
Cable length	2.0 m	2.0 m	2.0 m	2.0 m
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
High Speed Meter (included)				
	HSM-1000	HSM-1000	HSM-1000	HSM-1000
(1) max 2 sec exposure, max 20% duty cycle. (2) 3mm beam diameter, scanning 80% of active area (3) Damage thresholds also depend on power level. (4) Single shot	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Recommended ambient temperature: 10 -30 °C	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Recommended ambient temperature: 10 -30 °C	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Recommended ambient temperature: 10 -35 °C	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Water Min. 1 l/min, Max 4 l/min (@ 10-25 °C). Admissible rate of water temperature variation < 1 °C/min.

Mechanical system specification: see drawings for BM-A-5W-14-T, BM-A-8W-14-T, BM-A-15W-14-T, BM-W-20W-14-T; HSM-1000.

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

High Speed Enhanced System
HIGH SENSITIVITY – ENHANCED VERSION
min Pulse Energy: 3 µJ

Range: 3 mW to 50 W; Max Energy Density: 120 mJ/cm²



Power Mode	BM-A-5W-10-B-ENH	BM-A-10W-10-B-ENH	BM-A-25W-10-B-ENH	BM-W-50W-10-B-ENH
Max. Average Power	5 W	10 W	25 W	50 W
Max. Average Power (1)	25 W	25 W	35 W	60 W
Power Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Energy Mode				
Max. Energy	20 mJ	20 mJ	20 mJ	20 mJ
Min. Energy	3 µJ	3 µJ	3 µJ	3 µJ
Max repetition rate	1 MHz	1 MHz	1 MHz	1 MHz
Energy Resolution	0.1 µJ	0.1 µJ	0.1 µJ	0.1 µJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Sensor Absorber Specs				
Aperture	10 x 10 mm	10 x 10 mm	10 x 10 mm	10 x 10 mm
Type	B	B	B	B
Spatial Uniformity (2)	± 5%	± 5%	± 5%	± 5%
Absorber Spectral Range	0.5 – 1.1 µm	0.5 – 1.1 µm	0.5 – 1.1 µm	0.5 – 1.1 µm
Calibration Spectral Range	0.532 µm 1.07 µm (a)	0.532 µm 1.07 µm (a)	0.532 µm 1.07 µm (a)	0.532 µm 1.07 µm (a)
Max Power Density (3)	5 kW / cm²	5 kW / cm²	5 kW / cm²	5 kW / cm²
Max Energy Density (J/cm²) (4)	120 mJ/cm²	120 mJ/cm²	120 mJ/cm²	120 (mJ /cm²)
Sensor General Characteristics				
Cooling	Convection (b)	Convection (b)	Forced Air (c)	Water (c)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	40 °C
Weight	130 g	240 g	380 g	320 g
Dimension	60x60x16.5 mm	60x60x41.6 mm	60 x 60 x 66 mm	60 x 60 x 25.7 mm
Cable length	2.0 m	2.0 m	2.0 m	2.0 m
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
High Speed Meter (included)				
	HSM-1000	HSM-1000	HSM-1000	HSM-1000
Notes				
(1) max 2 sec exposure, max 20% duty cycle. (2) laser beam over 6x6mm central area (3) Damage thresholds also depend on power level. (4) Single shot	(a) Others wavelength on request (b) Recommended ambient temperature: 10 -30 °C	(a) Others wavelength on request (b) Recommended ambient temperature: 10 -30 °C	(a) Others wavelength on request (b) Recommended ambient temperature: 10 -35 °C	(a) Others wavelength on request (b) Water Min. 1 l/min, Max 4 l/min (@ 10-25 °C). Admissible rate of water temperature variation: < 1 °C/min.

Mechanical system specification: see drawings for BM-A-5W-10-B, BM-A-10W-10-B, BM-A-25W-10-B, BM-W-50W-10-B; HSM-1000.

High Speed Enhanced System
HIGH SENSITIVITY – AMPLIFIED ENHANCED VERSION
min Pulse Energy: 0.25 µJ



Range: 1 mW to 20 W; Max Energy Density: 35 mJ/cm2

Power Mode	BM-A-5W-14-TX-ENH	BM-A-8W-14-TX-ENH	BM-A-15W-14-TX-ENH	BM-W-20W-14-TX-ENH
Max. Average Power	5 W	8 W	15 W	20 W
Max. Average Power (1)	15 W	15 W	20 W	25 W
Power Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Energy Mode				
Max. Energy	40 µJ (a) 1000 µJ (b)	40 µJ (a) 1000 µJ (b)	40 µJ (a) 1000 µJ (b)	40 µJ (a) 1000 µJ (b)
Min. Energy	0.25 µJ (a) 20 µJ (b)	0.25 µJ (a) 20 µJ (b)	0.25 µJ (a) 20 µJ (b)	0.25 µJ (a) 20 µJ (b)
Max repetition rate	1 MHz	1 MHz	1 MHz	1 MHz
Energy Resolution	0.01 µJ	0.01 µJ	0.01 µJ	0.01 µJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Sensor Absorber Specs				
Aperture	14 x 14 mm	14 x 14 mm	14 x 14 mm	14 x 14 mm
Type	T	T	T	T
Spatial Uniformity (2)	± 5 %	± 5 %	± 5 %	± 5 %
Min. Beam diameter	3 mm	3 mm	3 mm	3 mm
Absorber Spectral Range	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm
Calibration Spectral Range	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)
Max Power Density (3)	0.1 kW / cm2	0.1 kW / cm2	0.1 kW / cm2	0.1 kW / cm2
Max Energy Density (4)	35 mJ/cm^2	35 mJ/cm^2	35 mJ/cm^2	35 mJ/cm^2
Sensor General Characteristics				
Cooling	Convection (e)	Convection (c)	Forced Air (c)	Water (e)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	40 °C
Weight	130 g	240 g	380 g	1.70 g
Dimensions	60x60x16.5 mm	60x60x41.6 mm	60 x 60 x 66 mm	60 x 60 x 25.7 mm
Cable length	2.0 m	2.0 m	2.0 m	2.0 m
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
High Speed Meter (included)				
	HSM-1000	HSM-1000	HSM-1000	HSM-1000
(1) max 2 sec exposure, max 20% duty cycle. (2) 3mm beam diameter, scanning 80% of active area (3) Damage thresholds also depend on power level. (4) Single shot	(a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). 10.6 µm: sensor reflectivity 70% (d). Others wavelength on request (e). Recommended ambient temperature: 10 -30 °C	(a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). 10.6 µm: sensor reflectivity 70% (d). Others wavelength on request (e). Recommended ambient temperature: 10 -30 °C	(a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). 10.6 µm: sensor reflectivity 70% (d). Others wavelength on request (e). Recommended ambient temperature: 10 -30 °C	(a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). @ 10.6 µm sensor reflectivity 70% (d). Others wavelength on request (e). Water Min. 1 l/min, Max 4 l/min (@ 10-25 °C). Admissible rate of water temperature variation < 1 °C/min.

Mechanical system specification: see drawings for BM-A-5W-14-T, BM-A-8W-14-T, BM-A-15W-14-T, BM-W-20W-14-T; HSM-1000.

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

Pulse Controller

Pulse Controller is a special version of the High Speed Meter (HSM-1000-PC) specifically developed for ultrafast lasers:

- to detect in real time and display on a PC, any laser missing pulse or any laser pulse below a user specified energy threshold;
- to display on a PC and perform statistics on many laser parameters such as pulse energy, power, repetition rate, peak energy.

Pulse Controller can work together with any of the Blink High Speed Sensors to detect "Missing" or "Low Energy" Laser pulse.

Pulse Controller is provided also as "High Sensitivity" Enhanced version able to measure Pulse Energy down to 0.25 µJ.

Pulse Controller with Enhanced version is a measurement **system** made by the High Speed sensor Blink HS and HSM-1000-PC High Speed Meter. Such a low energy, combined with the high repetition rate, requires a dedicated and accurate calibration procedure, performed on the **complete** Pulse Controller Enhanced system.



Detection of EVERY missing pulse

Detection of EVERY low energy pulse with energy below a user defined threshold.

Broadband Operation
(250-1100 nm and 10.6 µm)

Pulse Energy Measurement
(up to 0.8 MHz)

Max. Rep. Rate: 0.8 MHz

Suitable for ultrashort pulsed lasers up to femtosecond

HOW TO ORDER:

HIGH SENSITIVITY ENHANCED VERSION (Min measurable pulse energy: 0.25 µJ)
Select Ordering Code without any option for Hirose IX head connectivity. No other connectivity option is available.

Ordering Code	Power Range	Energy Range	Max Energy Density	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
BM-A-5W-14-T-E-PC	1 mW - 5 W	1 µJ – 10 mJ	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Convection	Hirose IX to HSM
BM-A-8W-14-T-E-PC	1 mW - 8 W	1 µJ – 10 mJ	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Convection	Hirose IX to HSM
BM-A-15W-14-T-E-PC	1 mW - 15 W	1 µJ – 10 mJ	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Forced Air	Hirose IX to HSM
BM-W-20W-14-T-E-PC	1 mW - 20 W	1 µJ – 10 mJ	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Water	Hirose IX to HSM
BM-A-5W-10-B-E-PC	3 mW - 5 W	3 µJ – 20 mJ	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Convection	Hirose IX to HSM
BM-A-10W-10-B-E-PC	3 mW - 10 W	3 µJ – 20 mJ	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Convection	Hirose IX to HSM
BM-A-25W-10-B-E-PC	3 mW - 25 W	3 µJ – 20 mJ	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Forced Air	Hirose IX to HSM
BM-W-50W-10-B-E-PC	3 mW - 50 W	3 µJ – 20 mJ	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Water	Hirose IX to HSM
BM-A-5W-14-TX-E-PC	1 mW - 5W	0.25 µJ – 40 mJ (*); 20 µJ -1000 µJ (**)	35 mJ/cm2	14 x 14 mm	0.2 – 11 µm	T	Convection	Hirose IX to HSM
BM-A-8W-14- TX-E-PC	1 mW - 8W	0.25 µJ – 40 mJ (*); 20 µJ -1000 µJ (**)	35 mJ/cm2	14 x 14 mm	0.2 – 11 µm	T	Convection	Hirose IX to HSM
BM-A-15W-14- TX-E-PC	1 mW - 15W	0.25 µJ – 40 mJ (*); 20 µJ -1000 µJ (**)	35 mJ/cm2	14 x 14 mm	0.2 – 11 µm	T	Forced Air	Hirose IX to HSM
BM-W-20W-14- TX-E-PC	1 mW - 20W	0.25 µJ – 40 mJ (*); 20 µJ -1000 µJ (**)	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Water	Hirose IX to HSM

(*): wavelength 1064nm, pulse duration < 10 ns
(**) wavelength 1064nm, pulse duration = 10 ms

Pulse Controller - Enhanced System
HIGH SENSITIVITY – ENHANCED VERSION
Range: 1 mW to 20 W; Max Energy Density: 35 mJ/cm2



Power Mode	BM-A-5W-14-T-E-PC	BM-A-8W-14-T-E-PC	BM-A-15W-14-T-E-PC	BM-W-20W-14-T-E-PC
Max. Average Power	5 W	8 W	15 W	20 W
Max. Average Power (1)	15 W	15 W	20 W	20 W
Power Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Energy Mode				
Max. Energy	10 mJ	10 mJ	10 mJ	10 mJ
Min. Energy	1 µJ	1 µJ	1 µJ	1 µJ
Max repetition rate	0.8 MHz	0.8 MHz	0.8 MHz	0.8 MHz
Energy Resolution	0.05 µJ	0.05 µJ	0.05 µJ	0.05 µJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Sensor Absorber Specs				
Aperture	14 x 14 mm	14 x 14 mm	14 x 14 mm	14 x 14 mm
Type	T	T	T	T
Spatial Uniformity (2)	± 5%	± 5%	± 5%	± 5%
Absorber Spectral Range	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm
Calibration Spectral Range	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)
Max Power Density (3)	0.1 kW / cm²	0.1 kW / cm²	0.1 kW / cm²	0.1 kW / cm²
Max Energy Density (J/cm²) (4)	35 mJ/cm²	35 mJ/cm²	35 mJ/cm²	35 (mJ /cm²)
Sensor General Characteristics				
Cooling	Convection (c)	Convection (c)	Forced Air (c)	Water (c)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	40 °C
Weight	130 g	240 g	380 g	1.70 g
Dimension	60x60x16.5 mm	60x60x41.6 mm	60 x 60 x 66 mm	60 x 60 x 25.7 mm
Cable length	2.0 m	2.0 m	2.0 m	2.0 m
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
High Speed Meter (included)				
	HSM-1000-PC	HSM-1000-PC	HSM-1000-PC	HSM-1000-PC
(1) max 2 sec exposure, max 20% duty cycle. (2) 3mm beam diameter, scanning 80% of active area (3) Damage thresholds also depend on power level. (4) Single shot	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Recommended ambient temperature: 10 -30 °C	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Recommended ambient temperature: 10 -30 °C	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Recommended ambient temperature: 10 -35 °C	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Water Min. 1 l/min, Max 4 l/min (@ 10-25 °C). Admissible rate of water temperature variation < 1 °C/min.

Mechanical system specification: see drawings for BM-A-5W-14-T, BM-A-8W-14-T, BM-A-15W-14-T, BM-W-20W-14-T; HSM-1000-PC.

Pulse Controller - Enhanced System
HIGH SENSITIVITY – ENHANCED VERSION
Range: 3 mW to 50 W; Max Energy Density: 120 mJ/cm²



Power Mode	BM-A-5W-10-B-E-PC	BM-A-10W-10-B-E-PC	BM-A-25W-10-B-E-PC	BM-W-50W-10-B-E-PC
Max. Average Power	5 W	10 W	25 W	50 W
Max. Average Power (1)	25 W	25 W	35 W	60 W
Power Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Energy Mode				
Max. Energy	20 mJ	20 mJ	20 mJ	20 mJ
Min. Energy	3 µJ	3 µJ	3 µJ	3 µJ
Max repetition rate	0.8 MHz	0.8 MHz	0.8 MHz	0.8 MHz
Energy Resolution	0.1 µJ	0.1 µJ	0.1 µJ	0.1 µJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Sensor Absorber Specs				
Aperture	10 x 10 mm	10 x 10 mm	10 x 10 mm	10 x 10 mm
Type	B	B	B	B
Spatial Uniformity (2)	± 5%	± 5%	± 5%	± 5%
Absorber Spectral Range	0.5 – 1.1 µm	0.5 – 1.1 µm	0.5 – 1.1 µm	0.5 – 1.1 µm
Calibration Spectral Range	0.532 µm 1.07 µm (a)	0.532 µm 1.07 µm (a)	0.532 µm 1.07 µm (a)	0.532 µm 1.07 µm (a)
Max Power Density (3)	5 kW / cm²	5 kW / cm²	5 kW / cm²	5 kW / cm²
Max Energy Density (J/cm²) (4)	120 mJ/cm²	120 mJ/cm²	120 mJ/cm²	120 (mJ /cm²)
Sensor General Characteristics				
Cooling	Convection (b)	Convection (b)	Forced Air (c)	Water (c)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	40 °C
Weight	130 g	240 g	380 g	320 g
Dimension	60x60x16.5 mm	60x60x41.6 mm	60 x 60 x 66 mm	60 x 60 x 25.7 mm
Cable length	2.0 m	2.0 m	2.0 m	2.0 m
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
High Speed Meter (included)				
	HSM-1000-PC	HSM-1000-PC	HSM-1000-PC	HSM-1000-PC
Notes				
(1) max 2 sec exposure, max 20% duty cycle. (2) laser beam over 6x6mm central area (3) Damage thresholds also depend on power level. (4) Single shot	(a) Others wavelength on request (b) Recommended ambient temperature: 10 -30 °C	(a) Others wavelength on request (b) Recommended ambient temperature: 10 -30 °C	(a) Others wavelength on request (b) Recommended ambient temperature: 10 -35 °C	(a) Others wavelength on request (b) Water Min. 1 l/min, Max 4 l/min (@ 10-25 °C). Admissible rate of water temperature variation: < 1 °C/min.

Mechanical system specification: see drawings for BM-A-5W-10-B, BM-A-10W-10-B, BM-A-25W-10-B, BM-W-50W-10-B; HSM-1000-PC.

Pulse Controller - Enhanced System

HIGH SENSITIVITY – AMPLIFIED ENHANCED VERSION

Range: 1 mW to 20 W; Max Energy Density: 35 mJ/cm2



Power Mode	BM-A-5W-14-TX-E-PC	BM-A-8W-14-TX-E-PC	BM-A-15W-14-TX-E-PC	BM-W-20W-14-TX-E-PC
Max. Average Power	5 W	8 W	15 W	20 W
Max. Average Power (1)	15 W	15 W	20 W	25 W
Power Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Energy Mode				
Max. Energy	40 µJ (a) 1000 µJ (b)	40 µJ (a) 1000 µJ (b)	40 µJ (a) 1000 µJ (b)	40 µJ (a) 1000 µJ (b)
Min. Energy	0.25 µJ (a) 20 µJ (b)	0.25 µJ (a) 20 µJ (b)	0.25 µJ (a) 20 µJ (b)	0.25 µJ (a) 20 µJ (b)
Max repetition rate	0.8 MHz	0.8 MHz	0.8 MHz	0.8 MHz
Energy Resolution	0.01 µJ	0.01 µJ	0.01 µJ	0.01 µJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Sensor Absorber Specs				
Aperture	14 x 14 mm	14 x 14 mm	14 x 14 mm	14 x 14 mm
Type	T	T	T	T
Spatial Uniformity (2)	± 5 %	± 5 %	± 5 %	± 5 %
Min. Beam diameter	3 mm	3 mm	3 mm	3 mm
Absorber Spectral Range	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm
Calibration Spectral Range	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)
Max Power Density (3)	0.1 kW / cm2	0.1 kW / cm2	0.1 kW / cm2	0.1 kW / cm2
Max Energy Density (4)	35 mJ/cm^2	35 mJ/cm^2	35 mJ/cm^2	35 mJ/cm^2
Sensor General Characteristics				
Cooling	Convection (e)	Convection (c)	Forced Air (c)	Water (e)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	40 °C
Weight	130 g	240 g	380 g	1.70 g
Dimensions	60x60x16.5 mm	60x60x41.6 mm	60 x 60 x 66 mm	60 x 60 x 25.7 mm
Cable length	2 m	2.0 m	2.0 m	2.0 m
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
High Speed Meter (included)				
	HSM-1000-PC	HSM-1000-PC	HSM-1000-PC	HSM-1000-PC
(1) max 2 sec exposure, max 20% duty cycle. (2) 3mm beam diameter, scanning 80% of active area (3) Damage thresholds also depend on power level. (4) Single shot	(a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). 10.6 µm: sensor reflectivity 70% (d). Others wavelength on request (e). Recommended ambient temperature: 10 -30 °C	(a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). 10.6 µm: sensor reflectivity 70% (d). Others wavelength on request (e). Recommended ambient temperature: 10 -30 °C	(a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). 10.6 µm: sensor reflectivity 70% (d). Others wavelength on request (e). Recommended ambient temperature: 10 -30 °C	(a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). @ 10.6 µm sensor reflectivity 70% (d). Others wavelength on request (e). Water Min. 1 l/min, Max 4 l/min (@ 10-25 °C). Admissible rate of water temperature variation < 1 °C/min.

Mechanical system specification: see drawings for BM-A-5W-14-T, BM-A-8W-14-T, BM-A-15W-14-T, BM-W-20W-14-T; HSM-1000-PC.

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

Thermal Sensors



Thermal methods of measuring power and energy are those in which radiant energy is absorbed and converted into heat, which generates a temperature rise in the absorber. The absorbed energy is then measured through a function that takes into account the temperature gradient between the hot area (where the laser strikes) and a cool area (where the generated heat is dissipated). This measure can be done using thermocouples arrays (thermopile). The temperature difference will generate a voltage at the end of each single thermocouple and the resulting total voltage will be proportional to the incident power or energy. Laser Point manufactures different families of state of the art detector heads for measurement of powers and energies of all lasers, from UV to the Far Infrared, in any application within the industrial, medical or scientific fields. All thermal sensors allow performing "long term" laser power measurements. Different cooling methods among convention, forced air and water are used depending on the maximum measurable power. Each thermal sensor is provided with certificate with NIST and PTB traceability. Thermal sensors can be provided with DB15 or with USB and RS-232 connector (PC-plug option).

- Thermal sensors for Low power lasers
  - Models up to 40W (200W intermittent)
  - Sensitive thermopile sensors for power detection down to 10µW and energy to 2mJ
  - Broadband and High resistant coatings to 28KW/cm²
  - Energy measurement up to 200 Joules
  - NIST and PTB (Physikalisch-Technische Bundesanstalt) traceability

HOW TO ORDER:

Select Ordering Code without any option for DB15 head connectivity to Plus2 and PC-Link Meters;
Add connectivity option "U" to the Ordering Code for USB connectivity (PC-PLUG series);
Add connectivity option "R" to the Ordering Code for RS-232 connectivity (PC-PLUG series).

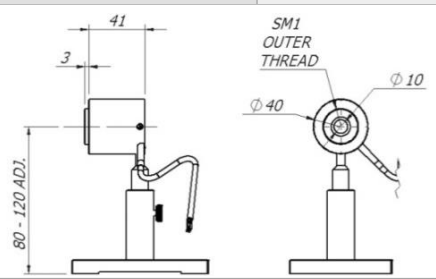
Ordering code	Power Range	Max Intermittent Power	Energy range	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
A-02-D12-BBF	0.1 mW – 0.2 W	200 mW	1 mJ - 200 mJ	10 mm	0.19 - 25 µm	BBF	Convection	DB15
A-2-D12-BBF	1 mW - 2 W	2 W	1 mJ - 2 J	10 mm	0.19 - 25 µm	BBF	Convection	DB15
A-2-D12-HPB	1 mW - 2 W	2 W	1 mJ - 2 J	10 mm	0.19 - 25 µm	HPB	Convection	DB15
A-5-D12-BBF	10 mW - 5 W	7.5 W	10 mJ - 5 J	10 mm	0.19 - 25 µm	BBF	Convection	DB15
A-10-D12-HPB	10 mW - 10 W	15 W	10 mJ - 15 J	12 mm	0.19 - 25 µm	HPB	Convection	DB15
A-10-D20-BBF	10 mW - 10 W	15 W	10 mJ - 15 J	20 mm	0.19 - 25 µm	BBF	Convection	DB15
A-10-D20-HPB	10 mW - 10 W	15 W	10 mJ - 15 J	20 mm	0.19 - 25 µm	HPB	Convection	DB15
A-30-D25-HPB	20 mW - 30 W	45 W	50 mJ - 45 J	25 mm	0.19 - 25 µm	HPB	Convection	DB15
A-40-D25-BBF	20 mW - 40 W	60 W	50 mJ - 60 J	25 mm	0.19 - 25 µm	BBF	Convection	DB15
A-40-D25-HPB	20 mW - 40 W	60 W	50 mJ - 60 J	25 mm	0.19 - 25 µm	HPB	Convection	DB15
A-40-D40-HPB	20 mW - 40 W	60 W	50 mJ - 60 J	40 mm	0.19 - 25 µm	HPB	Convection	DB15
A-40/200-D25-HPB	150 mW - 40 W	200 W	200 mJ - 200 J	25 mm	0.19 - 25 µm	HPB	Convection	DB15
A-40/200-D40-HPB	100 mW - 40 W	200 W	150 mJ - 200 J	40 mm	0.19 - 25 µm	HPB	Convection	DB15
A-40/200-D60-HPB	200 mW - 40 W	200 W	250 mJ - 200 J	60 mm	0.19 - 25 µm	HPB	Convection	DB15

Thermal Sensors for Low Power Lasers

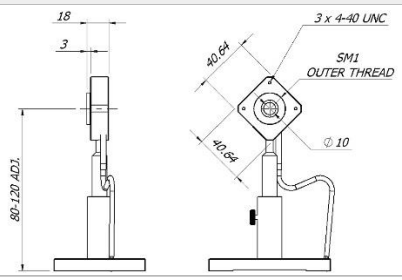
Range: 100 µW to 5 W



Ordering Code	A-02-D12-BBF	A-2-D12-BBF	A-2-D12-HPB	A-5-D12-HPB
Power Mode				
Max. Average Power	200 mW	2 W	2 W	5 W
Max. Intermittent Power (1)	200 mW	2 W	2 W	7.5 W
Min. Power	0.1 mW	1 mW	1 mW	10 mW
Power Resolution	10 µW	10 µW	10 µW	100 µW
Noise Equivalent Power (NEP)	5 µW	50 µW	50 µW	500 µW
Response Time (0-90%)	2 sec	2 sec	2.5 sec	0.7 sec
Power Calibration Uncertainty	± 3%	± 3%	± 3%	± 3%
Power Linearity (2)	± 1%	± 1%	± 1%	± 1%
Single Shot Energy Mode				
Max. Energy (with 100 ms pulse)	200 mJ	2 J	2 J	5 J
Min. Energy	1 mJ	1 mJ	1 mJ	10 mJ
Energy Resolution	10 µJ	10 µJ	10 µJ	0.1 mJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	10 mm	10 mm	10 mm	10 mm
Type	BBF	BBF	HPB	BBF
Absorber Spectral Range	0.19 - 25 µm	0.19 - 25 µm	0.19 - 11 µm	0.19 - 25 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (3)	200 W/cm²	200 W/cm²	18 kW/cm² @10 W	200 W/cm²
Max Energy Density J/cm² (3)	5ms pulse width: 3.6 10µs pulse width: 0.2 10ns pulse width: 0.1	5ms pulse width: 3.6 10µs pulse width: 0.2 10ns pulse width: 0.1	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 3.6 10µs pulse width: 0.2 10ns pulse width: 0.1
General Characteristics				
Cooling	Convection	Convection	Convection	Convection
Weight	0.2 kg	0.2 kg	0.2 kg	0.2 kg
Dimension	Ø 40 x 44 mm	Ø 40 x 44 mm	Ø 40 x 44 mm	41 x 41 x 18 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes				
(1). 2 minutes max (2). Detector centrally irradiated @50% of useful surface. (3). Damage thresholds also depend on power level. Please see damage graphs for more details.	Available with fiber adapter			



A-02-D12-BBF A-2-D12-BBF A-2-D12-HPB



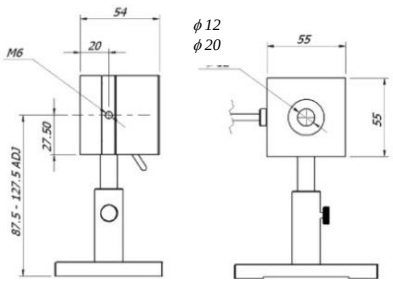
A-5-D12-HPB

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

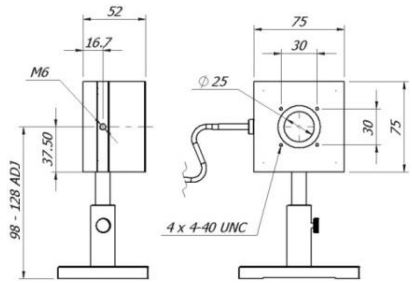
Thermal Sensors for Low Power Lasers
Range: 10 mW to 30 W



Ordering Code	A-10-D12-HPB	A-10-D20-BBF	A-10-D20-HPB	A-30-D25-HPB
Power Mode				
Max. Average Power	10 W	10 W	10 W	30 W
Max. Intermittent Power (1)	15 W	15 W	15 W	45 W
Min. Power	10 mW	10 mW	10 mW	20 mW
Power Resolution	100 µW	100 µW	100 µW	1 mW
Noise Equivalent Power (NEP)	500 µW	600 µW	600 µW	1 mW
Response Time (0-90%)	0.8 sec	1 sec	1 sec	1.5 sec
Power Calibration Uncertainty	± 3%	± 3%	± 3%	± 3%
Power Linearity (2)	± 1%	± 1%	± 1%	± 1%
Single Shot Energy Mode				
Max. Energy (with 100 ms pulse)	15 J	15 J	15 J	45 J
Min. Energy	10 mJ	10 mJ	10 mJ	50 mJ
Energy Resolution	0.1 mJ	0.1 mJ	0.1 mJ	1 mJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	12 mm	20 mm	20 mm	25 mm
Type	HPB	BBF	HPB	HPB
Absorber Spectral Range	0.19 - 11 µm	0.19 - 25 µm	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (3)	18 kW/cm² @10 W	200 W/cm²	18 kW/cm² @10 W	18 kW/cm² @10 W
Max Energy Density J/cm² (3)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 3.6 10µs pulse width: 0.2 10ns pulse width: 0.1	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3 [2]	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
General Characteristics				
Cooling	Convection	Convection	Convection	Convection
Weight	0.3 kg	0.3 kg	0.3 kg	0.5 kg
Dimension	55 x 55 x 54 mm	55 x 55 x 54 mm	55 x 55 x 54 mm	75 x 75 x 52 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes				
(1). 2 minutes max (2). Detector centrally irradiated @50% of useful surface. (3). Damage thresholds also depend on power level. Please see damage graphs for more details.		Available with fiber adapter		



A-10-D12-HPB A-10-D20-BBF A-10-D20-HPB



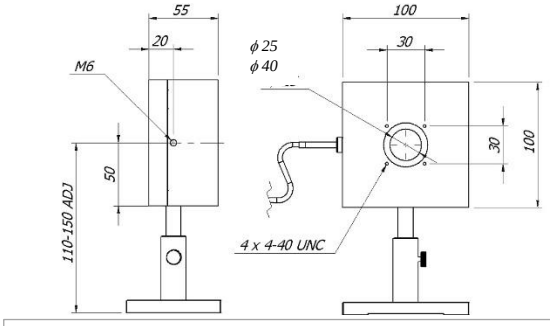
A-30-D25-HPB

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Thermal Sensors for Low Power Lasers
Range: 20 mW to 40 W



Ordering Code	A-40-D25-BBF	A-40-D25-HPB	A-40-D40-HPB
Power Mode			
Max. Average Power	40 W	40 W	40 W
Max. Intermittent Power (1)	60 W	60 W	60 W
Min. Power	20 mW	20 mW	20 mW
Power Resolution	1 mW	1 mW	1 mW
Noise Equivalent Power (NEP)	1 mW	1 mW	1 mW
Response Time (0-90%)	1.5 sec	1.5 sec	1.8 sec
Power Calibration Uncertainty	± 3%	± 3%	± 3%
Power Linearity (2)	± 1%	± 1%	± 1%
Single Shot Energy Mode			
Max. Energy (with 100 ms pulse)	60 J	60 J	60 J
Min. Energy	50 mJ	50 mJ	50 mJ
Energy Resolution	1 mJ	1 mJ	1 mJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%
Absorber Specs			
Aperture	25 mm	25 mm	40 mm
Type	BBF	HPB	HPB
Absorber Spectral Range	0.19 - 25 µm	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (3)	200 W/cm²	9 kW/cm² @40 W	9 kW/cm² @40 W
Max Energy Density J/cm² (3)	5ms pulse width: 3.6 10µs pulse width: 0.2 10ns pulse width: 0.1	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
General Characteristics			
Cooling	Convection	Convection	Convection
Weight	0.9 kg	0.9 kg	0.9 kg
Dimension	100 x 100 x 55 mm	100 x 100 x 55 mm	100 x 100 x 55 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes			
(1). 2 minutes max (2). Detector centrally irradiated @50% of useful surface. (3). Damage thresholds also depend on power level. Please see damage graphs for more details.	Available with fiber adapter	Available with fiber adapter	



A-40-D25-BBF A-40-D25-HPB A-40-D40-HPB

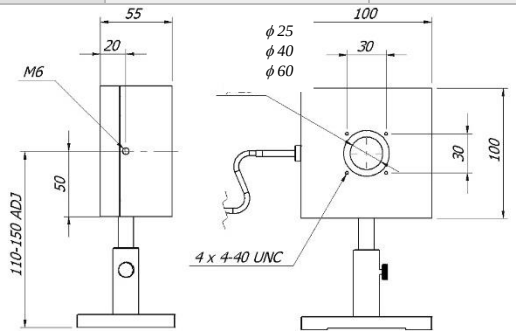
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Thermal Sensors for Low Power Lasers

Range: 20 mW to 40 W (200W intermittent)



Ordering Code	A-40/200-D25-HPB	A-40/200-D40-HPB	A-40/200-D60-HPB
Power Mode			
Max. Average Power	40 W	40 W	40 W
Max. Intermittent Power (1)	200 W	200 W	200 W
Min. Power	150 mW	100 mW	200 mW
Power Resolution	1 mW	1 mW	1 mW
Noise Equivalent Power (NEP)	6 mW	5 mW	10 mW
Response Time (0-90%)	1.7 sec	1.7 sec	3 sec
Power Calibration Uncertainty	± 3%	± 3%	± 3%
Power Linearity (2)	± 1%	± 1%	± 1%
Single Shot Energy Mode			
Max. Energy (with 100 ms pulse)	200 J	200 J	200 J
Min. Energy	200 mJ	150 mJ	250 mJ
Energy Resolution	1 mJ	1 mJ	1 mJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%
Absorber Specs			
Aperture	25 mm	40 mm	60 mm
Type	HPB	HPB	HPB
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (3)	11 kW/cm² @40 W	11 kW/cm² @40 W	11 kW/cm² @40 W
Max Energy Density J/cm² (3)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
General Characteristics			
Cooling	Convection	Convection	Convection
Weight	0.9 kg	0.9 kg	0.9 kg
Dimension	100 x 100 x 55 mm	100 x 100 x 55 mm	100 x 100 x 55 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes			
(1). 2 minutes max (2). Detector centrally irradiated @50% of useful surface. (3). Damage thresholds also depend on power level. Please see damage graphs for more details.	Available with fiber adapter		



A-40/200-D25-HPB A-40/200-D40-HPB A-40/200-D60-HPB

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- Thermal sensors for Medium power lasers



  - Air Cooled models to 600W for continuous use and 800 W for intermittent
  - Energy measurement up to 800 joules
  - High resistant coatings: up to 12 KW/cm² at the maximum rated power
  - Energy damage threshold up to 250J/cm²
  - NIST and PTB (Physikalisch-Technische Bundesanstalt) traceability

HOW TO ORDER:

Select Ordering Code without any option for DB15 head connectivity to Plus2 and PC-Link Meters;
Add connectivity option "U" to the Ordering Code for USB connectivity (PC-PLUG series);
Add connectivity option "R" to the Ordering Code for RS-232 connectivity (PC-PLUG series).

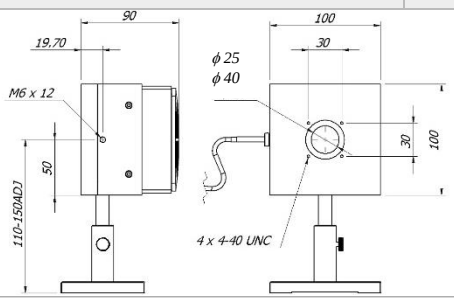
Ordering code	Power Range	Max Intermittent Power	Energy range	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
A-200-D25-HPB	0.2 W - 200 W	250 W	0.5 J - 250 J	25 mm	0.19 - 11 µm	HPB	Forced Air	DB15
A-200-D25-SHC	0.2 W - 200 W	250 W	0.5 J - 250 J	25 mm	0.19 - 11 µm	SHC	Forced Air	DB15
A-200-D40-HPB	0.2 W - 200 W	250 W	0.5 J - 250 J	40 mm	0.19 - 11 µm	HPB	Forced Air	DB15
A-200-D40-SHC	0.2 W - 200 W	250 W	0.5 J - 250 J	40 mm	0.19 - 11 µm	SHC	Forced Air	DB15
A-200-D60-HPB	0.3 W - 200 W	250 W	1 J - 250 J	60 mm	0.19 - 11 µm	HPB	Forced Air	DB15
A-200-D60-SHC	0.3 W - 200 W	250 W	1 J - 250 J	60 mm	0.19 - 11 µm	SHC	Forced Air	DB15
W-200-D40-HPB	0.2 W - 200 W	300 W	1 J - 300 J	40 mm	0.19 - 11 µm	HPB	Water	DB15
W-200-D40-SHC	0.2 W - 200 W	300 W	1 J - 300 J	40 mm	0.19 - 11 µm	SHC	Water	DB15
A-300-D60-HPB	0.5 W - 300 W	400 W	1 J - 400 J	60 mm	0.19 - 11 µm	HPB	Forced Air	DB15
A-600-D40-HPB	0.5 W - 600 W	800 W	1 J - 800 J	40 mm	0.19 - 11 µm	HPB	Forced Air	DB15
A-600-D60-SHC	0.5 W - 600 W	800 W	1 J - 800 J	60 mm	0.19 - 11 µm	SHC	Forced Air	DB15
W-600-D30-HPB	0.5 W - 600 W	800 W	1 J - 800 J	30 mm	0.19 - 11 µm	HPB	Water	DB15
W-600-D30-SHC	0.5 W - 600 W	800 W	1 J - 800 J	30 mm	0.19 - 11 µm	SHC	Water	DB15
W-600-D70-HPB	0.5 W - 600 W	700 W	1 J - 700 J	70 mm	0.19 - 11 µm	HPB	Water	DB15
W-600-D70-SHC	0.5 W - 600 W	700 W	1 J - 700 J	70 mm	0.19 - 11 µm	SHC	Water	DB15

Thermal Sensors for Medium Power Lasers

Range: 200 mW to 200 W



Ordering Code	A-200-D25-HPB	A-200-D25-SHC	A-200-D40-HPB	A-200-D40-SHC
Power Mode				
Max. Average Power	200 W	200 W	200 W	200 W
Max. Intermittent Power (1)	250 W	250 W	250 W	250 W
Min. Power	0.2 W	0.2 W	0.2 W	0.2 W
Power Resolution	10 mW	10 mW	10 mW	10 mW
Noise Equivalent Power (NEP)	10 mW	10 mW	10 mW	10 mW
Response Time (0-90%)	1.7 sec	1.7 sec	2 sec	2 sec
Power Calibration Uncertainty	± 3%	± 3%	± 3%	± 3%
Power Linearity (2)	± 1%	± 1%	± 1%	± 1%
Single Shot Energy Mode				
Max. Energy (with 100 ms pulse)	250 J	250 J	250 J	250 J
Min. Energy	0.5 J	0.5 J	0.5 J	0.5 J
Energy Resolution	10 mJ	10 mJ	10 mJ	10 mJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	25 mm	25 mm	40 mm	40 mm
Type	HPB	SHC	HPB	SHC
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.2 - 1.1 µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.2 - 1.1 µm, 9 - 11 µm
Max Power Density (3)	4 kW/cm² @200 W	17 kW/cm² @200 W	4 kW/cm² @200 W	17 kW/cm² @200 W
Max Energy Density J/cm² (3)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1
General Characteristics				
Cooling	Forced Air with Fan (a)	Forced Air with Fan (a)	Forced Air with Fan (a)	Forced Air with Fan (a)
Weight	1.2 kg	1.2 kg	1.2 kg	1.2 kg
Dimension	100 x 100 x 85 mm	100 x 100 x 85 mm	100 x 100 x 85 mm	100 x 100 x 85 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes				
(1). 2 minutes max (2). Detector centrally irradiated @50% of useful surface. (3). Damage thresholds also depend on power level. Please see damage graphs for more details.	Available with fiber adapter (a). 12V DC Power Supply Included		(a). 12V DC Power Supply Included	



A-200-D25-HPB A-200-D25-SHC A-200-D40-HPB A-200-D40-SHC

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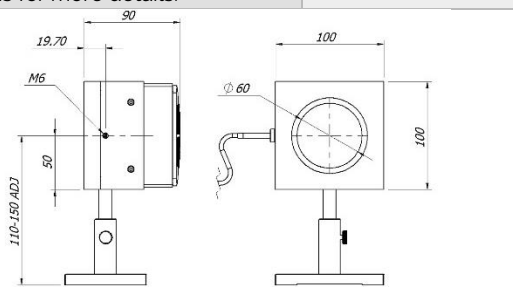
Thermal Sensors for Medium Power Lasers

Range: 200 mW to 200 W

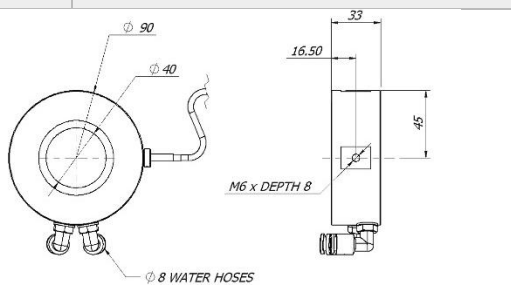




Ordering Code	A-200-D60-HPB	A-200-D60-SHC	W-200-D40-HPB	W-200-D40-SHC
Power Mode				
Max. Average Power	200 W	200 W	200 W	200 W
Max. Intermittent Power (1)	250 W	250 W	300 W	300 W
Min. Power	0.3 W	0.3 W	0.2 W	0.2 W
Power Resolution	10 mW	10 mW	10 mW	10 mW
Noise Equivalent Power (NEP)	15 mW	15 mW	10 mW	10 mW
Response Time (0-90%)	3 sec	3 sec	2 sec	2 sec
Power Calibration Uncertainty	± 3%	± 3%	± 3%	± 3%
Power Linearity (2)	± 1%	± 1%	± 1.5%	± 1.5%
Single Shot Energy Mode				
Max. Energy (with 100 ms pulse)	250 J	250 J	300 J	300 J
Min. Energy	1 J	1 J	1 J	1 J
Energy Resolution	10 mJ	10 mJ	10 mJ	10 mJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	60 mm	60 mm	40 mm	40 mm
Type	HPB	SHC	HPB	SHC
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.2 - 1.1 µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.2 - 1.1 µm, 9 - 11 µm
Max Power Density (3)	4 kW/cm² @200 W	17 kW/cm² @200 W	7 kW/cm² @200 W	28 kW/cm² @200 W
Max Energy Density J/cm² (3)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1
General Characteristics				
Cooling	Forced Air with Fan (a)	Forced Air with Fan (a)	Water (a)	Water (a)
Weight	1.2 kg	1.2 kg	0.6 kg	0.6 kg
Dimension	100 x 100 x 85 mm	100 x 100 x 85 mm	Ø 90 x 33 mm	Ø 90 x 33 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes				
(1). 2 minutes max (2). Detector centrally irradiated @50% of useful surface. (3). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). 12V DC Power Supply Included		(a). Water 1.5 liter/min (@ 22°C); admissible rate of temperature variation < 1 °C/min	



A-200-D60-HPB A-200-D60-SHC



W-200-D40-HPB W-200-D40-SHC

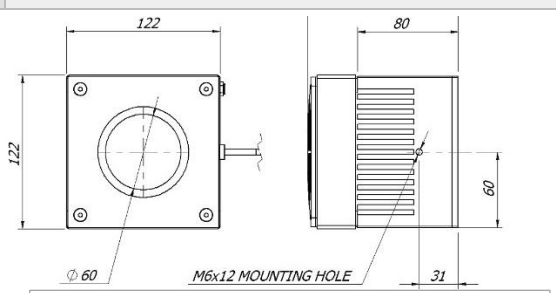
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Thermal Sensors for Medium Power Lasers

Range: 500 mW to 300 W



Ordering Code	A-300-D60-HPB
Power Mode	
Max. Average Power	300 W
Max. Intermittent Power (1)	400 W
Min. Power	0.5 W
Power Resolution	10 mW
Noise Equivalent Power (NEP)	25 mW
Response Time (0-90%)	3.5 sec
Power Calibration Uncertainty	± 3%
Power Linearity (2)	± 1%
Single Shot Energy Mode	
Max. Energy (with 100 ms pulse)	400 J
Min. Energy	1 J
Energy Resolution	10 mJ
Energy Calibration Uncertainty	± 5%
Absorber Specs	
Aperture	60 mm
Type	HPB
Absorber Spectral Range	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (3)	6 kW/cm² @200 W
Max Energy Density J/cm² (3)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
General Characteristics	
Cooling	Forced Air with Fan (a)
Weight	2.1 kg
Dimension	122 x 122 x 120 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Stand and Post	Heavy Duty Stand
Notes	
(1). 2 minutes max (2). Detector centrally irradiated @50% of useful surface. (3). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). 12V DC Power Supply Included



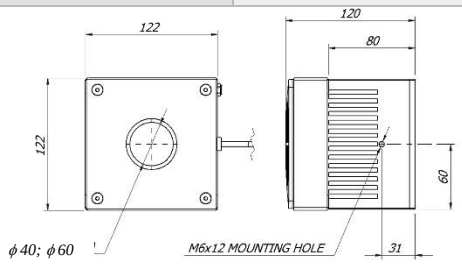
A-300-D60-HPB

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Thermal Sensors for Medium Power Lasers
Range: 500 mW to 600 W



Ordering Code	A-600-D40-HPB	A-600-D60-SHC
Power Mode		
Max. Average Power	600 W	600 W
Max. Intermittent Power (1)	800 W	800 W
Min. Power	0.5 W	0.5 W
Power Resolution	10 mW	10 mW
Noise Equivalent Power (NEP)	50 mW	50 mW
Response Time (0-90%)	5 sec	4 sec
Power Calibration Uncertainty	± 3%	± 3%
Power Linearity (2)	± 1.5%	± 1.5%
Single Shot Energy Mode		
Max. Energy (with 100 ms pulse)	800 J	800 J
Min. Energy	1 J	1 J
Energy Resolution	10 mJ	10 mJ
Energy Calibration Uncertainty	± 5%	± 5%
Absorber Specs		
Aperture	40 mm	60 mm
Type	HPB	SHC
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.2 - 1.1 µm, 9 - 11 µm
Max Power Density (3)	3 kW/cm² @500 W	11 kW/cm² @500 W
Max Energy Density J/cm² (3)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1
General Characteristics		
Cooling	Forced Air with Fan (a)	Forced Air with Fan (a)
Weight	2.2 kg	2.5 kg
Dimension	122 x 122 x 120 mm	122 x 122 x 120 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Stand and Post	Heavy Duty Stand	Heavy Duty Stand
Notes		
(1). 2 minutes max (2). Detector centrally irradiated @50% of useful surface. (3). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). 12V DC Power Supply Included	



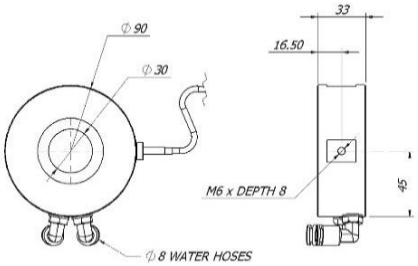
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Thermal Sensors for Medium Power Lasers

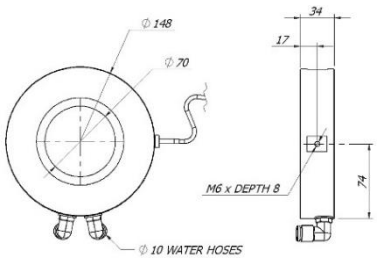
Range: 500 mW to 600 W



Ordering Code	W-600-D30-HPB	W-600-D30-SHC	W-600-D70-HPB	W-600-D70-SHC
Power Mode				
Max. Average Power	600 W	600 W	600 W	600 W
Max. Intermittent Power (1)	800 W	800 W	700 W	700 W
Min. Power	0.5 W	0.5 W	0.5 W	0.5 W
Power Resolution	10 mW	10 mW	10 mW	10 mW
Noise Equivalent Power (NEP)	25 mW	25 mW	30 mW	30 mW
Response Time (0-90%)	2 sec	2 sec	4 sec	4 sec
Power Calibration Uncertainty	± 3%	± 3%	± 3%	± 3%
Power Linearity (2)	± 1.5%	± 1.5%	± 1.5%	± 1.5%
Single Shot Energy Mode				
Max. Energy (with 100 ms pulse)	800 J	800 J	700 J	700 J
Min. Energy	2 J	2 J	1 J	1 J
Energy Resolution	10 mJ	10 mJ	10 mJ	10 mJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	30 mm	30 mm	70 mm	70 mm
Type	HPB	SHC	HPB	SHC
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.2 - 1.1 µm, 9 - 11 µm	0.2 - 1.1 µm, 9 - 11 µm	0.2 - 1.1 µm, 9 - 11 µm
Max Power Density (3)	5 kW/cm² @500 W	19 kW/cm² @500 W	5 kW/cm² @500 W	19 kW/cm² @500 W
Max Energy Density J/cm² (3)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1
General Characteristics				
Cooling	Water (a)	Water (a)	Water (a)	Water (a)
Weight	0.6 kg	0.6 kg	1.9 kg	1.9 kg
Dimension	Ø 90 x 33 mm	Ø 90 x 33 mm	Ø 148 x 34 mm	Ø 148 x 34 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes				
(1). 2 minutes max (2). Detector centrally irradiated @50% of useful surface. (3). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Water 3 liter/min (@ 22°C); admissible rate of temperature variation < 1 °C/min			



W-600-D30-HPB; W-600-D30-SHC



W-600-D70-HPB; W-600-D70-SHC;

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

- Thermal sensors for High power lasers

    - Water Cooled Heads to 6KW for continuous use and 9KW for intermittent
    - High resistant coatings: up to 6KW/cm² at the maximum rated power
    - Energy damage threshold up to 250J/cm²
    - NIST and PTB (Physikalisch-Technische Bundesanstalt) traceable calibrations

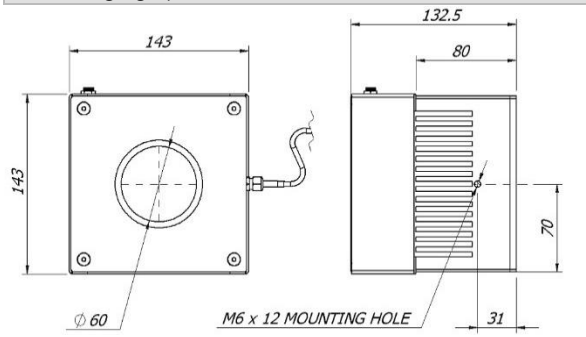
HOW TO ORDER:

Select Ordering Code without any option for DB15 head connectivity to Plus2 and PC-Link Meters;
Add connectivity option "U" to the Ordering Code for USB connectivity (PC-PLUG series);
Add connectivity option "R" to the Ordering Code for RS-232 connectivity (PC-PLUG series).

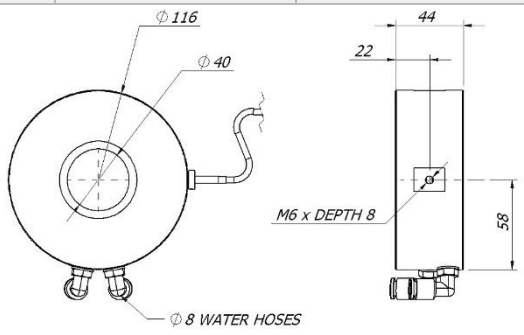
Ordering code	Power Range	Max Intermittent Power	Energy range	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
A-1200-D60-SHC	2 W - 1200 W	1400 W	5 J - 1200 J	60 mm	0.19 - 11 µm	SHC	Forced Air	DB15
W-1500-D40-HPB	4 W - 1500 W	2250 W	5 J - 2250 J	40 mm	0.19 - 11 µm	HPB	Water	DB15
W-1500-D40-SHC	4 W - 1500 W	2250 W	5 J - 2250 J	40 mm	0.19 - 11 µm	SHC	Water	DB15
W-3000-D55-HPB	6 W - 3 kW	4.5 kW	n.a.	55 mm	0.19 - 11 µm	HPB	Water	DB15
W-3000-D55-SHC	6 W - 3 kW	4.5 kW	n.a.	55 mm	0.19 - 11 µm	SHC	Water	DB15
W-6000-D55-SHC	15 W - 6 kW	9 kW	n.a.	55 mm	0.19 - 11 µm	SHC	Water	DB15

Thermal Sensors for High Power Lasers
Range: 2 W to 1500 W

Ordering Code	A-1200-D60-SHC	W-1500-D40-HPB	W-1500-D40-SHC
Power Mode			
Max. Average Power	1200 W	1500 W	1500 W
Max. Intermittent Power (1)	1400 W	2250 W	2250 W
Min. Power	2 W	4 W	4 W
Power Resolution	100 mW	100 mW	100 mW
Noise Equivalent Power (NEP)	100 mW	200 mW	200 mW
Response Time (0-90%)	6 sec	4 sec	4 sec
Power Calibration Uncertainty	± 3%	± 5%	± 5%
Power Linearity (2)	± 1.5%	± 1.5%	± 1.5%
Single Shot Energy Mode			
Max. Energy (with 100 ms pulse)	1200 J	2250 J	2250 J
Min. Energy	5 J	5 J	5 J
Energy Resolution	100 mJ	100 mJ	100 mJ
Energy Calibration Uncertainty	± 5%	± 7%	± 7%
Absorber Specs			
Aperture	60 mm	40 mm	40 mm
Type	SHC	HPB	SHC
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.2 - 1.1 µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.2 - 1.1 µm, 9 - 11 µm
Max Power Density (3)	5 kW/cm² @1 kW	2.4 kW/cm² @1 kW	7 kW/cm² @1 kW
Max Energy Density J/cm² (3)	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1
General Characteristics			
Cooling	Forced Air with Fan (a)	Water (a)	Water (a)
Weight	4.4 kg	1.1 kg	1.1 kg
Dimension	143 x 143 x 132 mm	Ø 116 x 44 mm	Ø 116 x 44 mm
Cable length - connector	5 m - DB15 5 m – USB (U option) 5 m - RS232 (R option)	5 m - DB15 5 m – USB (U option) 5 m - RS232 (R option)	5 m - DB15 5 m – USB (U option) 5 m - RS232 (R option)
Stand and Post	Heavy Duty Stand	Heavy Duty Stand	Heavy Duty Stand
Notes			
(1). 2 minutes max (2). Detector centrally irradiated @50% of useful surface. (3). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). 24V DC Power Supply Included	(a). Water 4 liter/min (@ 22°C); admissible rate of temperature variation < 1 °C/min	(a). Water 4 liter/min (@ 22°C); admissible rate of temperature variation < 1 °C/min



A-1200-D60-SHC

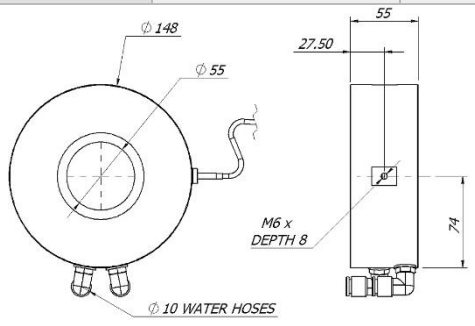


W-1500-D40-HPB W-1500-D40-SHC

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

Thermal Sensors for High Power Lasers
Range: 6 W to 6 kW

Ordering Code	W-3000-D55-HPB	W-3000-D55-SHC	W-6000-D55-SHC
Power Mode			
Max. Average Power	3 kW	3 kW	6 kW
Max. Intermittent Power (1)	4.5 kW	4.5 kW	9 kW
Min. Power	6 W	6 W	15 W
Power Resolution	1 W	1 W	1 W
Noise Equivalent Power (NEP)	0.25 W	0.25 W	0.5 W
Response Time (0-90%)	5 sec	5 sec	3.5 sec
Power Calibration Uncertainty	± 5%	± 5%	± 5%
Power Linearity (2)	± 2%	± 2%	± 2%
Single Shot Energy Mode			
Max. Energy (with 100 ms pulse)	n.a.	n.a.	n.a.
Min. Energy	n.a.	n.a.	n.a.
Energy Resolution	n.a.	n.a.	n.a.
Energy Calibration Uncertainty	n.a.	n.a.	n.a.
Aperture	55 mm	55 mm	55 mm
Type	HPB	SHC	SHC
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.2 - 1.1 µm, 9 - 11 µm	0.2 - 1.1 µm, 9 - 11 µm
Max Power Density (3)	1.8 kW/cm² @2kW	3.6 kW/cm² @2kW	4 kW/cm² @5kW
Max Energy Density J/cm² (3)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1
General Characteristics			
Cooling	Water (a)	Water (a)	Water (a)
Weight	2.3 kg	4.2 kg	4.2 kg
Dimension	Ø 148 x 55 mm	Ø 148 x 55 mm	Ø 148 x 55 mm
Cable length - connector	5 m - DB15 5 m – USB (U option) 5 m - RS232 (R option)	5 m - DB15 5 m – USB (U option) 5 m - RS232 (R option)	5 m - DB15 5 m – USB (U option) 5 m - RS232 (R option)
Stand and Post	Heavy Duty Stand	Heavy Duty Stand	Heavy Duty Stand
Notes			Notes
(1). 2 minutes max (2). Detector centrally irradiated @50% of useful surface. (3). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Water 5 liter/min (@ 22°C); admissible rate of temperature variation < 1 °C/min	(a). Water 5 liter/min (@ 22°C); admissible rate of temperature variation < 1 °C/min	(a). Water 8 liter/min (@ 22°C); admissible rate of temperature variation < 1 °C/min



W-3000-D55-HPB W-3000-D55-SHC W-6000-D55-SHC

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

- Thermal sensors for pulsed lasers

    - High damage thresholds volume absorbers:
      peak powers to 100GW/cm²; energy densities to 4J/cm² @ ns pulses
    - Large Area Detectors to 40 mm
    - Avg. Power and Single Shot Energy Measurement
    - NIST and PTB (Physikalisch-Technische Bundesanstalt) traceable Calibrations

HOW TO ORDER:

Select Ordering Code without any option for DB15 head connectivity to Plus2 and PC-Link Meters;
Add connectivity option "U" to the Ordering Code for USB connectivity (PC-PLUG series);
Add connectivity option "R" to the Ordering Code for RS-232 connectivity (PC-PLUG series).

Ordering code	Power Range	Max Intermittent Power	Energy range	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
10-BB-D12-L	2 mW - 10 W	15 W	50 mJ - 10 J	12 mm	0.4 - 2 µm	BB	Convection	DB15
10-BB-D25	2 mW - 10 W	15 W	50 mJ - 10 J	25 mm	0.4 - 5.2 µm	BB	Convection	DB15
10-UVA-D25	2 mW - 10 W	15 W	50 mJ - 10 J	25 mm	0.25 - 0.4 µm	UVA	Convection	DB15
10-UVC-D25	2 mW - 10 W	15 W	50 mJ - 10 J	25 mm	0.19 – 0.25 µm	UVC	Convection	DB15
20-BB-D40	40 mW - 20 W	30 W	100 mJ - 20 J	40 mm	0.4 - 5.2 µm	BB	Convection	DB15
20-UVA-D40	40 mW - 20 W	30 W	100 mJ - 20 J	40 mm	0.25 - 0.4 µm	UVA	Convection	DB15
20-UVC-D40	40 mW - 20 W	30 W	100 mJ - 20 J	40 mm	0.19 – 0.25 µm	UVC	Convection	DB15

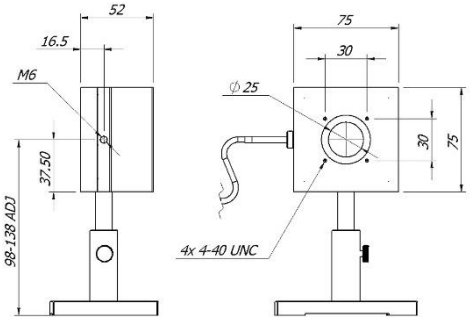
Thermal Sensors for Pulsed Lasers

Range: 2 mW to 10 W; 50 mJ to 10 J

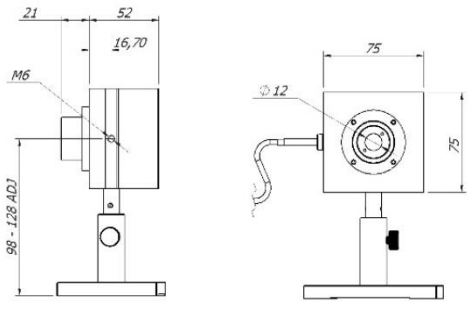




Ordering Code	10-BB-D12-L	10-BB-D25	10-UVA-D25	10-UVC-D25
Power Mode				
Max. Average Power	10 W	10 W	10 W	10 W
Max. Intermittent Power (1)	15 W	15 W	15 W	15 W
Min. Power	2 mW	2 mW	2 mW	2 mW
Power Resolution	100 µW	100 µW	100 µW	100 µW
Noise Equivalent Power (NEP)	100 µW	100 µW	100 µW	100 µW
Response Time (0-90%)	3 sec	3 sec	3 sec	3 sec
Power Calibration Uncertainty	± 3%	± 3%	± 3%	± 3%
Power Linearity (2)	± 1%	± 1%	± 1%	± 1%
Single Shot Energy Mode				
Max. Energy (with 100 ms pulse)	10 J	10 J	10 J	10 J
Min. Energy	50 mJ	50 mJ	50 mJ	50 mJ
Energy Resolution	1 mJ	1 mJ	1 mJ	1 mJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	12 mm	25 mm	25 mm	25 mm
Type	BB+L	BB	UVA	UVC
Absorber Spectral Range	0.4 - 2 µm	0.4 - 5.2 µm	0.25 - 0.4 µm	0.19 - 0.25 µm
Calibration Spectral Range	0.4 - 2 µm	0.4 - 5.2 µm	0.25 - 0.4 µm	0.19 - 0.25 µm
Max Power Density (3)	140 W/cm²	35 W/cm²	9 W/cm²	40 W/cm²
Max Energy Density J/cm² (3)	Single Pulse: (a) 10ms pulse width: 40 <10µs pulse width: 30	Single Pulse: (a) 10ms pulse width: 13 <10µs pulse width: 10	Single Pulse: (a) 10ms pulse width: 5 <10µs pulse width: 4	Single Pulse: (a) 10ms pulse width: 15 <10µs pulse width: 9
General Characteristics				
Cooling	Convection	Convection	Convection	Convection
Weight	0.6 kg	0.5 kg	0.5 kg	0.5 kg
Dimension	75 x 75 x 73 mm	75 x 75 x 52 mm	75 x 75 x 52 mm	75 x 75 x 52 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes				
(1). 2 minutes max (2). Detector centrally irradiated @50% of useful surface. (3). Damage thresholds also depend on power level. Please see damage graphs for more details.	Available with fiber adapter (a). For repeated pulses, see volume absorber damage graphs.			



10-BB-D25 10-UVA-D25 10-UVC-D25



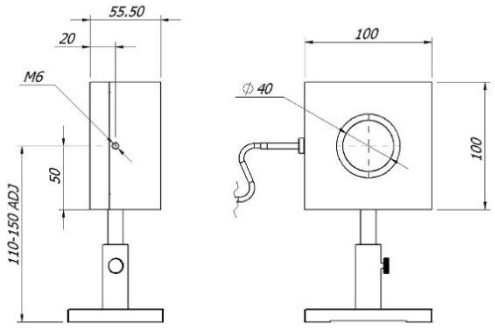
10-BB-D12-L

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

Thermal Sensors for Pulsed Lasers

Range: 40 mW to 20 W; 100 mJ to 20 J

Ordering Code	20-BB-D40	20-UVA-D40	20-UVC-D40
Power Mode			
Max. Average Power	20 W	20 W	20 W
Max. Intermittent Power (1)	30 W	30 W	30 W
Min. Power	40 mW	40 mW	40 mW
Power Resolution	1 mW	1 mW	1 mW
Noise Equivalent Power (NEP)	1 mW	1 mW	1 mW
Response Time (0-90%)	3 sec	3 sec	3 sec
Power Calibration Uncertainty	± 3%	± 3%	± 3%
Power Linearity (2)	± 1%	± 1%	± 1%
Single Shot Energy Mode			
Max. Energy (with 100 ms pulse)	20 J	20 J	20 J
Min. Energy	100 mJ	100 mJ	100 mJ
Energy Resolution	1 mJ	1 mJ	1 mJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%
Absorber Specs			
Aperture	40 mm	40 mm	40 mm
Type	BB	UVA	UVC
Absorber Spectral Range	0.4 - 5.2 µm	0.25 - 0.4 µm	0.19 - 0.25 µm
Calibration Spectral Range	0.4 - 5.2 µm	0.25 - 0.4 µm	0.19 - 0.25 µm
Max Power Density (3)	35 W/cm²	9 W/cm²	40 W/cm²
Max Energy Density J/cm² (3)	Single Pulse: (a) 10ms pulse width: 13 <10µs pulse width: 10	Single Pulse: (a) 10ms pulse width: 5 <10µs pulse width: 4	Single Pulse: (a) 10ms pulse width: 15 <10µs pulse width: 9
General Characteristics			
Cooling	Convection	Convection	Convection
Weight	0.9 kg	0.9 kg	0.9 kg
Dimension	100 x 100 x 55 mm	100 x 100 x 55 mm	100 x 100 x 55 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes			
(1). 2 minutes max (2). Detector centrally irradiated @50% of useful surface. (3). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). For repeated pulses, see volume absorber damage graphs.		



20-BB-D40 20-UVA-D40 20-UVC-D40

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

- Thermal sensors for high energy density lasers



  - Designed for High Energy Density, High Peak Power Lasers
  - Avg. Power and Single Shot Energy Measurement
  - Beam Expander associated to High damage absorbers: avg. power density to 100GW/cm² peak power density to 30GW/cm²; energy density to 30J/cm²
  - Energy measurement up to 10 joules with ns pulses
  - NIST and PTB (Physikalisch-Technische Bundesanstalt) traceable Calibrations

HOW TO ORDER:

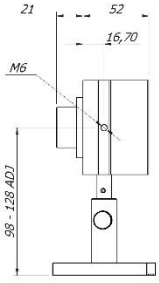
Select Ordering Code without any option for DB15 head connectivity to Plus2 and PC-Link Meters;
Add connectivity option "U" to the Ordering Code for USB connectivity (PC-PLUG series);
Add connectivity option "R" to the Ordering Code for RS-232 connectivity (PC-PLUG series).

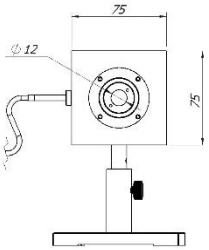
Ordering code	Power Range	Max Intermittent Power	Energy range	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
A-10-D12-DIF	10 mW - 10 W	15 W	10 mJ - 15 J	12 mm	0.2 - 2.1 µm	DIF	Convection	DB15
A-30-D12-SHC-L	20 mW - 30 W	45 W	100 mJ - 45 J	12 mm	0.2 - 1.1 µm	SHC	Convection	DB15
A-30-D18-DIF	25 mW - 30 W	45 W	100 mJ - 45 J	18 mm	0.2 - 2.1 µm	DIF	Convection	DB15
A-40-D33-DIF	25 mW - 40 W	60 W	100 mJ - 60 J	33 mm	0.2 - 2.1 µm	DIF	Convection	DB15
A-200-D12-SHC-L	0.2 W - 200 W	250 W	0.5 J - 250 J	12 mm	0.2 - 1.1 µm	SHC	Forced Air	DB15

Thermal Sensors for high energy density lasers

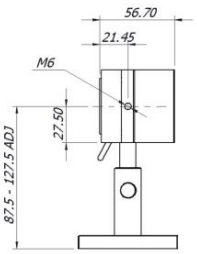
Range: 10 mW to 30 W; 10 mJ to 45 J

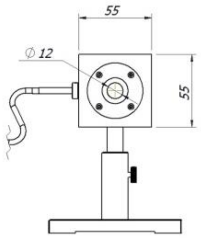
Ordering Code	A-10-D12-DIF	A-30-D18-DIF	A-30-D12-SHC-L
Power Mode			
Max. Average Power	10 W	30 W	30 W
Max. Intermittent Power (1)	15 W	45 W	45 W
Min. Power	10 mW	25 mW	20 mW
Power Resolution	100 µW	1 mW	1 mW
Noise Equivalent Power (NEP)	600 µW	1 mW	1 mW
Response Time (0-90%)	1 sec	1.5 sec	1.5 sec
Power Calibration Uncertainty	± 3%	± 3%	± 3%
Power Linearity (2)	± 1%	± 1.5%	± 1.5%
Single Shot Energy Mode			
Max. Energy (with 100 ms pulse)	15 J	45 J	45 J
Min. Energy	10 mJ	100 mJ	100 mJ
Energy Resolution	0.1 mJ	1 mJ	1 mJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%
Absorber Specs			
Aperture	12 mm	18 mm	12 mm
Type	DIF	DIF	SHC + L
Absorber Spectral Range	0.2 - 2.1 µm	0.2 - 2.1 µm	0.2 - 1.1 µm
Calibration Spectral Range	0.532 µm; 1.064 µm	0.532 µm; 1.064 µm	0.2 - 1.1 µm
Max Power Density (3)	160 kW/cm²	160 kW/cm²	100 kW/cm²
Max Energy Density J/cm² 3)	5ms pulse width: 1200 10µs pulse width: 22 10ns pulse width: 6.5	5ms pulse width: 1200 10µs pulse width: 22 10ns pulse width: 6.5	5ms pulse width: 320 10µs pulse width: 12 10ns pulse width: 3
General Characteristics			
Cooling	Convection	Convection	Convection
Weight	0.6 kg	0.6 kg	0.6 kg
Dimension	75 x 75 x 52 mm	75 x 75 x 52 mm	75 x 75 x 73 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes			
(1). 2 minutes max (2). Detector centrally irradiated @50% of useful surface. (3). Damage thresholds also depend on power level. Please see damage graphs for more details.			



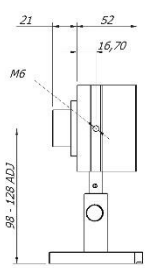


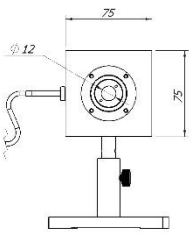
A-10-D12-DIF





A-30-D18-DIF





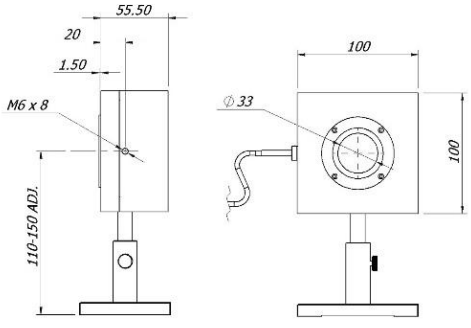
A-30-D12-SHC-L

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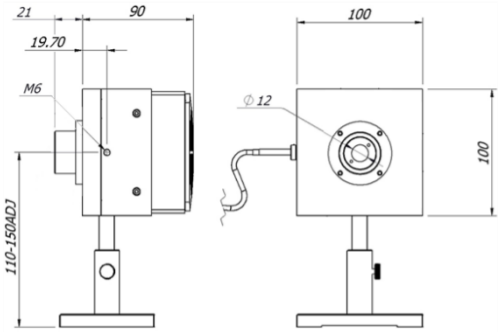
Thermal Sensors for high energy density lasers

Range: 25 mW to 200 W; 100 mJ to 250 J

Ordering Code	A-40-D33-DIF	A-200-D12-SHC-L
Power Mode		
Max. Average Power	40 W	200 W
Max. Intermittent Power (1)	60 W	250 W
Min. Power	25 mW	200 mW
Power Resolution	1 mW	10 mW
Noise Equivalent Power (NEP)	1 mW	10 mW
Response Time (0-90%)	1.8 sec	1.7 sec
Power Calibration Uncertainty	± 3%	± 3%
Power Linearity (2)	± 1.5%	± 1.5%
Single Shot Energy Mode		
Max. Energy (with 100 ms pulse)	60 J	250 J
Min. Energy	100 mJ	500 mJ
Energy Resolution	1 mJ	10 mJ
Energy Calibration Uncertainty	± 5%	± 5%
Absorber Specs		
Aperture	33 mm	12 mm
Type	DIF	SHC + L
Absorber Spectral Range	0.2 - 2.1 µm	0.2 - 1.1 µm
Calibration Spectral Range	0.532 µm; 1.064 µm	0.2 - 1.1 µm
Max Power Density (3)	160 kW/cm²	50 kW/cm² @ 200 W
Max Energy Density J/cm² (3)	5ms pulse width: 1200 10µs pulse width: 22 10ns pulse width: 6.5	5ms pulse width: 320 10µs pulse width: 12 10ns pulse width: 3
General Characteristics		
Cooling	Convection	Forced Air with Fan (a)
Weight	0.9 kg	1.3 Kg
Dimension	100 x 100 x 55 mm	100 x 100 x 111 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Stand and Post	Light Duty Stand	Light Duty Stand
Notes		
(1). 2 minutes max (2). Detector centrally irradiated @50% of useful surface. (3). Damage thresholds also depend on power level. Please see damage graphs for more details.		



A-40-D33-DIF



A-200-D12-SHC-L

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Beam Dumps

Beam Dumps are used to block and absorb unwanted beams, preventing them to propagate in the working environment. Laser Point provides both air and water cooled dumps, from laser power up to 6000W.

HOW TO ORDER:

Select Ordering Code without any option for head without any connectivity

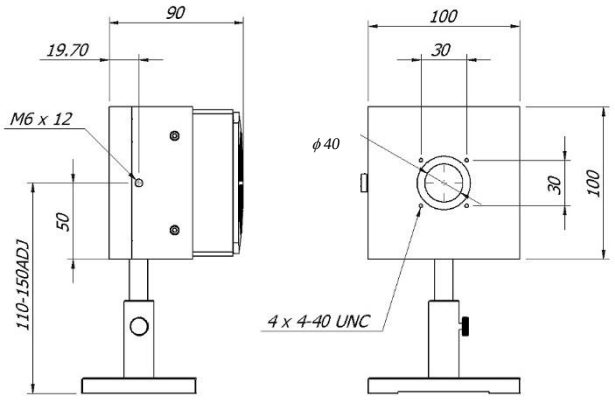
Ordering code	Max Power	Max Intermittent Power	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
A-200-D40-HPB-DUMP	200 W	250 W	40 mm	0.19 - 11 µm	HPB	Forced Air	Without cable
A-200-D40-SHC-DUMP	200 W	250 W	40 mm	0.19 - 11 µm	SHC	Forced Air	Without cable
A-600-D60-SHC-DUMP	600 W	800 W	60 mm	0.19 - 11 µm	SHC	Forced Air	Without cable
W-1500-D40-SHC-DUMP	1500 W	2250 W	40 mm	0.19 - 11 µm	SHC	Water	Without cable
W-6000-D55-SHC-DUMP	6000 W	9000 W	55 mm	0.19 - 11 µm	SHC	Water	Without cable

Beam Dump for Medium Power Lasers

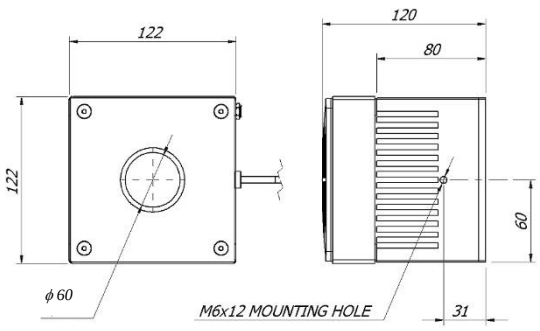
Range: 200 W to 600 W



Ordering Code	A-200-D40-HPB-DUMP	A-200-D40-SHC-DUMP	A-600-D60-SHC-DUMP
Power Mode			
Max. Average Power	200 W	200 W	600 W
Max. Intermittent Power (1)	250 W	250 W	800 W
Absorber Specs			
Aperture	40 mm	40 mm	60 mm
Type	HPB	SHC	SHC
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm	0.19 - 11 µm
Max Power Density (2)	4 kW/cm² @ 200 W	17 kW/cm² @200 W	17 kW/cm² @200 W 11 kW/cm² @500 W
Max Energy Density J/cm² (2)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1
General Characteristics			
Cooling	Forced Air with Fan (a)	Forced Air with Fan (a)	Forced Air with Fan (a)
Weight	1.2 kg	1.2 kg	2.5 kg
Dimension	100 x 100 x 85 mm	100 x 100 x 85 mm	122 x 122 x 120 mm
Cable length - connector	N.A	N.A	N.A
Stand and Post	Light Duty Stand	Light Duty Stand	Heavy Duty Stand
Notes			
(1). 2 minutes max (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). 12V DC Power Supply Included	(a). 12V DC Power Supply Included	(a). 12V DC Power Supply Included



A-200-D40-HPB-DUMP A-200-D40-SHC-DUMP

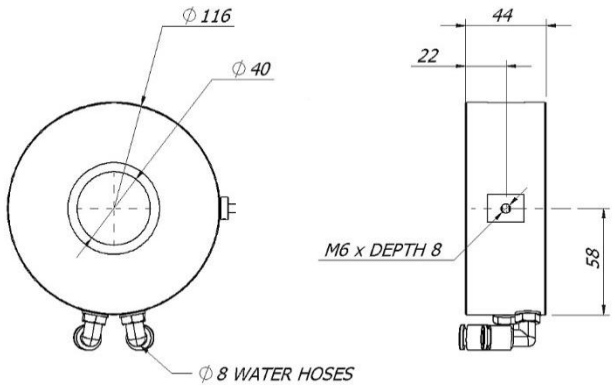


A-600-D60-SHC-DUMP

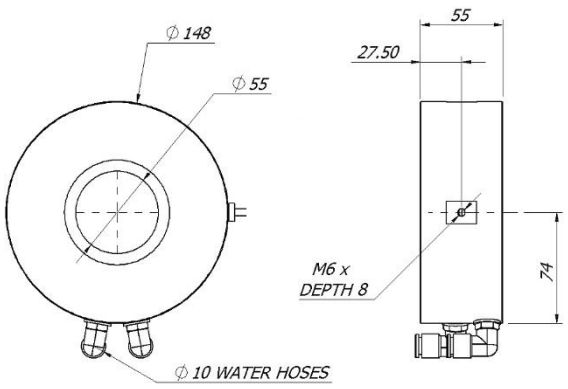
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Beam Dump for High Power Lasers
Range: 1500 W to 6000 W

Ordering Code	W-1500-D40-SHC-DUMP	W-6000-D55-SHC-DUMP
Power Mode		
Max. Average Power	1500 W	6000 W
Max. Intermittent Power (1)	2250 W	9000 W
Absorber Specs		
Aperture	40 mm	55 mm
Type	SHC	SHC
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm
Max Power Density (2)	11 kW/cm² @500 W 7 kW/cm² @1 kW	11 kW/cm² @500 W 4 kW/cm² @5kW
Max Energy Density J/cm² (2)	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1	5ms pulse width: 115 J/cm² 10µs pulse width: 4 J/cm² 10ns pulse width: 1 J/cm²
General Characteristics		
Cooling	Water (a)	Water (a)
Weight	1.1 kg	4.2 kg
Dimension	Ø 116 x 44 mm	Ø 148 x 55 mm
Cable length - connector	N.A.	N.A.
Stand and Post	Heavy Duty Stand	Heavy Duty Stand
Notes		
(1). 2 minutes max (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Water 4 liter/min (@ 22°C);	(a). Water 8 liter/min (@ 22°C);



W-1500-D40-SHC-DUMP



W-6000-D55-SHC-DUMP

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Calorimeters

Laser Point has developed a Calorimeter capable to measure very high powers, up to 12 kW. This product is the result of Laser Point's ability to explore new materials and manage the heat dissipation through a sophisticate thermal design. The new calorimeter is extremely compact and lightweight compared to alternative instruments of the same class; moreover, it does not require any defocusing optics in the absorbing cavity. The detector is characterized by a Linearity of ± 2% to its full scale and it is supplied with±5% calibration accuracy, traceable to PTB/NIST standards.

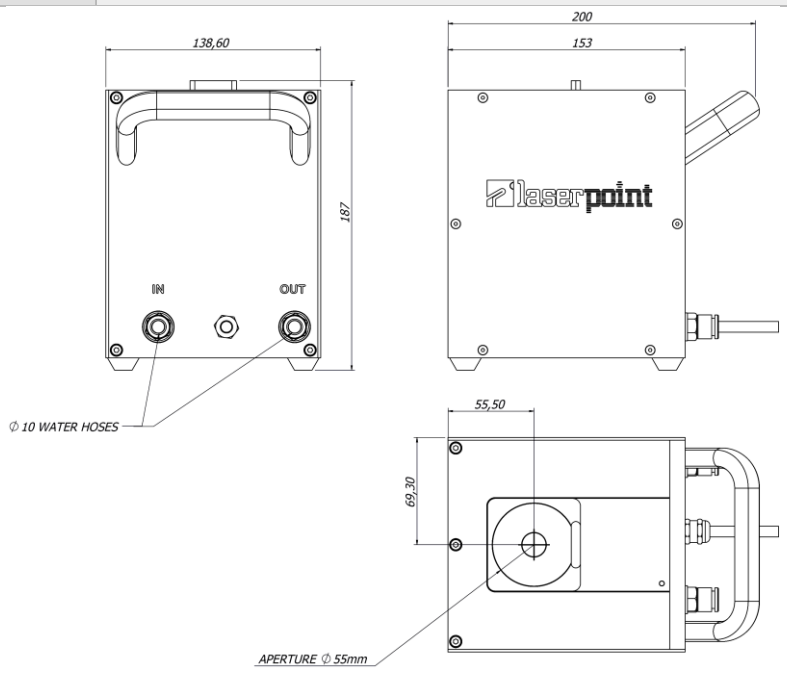
HOW TO ORDER:

Select Ordering Code for USB head connectivity; no other connectivity options are available.

Ordering Code	Max Power	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
W-12K-D55-SHC-U	100 W - 12 kW	55 mm	0.19 - 11 µm	SHC	Water	USB



Ordering Code	W-12K-D55-SHC-U
Power Mode	
Max. Average Power	12 kW
Min. Power	100 W
Power Resolution	10 W
Noise Equivalent Power (NEP)	5 W
Response Time (0-90%)	7 sec
Power Calibration Uncertainty	± 5%
Power Linearity (1)	± 2%
Absorber Specs	
Aperture	55 mm
Type	SHC
Absorber Spectral Range	0.19 - 11 µm
Calibration Spectral Range	1.06µm, 10.6µm
Max Power Density (2)	5 kW/cm² @5kW
Max Energy Density J/cm² (2)	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1
General Characteristics	
Cooling	Water (a)
Weight	6 kg
Dimension	140 x 200 x 180 mm
Cable length - connector	5 m – USB (U option)
Stand and Post	n.a.
Notes	
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Water 8 liter/min (@ 22°C); admissible rate of temperature variation < 1 °C/min



W-12K-D55-SHC-U

Power Probes

Many applications do not require "long term" power monitoring, but it is sufficient to have readings in a snapshot just to monitor if the power level is ok, as there is no necessity to measure over an extended period of time the laser power stability; moreover, many times water is not available on the laser machines, so service operations are easier if the measurement instrument do not require water cooling: that's the world for a different class of instruments known as "**Power Probes"**. These instruments are stand-alone meters made of a thermal probe connected to electronics with its display. In general, instruments of this type are thermometers that measure a temperature difference in a fixed time and have a simple digital display. **FIT** and **CRONOS** have been ergonomically designed in all their details, such as the LCD display and the balance of weights, to provide a comfortable and safe operation.

Laser Point has introduced a real breakthrough in the field with two series of fully automatic laser power probes that calculate laser power by a microprocessor based measurement of temperature dynamics. Their measurement and acquisition technique self-determines the time needed to carry out a measurement: data acquisition is triggered and stopped by detecting set heat parameters thresholds.

The absorbers feature low reflections and high damage thresholds; in particular the high power, multi kilowatt CRONOS have a concave conical shape to avoid dangerous back-reflections toward the operator.

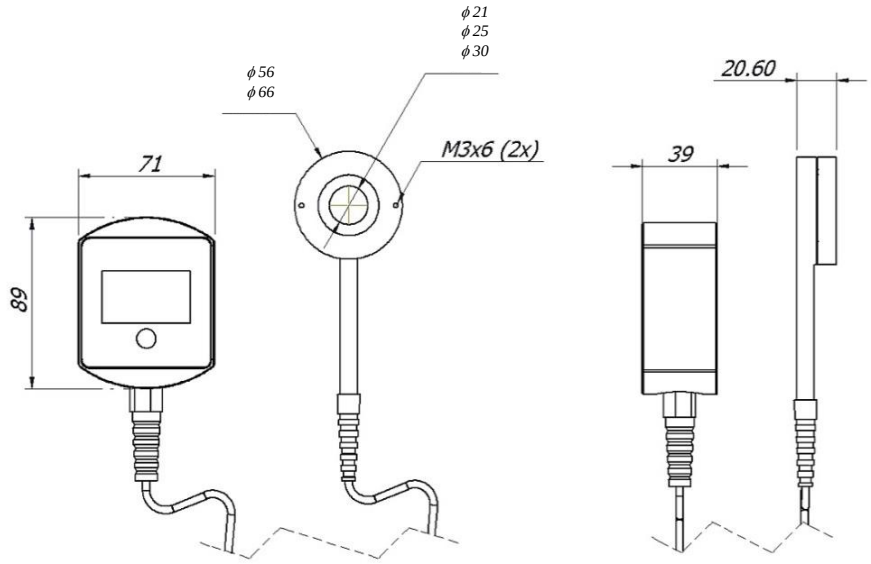
- ## FIT Series: Fully automatic, handheld Low/Medium Power Probes

  - 3 models cover from 500mW to 500W.
  - dual wavelength (CO2 and Yag) ,
  - ±1% repeatability
  - ±3% accuracy
  - 10 mW resolution on 50W probe
  - Recalibration possible by User



Ordering code	Power Range	Max Intermittent Power	Energy range	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
Fit-50	0.5 W – 50 W	N.A.	N.A.	20 mm	0.19 - 1.1 µm	HPB	Convection	N.A.
Fit-200	2 W – 200 W	N.A.	N.A.	20 mm	0.19 - 1.1 µm	HPB	Convection	N.A.
Fit-500	5 W – 500 W	N.A.	N.A.	20 mm	0.19 - 1.1 µm	HPB	Convection	N.A.

Ordering Code	FIT-50	FIT-200	FIT-500
Power Mode			
Max. Average Power	50 W	200 W	500 W
Min. Measurable Power	0.5 W	2 W	5 W
Min. Meas. Power @3% accuracy	2 W	8 W	20 W
Power Resolution	10 mW	100 mW	100 mW
Time to measure and display:	4 sec	4 sec	4 sec
Power Calibration Uncertainty	± 3%	± 3%	± 3%
Repeatability:	± 1%	± 1%	± 1%
Absorber Specs			
Aperture	20 mm	20 mm	25 mm
Type	HPB	HPB	HPB
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (1)	9 kW/cm² @40 W	6 kW/cm² @200 W	4 kW/cm² @500 W
Max Energy Density J/cm² (1)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
General Characteristics			
Max Allowed Probe Temperature	70 °C	70 °C	70
Power Supply	3V (2 AA Batteries)	3V (2 AA Batteries)	3V (2 AA Batteries)
Battery runtime:	200 hrs	200 hrs	200 hrs
Cooling	Convection	Convection	Convection
Weight	0.5 kg	0.5 kg	0.6 kg
Dimension	Ø 56 x 21 mm (sensor head) 89 x 71 x 39 mm (meter)	Ø 56 x 25 mm (sensor head) 89 x 71 x 39 mm (meter)	Ø 66 x 30 mm (sensor head) 89 x 71 x 39 mm (meter)
Cable length	1.2 m	1.2 m	1.2 m
Notes			
(1). Damage thresholds also depend on power level. Please see damage graphs for more details.			



FIT-50 FIT-200 FIT-500

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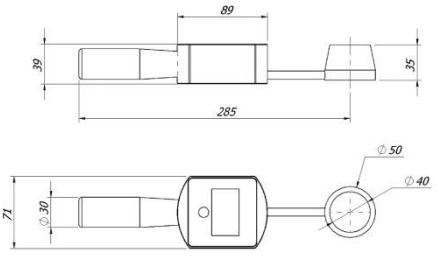
- Cronos Series: Fully automatic, handheld High Power Probes

  - 3 models cover from 30W to 10kW
  - dual wavelength (CO2 and Yag) ,
  - ±2% repeatability (±5% for 5 and 10KW models)
  - ±4% accuracy
  - 1W resolution on 10KW probe
  - Recalibration possible by User

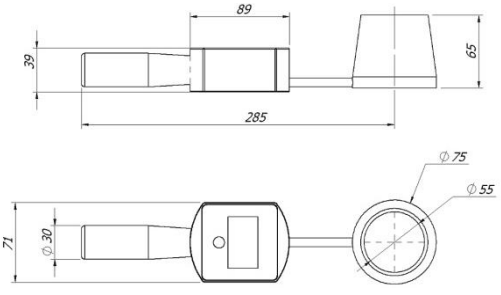


Ordering code	Power Range	Max Intermittent Power	Energy range	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
Cronos-LP1.5	30 W - 1500 W	N.A.	N.A.	40 mm	0.19 - 1.1 µm	HPB	Convection	N.A.
Cronos-LP5.0	100 W – 5 kW	N.A.	N.A.	55 mm	0.19 - 1.1 µm	HPB	Convection	N.A.
Cronos-LP10	200 W – 10 kW	N.A.	N.A.	65 mm	0.19 - 1.1 µm	HPB	Convection	N.A.

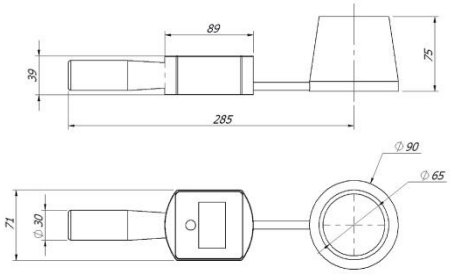
Ordering Code	Cronos-LP1.5	Cronos-LP5.0	Cronos-LP10
Power Mode			
Max. Average Power	1500 W	5 kW	10 kW
Min. Measurable Power	30 W	100 W	200 W
Min. Meas. Power @3% accuracy	150 W	500 W	1000 W
Power Resolution	1 W	1 W	1 W
Time to measure and display:	8-15 sec (a)	8-15 sec (a)	8-15 sec (a)
Power Calibration Uncertainty	± 4%	± 4%	± 4%
Repeatability:	± 2%	± 5%	± 5%
Absorber Specs			
Aperture	40 mm	55 mm	65 mm
Type	HPB	HPB	HPB
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (1)	3.5 kW/cm² @1 kW	2.5 kW/cm² @5kW	2 kW/cm² @10kW
Max Energy Density J/cm² (1)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
General Characteristics			
Max Allowed Probe Temperature	150	150	150
Power Supply	3V (2 AA Batteries)	3V (2 AA Batteries)	3V (2 AA Batteries)
Battery runtime:	200 hrs	200 hrs	200 hrs
Cooling	Convection	Convection	Convection
Weight	0.6 kg	1.1 kg	1.6 kg
Dimension	310 x 71 x 39 mm	322 x 75 x 65 mm	330 x 90 x 75 mm
Cable length	n.a.	n.a.	n.a.
Notes			
(1). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). From 8 s for max power measurements, up to 15 s for min power.		



Cronos-LP1.5



Cronos-LP5.0



Cronos-LP10

LASERPOINT
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- ## Extreme Series: handheld Extreme High Power Probes

LaserPoint EXTREME is a new laser probe suited for extreme high power lasers measurements up to 20kW, without any need for water cooling. Its portable and compact design makes it ideal for servicing and maintenance of high power fiber and solid state lasers.



- Designed for Extreme high power Lasers
- Compact and portable
- No need for Water Cooling
- Laser beam pointing for precise beam positioning
- Power Range: 500W – 40kW
- 10W resolution
- Depending on the desired power range, laser pulse must be set to 200 ms or 500 ms

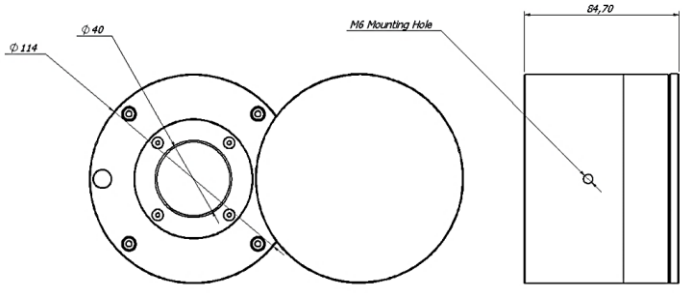


HOW TO ORDER:

Select Ordering Code without any option for DB15 head connectivity to Plus2

Ordering code	Power Range	Useful Aperture	Spectral Range	Absorber	Cooling	Connectivity
Extreme-20	500 W - 20 kW	35 mm	1050nm - 1070nm	C	Convection	DB15
Extreme-40	500 W - 40 kW	35 mm	1050nm - 1070nm	C	Convection	DB15

Ordering Code	Extreme-20	Extreme-40
Power Mode (1)		
Requested pulse duration (1)	200, 500 ms	100, 200, 500 ms
Max. Average Power	20 kW (a)	40 kW (a)
Min. Power	500 W (b)	500 W (b)
Power Resolution	10 W	10 W
Noise Equivalent Power (NEP)	10 W (c)	10 W (c)
Response Time	4-10 sec	4-10 sec
Power Calibration Uncertainty (1)	± 5%	± 5%
Power Linearity (2)	± 2%	± 2%
Repeatability	± 1%	± 1%
Absorber Specs		
Aperture	ø 35 mm	ø 35 mm
Type	C	C
Absorber Spectral Range	1050 nm - 1090 nm	1050 nm - 1090 nm
Calibration Spectral Range	1070 nm	1070 nm
Max Power Density (3)	15 kW / cm2 @ 20 kW (d)	15 kW/cm^2 @ 20 kW (d) 12 kW/cm^2 @ 20 kW (e)
Max Energy Density (3)	3000 J / cm2 (d)	3000 J/cm^2 (c)
General Characteristics		
Cooling	Convection	Convection
Weight	2.55 kg	2.55 kg
Dimension	ø 115 mm x 85 mm	∅ 115 mm x 85 mm
Cable length - connector	2.5 m – DB15	2.5 m – DB15
Notes		
(1) Laser pulse duration must be controlled with high precision: shorter or longer duration will directly affect measurement uncertainty. Recommended Laser rise time < 200 µs. (2) Detector centrally irradiated, 50% of useful surface. (3) Damage thresholds also depend on power level	(a) pulse duration 200ms (8kW with 500ms). (b) pulse duration 500ms (1kW with 200ms). (c) pulse duration 500ms (25W with 200ms). (d) 200ms pulse duration.	(a) pulse duration 200ms (8kW with 500ms). (b) pulse duration 500ms (1kW with 200ms). (c) pulse duration 500ms (25W with 200ms). (d) 200ms pulse duration (e) 200ms pulse duration.



Extreme-20 ; Extreme-40

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- ## FIT-IPL-R: Handheld Energy/Power Probes for Intense Pulsed Light (IPL)

Ordering code	Power Range	Max Intermittent Power	Energy range	Useful Aperture	Spectral Range	Cooling	Connectivity
Fit-IPL-R	1 W - 100 W	N.A.	3.5 J – 350 J	20 x 60 mm	0.4 – 2.1 µm	Convection	N.A.

Fit-IPL-R is a fully automatic, hand-held energy and power meter designed for IPL (Intense Pulsed Light) applications.



Fit-IPL-R measurement and data acquisition are fully automatic, making this technique virtually free from operator induced errors.

Fit-IPL-R can measure both flash-lamps single shot energies up to 350 Joules and average powers, when in burst mode operation, up to 100 W.

Fit-IPL-R innovative measurement concept reduces the time of measurement and display to 10 sec. with excellent repeatability (±1%), accuracy (±3%) and high resolution (10 mW and 100mJ) associated with a wide dynamic range of measurement (down to 1% of f.s.).

The broadband detector works in the range from 400 nm to 1400 nm, which is the range of interest for the majority of applications (photo-epilation, skin rejuvenation, treatments of acne, vascular and pigmented lesions, and psoriasis).

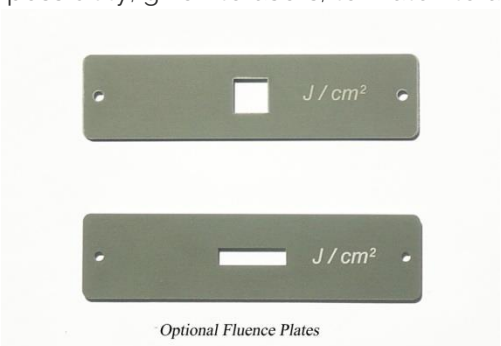
The absorber coating of Fit-IPL-R remains fully responsive also when filters are used to reduce the lamp spectral bandwidth. This absorber is very robust, as it has been designed to face the extreme fluence (up to 90J/cm2) of professional systems (medical and clinic) where the highest pulse energies are involved. Moreover, it is also very flexible since it can operate with semi-professional systems (beauty salons) and consumer-oriented systems (2 to 10J/cm^2).

Fit-IPL-R has a window for gel or water coupled handpieces but can also measure air coupled IPLs.

The unit bears a multifunction LCD that simultaneously indicates the flash lamp energy (or power) delivered by the handpiece; it also shows the mode of operation (single shot for energy or repetitive for power), probe model and warning for low-battery. A bar graph shows the sensor temperature to inform the operator whether he can still perform more measurements before the sensor reaches its maximum allowable temperature. Additionally, the probe status is displayed by a two colour LED indicating if the instrument is ready for measurement, if the reading is in progress or over and if cooling is needed.



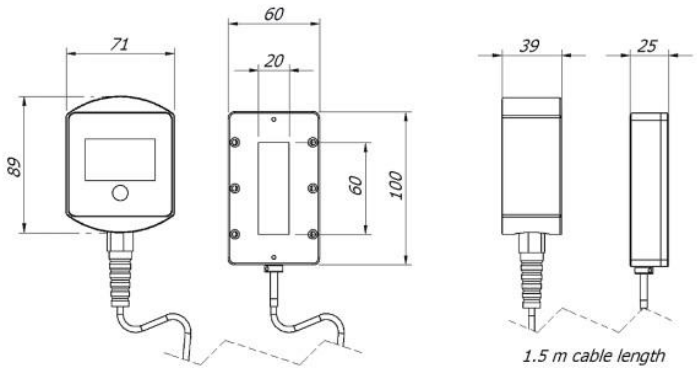
An important feature of this instrument is the possibility, given to users, to match to a custom reference or make in house recalibrations by means of a lateral micro-switch usable to modify the sensitivity.1 cm^2 diaphragm (available as a 10x10mm or 20x0.5 mm) can be mounted on the head to get the value of fluence (J/cm^2) delivered to the patient.



Optional Fluence Plates

Fit-IPL-R is operated by a single button; it shuts automatically off after 5 minutes of non-operation and always stores its last measurement in memory. Two common AA batteries allow a minimum of 4000 measurements.

Ordering Code	FIT-IPL-R
Power Mode	
Max. Average Power	100 W
Min. Measurable Power	1 W
Min. Meas. Power @3% accuracy	2 W
Power Resolution	100 mW
Time to measure and display:	10 sec
Power Calibration Uncertainty	± 3%
Repeatability:	± 1%
Single Shot Energy Mode	
Max. Energy (with 100 ms pulse)	350 J
Min. Measurable Energy	3.5 J
Min. Meas Energy @3% accuracy	7 J
Energy Resolution	100 mJ
Wait time between 2 measures	25 sec
Energy Calibration Uncertainty	± 5%
Repeatability:	± 3%
Absorber Specs	
Aperture	20 x 60 mm (a)
Absorber Spectral Range	0.4 - 2.1 µm
Calibration Spectral Range	0.45 – 1.1 µm
Max Power Density (1)	10 kW/cm² @40 W
Max Energy Density J/cm² (1)	10ms pulse width: 30 1ms pulse width: 6 100µs pulse width: 2
General Characteristics	
Power Supply	3V (2 AA Batteries)
Battery runtime:	200 hrs
Cooling	Convection
Weight	0.6 kg
Dimension	60 x 100 x 25 mm (sensor head) 89 x 71 x 39 mm (electronics)
Cable length	1.5 m
Notes	
(1). Damage thresholds also depend on power level. Please see damage graphs for more details	(a). Option: plate with 1 cm² bore for fluence (J/cm²) measurement. Available sizes 10 x 10 mm² and 20 x 5 mm².



LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

OEM Solutions

A customer-driven supplier of OEM sensors



Laser Point has developed a series of compact power sensors that can be easily integrated into laser machines to monitor the power during the operation. For more than two decades Laser Point has been supplying OEM power & energy sensors to some of the world's leading laser manufacturers. R&D activities are still strong, especially on new applications or on the design of new detectors.

Advantages of Laser Point OEM Laser Measurement Products



Sensor discs manufactured by Laser Point are characterized by high sensitivity and low impedance. High sensitivity is important to maximize the signal-to-noise ratio when working at low powers. Around those sensor disks, complete OEM heads are designed and supplied with housings, cooling systems and amplifying electronics based on Customer's requirements and specifications.
Compared to other types of sensors which might be used in equivalent applications, thermopile detectors can be applied directly onto the beam, even at high powers.
Laser Point sensors are made with robust materials and coatings that can be used from UV to Far Infrared and with concentrated beams, without the risk of damaging the detector even at extreme power densities.
Laser Point provides thermopiles with a high degree of linearity over their entire working range and with large areas suitable for the largest beams.
Thermopile sensors are almost insensitive to the position and the size of the beam when it strikes on their active area. Therefore alignment is never critical and installation time for OEM applications is fast.
Everything has been designed to provide accurate and reliable measurements of lasers such as CO^2, Excimers, Laser Diodes, Nd-Yag from 3W to 200W at competitive prices.
All OEM sensors undergo to a series of in house inspections and controls, which include individual tests of sensitivity and impedance. A full calibration, with NIST or PTB traceability, is available on request.

Custom Products and Technical Support

If you do not find in our current catalog what you need, we can design custom sensors, housings and electronics that fit your requirements. Ask our Application Engineers for technical support: we have extensive knowledge in optics, lasers, thermal behaviors and materials to answer your requests.

- OEM Thermal sensors

Thermal sensor series can be provided with bare wires connectivity or with USB and RS-232 connector.

- OEM Thermal Heads embedding high sensitivity sensor disks
- Compact size
- Available with air and water cooling
- Broadband operation from UV to Far Infrared
- Sensors Disks with High Resistant Coatings to endure high power densities
- High degree of linearity over the sensor's entire working range
- Single shot energy measurement capability with suitable electronics
- Supplied with 1,5m cable (up to 5m on request) or DB15 connector for Laser Point's Meters

HOW TO ORDER:

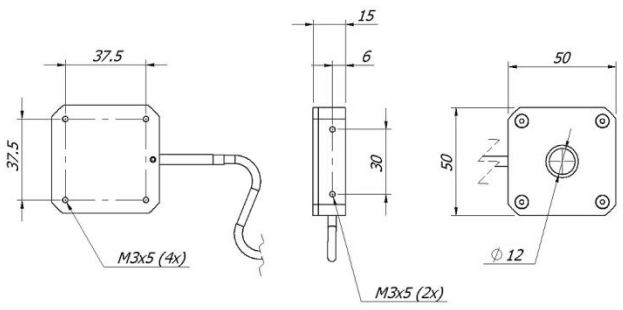
Select Ordering Code without any option for bare wires;
Add connectivity option "U" to the Ordering Code for USB connectivity (PC-PLUG series);
Add connectivity option "R" to the Ordering Code for RS-232 connectivity (PC-PLUG series).

Ordering code	Power Range	Useful Aperture	Spectral Range	External Size (mm)	Absorber	Cooling	Connectivity
CSA-2-D12-BBF	10 mW – 2 W	12 mm	0.19 - 25 µm	50 x 50 x 15	BBF	Conduction	Bare wires
CSA-2-D12-HPB	10 mW – 2 W	12 mm	0.19 - 11 µm	50 x 50 x 15	HPB	Conduction	Bare wires
CSA-5-D12-BBF	10 mW - 5 W	12 mm	0.19 - 25 µm	40.64 x 40.64 x 15	BBF	Conduction	Bare wires
CSA-20-D20-BBF	20 mW - 20 W	20 mm	0.19 - 25 µm	50 x 50 x 15	BBF	Conduction	Bare wires
CSA-20-D20-HPB	20 mW - 20 W	20 mm	0.19 - 11 µm	50 x 50 x 15	HPB	Conduction	Bare wires
CSA-50-D30-HPB	50 mW - 50 W	30 mm	0.19 - 11 µm	60 x 60 x 67	HPB	Forced Air	Bare wires
CSW-50-D20-HPB	50 mW - 50 W	20 mm	0.19 - 11 µm	50 x 50 x 20	HPB	Water	Bare wires
CSW-50-D25-HPB	50 mW - 50 W	25 mm	0.19 - 11 µm	60 x 60 x 20	HPB	Water	Bare wires
CSA-100-D30-HPB	100 mW - 100 W	30 mm	0.19 - 11 µm	60 x 60 x 67	HPB	Forced Air	Bare wires
CSW-200-D20-HPB	0.2 W - 200 W	20 mm	0.19 - 11 µm	50 x 50 x 23	HPB	Water	Bare wires
CSW-200-D30-HPB	0.2 W - 200 W	30 mm	0.19 - 11 µm	60 x 60 x 23	HPB	Water	Bare wires

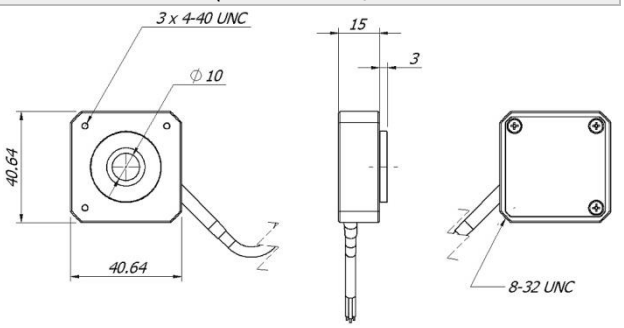
OEM Thermal Sensors
Range: 10 mW to 5 W



Ordering Code	CSA-2-D12-BBF	CSA-2-D12-HPB	CSA-5-D12-BBF
Power Mode			
Max. Average Power	2 W	2 W	5 W
Nominal Sensitivity	2.2 mV/W	1.8 mV/W	2 mV/W
Min. Power	10 mW	10 mW	10 mW
Power Resolution	100 µW	100 µW	100 µW
Noise Equivalent Power (NEP)	500 µW	500 µW	500 µW
Response Time (0-90%)	1 sec (a)	1 sec (a)	1 sec (a)
Power Calibration Uncertainty	± 3%	± 3%	± 3%
Power Linearity (1)	± 1%	± 1%	± 1%
Absorber Specs			
Aperture	12 mm	12 mm	12 mm
Type	BBF	HPB	BBF
Absorber Spectral Range	0.19 - 25 µm	0.19 - 11 µm	0.19 - 25 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (2)	200 W/cm²	18 kW/cm² @10 W	200 W/cm²
Max Energy Density J/cm² (2)	5ms pulse width: 3.6 10µs pulse width: 0.2 10ns pulse width: 0.1	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 3.6 10µs pulse width: 0.2 10ns pulse width: 0.1
General Characteristics			
Cooling	Conduction (b)	Conduction (b)	Conduction (b)
Weight	0.15 kg	0.15 kg	0.15 kg
Dimension	50 x 50 x 15 mm	50 x 50 x 15 mm	50 x 50 x 15 mm
Cable length - connector	1.5 m – Bare wire (c) 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m – Bare wire (c) 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m – Bare wire (c) 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Notes			
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Accelerated by Laser Point electronics (b). Conduction, through heat sink. (c). Available, on request, with DB15 connector.		



CSA-2-D12-BBF CSA-2-D12-HPB



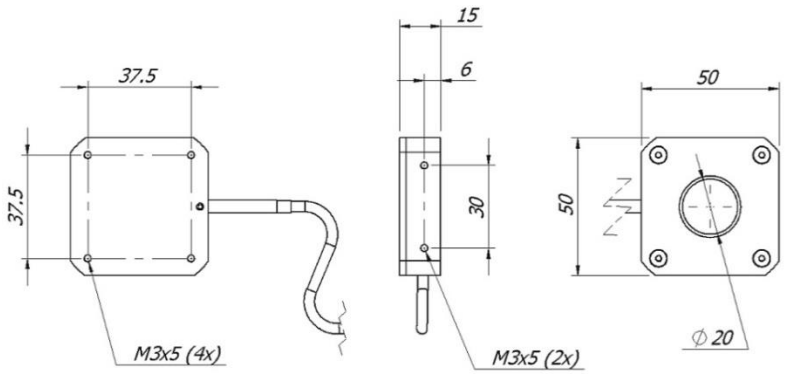
CSA-5-D12-BBF

LASERPOINT
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OEM Thermal Sensors
Range: 20 mW to 20 W



Ordering Code	CSA-20-D20-BBF	CSA-20-D20-HPB
Power Mode		
Max. Average Power	20 W	20 W
Nominal Sensitivity	1.8 mV/W	1.6 mV/W
Min. Power	20 mW	20 mW
Power Resolution	100 µW	100 µW
Noise Equivalent Power (NEP)	600 µW	600 µW
Response Time (0-90%)	1.5 sec (a)	1.5 sec (a)
Power Calibration Uncertainty	± 3%	± 3%
Power Linearity (1)	± 1.5%	± 1.5%
Absorber Specs		
Aperture	20 mm	20 mm
Type	BBF	HPB
Absorber Spectral Range	0.19 - 25 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (2)	200 W/cm²	14 kW/cm² @10 W
Max Energy Density J/cm² (2)	5ms pulse width: 3.6 10µs pulse width: 0.2 10ns pulse width: 0.1	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
General Characteristics		
Cooling	Conduction (b)	Conduction (b)
Weight	0.15 kg	0.15 kg
Dimension	50 x 50 x 15 mm	50 x 50 x 15 mm
Cable length - connector	1.5 m – Bare wire (c) 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m – Bare wire (c) 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Notes		
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Accelerated by Laser Point electronics (b). Conduction, through heat sink. (c). Available, on request, with DB15 connector.	



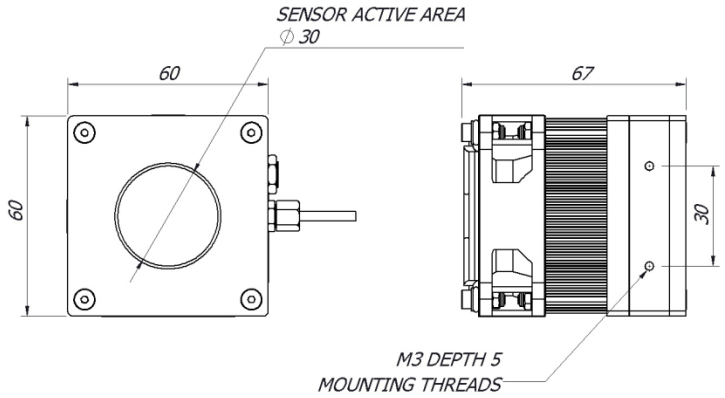
CSA-20-D20-BBF CSA-20-D20-HPB

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

OEM Thermal Sensors
Range: 50 mW to 50 W



Ordering Code	CSA-50-D30-HPB
Power Mode	
Max. Average Power	50 W
Nominal Sensitivity	1 mV/W
Min. Power	50 mW
Power Resolution	1 mW (a)
Noise Equivalent Power (NEP)	1 mW (a)
Response Time (0-90%)	2 sec (b)
Power Calibration Uncertainty	± 3%
Power Linearity (1)	± 1.5%
Absorber Specs	
Aperture	30 mm
Type	HPB
Absorber Spectral Range	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (2)	4 kW/cm² @50 W
Max Energy Density J/cm² (2)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
General Characteristics	
Cooling	Forced Air with Fan (c)
Weight	0.3 kg
Dimension	60 x 60 x 67 mm
Cable length - connector	1.5 m – Bare wire (d) 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Notes	
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Using Laserpoint Plus 2 electronics (b). Accelerated with Laserpoint electronics (c). 12V DC Fan. Power supply not included. (d). Available, on request, with DB15 connector.

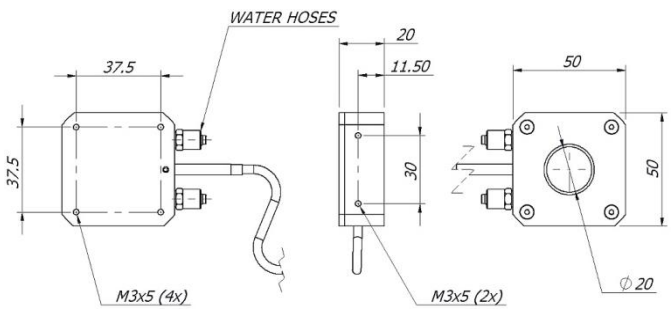


CSA-50-D30-HPB

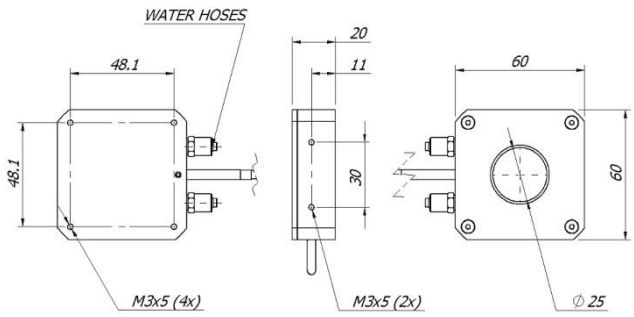
OEM Thermal Sensors
Range: 50 mW to 50 W



Ordering Code	CSW-50-D20-HPB	CSW-50-D25-HPB
Power Mode		
Max. Average Power	50 W	50 W
Nominal Sensitivity	0.9 mV/W	1 mV/W
Min. Power	50 mW	50 mW
Power Resolution	1 mW	1 mW
Noise Equivalent Power (NEP)	2 mW	2 mW
Response Time (0-90%)	2 sec (a)	2 sec (a)
Power Calibration Uncertainty	± 3%	± 3%
Power Linearity (1)	± 1.5%	± 1.5%
Absorber Specs		
Aperture	20 mm	25 mm
Type	HPB	HPB
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (2)	11 kW/cm² @40 W	11 kW/cm² @40 W
Max Energy Density J/cm² (2)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
General Characteristics		
Cooling	Water (b)	Water (b)
Weight	0.25 kg	0.25 kg
Dimension	50 x 50 x 20 mm	60 x 60 x 20 mm
Cable length - connector	1.5 m – Bare wire (c) 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m – Bare wire (c) 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Notes		
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Accelerated by Laser Point electronics (b). Water 0.5 liter/min (@ 22°C) (c). Available, on request, with DB15 connector.	



CSW-50-D20-HPB



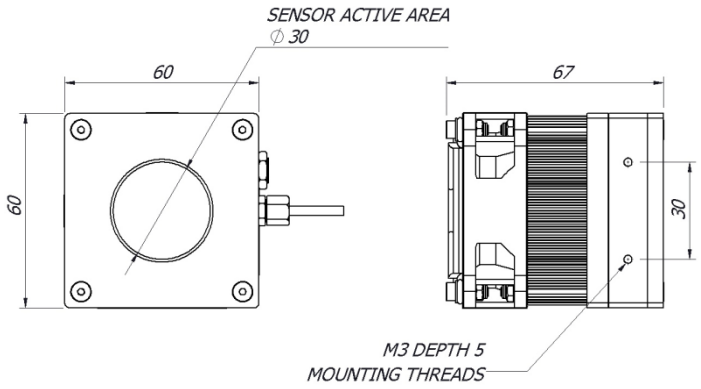
CSW-50-D25-HPB

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OEM Thermal Sensors
Range: 200 mW to 100 W



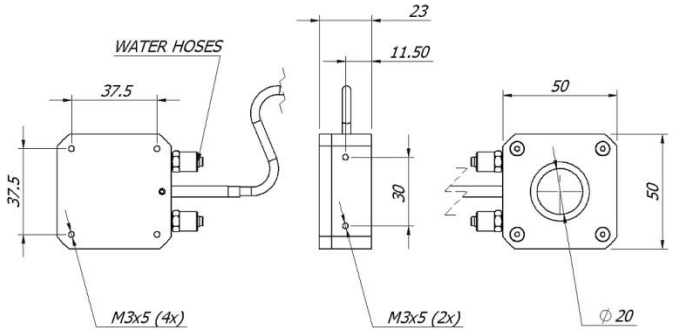
Ordering Code	CSA-100-D30-HPB
Power Mode	
Max. Average Power	100 W
Nominal Sensitivity	0.2 mV/W
Min. Power	200 mW
Power Resolution	10 mW (a)
Noise Equivalent Power (NEP)	10 mW (a)
Response Time (0-90%)	3 sec (b)
Power Calibration Uncertainty	± 3%
Power Linearity (1)	± 1.5%
Absorber Specs	
Aperture	ø 30 mm
Type	HPB
Absorber Spectral Range	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (2)	4 kW/cm² @100 W
Max Energy Density J/cm² (2)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
General Characteristics	
Cooling	Forced Air with Fan (c)
Weight	0.3 kg
Dimension	60 x 60 x 67 mm
Cable length - connector	1.5 m – Bare wire (d) 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Notes	
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Using Laserpoint Plus 2 electronics (b). Accelerated with Laserpoint electronics (c). 12V DC Fan. Power supply not included. (d). Available, on request, with DB15 connector.



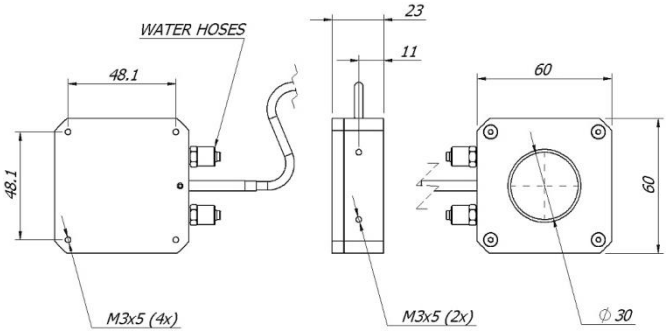
CSA-100-D30-HPB

OEM Thermal Sensors
Range: 200 mW to 200 W

Ordering Code	CSW-200-D20-HPB	CSW-200-D30-HPB
Power Mode		
Max. Average Power	200 W	200 W
Nominal Sensitivity	0.22 mV/W	0.22 mV/W
Min. Power	0.2 W	0.2 W
Power Resolution	10 mW	10 mW
Noise Equivalent Power (NEP)	10 mW	10 mW
Response Time (0-90%)	3 sec (a)	2.5 sec (a)
Power Calibration Uncertainty	± 3%	± 3%
Power Linearity (1)	± 1.5%	± 1.5%
Absorber Specs		
Aperture	20 mm	30 mm
Type	HPB	HPB
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (2)	7 kW/cm² @200 W	7 kW/cm² @200 W
Max Energy Density J/cm² (2)	5ms pulse width: 36 J² 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
General Characteristics		
Cooling	Water (b)	Water (b)
Weight	0.25 kg	0.25 kg
Dimension	50 x 50 x 23 mm	60 x 60 x 23 mm
Cable length - connector	1.5 m – Bare wire (c) 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m – Bare wire (c) 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Notes		
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Accelerated by Laser Point electronics (b). Conduction, through heat sink. (c). Available, on request, with DB15 connector.	



CSW-200-D20-HPB



CSW-200-D30-HPB

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

- ## OEM High Speed Thermal sensors – OEM Blink Fast Response

OEM High Speed Thermal sensor series can be provided with bare wires connectivity or with USB and RS-232 connector.

- OEM High Speed Thermal Heads embedding high sensitivity high speed sensor disks
- Compact size
- Available with air and water cooling
- Broadband operation from UV to Far Infrared
- Sensors Disks with High Resistant Coatings to endure high power densities
- High degree of linearity over the sensor's entire working range
- Energy measurement capability with suitable electronics
- Supplied with bare wires, RS-232 or USB connectivity (or DB15 connector for Laser Point's Meters)
- Supplied with 1,5m cable (other option are available on request)

HOW TO ORDER:

Select Ordering Code without any option for bare wires;
Add connectivity option "U" to the Ordering Code for USB connectivity (PC-PLUG series);
Add connectivity option "R" to the Ordering Code for RS-232 connectivity (PC-PLUG series).

Ordering Code	Power Range	Energy Range	Max Energy Density	Useful Aperture	Spectral Range	Absorber	Cooling
BOL-A-5W-16-K	25 mW - 5 W	20 mJ – 5 J	1 J/cm2	16 x 16 mm	0.2 – 25 µm	K	Convection
BOL-A-8W-16-K	25 mW - 8 W	20 mJ – 5 J	1 J/cm2	16 x 16 mm	0.2 – 25 µm	K	Convection
BOL-A-25W-16-K	25 mW - 25 W	20 mJ – 5 J	1 J/cm2	16 x 16 mm	0.2 – 25 µm	K	Forced Air
BOL-W-50W-16-K	30 mW - 50 W	25 mJ – 5 J	1 J/cm2	16 x 16 mm	0.2 – 25 µm	K	Water
BOL-A-5W-12-A	50 mW - 5 W	50 mJ – 10 J	10 J/cm2	12 x 12 mm	0.5 – 1.1 µm	A	Convection
BOL-A-10W-12-A	50 mW - 10 W	50 mJ – 10 J	10 J/cm2	12 x 12 mm	0.5 – 1.1 µm	A	Convection
BOL-A-50W-12-A	100 mW - 50 W	50 mJ – 10 J	10 J/cm2	12 x 12 mm	0.5 – 1.1 µm	A	Forced Air
BOL-W-100W-12-A	100 mW - 100 W	50 mJ – 10 J	10 J/cm2	12 x 12 mm	0.5 – 1.1 µm	A	Water

OEM High Speed Thermal sensors – OEM Blink Fast Response

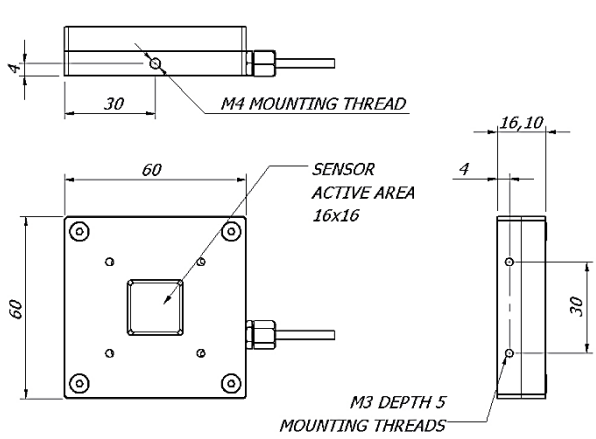
Range: 25 mW to 50 W; Max Density Energy: 1 J/cm²



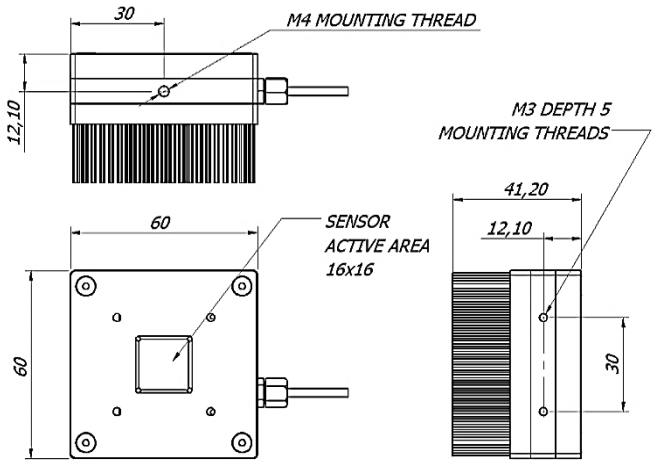


Ordering Code	BOL-A-5W-16-K	BOL-A-8W-16-K	BOL-A-25W-16-K	BOL-W-50W-16-K
Power Mode				
Max. Average Power	5 W	8 W	25 W	50 W
Max. Intermittent Power (1)	25 W	25 W	N.A.	N.A.
Min. Power	25 mW	25 mW	25 mW	30 mW
Noise Equivalent Power (NEP)	1 mW	1 mW	1 mW	1.5 mW
Natural Response Time (0-90%)	Typ. 90 ms (min. 50 ms – max. 120 ms)	Typ. 90 ms (min. 50 ms – max. 120 ms)	Typ. 90 ms (min. 50 ms – max. 120 ms)	Typ. 90ms (min. 50 ms – max. 120 ms)
Power Calibration Uncertainty	± 3%	± 3%	± 3%	± 3%
Power Linearity (2)	± 3%	± 3%	± 3%	± 5%
Spatial uniformity (3)	± 3%	± 3%	± 3%	± 3%
Energy Mode				
Max. Energy	5 J	5 J	5 J	5 J
Min. Energy	20 mJ	20 mJ	20 mJ	25 mJ
Max repetition rate	5 Hz	5 Hz	5 Hz	5 Hz
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	16 x 16 mm	16 x 16 mm	16 x 16 mm	16 x 16 mm
Type	K	K	K	K
Absorber Spectral Range	0.2 - 25 µm	0.2 - 25 µm	0.2 - 25 µm	0.2 - 25 µm
Calibration Spectral Range	0.25 - 1.1 µm; 10.6 µm	0.25 - 1.1 µm; 10.6 µm	0.25 - 1.1 µm; 10.6 µm	0.25 - 1.1 µm; 10.6 µm
Max Power Density (4)	1.5 kW/cm² (a)	1.5 kW/cm² (a)	1.5 kW/cm² (a)	1.5 kW/cm²
Max energy density (J/cm²)	10 ns pulse width: 1	10 ns pulse width: 1	10 ns pulse width: 1	10 ns pulse width: 1
General Characteristics				
Cooling	Passive (b)	Convection (b)	Forced Air (b)	Water (a)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	N.A.
Weight	140 g	240 g	380 g	130 g
Dimension	60 x 60 x 16.1 mm	60 x 60 x 41.2 mm	60 x 60 x 66 mm	56 x 56 x 18.5 mm
Cable length - connector	1.5 m – Bare wires 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m – Bare wires 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m – Bare wires 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m – Bare wires 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Notes				
(1) max 2 sec exposure, max 20% duty cycle. (2) Detector centrally irradiated @50% of useful surface. (3) 3mm beam diameter, scanning 80% of active area (4) Damage thresholds depend on power level.	(a) Measured at 1064 nm, 2 W. (b) Recommended ambient temperature: 10 - 30 °C	(a) Measured at 1064 nm, 2 W. (b) Recommended ambient temperature: 10 -30 °C	(a) Measured at 1064 nm, 5 W. (b) Recommended ambient temperature: 10 -35 °C	(a) Measured at 1064 nm, 10 W. (b) Water min. 1 l/min, max. 4 l/min (@ 10 - 25 °C); Admissible rate of water temperature variation < 1 °C/min

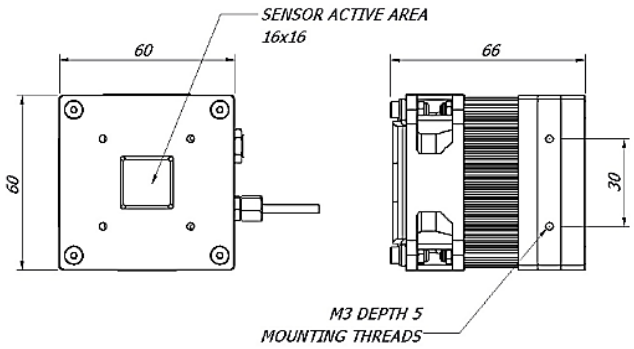
LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS



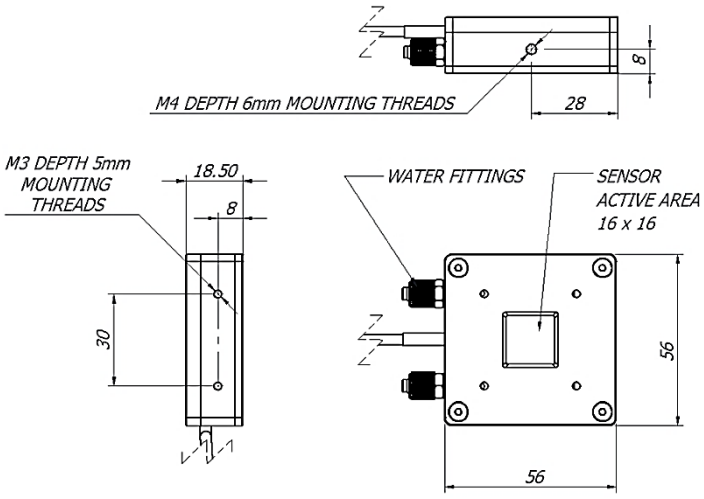
BOL-A-5W-16-K



BOL-A-8W-16-K



BOL-A-25W-16-K



BOL-W-50W-16-K

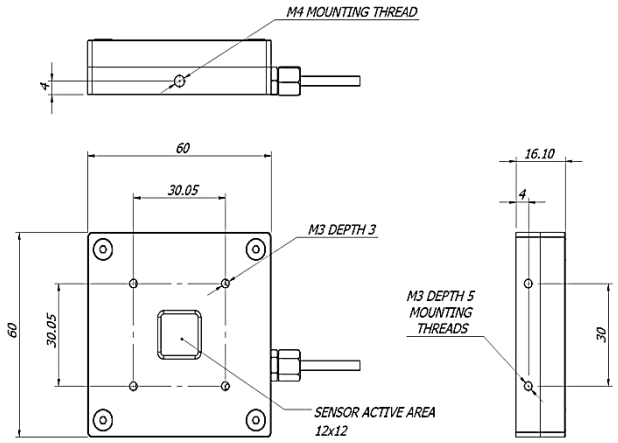
LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

OEM High Speed Thermal sensors – OEM Blink Fast Response

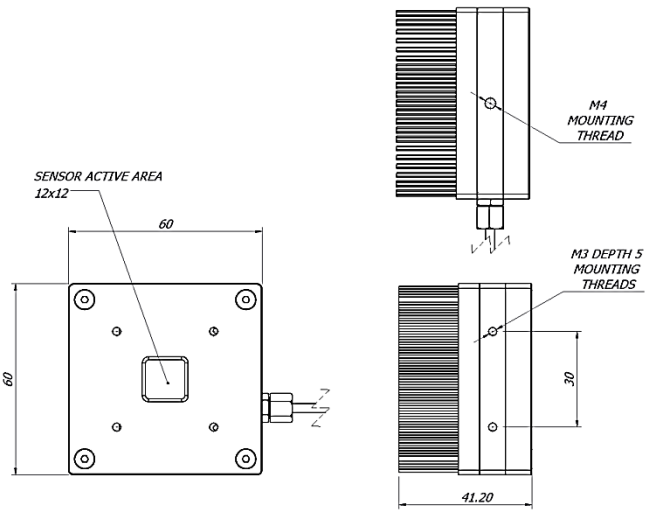
Range: 50 mW to 100 W; Max Density Energy: 10 J/cm²

Ordering Code	BOL-A-5W-12-A	BOL-A-10W-12-A	BOL-A-50W-12-A	BOL-W-100W-12-A
Power Mode				
Max. Average Power	5 W	10 W	50 W	100 W
Max. Intermittent Power (1)	50 W	50 W	60 W	120 W
Min. Power	50 mW	50 mW	100 mW	100 mW
Noise Equivalent Power (NEP)	4 mW	4 mW	4 mW	4 mW
Natural Response Time (0-90%)	Typ. 90 ms (min. 50 ms – max. 120 ms)	Typ. 90 ms (min. 50 ms – max. 120 ms)	Typ. 90 ms (min. 50 ms – max. 120 ms)	Typ. 90ms (min. 50 ms – max. 120 ms)
Power Calibration Uncertainty	± 3%	± 3%	± 3%	± 3%
Power Linearity (2)	± 3%	± 3%	± 3%	± 3%
Spatial uniformity (3)	± 3%	± 3%	± 3%	± 3%
Energy Mode				
Max. Energy	10 J	10 J	10 J	10 J
Min. Energy	50 mJ	50 mJ	50 mJ	50 mJ
Max repetition rate	5 Hz	5 Hz	5 Hz	5 Hz
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	12 x 12 mm	12 x 12 mm	12 x 12 mm	12 x 12 mm
Type	A	A	A	A
Absorber Spectral Range	0.5 – 1.1 µm	0.5 – 1.1 µm	0.5 – 1.1 µm	0.5 – 1.1 µm
Calibration Spectral Range	0.532 µm; 1.07 µm	0.532 µm; 1.07 µm	0.532 µm; 1.07 µm	0.532 µm; 1.07 µm
Max Power Density (4)	10 kW/cm² (a)	10 kW/cm² (a)	5 kW/cm² (a)	5 kW/cm²
Max energy density (J/cm²)	10ns pulse width: 10	10ns pulse width: 10	10ns pulse width: 10	10ns pulse width: 10
General Characteristics				
Cooling	Convection (b)	Convection (b)	Forced Air (b)	Water (b)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	N.A.
Weight	140 g	240 g	380 g	240 g
Dimension	60 x 60 x 16.1 mm	60 x 60 x 41.2 mm	60 x 60 x 66.5 mm	60 x 60 x 25.3 mm
Cable length - connector	1.5 m – Bare wires 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m – Bare wires 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m – Bare wires 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m – Bare wires 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Notes				
(1) max 2 sec exposure, max 20% duty cycle. (2) Detector centrally irradiated @50% of useful surface. (3) 3mm beam diameter, scanning 80% of active area (4) Damage thresholds depend on power level.	(a) Measured at 1064 nm, 5 W. (b) Recommended ambient temperature: 10 - 30 °C	(a) Measured at 1064 nm, 10 W. (b) Recommended ambient temperature: 10 -30 °C	(a) Measured at 1064 nm, 50 W. (b) Recommended ambient temperature: 10 -35 °C	(a) Measured at 1064 nm, 100 W. (b) Water min. 1 l/min, max. 4 l/min (@ 10 - 25 °C); Admissible rate of water temperature variation < 1 °C/min

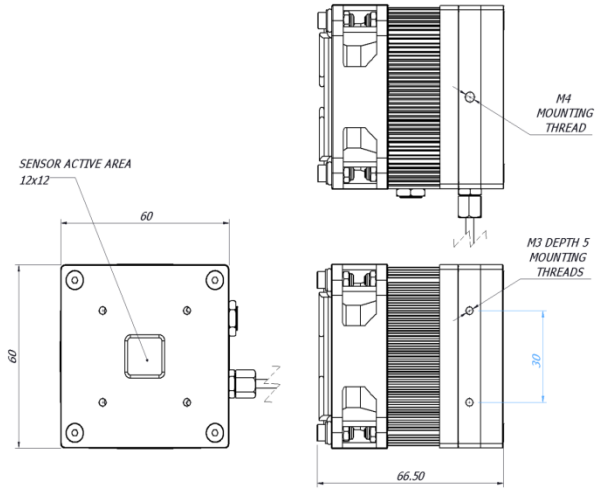
LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS



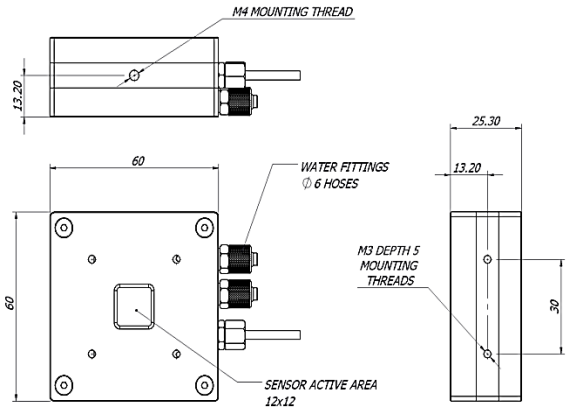
BOL-A-5W-12-A



BOL-W-10W-12-A



BOL-A-50W-12-A



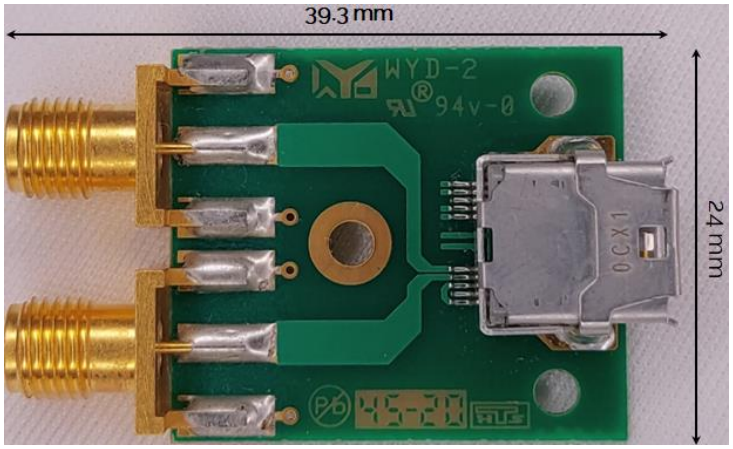
BOL-W-100W-12-A

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

- OEM High Speed Thermal sensors – OEM Blink High Speed – Standard version

  min Pulse Energy: 10 µJ

  - OEM High Speed Thermal Heads to accurately monitor Ultrafast Lasers up to 1 MHz repetition rate and pulse duration down to femtosecond
  - Compact size
  - Available with air and water cooling
  - Broadband operation from UV to Far Infrared, CO2
  - High degree of linearity over the sensor's entire working range
  - Supplied with 2.0 m high frequency cable with IX60G Hirose high speed connector
  - Supplied with IX60G Hirose to SMA adapter to be easily interfaced with oscilloscope or integrated with Laser control system.



HOW TO ORDER:

Select Ordering Code without any option for IX60G Hirose high speed connectivity;

No other options are available.

Ordering Code	Power Range	Energy Range	Max Energy Density	Useful Aperture	Spectral Range	Absorber	Cooling
BOM-A-5W-14-T	1 mW - 5 W	10 µJ – 2 mJ (*) 250 µJ – 10 mJ (**)	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Convection
BOM-A-8W-14-T	1 mW - 8 W	10 µJ – 2 mJ (*) 250 µJ – 10 mJ (**)	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Convection
BOM-A-15W-14-T	1 mW - 15 W	10 µJ – 2 mJ (*) 250 µJ – 10 mJ (**)	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Forced Air
BOM-W-20W-14-T	1 mW - 20 W	10 µJ – 2 mJ (*) 250 µJ – 10 mJ (**)	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Water
BOM-A-5W-10-B	3 mW - 5 W	30 µJ – 5 mJ (*) 600 µJ – 20 mJ (**)	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Convection
BOM-A-10W-10-B	3 mW - 10 W	30 µJ – 5 mJ (*) 600 µJ – 20 mJ (**)	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Convection
BOM-A-25W-10-B	3 mW - 25 W	30 µJ – 5 mJ (*) 600 µJ – 20 mJ (**)	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Forced Air
BOM-W-50W-10-B	3 mW - 50 W	30 µJ – 5 mJ (*) 600 µJ – 20 mJ (**)	120 mJ/cm2	10 x 10 mm	0.5 – 1.1 µm	B	Water

(*): wavelength 1064nm, pulse duration < 10 ns

(**) wavelength 1064nm, pulse duration = 10 ms

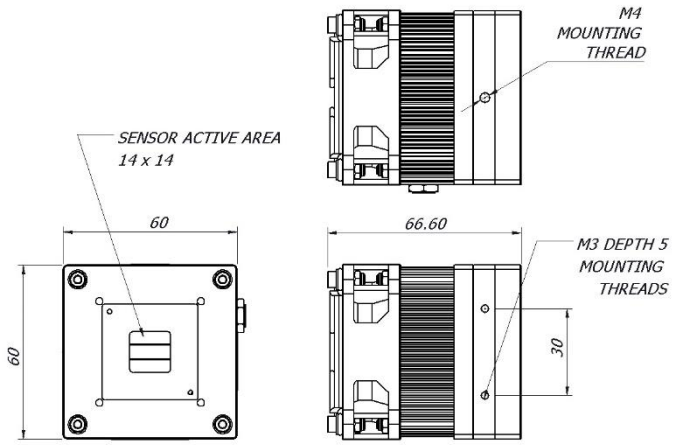
OEM High Speed Thermal sensors – OEM Blink High Speed

Range: 1 mW to 20 W; Max Density Energy: 35 mJ/cm²

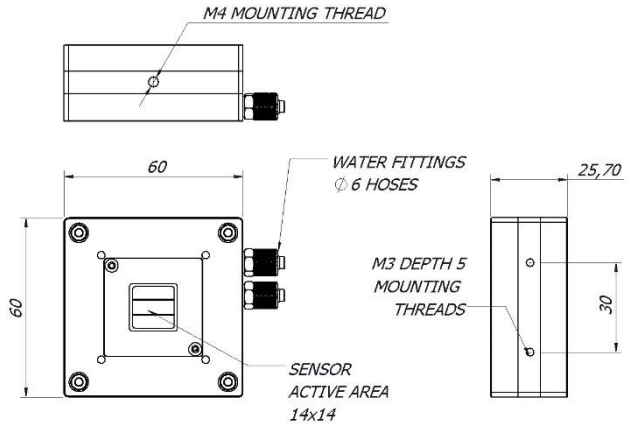


Ordering Code	BOM-A-5W-14-T	BOM-A-8W-14-T	BOM-A-15W-14-T	BOM-W-20W-14-T
Power Mode				
Max. Average Power	5 W	8 W	15 W	20 W
Power Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Energy Mode				
Max. Energy	10 mJ	10 mJ	10 mJ	10 mJ
Min. Energy	10 µJ	10 µJ	10 µJ	10 µJ
Max repetition rate	1 MHz	1 MHz	1 MHz	1 MHz
Energy Resolution	0.25 µJ	0.25 µJ	0.25 µJ	0.25 µJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	14 x 14 mm	14 x 14 mm	14 x 14 mm	14 x 14 mm
Type	T	T	T	T
Spatial Uniformity (1)	± 5%	± 5%	± 5%	± 5%
Absorber Spectral Range	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm
Calibration Spectral Range	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (a) (b)
Max Power Density (2)	0.1 kW / cm²	0.1 kW / cm²	0.1 kW / cm²	0.1 kW / cm²
Max Energy Density (3)	35 mJ/cm²	35 mJ/cm²	35 mJ/cm²	35 mJ /cm²
General Characteristics				
Cooling	Convection (c)	Convection (c)	Forced Air (c)	Water (c)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	NA
Weight	130 g	240 g	380 g	170 g
Dimension	60x60x16.5 mm	60x60x41.6 mm	60 x 60 x 66 mm	60 x 60 x 25.7 mm
Cable length	2. m	2. m	2. m	2. m
Notes				
(1) 3mm beam diameter, scanning 80% of active area (2) Damage thresholds also depend on power level. (3) Single shot	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Recommended ambient temperature: 10 -30 °C	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Recommended ambient temperature: 10 - 30 °C	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Recommended ambient temperature: 10 -35 °C	(a) @ 10.6 µm sensor reflectivity 70% (b) Others wavelength on request (c) Water Min. 1 l/min, Max 4 l/min (@ 10-25 °C). Admissible rate of water temperature variation < 1 °C/min.

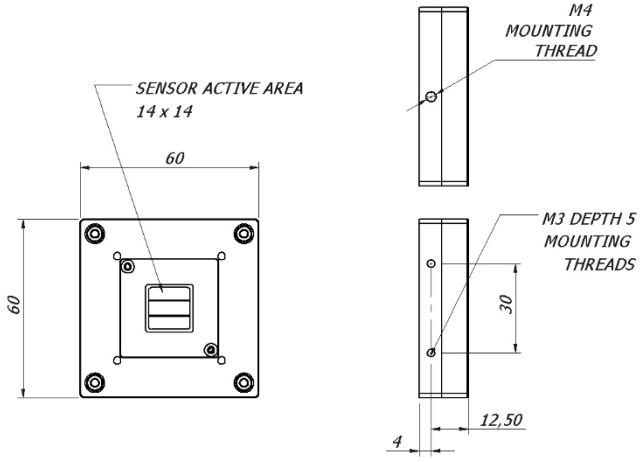
LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS



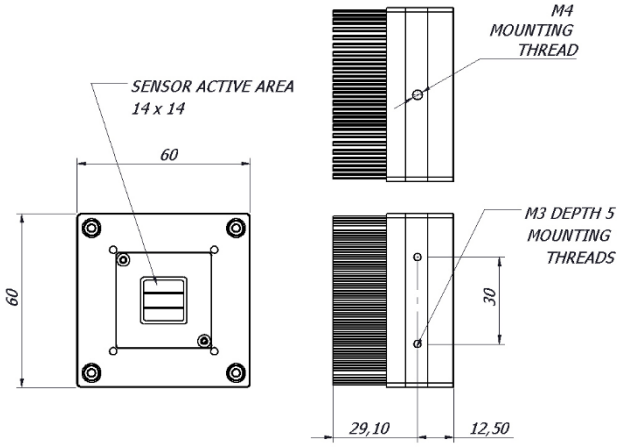
BOM-A-15W-14-T



BOM-W-20W-14-T



BOM-A-5W-14-T



BOM-A-8W-14-T

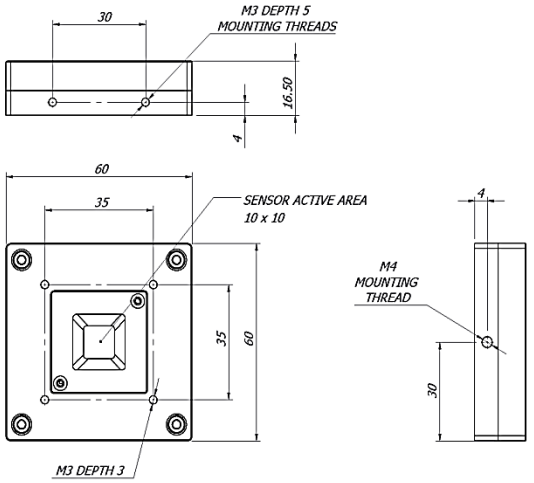
LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

OEM High Speed Thermal sensors – OEM Blink High Speed

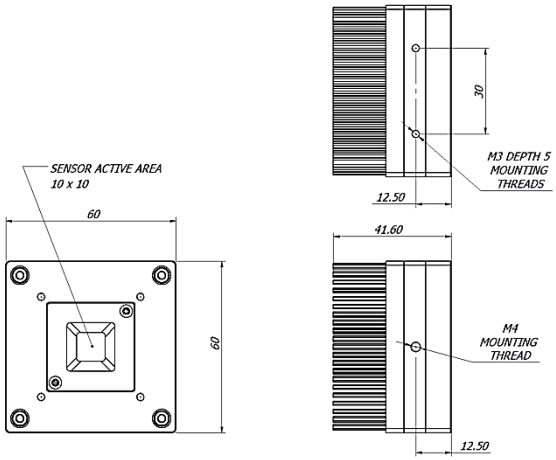
Range: 3 mW to 50 W; Max Density Energy: 120 J/cm²

Ordering Code	BOM-A-5W-10-B	BOM-A-10W-10-B	BOM-A-25W-10-B	BOM-W-50W-10-B
Power Mode				
Max. Average Power	5 W	10 W	25 W	50 W
Power Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Energy Mode				
Max. Energy	20 mJ	20 mJ	20 mJ	20 mJ
Min. Energy	30 µJ	30 µJ	30 µJ	30 µJ
Max repetition rate	1 MHz	1 MHz	1 MHz	1 MHz
Energy Resolution	0.5 µJ	0.5 µJ	0.5 µJ	0.5 µJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	10 x 10 mm	10 x 10 mm	10 x 10 mm	10 x 10 mm
Type	B	B	B	B
Spatial Uniformity (1)	± 5%	± 5%	± 5%	± 5%
Absorber Spectral Range	0.5 – 1.1 µm	0.5 - 111 µm	0.5 – 1.1 µm	0.5 – 1.1 µm
Calibration Spectral Range	0.532 µm 1.07 µm (a)	0.532 µm 1.07 µm (a)	0.532 µm 1.07 µm (a)	0.532 µm 1.07 µm (a)
Max Power Density (2)	5 kW / cm²	5 kW / cm²	5 kW / cm²	5 kW / cm²
Max Energy Density (3)	120 mJ/cm²	120 mJ/cm²	120 mJ/cm²	120 mJ /cm²
General Characteristics				
Cooling	Convection (b)	Convection (b)	Forced Air (b)	Water (b)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	40 °C
Weight	130 g	240 g	380 g	170 g
Dimension	60x60x16.5 mm	60x60x41.6 mm	60 x 60 x 66.5 mm	60 x 60 x 25.7 mm
Cable length	2. m	2. m	2. m	2. m
Notes				
(1) laser beam over 6 x 6 mm central area (2) Damage thresholds also depend on power level. (3) Single shot	(a) Others wavelength on request (b) Recommended ambient temperature: 10 - 30 °C	(a) Others wavelength on request (b) Recommended ambient temperature: 10 - 30 °C	(a) Others wavelength on request (b) Recommended ambient temperature: 10 -35 °C	(a) Others wavelength on request (b) Water Min. 1 l/min, Max 4 l/min (@ 10-25 °C). Admissible rate of water temperature variation < 1 °C/min.

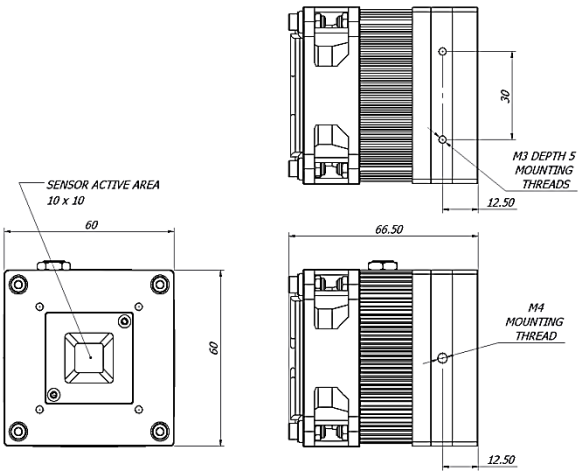
LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS



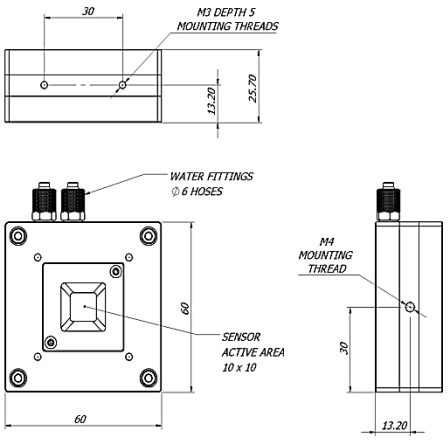
BOM-A-5W-10-B



BOM-A-10W-10-B



BOM-A-25W-10-B



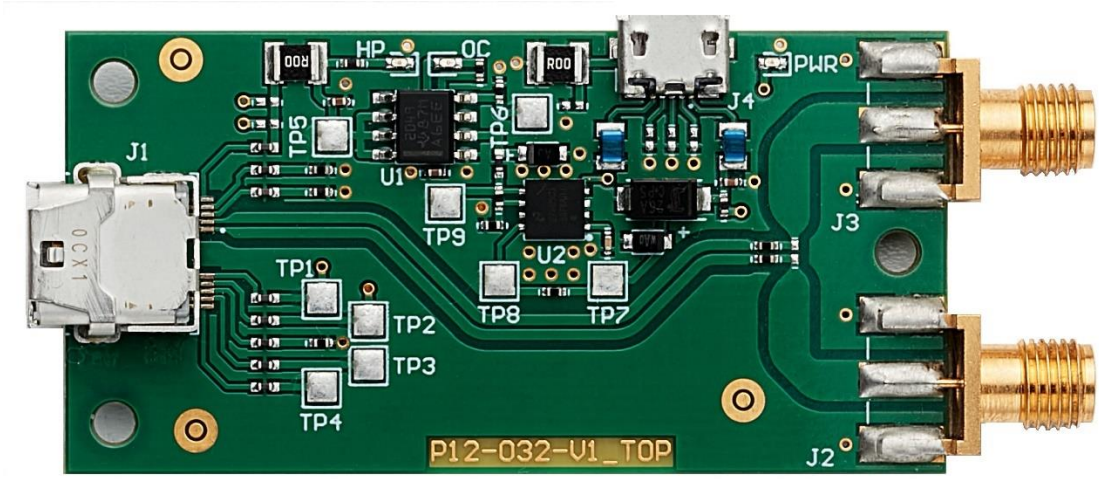
BOM-W-50W-10-B

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

- OEM High Speed Thermal sensors – High Sensitivity

  min Pulse Energy: 1 µJ

- OEM High Speed Thermal Heads to accurately monitor Ultrafast Lasers up to 1 MHz repetition rate and pulse duration down to femtosecond
- **High Sensitivity** OEM Amplified sensor to measure lower energies, down to 1µJ.; this is achieved thanks to a built-in amplifier, allowing for a larger sensitivity.
- Compact size
- Available with air and water cooling
- Broadband operation from UV to Far Infrared, CO2
- High degree of linearity over the sensor's entire working range
- Supplied with 2.0 m high frequency cable with IX60G Hirose high speed connector
- Supplied with IX60G Hirose to SMA adapter to be easily interfaced with oscilloscope or integrated with Laser control system.



HOW TO ORDER:

Select Ordering Code without any option for IX60G Hirose high speed connectivity;

No other options are available.

Ordering Code	Power Range	Energy Range	Max Energy Density	Useful Aperture	Spectral Range	Absorber	Cooling
BOM-A-5W-14-TX	1 mW - 5 W	1 µJ – 40 µJ (*) 40 µJ – 1000 µJ (**)	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Convection
BOM-A-8W-14-TX	1 mW - 8 W	1 µJ – 40 µJ (*) 40 µJ – 1000 µJ (**)	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Convection
BOM-A-15W-14-TX	1 mW - 15 W	1 µJ – 40 µJ (*) 40 µJ – 1000 µJ (**)	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Forced Air
BOM-W-20W-14-TX	1 mW - 20 W	1 µJ – 40 µJ (*) 40 µJ – 1000 µJ (**)	35 mJ/cm²	14 x 14 mm	0.2 – 11 µm	T	Water

(*): wavelength 1064nm, pulse duration < 10 ns

(**) wavelength 1064nm, pulse duration = 10 ms

OEM High Speed Thermal sensors – OEM Blink High Speed

Range: 1 mW to 20 W; Max Density Energy: 35 mJ/cm²



Ordering Code	BOM-A-5W-14-TX	BOM-A-8W-14-TX	BOM-A-15W-14-TX	BOM-W-20W-14-TX
Power Mode				
Max. Average Power	5 W	8 W	15 W	20 W
Power Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Energy Mode				
Max. Energy	40 µJ (a) 1000 µJ (b)	40 µJ (a) 1000 µJ (b)	40 µJ (a) 1000 µJ (b)	40 µJ (a) 1000 µJ (b)
Min. Energy	1 µJ (a) 40 µJ (b)	1 µJ (a) 40 µJ (b)	1 µJ (a) 40 µJ (b)	1 µJ (a) 40 µJ (b)
Max repetition rate	1 MHz	1 MHz	1 MHz	1 MHz
Energy Resolution	0.01 µJ	0.01 µJ	0.01 µJ	0.01 µJ
Energy Calibration Uncertainty	± 5%	± 5%	± 5%	± 5%
Absorber Specs				
Aperture	14 x 14 mm	14 x 14 mm	14 x 14 mm	14 x 14 mm
Type	T	T	T	T
Spatial Uniformity (1)	± 5%	± 5%	± 5%	± 5%
Absorber Spectral Range	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm	0.2 - 11 µm
Calibration Spectral Range	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)	0.355 µm 0.532 µm 1.07 µm 10.6 µm (c) (d)
Max Power Density (2)	0.1 kW / cm²	0.1 kW / cm²	0.1 kW / cm²	0.1 kW / cm²
Max Energy Density (3)	35 mJ/cm²	35 mJ/cm²	35 mJ/cm²	35 mJ /cm²
General Characteristics				
Cooling	Convection (c)	Convection (c)	Forced Air (c)	Water (c)
Maximum sensor operating temperature	60 °C	60 °C	40 °C	NA
Weight	130 g	240 g	380 g	170 g
Dimension	60x60x16.5 mm	60x60x41.6 mm	60 x 60 x 66 mm	60 x 60 x 25.7 mm
Cable length	2. m	2. m	2. m	2. m
Notes				
(1) 3mm beam diameter, scanning 80% of active area (2) Damage thresholds also depend on power level. (3) Single shot	(a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). 10.6 µm sensor reflectivity 70% (d). Others wavelength on request (e). Recommended ambient temperature: 10 -30 °C	(a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). 10.6 µm sensor reflectivity 70% (d). Others wavelength on request (e). Recommended ambient temperature: 10 -30 °C	(a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). 10.6 µm sensor reflectivity 70% (d). Others wavelength on request (e). Recommended ambient temperature: 10 -30 °C	(a). wavelength 1064nm, pulse duration < 10 ns (b). wavelength 1064nm, pulse duration = 10 ms (c). 10.6 µm sensor reflectivity 70% (d). Others wavelength on request (e). Water Min. 1 l/min, Max 4 l/min (@ 10-25 °C). Admissible rate of water temperature variation < 1 °C/min

Mechanical specification: see drawings for BM-A-5W-14-T, BM-A-8W-14-T, BM-A-15W-14-T, BM-W-20W-14-T

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

- OEM Power Probes

OEM Power Probes can be provided with DB15 connectivity or with USB and RS-232 connector.

- Lowest cost solution for monitoring of laser power
- No Water Cooling up to 6KW
- Complete laser power measurement in 4-6sec

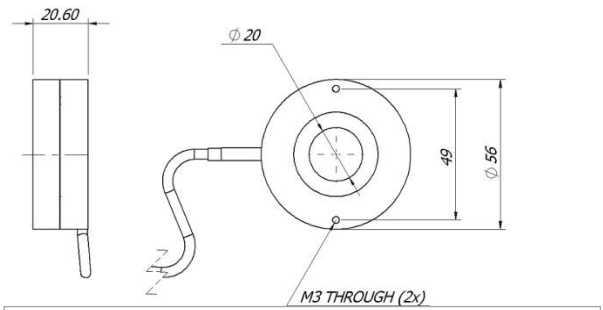
HOW TO ORDER:

Select Ordering Code without any option for DB15 head connectivity to Plus2 and PC-Link Meters;
Add connectivity option "U" to the Ordering Code for USB connectivity (PC-PLUG series);
Add connectivity option "R" to the Ordering Code for RS-232 connectivity (PC-PLUG series).

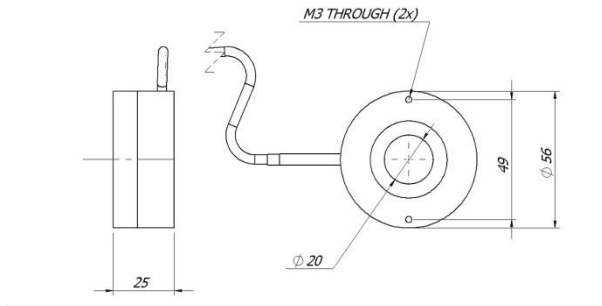
Ordering code	Power Range	Useful Aperture	Spectral Range	External Size (mm)	Absorber	Cooling	Connectivity
Fit-50-H	0.1 W - 50 W	20 mm	0.19 - 11 µm	Ø 56 x 21	HPB	Conduction	DB15
Fit-200-H	0.5 W - 200 W	20 mm	0.19 - 11 µm	Ø 56 x 25	HPB	Conduction	DB15
Fit-500-H	1 W - 500 W	25 mm	0.19 - 11 µm	Ø 66 x 30	HPB	Conduction	DB15
Fit-3000-H	60 W - 3000 W	40 mm	0.19 - 11 µm	Ø 92 x 65	HPB	Conduction	DB15
Fit-6000-H	150 W - 6000 W	60 mm	0.19 - 11 µm	Ø 100 x 100	SHC	Conduction	DB15
Fit-IPL-R-H	2 W - 100 W	20 x 60 mm	0.19 - 11 µm	60 x 100 x 26 mm		Conduction	DB15

OEM Power Probe
Range: 100 mW to 500 W

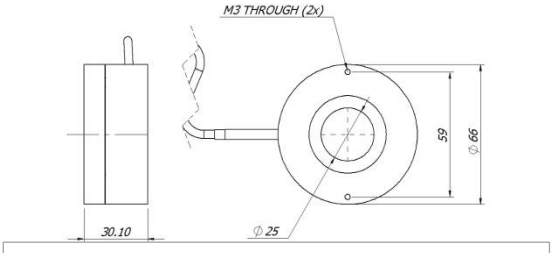
Ordering Code	FIT-50-H	FIT-200-H	FIT-500-H
Power Mode			
Max. Average Power	50 W	200 W	500 W
Min. Power	0.1 W	0.5 W	1 W
Power Resolution	1 mW	10 mW	10 mW
Noise Equivalent Power (NEP)	2 mW	10 mW	20 mW
Response Time (0-90%)	5 sec	5 sec	5 sec
Power Calibration Uncertainty	± 3%	± 3%	± 3%
Power Linearity (1)	± 1%	± 1%	± 1%
Absorber Specs			
Aperture	20 mm	20 mm	25 mm
Type	HPB	HPB	HPB
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (2)	9 kW/cm² @40 W	6 kW/cm² @200 W	4 kW/cm² @500 W
Max Energy Density J/cm² (2)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
General Characteristics		General Characteristics	General Characteristics
Cooling	Conduction (a)	Conduction (a)	Conduction (a)
Weight	0.2 kg	0.2 kg	0.3 kg
Dimension	Ø 56 x 21 mm	Ø 56 x 25 mm	Ø 66 x 30 mm
Cable length - connector	1.5 m – DB15) 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m – DB15) 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m – DB15) 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Notes			
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Conduction, through heat sink		



FIT-50-H



FIT-200-H

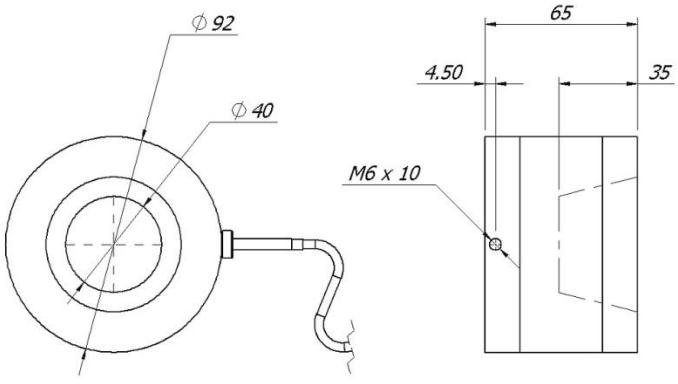


FIT-500-H

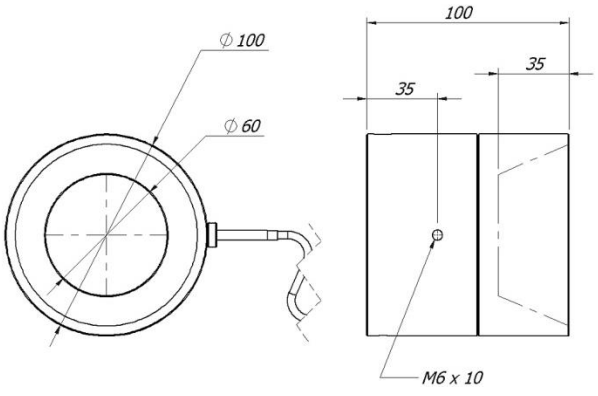
LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

OEM Power Probe
Range: 60 W to 6k W

Ordering Code	FIT-3000-H	FIT-6000-H
Power Mode		
Max. Average Power	3000 W	6000 W
Min. Power	60 W	150 W
Power Resolution	100 mW	1 W
Noise Equivalent Power (NEP)	100 mW	0.25 W
Response Time (0-90%)	6 sec	6 sec
Power Calibration Uncertainty	± 5%	± 5%
Power Linearity (1)	± 1.5%	± 1.5%
Absorber Specs		
Aperture	40 mm	60 mm
Type	HPB	SHC
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.25 - 1.1 µm, 9 - 11 µm
Max Power Density (2)	3 kW/cm² @2kW	4 kW/cm² @5kW
Max Energy Density J/cm² (2)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 115 10µs pulse width: 4 10ns pulse width: 1
General Characteristics		
Cooling	Conduction (a)	Conduction (a)
Weight	1.1 kg	2.5 kg
Dimension	Ø 92 x 65 mm	Ø 100 x 100 mm
Cable length - connector	1.5 m – DB15) 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m – DB15) 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Notes		
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details	(a). Conduction, through heat sink	



FIT-3000-H

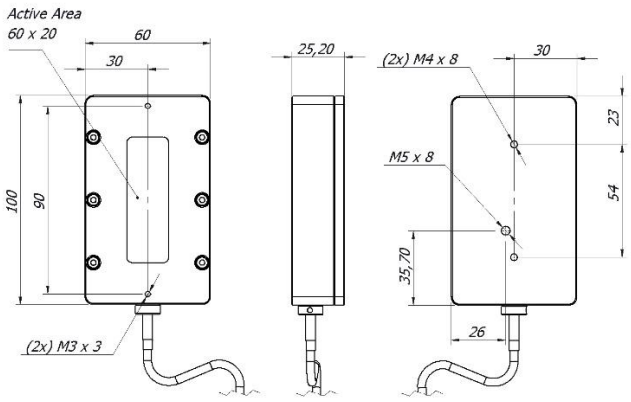


FIT-6000-H

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

OEM Power Probe
Range: 60 W to 6k W

Ordering Code	FIT-IPL-R-H
Power Mode	
Max. Average Power	100 W
Min. Power	2 W
Power Resolution	100 mW
Noise Equivalent Power (NEP)	50 mW
Power Calibration Uncertainty	± 3%
Power Linearity (1)	± 1%
Single Shot Energy Mode	
Max. Energy (with 100 ms pulse)	350 J
Min. Measurable Energy	2 J
Energy Resolution	100 mJ
Wait time between 2 measures	20 sec
Energy Calibration Uncertainty	± 5%
Absorber Specs	
Aperture	20 x 60 mm (a)
Absorber Spectral Range	0.4 - 2.1 µm
Calibration Spectral Range	0.45 - 1.1 µm
Max Power Density (2)	10 kW/cm² @40 W
Max Energy Density J/cm² (2)	10ms pulse width: 30 1ms pulse width: 6 100µs pulse width: 2
Absorber Specs	
Cooling	Conduction (b)
Weight	0.2 kg
Dimension	60 x 100 x 26 mm
Cable length - connector	1.5 m – DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Notes	
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Option: plate with 1 cm² bore for fluence (J/cm²) measurement. Available sizes 10 x 10 mm² and 20 x 5 mm². (b) Conduction, through heat sink



LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

- OEM Amplified Thermal Sensors

    - OEM Thermal Heads embedding sensor disks and analog electronics
    - Out Voltage: 5V @ full scale
    - Electronics for Amplification and signals acceleration
    - Compact size
    - Available with air and water cooling
    - Broadband operation from UV to Far Infrared
    - Sensors Disks with High Resistant Coatings to endure high power densities
    - High degree of linearity over the sensor's entire working range
    - Single shot energy measurement capability with suitable electronics.
    - Standard supplied with 4x 150 mm leads

HOW TO ORDER:

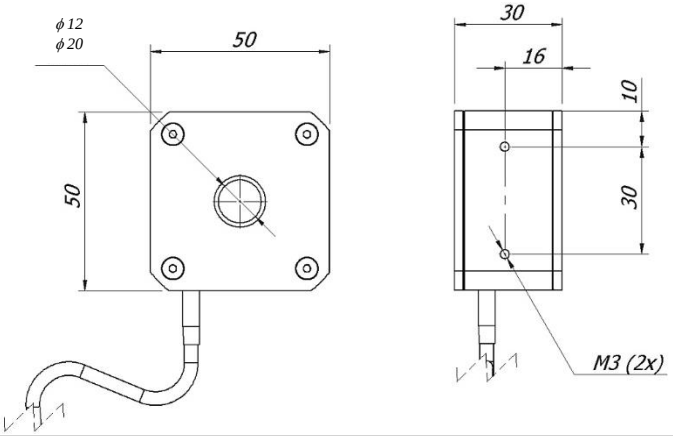
Select Ordering Code without any option for bare wires head connectivity;
No other connectivity option is available.

Ordering Code	Power Range	Useful Aperture	Spectral Range	External Size (mm))	Absorber	Cooling	Connectivity
AHA-2-D12-HPB	8 mW - 2 W	12 mm	0.19 - 11 µm	50 x 50 x 30	HPB	Conduction	Bare wire
AHA-5-D12-HPB	20 mW - 5 W	12 mm	0.19 - 11 µm	50 x 50 x 30	HPB	Conduction	Bare wire
AHA-5-D20-BBF	20 mW - 5 W	20 mm	0.19 - 25 µm	50 x 50 x 30	BBF	Conduction	Bare wire
AHA-5-D20-HPB	20 mW - 5 W	20 mm	0.19 - 11 µm	50 x 50 x 30	HPB	Conduction	Bare wire
AHA-10-D20-BBF	40 mW - 10 W	20 mm	0.19 - 25 µm	50 x 50 x 30	BBF	Conduction	Bare wire
AHA-10-D20-HPB	40 mW - 10 W	20 mm	0.19 - 11 µm	50 x 50 x 30	HPB	Conduction	Bare wire
AHA-20-D20-BBF	80 mW - 20 W	20 mm	0.19 - 25 µm	50 x 50 x 30	BBF	Conduction	Bare wire
AHA-20-D20-HPB	80 mW - 20 W	20 mm	0.19 - 11 µm	50 x 50 x 30	HPB	Conduction	Bare wire
AHW-20-D20-BBF	80 mW - 20 W	20 mm	0.19 - 25 µm	50 x 50 x 30	BBF	Conduction	Bare wire
AHW-20-D20-HPB	80 mW - 20 W	20 mm	0.19 - 11 µm	50 x 50 x 30	HPB	Conduction	Bare wire
AHW-20-D25-BBF	80 mW - 20 W	25 mm	0.19 - 25 µm	60 x 60 x 30	BBF	Conduction	Bare wire
AHW-20-D25-HPB	80 mW - 20 W	25 mm	0.19 - 11 µm	60 x 60 x 30	HPB	Conduction	Bare wire
AHW-50-D20-HPB	200 mW - 50 W	20 mm	0.19 - 11 µm	50 x 50 x 30	HPB	Conduction	Bare wire
AHW-50-D25-HPB	200 mW - 50 W	25 mm	0.19 - 11 µm	60 x 60 x 30	HPB	Conduction	Bare wire
AHW-100-D20-HPB	400 mW - 100 W	20 mm	0.19 - 11 µm	50 x 50 x 30	HPB	Conduction	Bare wire
AHW-100-D30-HPB	400 mW - 100 W	30 mm	0.19 - 11 µm	60 x 60 x 33	HPB	Conduction	Bare wire
AHW-150-D30-HPB	600 mW - 150 W	30 mm	0.19 - 11 µm	60 x 60 x 33	HPB	Conduction	Bare wire
AHW-200-D20-HPB	800 mW - 200 W	20 mm	0.19 - 11 µm	50 x 50 x 30	HPB	Conduction	Bare wire
AHW-200-D30-HPB	800 mW - 200 W	30 mm	0.19 - 11 µm	60 x 60 x 33	HPB	Conduction	Bare wire

OEM Amplified Thermal Sensors
Range: 8 mW to 5 W



Ordering Code	AHA-2-D12-HPB	AHA-5-D12-HPB	AHA-5-D20-BBF	AHA-5-D20-HPB
Power Mode				
Max. Average Power	2 W	5 W	5 W	5 W
Min. Power	8 mW	20 mW	20 mW	20 mW
Power Resolution	0.4 mW	1 mW	1 mW	1 mW
Response time (0-90%)	< 1 sec	< 1 sec	< 1 sec	< 1 sec
Power Linearity (1)	± 1%	± 1%	± 1%	± 1%
Absorber Specs				
Aperture	12 mm	12 mm	20 mm	20 mm
Type	HPB	HPB	BBF	HPB
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm	0.19 - 25 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (2)	14 kW/cm² @10 W	14 kW/cm² @10 W	200 W/cm²	14 kW/cm² @10 W
Max Energy Density J/cm² (2)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 3.6 10µs pulse width: 0.2 10ns pulse width: 0.1	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
Amplifier Specs				
Amplifier Input Voltage	±7 to ±12 VDC, or 14 to 24 VDC floating	±7 to ±12 VDC, or 14 to 24 VDC floating	±7 to ±12 VDC, or 14 to 24 VDC floating	±7 to ±12 VDC, or 14 to 24 VDC floating
Output Voltage @ Full Scale	5 V	5 V	5 V	5 V
Min Detectable Voltage	5 mV	5 mV	5 mV	5 mV
Sensitivity	2500 mV/W	1000 mV/W	1000 mV/W	1000 mV/W
General Characteristics				
Cooling	Conduction (a)	Conduction (a)	Conduction (a)	Conduction (a)
Weight	0.2 kg	0.2 kg	0.2 kg	0.2 kg
Dimension	50 x 50 x 30 mm	50 x 50 x 30 mm	50 x 50 x 30 mm	50 x 50 x 30 mm
Cable length - connector	1.5 m – Bare wire	1.5 m – Bare wire	1.5 m – Bare wire	1.5 m – Bare wire
Notes				
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Conduction, through heat sink			



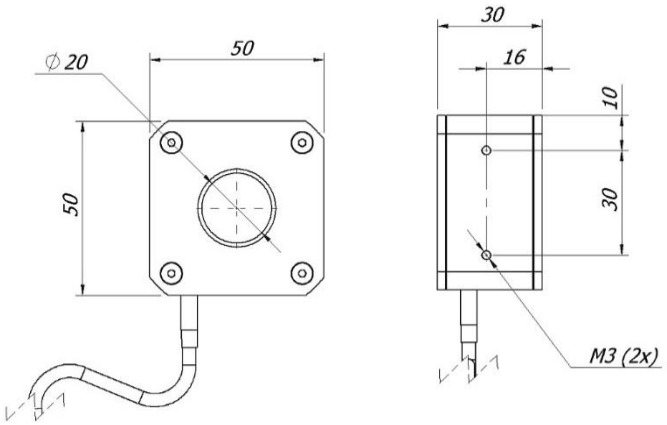
AHA-2-D12-HPB AHA-5-D12-HPB AHA-5-D20-BBF AHA-5-D20-HPB

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

OEM Amplified Thermal Sensors
Range: 40 mW to 10 W



Ordering Code	AHA-10-D20-BBF	AHA-10-D20-HPB
Power Mode		
Max. Average Power	10 W	10 W
Min. Power	40 mW	40 mW
Power Resolution	2 mW	2 mW
Response time (0-90%)	< 1 sec	< 1 sec
Power Linearity (1)	± 1%	± 1%
Absorber Specs		
Aperture	20 mm	20 mm
Type	BBF	HPB
Absorber Spectral Range	0.19 - 25 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (2)	200 W/cm²	14 kW/cm² @10 W
Max Energy Density J/cm² (2)	5ms pulse width: 3.6 10µs pulse width: 0.2 10ns pulse width: 0.1	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
Amplifier Specs		
Amplifier Input Voltage	±7 to ±12 VDC, or 14 to 24 VDC floating	±7 to ±12 VDC, or 14 to 24 VDC floating
Output Voltage @ Full Scale	5 V	5 V
Min Detectable Voltage	5 mV	5 mV
Sensitivity	500 mV/W	500 mV/W
General Characteristics		
Cooling	Conduction (a)	Conduction (a)
Weight	0.2 kg	0.2 kg
Dimension	50 x 50 x 30 mm	50 x 50 x 30 mm
Cable length - connector	1.5 m – Bare wire	1.5 m - Flying leads
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Conduction, through heat sink	



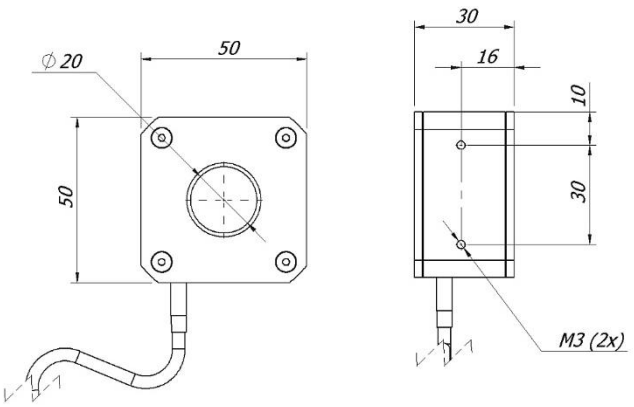
AHA-10-D20-BBF AHA-10-D20-HPB

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

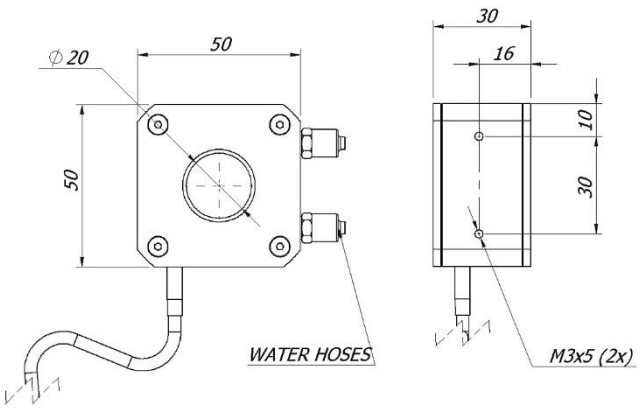
OEM Amplified Thermal Sensors
Range: 80 mW to 20 W



Ordering Code	AHA-20-D20-BBF	AHA-20-D20-HPB	AHW-20-D20-BBF	AHW-20-D20-HPB
Power Mode				
Max. Average Power	20 W	20 W	20 W	20 W
Min. Power	80 mW	80 mW	80 mW	80 mW
Power Resolution	4 mW	4 mW	4 mW	4 mW
Response time (0-90%)	< 1 sec	< 1 sec	< 1 sec	< 1 sec
Power Linearity (1)	± 1%	± 1%	± 1%	± 1%
Absorber Specs				
Aperture	20 mm	20 mm	20 mm	20 mm
Type	BBF	HPB	BBF	HPB
Absorber Spectral Range	0.19 - 25 µm	0.19 - 11 µm	0.19 - 25 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (2)	200 W/cm²	14 kW/cm² @10 W	200 W/cm²	14 kW/cm² @10 W
Max Energy Density J/cm² (2)	5ms pulse width: 3.6 10µs pulse width: 0.2 10ns pulse width: 0.1	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 3.6 10µs pulse width: 0.2 10ns pulse width: 0.1	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
Amplifier Specs				
Amplifier Input Voltage	±7 to ±12 VDC, or 14 to 24 VDC floating	±7 to ±12 VDC, or 14 to 24 VDC floating	±7 to ±12 VDC, or 14 to 24 VDC floating	±7 to ±12 VDC, or 14 to 24 VDC floating
Output Voltage @ Full Scale	5 V	5 V	5 V	5 V
Min Detectable Voltage	5 mV	5 mV	5 mV	5 mV
Sensitivity	250 mV/W	250 mV/W	250 mV/W	250 mV/W
General Characteristics				
Cooling	Conduction (a)	Conduction (a)	Water (a)	Water (a)
Weight	0.2 kg	0.2 kg	0.2 kg	0.2 kg
Dimension	50 x 50 x 30 mm	50 x 50 x 30 mm	50 x 50 x 30 mm	50 x 50 x 30 mm
Cable length - connector	1.5 m – Bare wire	1.5 m – Bare wire	1.5 m – Bare wire	1.5 m – Bare wire
Notes				
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Conduction, through heat sink		(a). Water 0.5 liter/min (@ 22°C)	



AHA-20-D20-BBF AHA-20-D20-HPB



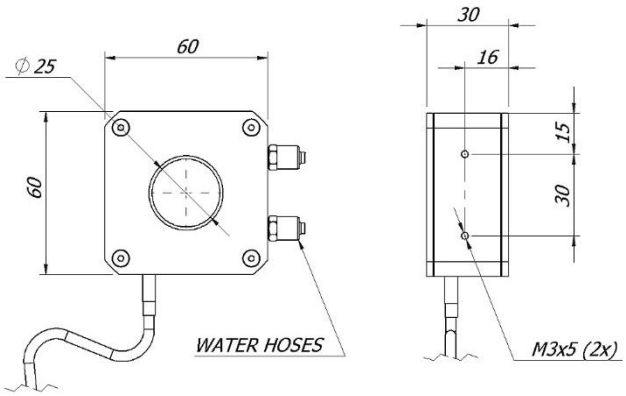
AHW-20-D20-BBF AHW-20-D20-HPB

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

OEM Amplified Thermal Sensors
Range: 80 mW to 20 W



Ordering Code	AHW-20-D25-BBF	AHW-20-D25-HPB
Power Mode		
Max. Average Power	20 W	20 W
Min. Power	80 mW	80 mW
Power Resolution	4 mW	4 mW
Response time (0-90%)	1.5 sec	1.5 sec
Power Linearity (1)	± 1%	± 1%
Absorber Specs		
Aperture	25 mm	25 mm
Type	BBF	HPB
Absorber Spectral Range	0.19 - 25 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (2)	200 W/cm²	14 kW/cm² @10 W
Max Energy Density J/cm² (2)	5ms pulse width: 3.6 10µs pulse width: 0.2 10ns pulse width: 0.1	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
Amplifier Specs		
Amplifier Input Voltage	±7 to ±12 VDC, or 14 to 24 VDC floating	±7 to ±12 VDC, or 14 to 24 VDC floating
Output Voltage @ Full Scale	5 V	5 V
Min Detectable Voltage	5 mV	5 mV
Sensitivity	250 mV/W	250 mV/W
General Characteristics		
Cooling	Water (a)	Water (a)
Weight	0.2 kg	0.2 kg
Dimension	60 x 60 x 30 mm	60 x 60 x 30 mm
Cable length - connector	1.5 m – Bare wire	1.5 m – Bare wire
Notes		
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Water 0.5 liter/min (@ 22°C)	



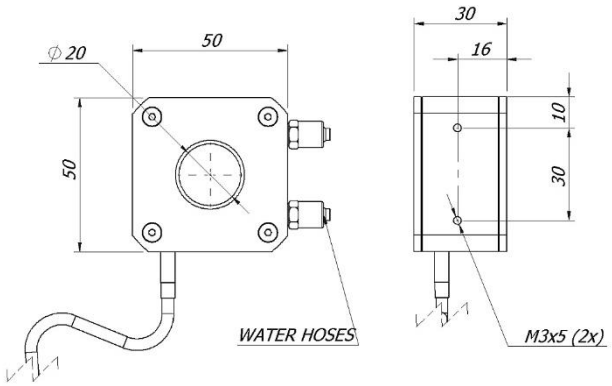
AHW-20-D25-BBF AHW-20-D25-HPB

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

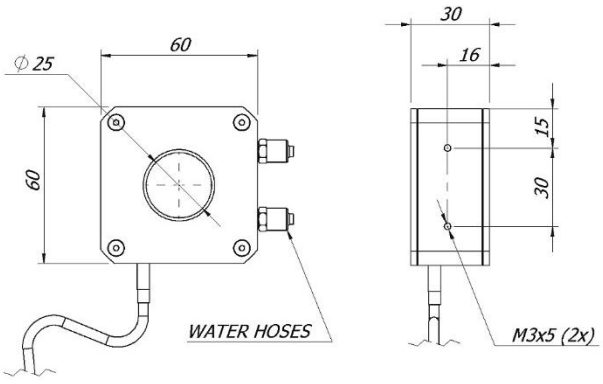
OEM Amplified Thermal Sensors
Range: 200 mW to 50 W



Ordering Code	AHW-50-D20-HPB	AHW-50-D25-HPB
Power Mode		
Max. Average Power	50 W	50 W
Min. Power	200 mW	200 mW
Power Resolution	10 mW	10 mW
Response time (0-90%)	1.5 sec	1.5 sec
Power Linearity (1)	± 1%	± 1%
Absorber Specs		
Aperture	20 mm	25 mm
Type	HPB	HPB
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (2)	9 kW/cm² @40 W	9 kW/cm² @40 W
Max Energy Density J/cm² (2)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
Amplifier Specs		
Amplifier Input Voltage	±7 to ±12 VDC, or 14 to 24 VDC floating	±7 to ±12 VDC, or 14 to 24 VDC floating
Output Voltage @ Full Scale	5 V	5 V
Min Detectable Voltage	5 mV	5 mV
Sensitivity	100 mV/W	100 mV/W
General Characteristics		
Cooling	Water (a)	Water (a)
Weight	0.3 kg	0.3 kg
Dimension	50 x 50 x 30 mm	60 x 60 x 30 mm
Cable length - connector	1.5 m – Bare wire	1.5 m – Bare wire
Notes		
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Water 0.5 liter/min (@ 22°C)	



AHW-50-D20-HPB



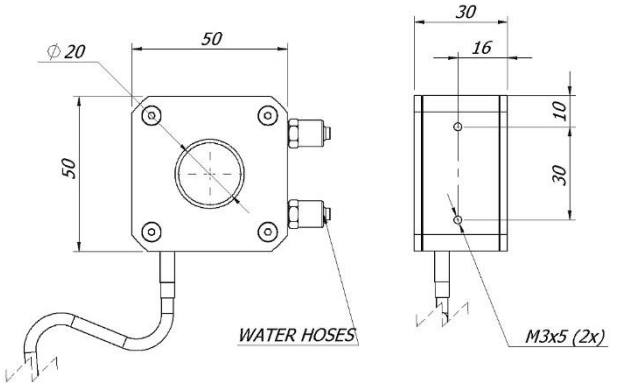
AHW-50-D25-HPB

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

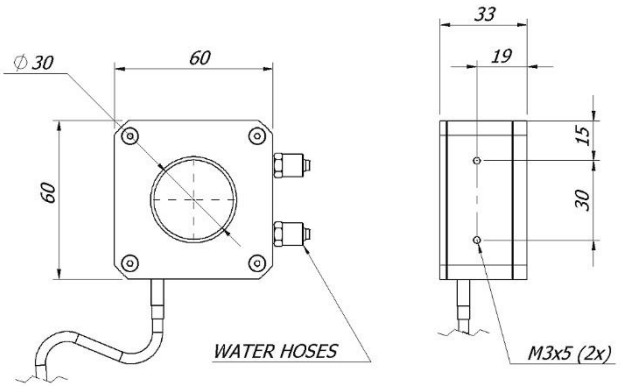
OEM Amplified Thermal Sensors
Range: 400 mW to 100 W



Ordering Code	AHW-100-D20-HPB	AHW-100-D30-HPB
Power Mode		
Max. Average Power	100 W	100 W
Min. Power	400 mW	400 mW
Power Resolution	20 mW	20 mW
Response time (0-90%)	2.5 sec	2.5 sec
Power Linearity (1)	± 1%	± 1%
Absorber Specs		
Aperture	20 mm	30 mm
Type	HPB	HPB
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (2)	9 kW/cm² @40 W	9 kW/cm² @40 W
Max Energy Density J/cm² (2)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
Amplifier Specs		
Amplifier Input Voltage	±7 to ±12 VDC, or 14 to 24 VDC floating	±7 to ±12 VDC, or 14 to 24 VDC floating
Output Voltage @ Full Scale	5 V	5 V
Min Detectable Voltage	5 mV	5 mV
Sensitivity	50 mV/W	50 mV/W
General Characteristics		
Cooling	Water (a)	Water (a)
Weight	0.3 kg	0.3 kg
Dimension	50 x 50 x 30 mm	60 x 60 x 33 mm
Cable length - connector	1.5 m – Bare wire	1.5 m – Bare wire
Notes		
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Water 1.5 liter/min (@ 22°C)	



AHW-100-D20-HPB



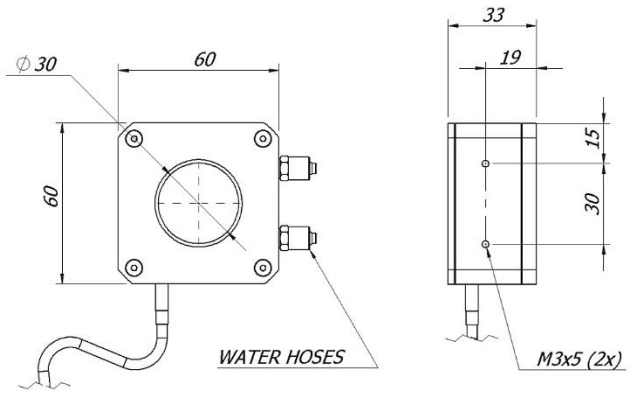
AHW-100-D30-HPB

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

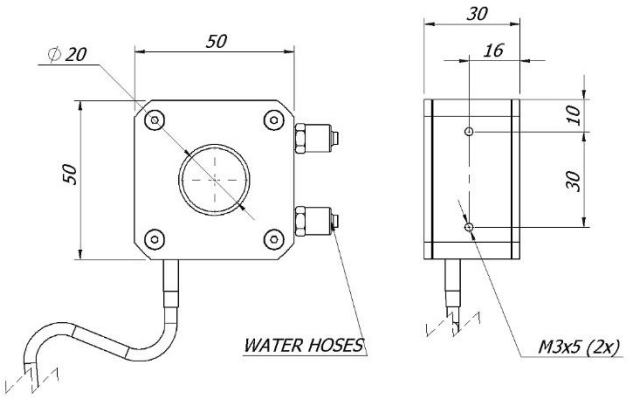
OEM Amplified Thermal Sensors
Range: 600 mW to 200 W



Ordering Code	AHW-150-D30-HPB	AHW-200-D20-HPB	AHW-200-D30-HPB
Power Mode			
Max. Average Power	150 W	200 W	200 W
Min. Power	600 mW	800 mW	800 mW
Power Resolution	30 mW	40 mW	40 mW
Response time (0-90%)	2.5 sec	2.5 sec	2.5 sec
Power Linearity (1)	± 1%	± 1%	± 1%
Absorber Specs			
Aperture	30 mm	20 mm	30 mm
Type	HPB	HPB	HPB
Absorber Spectral Range	0.19 - 11 µm	0.19 - 11 µm	0.19 - 11 µm
Calibration Spectral Range	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm	0.19 - 2.1 µm, 2.94µm, 9 - 11 µm
Max Power Density (2)	9 kW/cm² @40 W	6 kW/cm² @200 W	6 kW/cm² @200 W
Max Energy Density J/cm² (2)	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3	5ms pulse width: 36 10µs pulse width: 1.2 10ns pulse width: 0.3
Amplifier Specs			
Amplifier Input Voltage	±7 to ±12 VDC, or 14 to 24 VDC floating	±7 to ±12 VDC, or 14 to 24 VDC floating	±7 to ±12 VDC, or 14 to 24 VDC floating
Output Voltage @ Full Scale	5 V	5 V	5 V
Min Detectable Voltage	5 mV	5 mV	5 mV
Sensitivity	33.3 mV/W	25 mV/W	25 mV/W
General Characteristics			
Cooling	Water (a)	Water (a)	Water (a)
Weight	0.3 kg	0.3 kg	0.3 kg
Dimension	60 x 60 x 33 mm	50 x 50 x 30 mm	60 x 60 x 33 mm
Cable length - connector	1.5 m – Bare wire	1.5 m – Bare wire	1.5 m – Bare wire
Notes			
(1). Detector centrally irradiated @50% of useful surface. (2). Damage thresholds also depend on power level. Please see damage graphs for more details.	(a). Water 1.5 liter/min (@ 22°C)		



AHW-150-D30-HPB AHW-200-D30-HPB



AHW-200-D20-HPB

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

Fast Response OEM Amplified Series

- OEM Thermal Heads
- Fast Response Time (typ. 70 ms)
- Out Voltage: 5V @ full scale
- Electronics for Amplification and signals acceleration
- Compact size
- Water cooled
- Broadband operation from UV to Far Infrared

HOW TO ORDER:

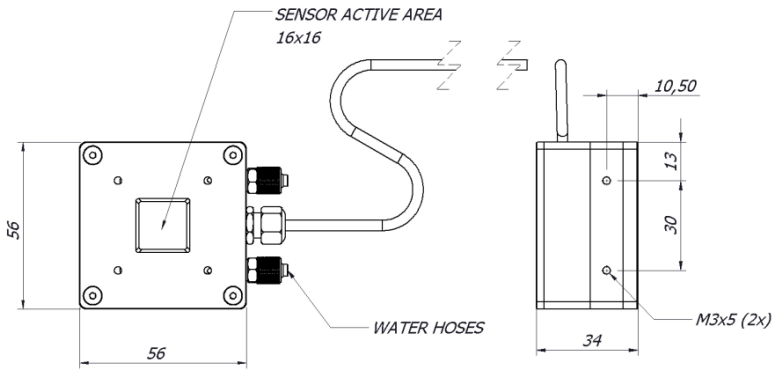
Select Ordering Code without any option for bare wires head connectivity;
No other connectivity option is available.

Ordering Code	Power Range	Useful Aperture	Spectral Range	External Size (mm))	Absorber	Cooling	Connectivity
BAL-W-20W-16-K	25 mW - 20 W	16 x 16 mm	0.2 - 25 µm	56 x 56 x 34	K	Water	Bare wire
BAL-W-50W-16-K	50 mW - 50 W	16 x 16 mm	0.2 - 25 µm	56 x 56 x 34	K	Water	Bare wire

OEM Amplified High Speed Thermal Sensors
Range: 25 mW to 50 W



Ordering Code	BAL-W-20W-16-K	BAL-W-50W-16-K
Power Mode		
Max. Average Power	20 W	50 W
Min. Power	25 mW	50 mW
Response time (0-90%)	Typ. 70 ms (min. 50 ms, max. 90 ms)	Typ. 70 ms (min. 50 ms, max. 90 ms)
Power Calibration Uncertainty	± 3%	± 3%
Power Linearity	± 5%	± 5%
Absorber Specs		
Aperture	16 mm x 16 mm	16 mm x 16 mm
Type	K	K
Absorber Spectral Range	0.2 - 25 µm	0.2 - 25 µm
Calibration Spectral Range	0.25 - 1.1 µm; 10.6 µm	0.25 - 1.1 µm; 10.6 µm
Max Power Density (1)	1.5 kW/cm²	1.5 kW/cm²
Max Energy Density J/cm² (2)	1 J/cm²	1 J/cm²
Amplifier Specs		
Amplifier Input Voltage	±7 to ±12 VDC, or 14 to 24 VDC floating	±7 to ±12 VDC, or 14 to 24 VDC floating
Output Voltage @ Full Scale	5 V	5 V
Min Detectable Voltage	5 mV	5 mV
Sensitivity	250 mV/W	100 mV/W
General Characteristics		
Cooling	Water (a)	Water (a)
Weight	300 g	300 g
Dimension	56 x 56 x 34 mm	56 x 56 x 34 mm
Cable length - connector	1.5 m	1.5 m
Notes		
(1). Measured at 1064nm, 10W, Damage thresholds also depend on power level. (2). 10 ns @ 1064nm	(a) Water min. 1 l/min, max. 4 l/min (@ 15 - 30 °C); Admissible rate of water temperature variation < 1 °C/min	



LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

Photodiode Sensors

Photodiode Sensors convert incident laser photons into carriers (electrons and holes), which are afterwards measured as voltage or current. Being characterized by low noise and high sensitivity, photodiodes are suitable to detect very low light levels, making them ideal for low power measurements of CW lasers. Compared to thermal sensors, photodiodes have a limited spectral range of operation and a low saturation value (1mW/cm^2 approximately), so it is often necessary to use attenuating filters when measuring relatively high powers. On the other end, photodiodes are the ideal choice for very low power measurements and when a fast response time is required.



Laser Point's sensors are calibrated with traceability to NIST and PTB standards and are shipped with a Calibration Certificate. Laser Point's series of photodiode can measure powers up to 500mW and can cover a wavelength range that extends from UV to the near IR.
They can be provided with DB15 connectivity or with USB and RS-232 connector.

- Photodiode Sensors
    - Sensitive detectors for low power measurements
    - UV enhanced and NIR Detectors (200nm to 1800nm)
    - Fiber adapters available (SMA, ST, FC, LC, SC)
    - NIST and PTB (Physikalisch-Technische Bundesanstalt) traceability

HOW TO ORDER:

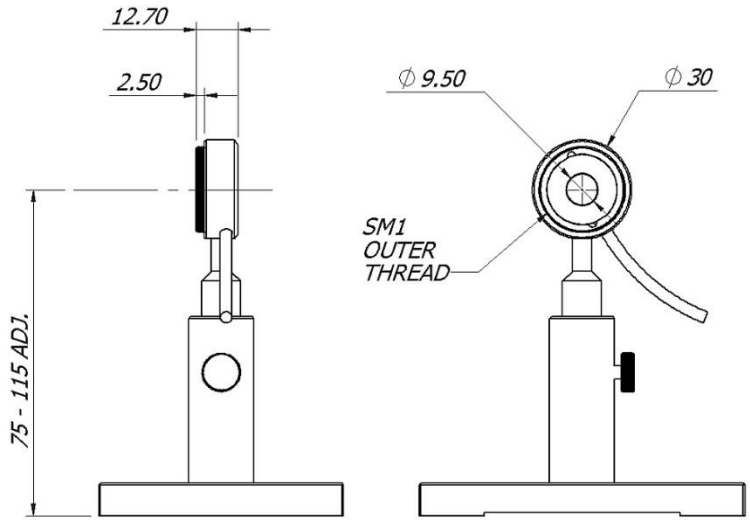
Select Ordering Code without any option for DB15 head connectivity to Plus2 Meter;
Add connectivity option "U" to the Ordering Code for USB connectivity (PC-PLUG series);
Add option connectivity "R" to the Ordering Code for RS-232 connectivity (PC-PLUG series).

Ordering Code	Power Range	Power Resolution	Useful Aperture	Spectral Range	Detector type	Cooling	Connectivity
PD-50-D9-UV	10 µW - 50 mW	100 nW	9.5 mm	200 - 1100 nm	Silicon	Convection	DB15
PD-50-D9-VIS	10 µW - 50 mW	100 nW	9.5 mm	400 - 1100 nm	Silicon	Convection	DB15
PD-50-D9-IR	100 µW - 40 mW	1 µW	9.5 mm	800 - 1800 nm	Germanium	Convection	DB15
PD-500-D9-VIS	100 µW - 500 mW	1 µW	9.5 mm	400 - 1100 nm	Silicon	Convection	DB15

Photodiode sensors
Range: 10 µW to 500 mW



Ordering Code	PD-50-D9-UV	PD-50-D9-VIS	PD-50-D9-IR	PD-500-D9-VIS
Power Mode				
Max. Average Power (1)	50 mW	50 mW	40 mW	500 mW
Min. Power	10 µW	10 µW	100 µW	100 µW
Power Resolution	100 nW	100 nW	1 µW	1 µW
Noise Equivalent Power (NEP) (1)	10 nW	10 nW	100 nW	100 nW
Response Time (0-90%)	0.25 sec	0.25 sec	0.25 sec	0.25 sec
Power Calibration Uncertainty	± 5% @200-400nm, ±3% @400-1000nm, ±5% @1000-1100nm	± 5% @400-500nm, ±3% @500-1000nm, ±5% @1000-1100nm	± 7% @800-1000nm, ±3% @1000-1650nm, ±5% @1650-1800nm	± 5% @400-500nm, ±3% @500-1000nm, ±5% @1000-1100nm
Dependence on beam position	± 2%	± 2%	± 2%	± 2%
Absorber Specs				
Aperture	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Type	Silicon	Silicon	Germanium	Silicon
Calibration Spectral Range	200 - 1100 nm	400 - 1100 nm	800 - 1800 nm	400 - 1100 nm
Max Power Density	20 W/cm²	20 W/cm²	10 W/cm²	20 W/cm²
General Characteristics				
Cooling	Convection	Convection	Convection	Convection
Weight	0.1 Kg	0.1 Kg	0.1 Kg	0.1 Kg
Dimension	Ø 31 x 14 mm	Ø 31 x 14 mm	Ø 31 x 14 mm	Ø 31 x 14 mm
Cable length - connector	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)	1.5 m - DB15 2.5 m – USB (U option) 1.5 m - RS232 (R option)
Stand and Post	Light Duty Stand	Light Duty Stand	Light Duty Stand	Light Duty Stand
Notes				
(1). Wavelength dependent.				



PD-50-D9-UV PD-50-D9-VIS PD-50-D9-IR PD-500-D9-VIS

LASERPOINT
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Laser Beam Delivery

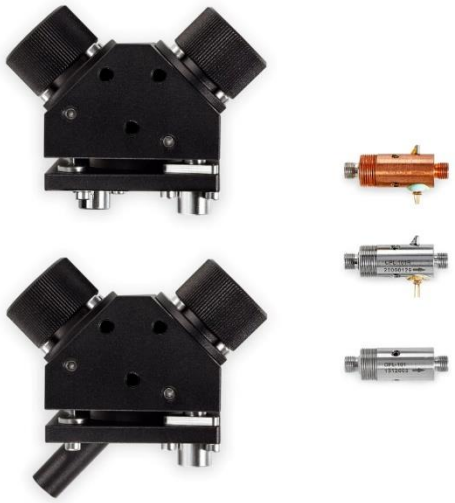
Laser beam delivery components are used in laser applications requiring:

- high efficiency optical power coupling between two specific optic fibers (Fiber to Fiber Couplers – FFC)
- laser beam splitting and bending to reach the working area and to monitor the laser power (Beam Benders – BB or Beam Splitters – BS)

FIBER TO FIBER COUPLER

FFC-R is a Fiber to Fiber coupler to efficiently couple single or combined wavelength power laser beams into the user output fiber. Its coupling design based on free space lens ensures a reliable and repeatable delivery of laser power into the user fiber, hence right to the working area. This device is suitable to couple laser power into larger core output fibers with output fiber/input fiber core ratio ≥ 1.5. Additionally to the efficient coupling of the power from the primary laser beam, FFC-R integrates a red aiming beam Laser Diode (LD) coaxially coupled into the user output fiber.

FFC-R can be provided without the red aiming beam (FFC).



Class III B Laser Diode operating at 660nm can be efficiently coupled using the same mechanical design of the coupler (FFC-660).

BEAM BENDER / SPLITTER

The Beam Bender (BB) series provides 90° angular beam displacement of reflected beam over 15.5 mm useful aperture. Reflectivity (%R) > 98% ordering with wavelength options.

The Beam Splitter (BS) series provides a 90° angular beam displacement of reflected beam over 10.0 mm useful aperture with minimal lateral beam displacement of transmitted beam.

BB and BS series have the following characteristics:

- Independent Orthogonal splitter adjustment providing precise and repeatable alignment;
- Optics removal and replacement which can be accomplished without affecting alignment;
- Face & Side Mounting Holes;
- Sealed Design;
- Anodized Aluminum Construction.

HOW TO ORDER:

FIBER TO FIBER COUPLER:

Ordering Code	Max. Power - Laser	Spectral Range - Laser	Max. Power - Red Laser	Spectral Range Red Laser	Connectivity	External Size
FCC	10 W	0.8 - 1.0 µm	N.A.	N.A.	SMA 905	Ø 12 x 36.5 mm
FFC-R	10 W	0.8 - 1.0 µm	0.35-1.0 mW	0.630-0.643 µm	SMA 905	Ø 12 x 36.5 mm
FFC-660	10 W	0.8 - 1.0 µm	20 mW	0.652-0.664 µm	SMA 905	Ø 12 x 36.5 mm

HOW TO ORDER:

BEAM BENDER / SPLITTER

BB / BS ordering codes are for Beam Bender / Splitter without optics (Customer has to mount its own optics according to the provided mechanical specifications)

Add Wavelength option to the Ordering Code BB or BS-50-50 from the following available nominal wavelengths:

BB wavelength options: 266nm: 0266; 355nm: 0355; 532nm: 0532; 1064nm: 1064.

BS-50-50 wavelength options: 355nm: 0355; 532nm: 0532; 1064nm: 1064.

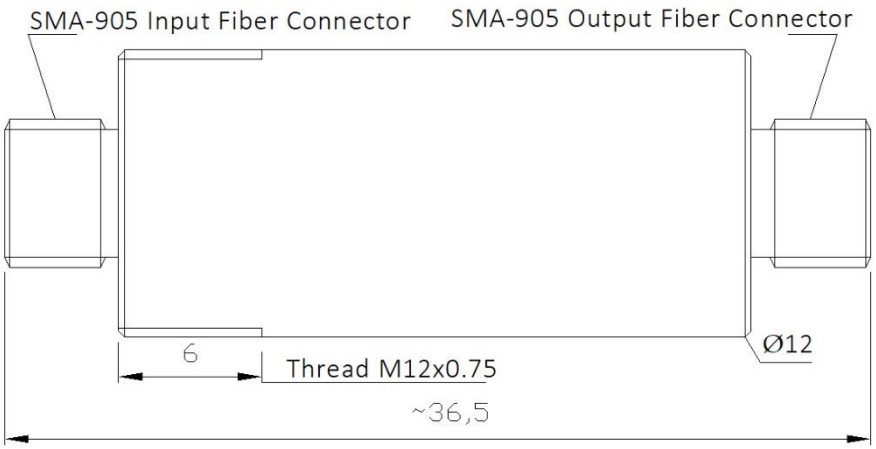
Other wavelengths are available under request

Ordering Code	Max. Power - Laser	Spectral Range - Laser	Max. Power - Red Laser	Spectral Range Red Laser
BB	N.A.	N.A.	15.5 mm	60 x 60 x 58.5 mm
BS	N.A.	N.A.	10.0 mm	60 x 60 x 72 mm
BS-50-50	50	50	10.0 mm	60 x 60 x 72 mm

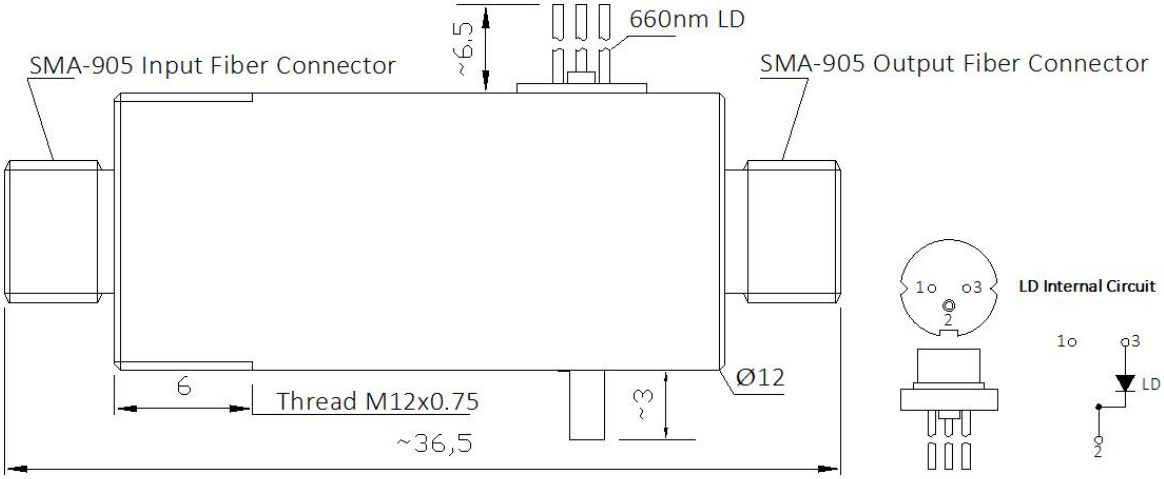
Fiber to Fiber Coupler

- High Power Optical Couplers for Multimode Fibers
- High Power Optical Couplers for Multimode Fibers, with Therapeuthic 660 nm Laser Diode (LD) integrated
- High Power Optical Couplers for Multimode Fibers, with Red Aiming Beam Laser Diode (LD) Integrated

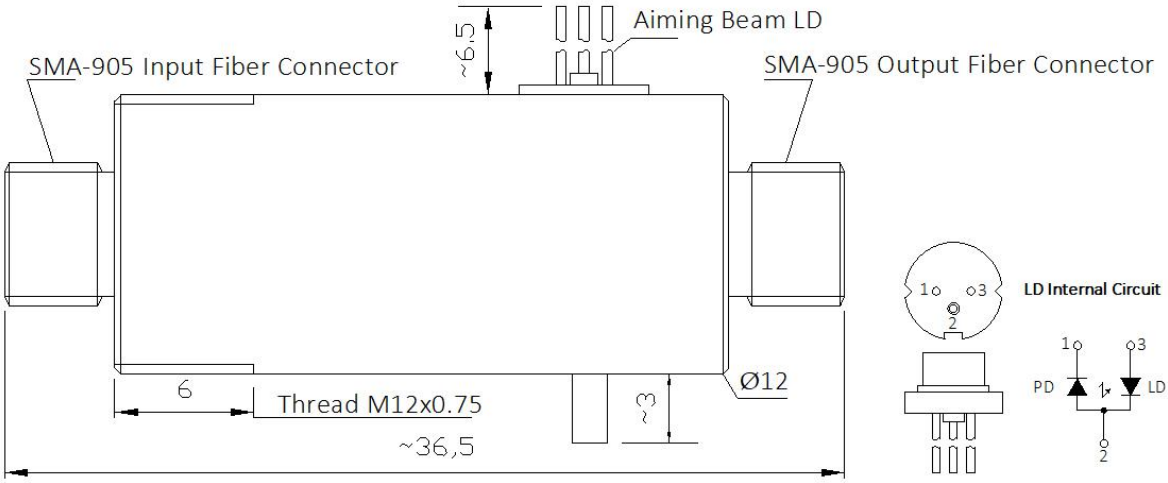
Ordering Code	FFC	FFC-R	FFC-660
Functional Characteristics			
Input Optical Power Max.	10 W	10 W	10 W
Wavelength Operating Range	0.800-1.000 µm	0.800-1.000 µm	0.800-1.000 µm
Magnification Factor	Typ. 1 : 1	Typ. 1 : 1	Typ. 1 : 1
Output Fiber N.A. (1) Min.	0.22	0.22	0.22
(Output Fiber) / (Input Fiber) Core Diameter Ratio Min.	> 1.5	> 1.5	> 1.5
Intrinsic Coupling Efficiency (2)	95 %	95 %	95 %
Red Beam LD Wavelength (3)	N.A.	0.630-0.643 µm (a)	0.652-0.664 µm (a)
Red Beam LD Power (3)	N.A.	0.35-1.0 mW (a)	20 mW (a)
Operating Temperature Range	15 – 40 °C	15 – 40 °C	15 – 40 °C
General Characteristics			
Input Fiber Connector	SMA 905	SMA 905	SMA 905
Output Fiber Connector	SMA 905	SMA 905	SMA 905
Weight	30 gr	30 gr	30 gr
Dimensions (3)	Length: 36.5mm, Diam. 12mm	Length: 36.5mm, Diam. 12mm	Length: 36.5mm, Diam. 12mm
LD Electrical Specifications (Tc = 25°C)			
Absolute Maximum Ratings	N.A.		
LD reverse voltage $V_{R(LD)}$	N.A.	2 V	2 V
PD reverse voltage $V_{R(PD)}$	N.A.	30 V	250°C (Max. 5 sec.)
Soldering Temperature	N.A.	250°C (Max. 5 sec.)	
Electrical Characteristics	N.A.		60-75 mA
Threshold current I_{th}	N.A.	25-35 mA	210 mA
Operating current I_{Op} Max.	N.A.	50 mA	350 mA (p_w = 30 ns, duty = 35%)
Operating voltage V_{Op}	N.A.	2.3-2.5 V	2.5-3.0 V
Monitor current I_s (V_{RPD} = 5V)	N.A.	0.5-2.0 mA	
Notes			
(1) Input Fiber N.A. 0.22 (2) Input Fiber Core Diameter 105µm NA 0.22; Output Fiber Core Diameter 200µm NA 0.22 AR/AR Coated T_{CASE} 25°C (3) Aiming Beam LD Pins Excluded		(a) I_{LD} 38mA. Output Fiber Core Diameter 200µm NA 0.22. T_{CASE} 25°C	(a) ILD 190mA. Output Fiber Core Diameter 400m NA 0.22. TCASE 25°C



FFC



FFC-660

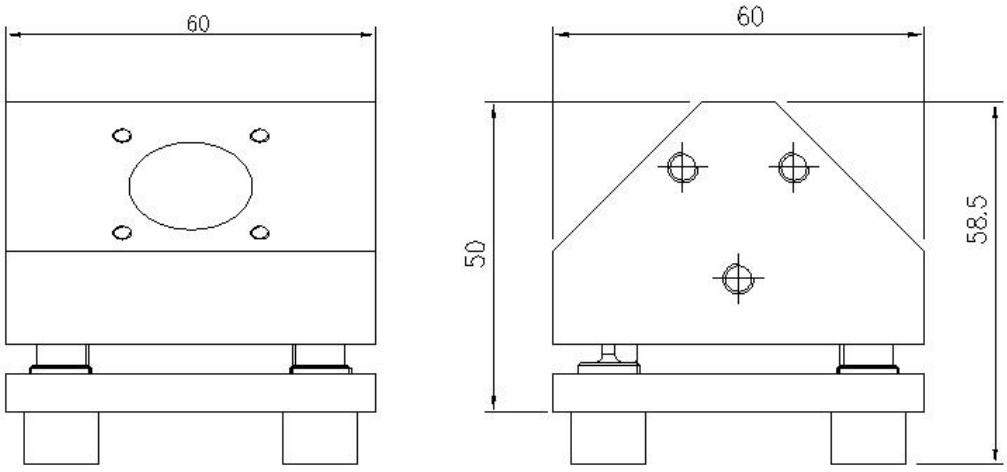


FFC-R

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

Beam Bender

Ordering Code	BB
Functional Characteristics	
Nominal Wavelength / Operating Range (1)	0.266 / (0.250 – 0.266) µm 0.355 / (0.343 – 0.355) µm 0.532 / (0.527 – 0.532) µm 1.064 / (1.020 – 1.070) µm
Nominal Wavelength / Reflectance s/p	0.266 / (>99/>98) % 0.355 / (>99.5/>99) % 0.532 / (>99.8/>99.3) % 1.064 / (>99.8/>99.6) %
Nominal Wavelength / LIDT (2)	0.266 / (1.4 J/cm^2 @0.266 µm; 3.8ns; 50Hz) 0.355 / (3.4 J/cm^2 @0.355 µm; 4.8 ns; 50 Hz 3.0 J/cm^2 @0.355 µm; 7.8 ns; 100 Hz) 0.532 / (9.0 J/cm^2 @0.532 µm; 5.2 ns; 50 Hz) 1.064 / (15.8 J/cm^2 @1.064 µm; 7.4 ns; 50 Hz)
Independent Orthogonal Mirror Adjustment	± 3°
Adjustment Screws	M10x0.50
Useful Aperture	15.5 mm
Surface quality, S-D	10 - 5
Surface flatness, P-V	<λ/10 @ 0.6328 µm
Operating Temperature Range	15 – 40 °C
General Characteristics	
Nominal Wavelength / Substrate material	0.266 / UVFS 0.355 / UVFS 0.532 / BK7 1.064 / UVFS
Mirror Diameter	25.4mm or 2.0"
Mirror Thickness	3 – 9 mm
Weight	395 gr
Dimensions	60.0 x 60.0 x 58.5 mm
Notes	
(1) Other Wavelengths available under request (2) LIDT: Laser Induced Damage Threshold	

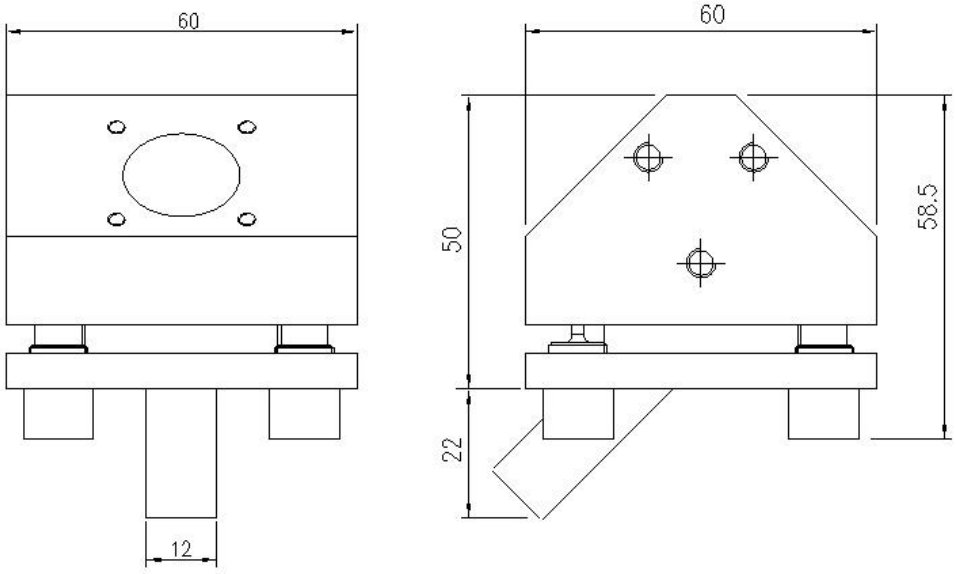


BB

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

Beam Splitter

Ordering Code	BS
Functional Characteristics	
Nominal Wavelength / Operating Range (1)	0.355 / (0.355) µm 0.532 / (0.515 – 0.532) µm 1.064 / (1.025 – 1.095) µm
Nominal Wavelength / Reflectance s/p	0.355 / (50+/-5) % 0.532 / (50+/-5) % 1.064 / (50+/-5) %
Separation of polarizations, Rs-Rp	< 5 %
Nominal Wavelength / LIDT (2)	0.355 / (6 J/cm² @1.064 µm; 10 ns) 0.532 / (6 J/cm² @1.064 µm; 10 ns) 1.064 / (6 J/cm² @1.064 µm; 10 ns)
Independent Orthogonal Mirror Adjustment	± 3˚
Adjustment Screws	M10x0.50
Useful Aperture	10.0 mm
Surface quality, S-D	20 - 10
Transmitted wavefront distortion	λ/8 @ 0.6328 µm
Coating on S2. ARsp	<0.75%
Operating Temperature Range	15 – 40 ˚C
General Characteristics	
Nominal Wavelength / Substrate material	0.355 / UVFS 0.532 / UVFS 1.064 / UVFS
Beamsplitter Diameter	25.4mm or 2.0"
Beamsplitter Thickness	3 mm
Angle of incidence AOI	45 ˚
Weight	395 gr
Dimensions	60.0 x 60.0 x 72.0 mm
Notes	
(1) Other Wavelengths available under request (2) LIDT: Laser Induced Damage Threshold	



BS

LASERPOINT
THE POINT OF DIFFERENCE IN PHOTONICS

Radiation Absorbers

A highly resistant absorber is fundamental to the correct operation, performance and reliability of any detector. On thermopile detectors the absorbing coating is directly deposited on the same substrate of the thermocouple.

The Damage threshold of the absorber is defined as the power density (W/cm²) above which it occurs a variation >1% (larger than 1%) in the laser power measurement.

This variation is mostly due to an irreversible change in the chemical and physical properties of the materials after the laser absorption. In order to have the largest possible value of the damage threshold, the absorber should be made by a material with the largest value of both the melting point and the thermal conductivity.

It should also resist to extreme thermal stresses happening for example in the case of narrow Gaussian beams or focused laser radiation (hot spots). Thermal dimensioning and material selection is optimized when the area interested by the laser is kept below 250°C, even with several kW of laser power applied.

In the case of pulsed lasers, the pulse duration has a strong influence on the damage threshold and can lead to two different kinds of coating damage. The damage process is ablative for very short pulses (typically below 100 ns): in this temporal regime the diffusion time of the generated heat within the material is much longer than the pulse length itself and this condition determines a strong localization of the laser energy and thus the direct ablation of the absorber's atoms. On the other hand, a pulse duration sufficiently long to allow a diffusion of heat within the absorber (pulses > 10msec) can lead to damages created by thermal effect.

Another important parameter is the absorption coefficient of the material at the laser wavelength ranges, which needs to have the following general characteristics:

- to be as high as possible (typically >70%), to guarantee an efficient absorption of the radiation even in the case of very thin thickness of deposited materials and to provide the lowest reflection at any wavelength;
- to have a spectral response that covers the broadest possible range of laser wavelengths;
- to provide the lowest possible reflection at any incidence angle.

Laser Point has always invested significant resources on the research for innovative coatings with the highest standards on the market; an example is the Super Hard Coating (SHC) that is characterized by an efficient and fast heat transfer, allowing resisting to extremely high power densities. SHC damage threshold is among the highest available on the market and makes it suitable for measuring very high power lasers.

- Surface Absorbers

  Surface absorbers consist of a thin layer, in general made of special mattes or refractory materials, deposited onto substrates that can easily transfer heat, like high conductivity metals. They are used for CW lasers or other sources that emit long pulses (with duration >300µsec). Radiation is almost entirely absorbed within that thin layer and then released as heat that flows through the thermopile.

- Volume Absorbers

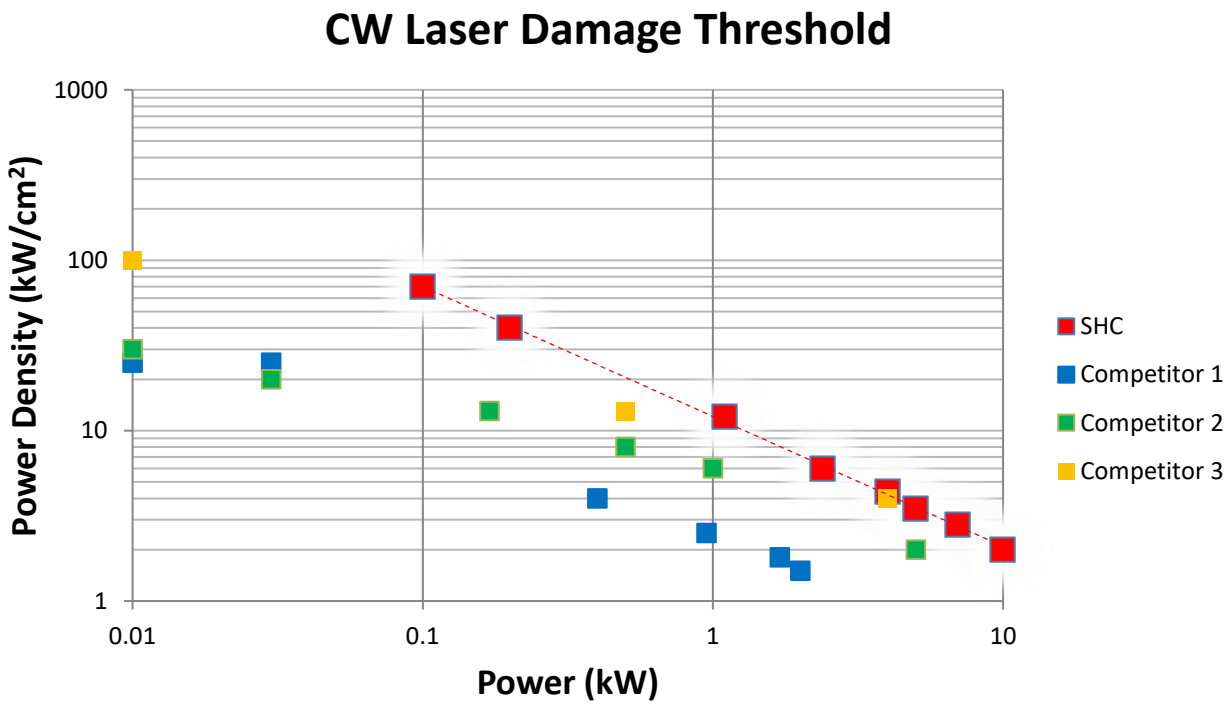
  For pulsed lasers with short pulse durations (lower than microseconds), the time needed by the heat to transfer from the area of impact and to be removed by the cooling system is longer than the duration of the pulse length. Therefore an excess of heat remains concentrated within a thin layer on the sensor's surface where it generates a sudden overheating of the absorbing material. Above a certain level, this excess of energy can cause damages such as the absorber's ablation.

  To overcome this problem, volume absorption technology is often used. Volume absorbers with depths of 0.5-2 mm rather than few microns allow the head to spread over a larger volume and thus reducing overheating effects. Various types of glasses and ceramics are used by Laser Point as absorbers to cover the UV-C range (190-250 nm), the UV-A (250-400 nm) and the VIS-NIR (BB absorber from 400nm to 5µm). Those absorbers can withstand peak powers up to 100GW/cm² and energy densities up to 30J/cm².

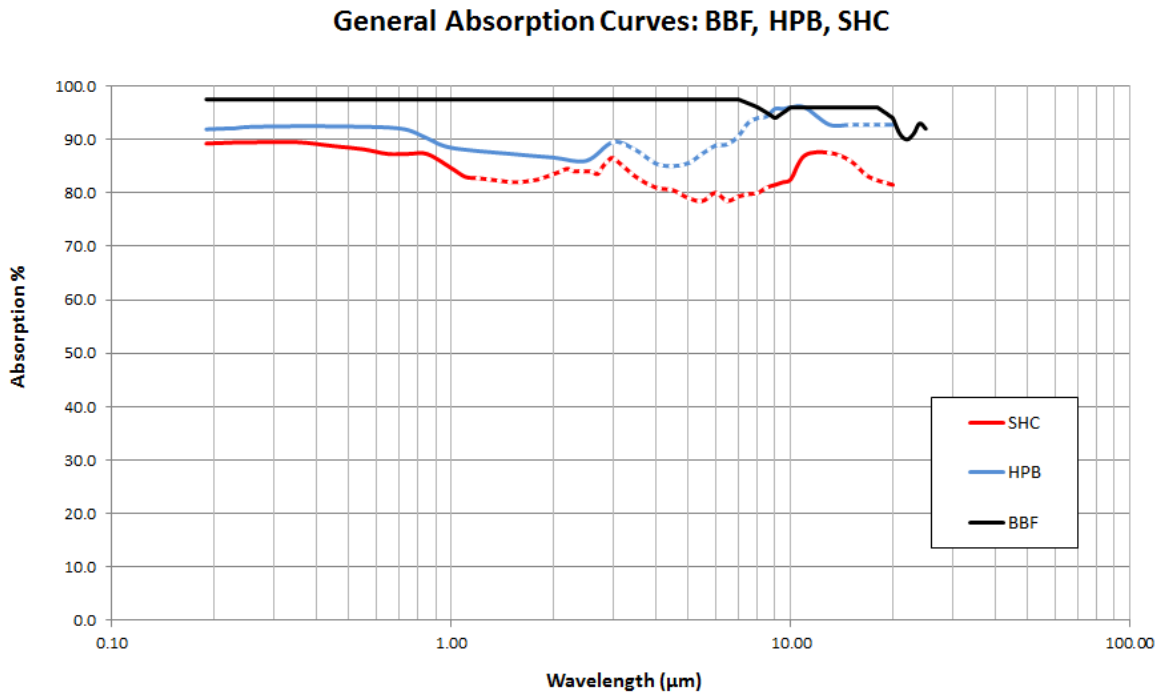
- The very best of laser absorbers: the Super Hard Coating (SHC)

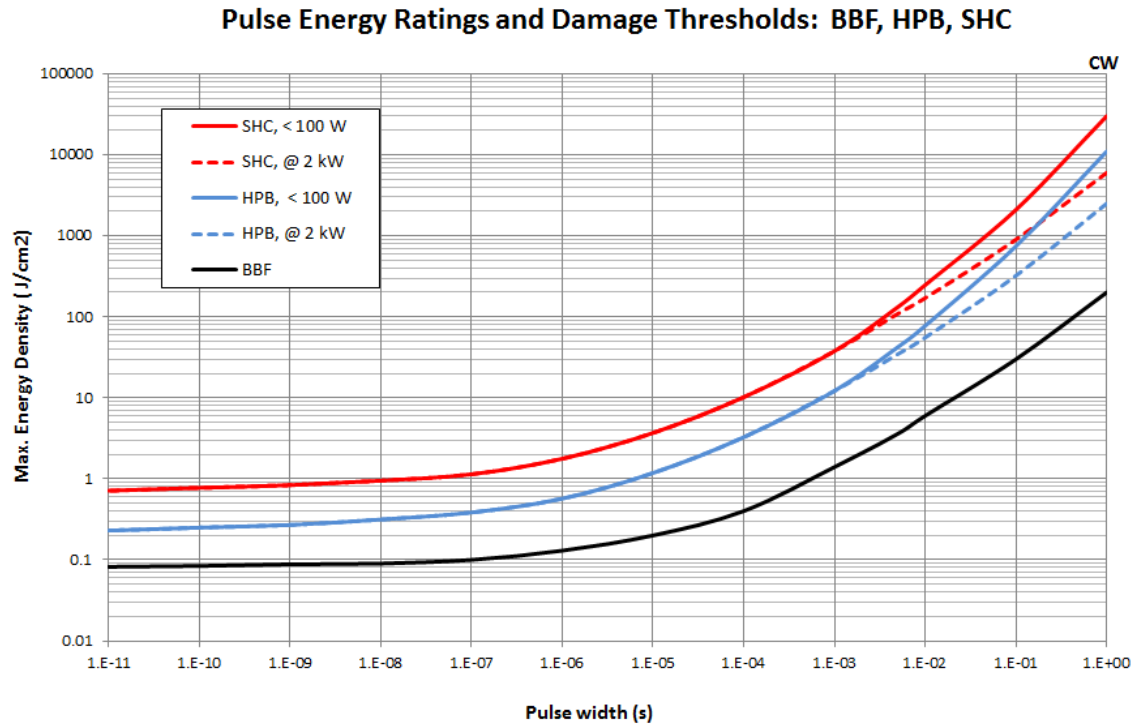
  SHC is one of the best laser coatings available on the market.

  Specification curves and values shown below for the SHC are based on test campaigns performed in collaboration with our customers in disruptive conditions; SHC can withstands more than 12KW/cm² in CW operation, when applying 1KW Yag laser, or 40J/cm² with laser diodes peak powers of 3.2 KW @1 ms. SHC also has an extended working range (0,25µm to 11µm) and a very high absorption ratio, making it suitable for a safe use in almost all laser applications. The graph below shows a comparison of the damage threshold values between Laser Point's SHC absorber and three other competitor absorbers available on the market, in CW conditions. The study was performed by an independent University Lab and the SHC was found to have the highest damage threshold values.



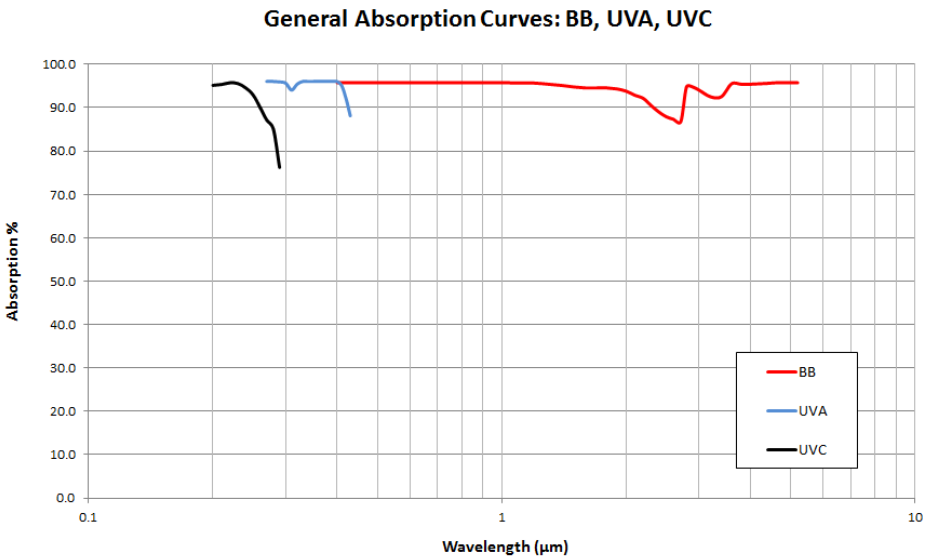
- Surface Absorbers: Absorption and Damage Threshold Curves

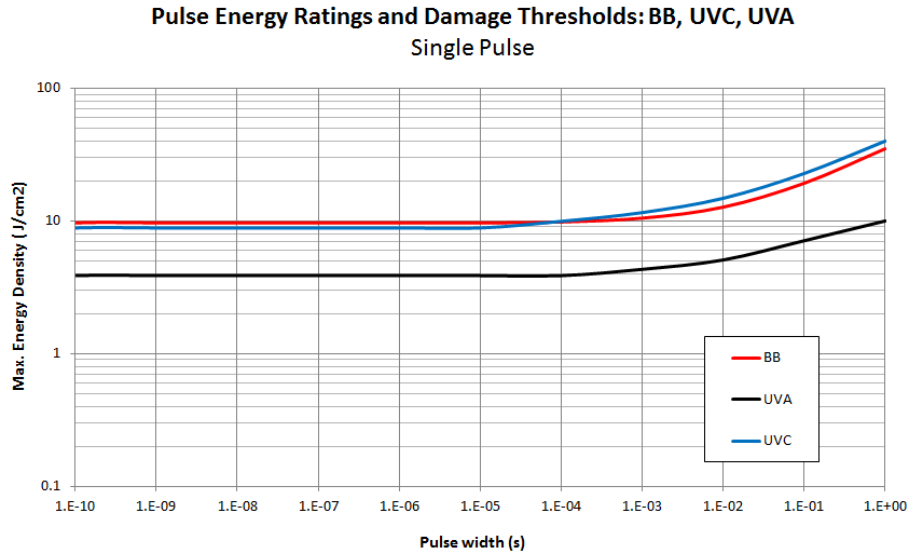


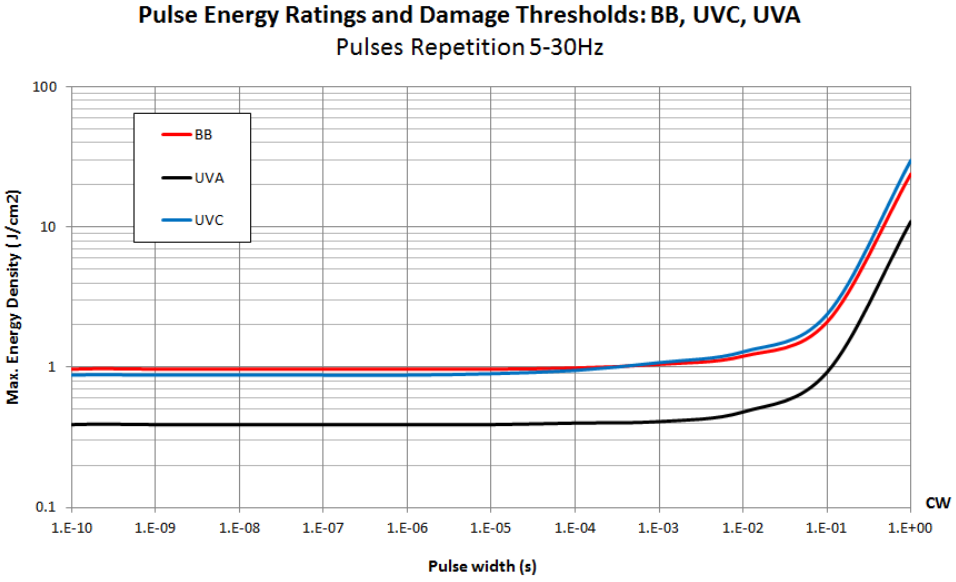


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- Volume Absorbers: Absorption and Damage Threshold Curves

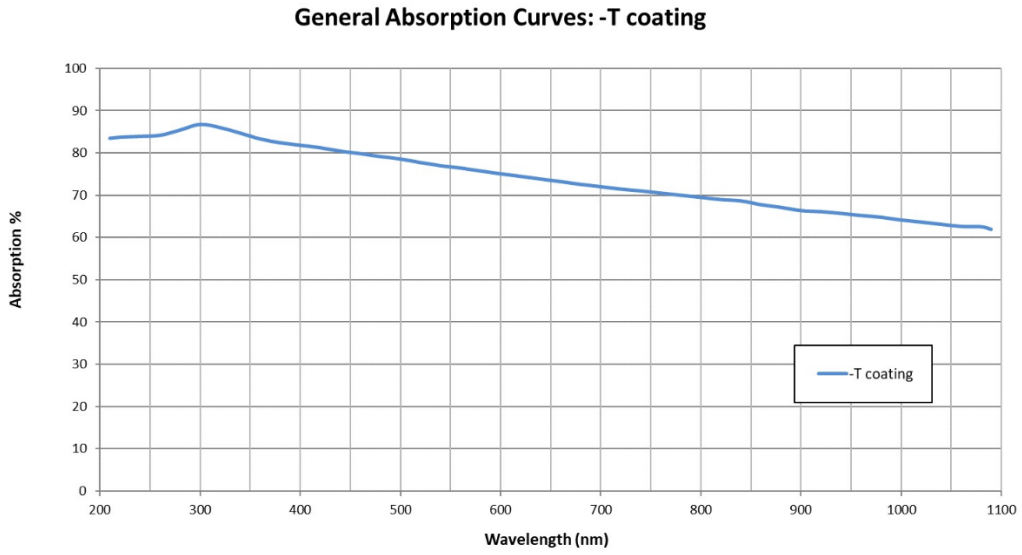


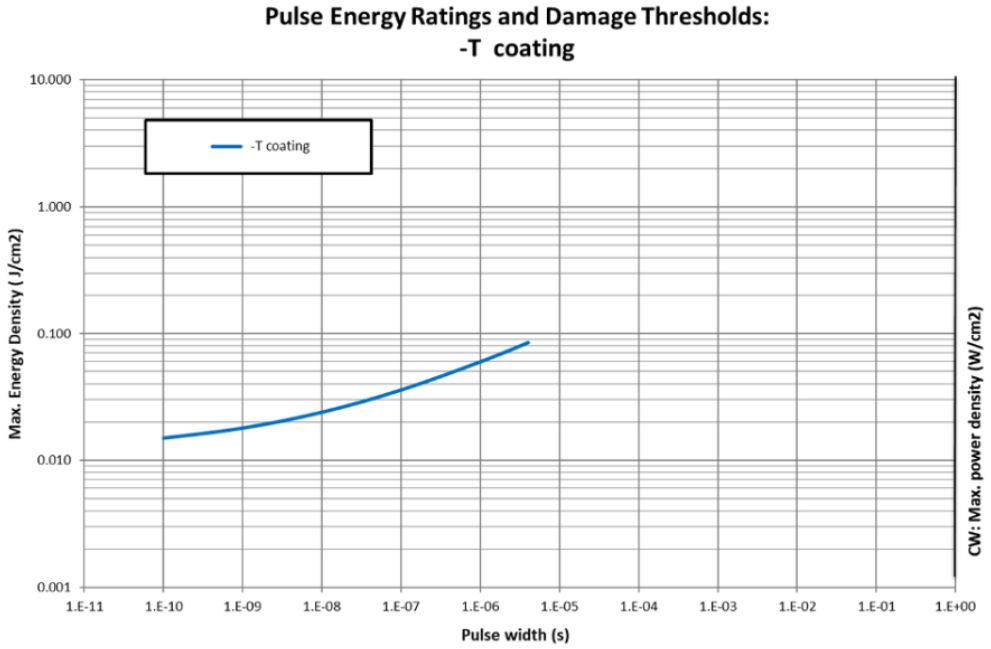




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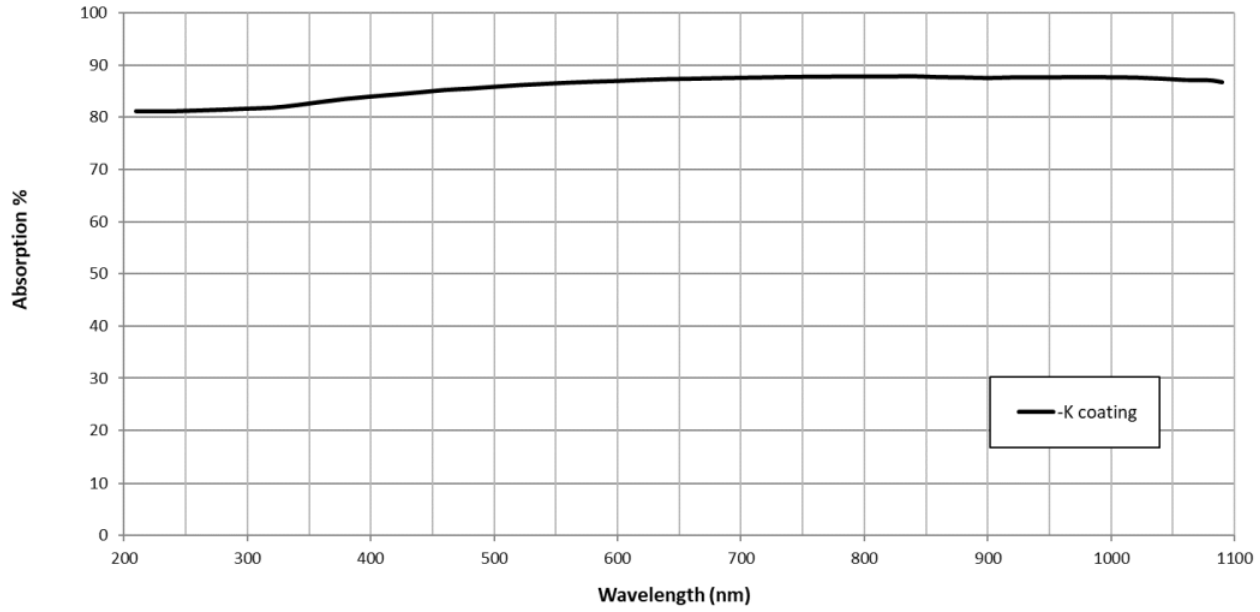
- Blink series Absorbers: Absorption Curves and Damage Threshold Curves



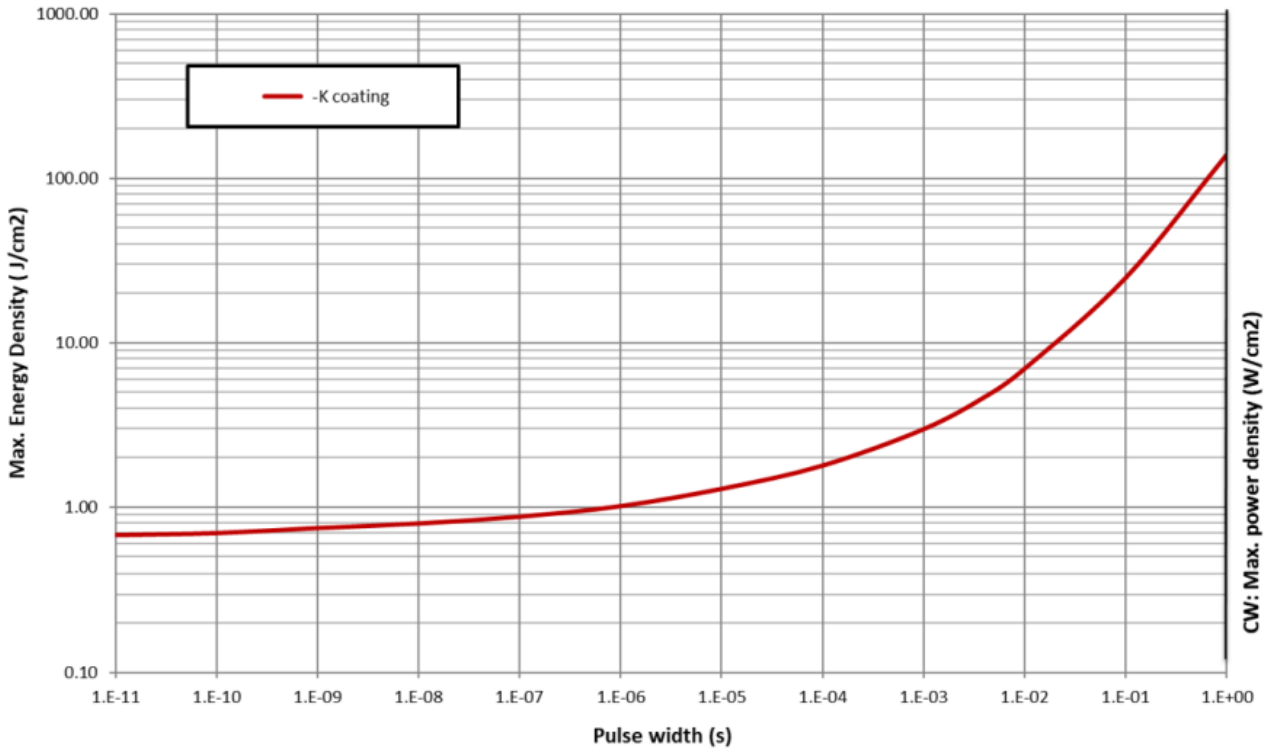


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General Absorption Curves: -K coating

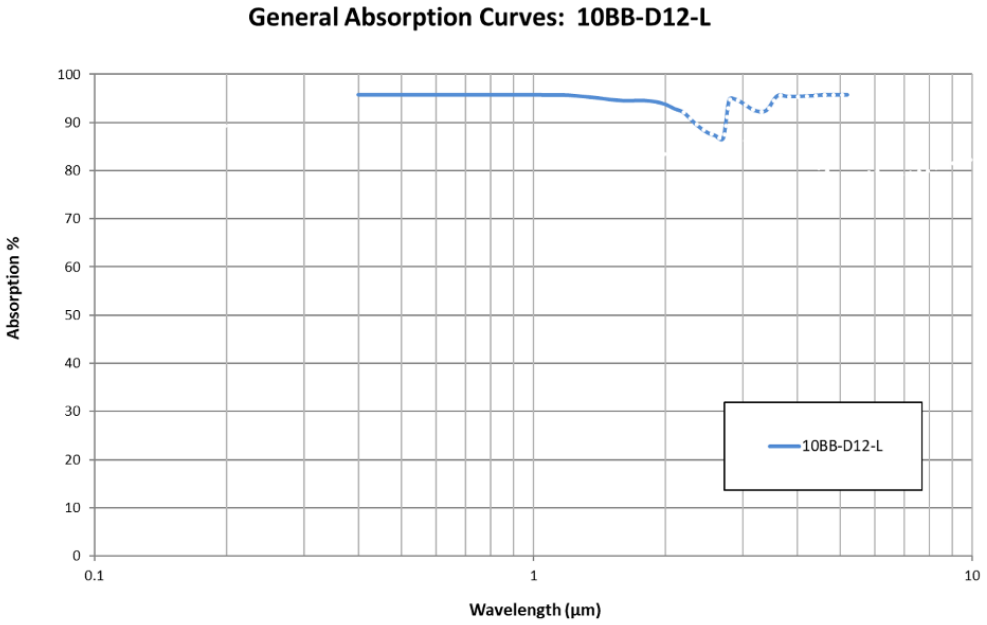


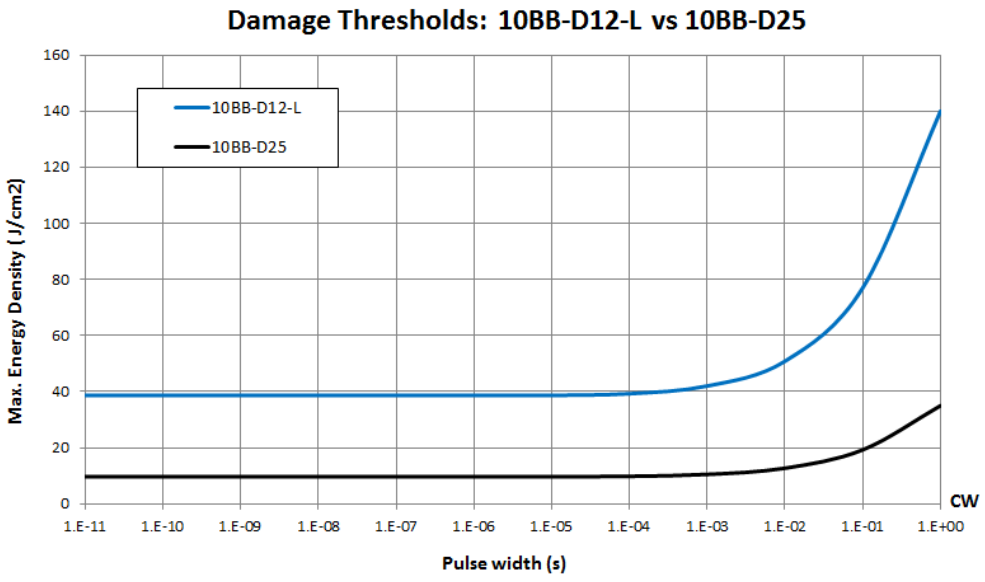
Pulse Energy Ratings and Damage Thresholds: -K coating



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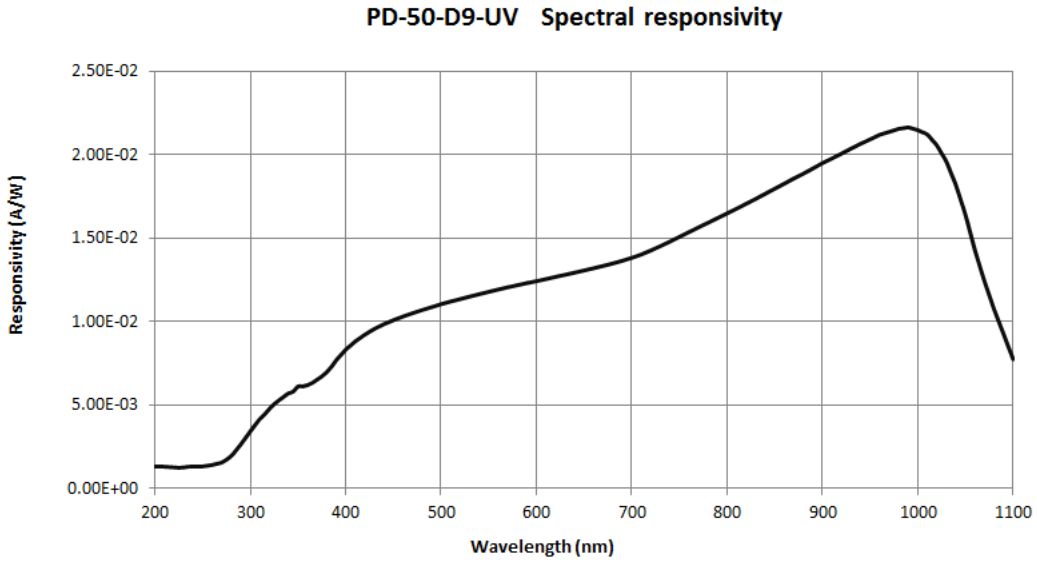
- Absorbers for High Energy Density: Absorption and Damage Threshold Curves

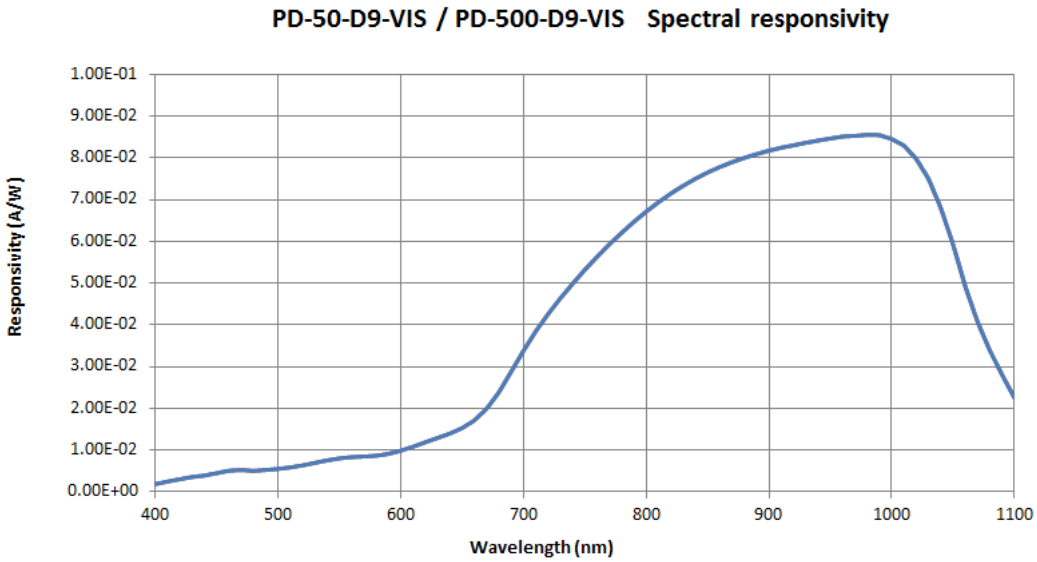


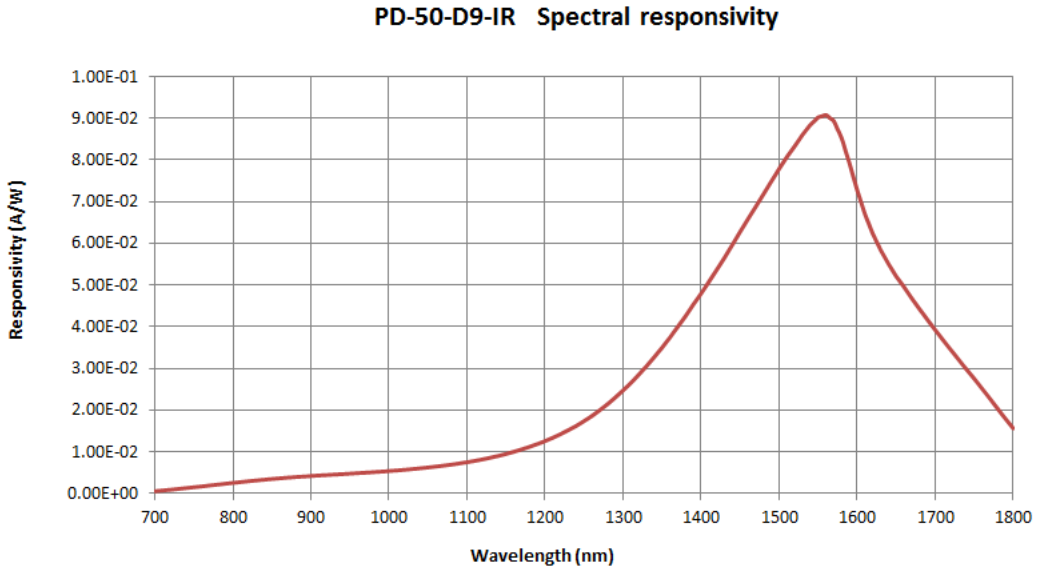


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- Photodiode: Absorption curves







Calibration and warranty

Certified Calibrations

Laser Point sensors are provided with a Calibration Certificates with traceability to the National Institute of Standards and Technology (NIST) Laboratories in Boulder, Colorado (USA) or the Physicalisch-Technische Bundesanstalt (PTB) in Berlin (Germany).

Periodic Recalibrations

The actual need for recalibration depends on how the instrument has been used, its conditions and also on the working environment conditions. However a regular maintenance and recalibration are essential to ensure the performances and accuracy of the instruments. International Metrology Laboratories, such as NIST and PTB, recommend an annual recalibration. In order to have your instruments properly serviced, the units must be shipped back to Laser Point where they will undergo a general check-up and full recalibration procedure.

Calibration Capabilities in Laser Point

Laser Point owns a number of laser sources that are used for in-house calibrations; these sources cover powers up to 300W and include pulsed lasers.
Laser Point also relies on contracts for the use of multi-kilowatt lasers with local Scientific Institutes for tests and standard calibrations for its high power heads.
A number of detector heads, calibrated at NIST and PTB at different wavelengths, are internally used as Golden Standards for calibration procedures.
To trace sensors' linearity to their full scale, some of those Golden Standards have been calibrated over their entire working range, up to > 1KW for CO^2 and 300W for YAG.
All measurements made by PTB and NIST, show the outstanding linearity of Laser Point sensors.

Warranty

Laser Point is in the laser measurement business since more than 25 years. Over this period it has sold tens of thousands of sensors worldwide which have shown an incredibly low rate of returns for defects in materials and workmanship.
Years of innovation in technology and product reliability have created the actual reputation of Laser Point. It's the confidence in its reliability that allows Laser Point to provide, first in this industry, a 3 YEARS WARRANTY on its products.

3 Years Limited Warranty Policy

All Laser Point products are warranted against defects in materials and workmanship for 36 months from the date of shipment. During the warranty period Laser Point will repair, or at its sole option, replace at no charge products proven to be defective.

Defective products can only be returned to Laser Point after issuance of an RMA number.

Shipment to and from Laser Point are at customer's charge.

The 3 Years Warranty does not provide for remedy of failures caused by accidental and physical damage, improper installation and operation, cleaning or un-authorized maintenance, misuse, abuse, modifications to the product not made by Laser Point personnel, software faults, normal wear and tear or any other event, act, default or omission outside Laser Point's control.

The 3 Years Warranty covers only those Laser Point Products sold after June 2017, bearing their serial numbers identified on the Order Form and corresponding to the serial numbers displayed on the instruments; no other Laser Point Products are covered by this Warranty. Refurbished, customized, and discontinued Laser Point products are not eligible for the Warranty services. The Warranty excludes all options, accessories and consumables.

No other expressed warranty is provided by Laser Point.

Accessories

Fiber Adapters

Fiber adapters interface the Laser power measurement head with a specific fiber connectors type (FC, LC, SC, SMA, ST)

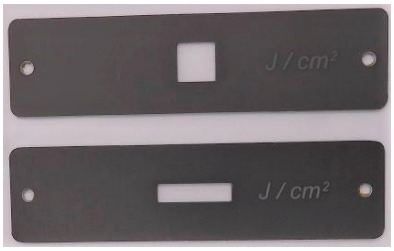
Fiber Adapter Type	SMA	SC	FC	ST	LC
Model	 S120-SMA	 S120-SC	 S120-FC	 S120-ST	 S120-LC

HOW TO ORDER:

Ordering Code	Description	Connectivity
S120-FC	FC Fiber Adapter Cap with Internal SM1 Thread	FC
S120-LC	LC Fiber Adapter Cap with Internal SM1 Thread	LC
S120-SC	LC Fiber Adapter Cap with Internal SM1 Thread	SC
S120-ST	ST Fiber Adapter Cap with Internal SM1 Thread	ST
S120-SMA	SMA Fiber Adapter Cap with Internal SM1 Thread	SMA
SM1-A	S120-XX mechanical adapter for A-10-D20, A-40-D25, A-40/200-D25, A-200-D25	NA

Fluence Plates

Mounting a specific fluence plate on a power probe for IPL measurements (FIT-IPL-R) allows the probe to provide the fluence value of the optical source.



HOW TO ORDER:

Ordering Code	Description	Useful Aperture
FLUENCE PLATE	Fluence Plate 1x1 for FIT-IPL -R only: metal plate with high precision, laser cut, 1cm² bore for fluence (J/cm²) measurement. Sizes 1.0x1.0 cm².	1x1 cm²
FLUENCE PLATE 05x2	Fluence Plate 2x0.5 for FIT-IPL -R only: metal plate with high precision, laser cut, 1cm² bore for fluence (J/cm²) measurement. Sizes 2.0x0.5 cm².	2x0.5 cm²

Power Supplies

Mounting a specific fluence plate on a power probe for IPL measurements (FIT-IPL-R) allows the probe to provide the fluence value of the optical source.



HOW TO ORDER:

Ordering Code	Description	Voltage	Current
PS-120/240-1000	Power Supply 120/240V - 1000mA for head series from A-200 to A-600, for RS232 Pc Plugs and Blink fan cooled heads.	120/240	1000 mA
PS-120/240-3000	Power Supply 120/240V - 3000mA for A-1200 heads.	120/240	3000 mA
PS-USB-120/240-1000	Power Supply 120/240V - 1000mA with cable for PLUS2 meter	120/240	1000 mA

Other ordering options

Further product customizations can be provided adding the following options to the ordering code:

Option	Option description
h	Cable length 0.4 m
y	Cable length 1.5 m
q	Cable length 2.5 m
c	Cable length 5 m
f	Cable length 7.5 m
d	Cable length 10 m
b	Without Light Duty Stand (*)
z	Without Heavy Duty Stand (*)

(*) See product specification to select the proper option.

Examples of Ordering Code with options:

A-02-D12-BBF -> Thermal sensor head with DB15 connectivity

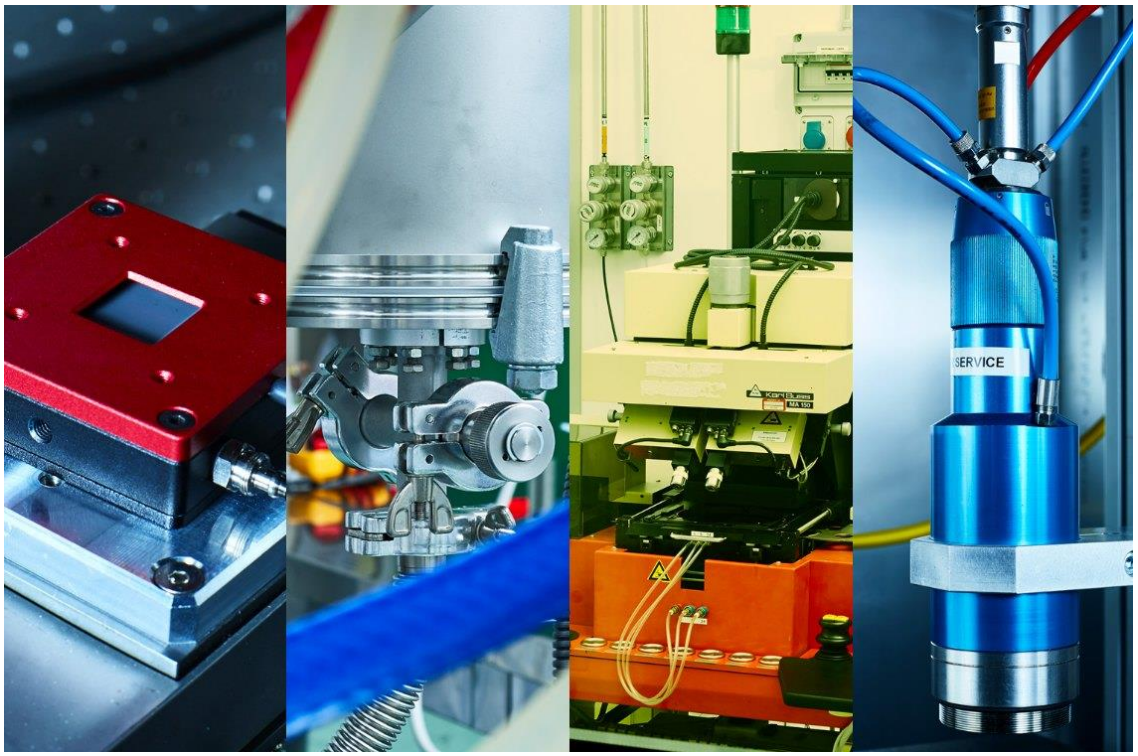
A-02-D12-BBF-U -> Thermal sensor head with USB connectivity

A-02-D12-BBF-R -> Thermal sensor head with RS-232 connectivity

A-02-D12-BBFhb -> Thermal sensor head with DB15 connectivity – 0.4 m cable length – without light duty stand

A-02-D12-BBF-Uhb -> Thermal sensor head with USB connectivity - 0.4 m cable length – without light duty stand

A-02-D12-BBF-Rhb -> Thermal sensor head with RS-232 connectivity - 0.4 m cable length – without light duty stand



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