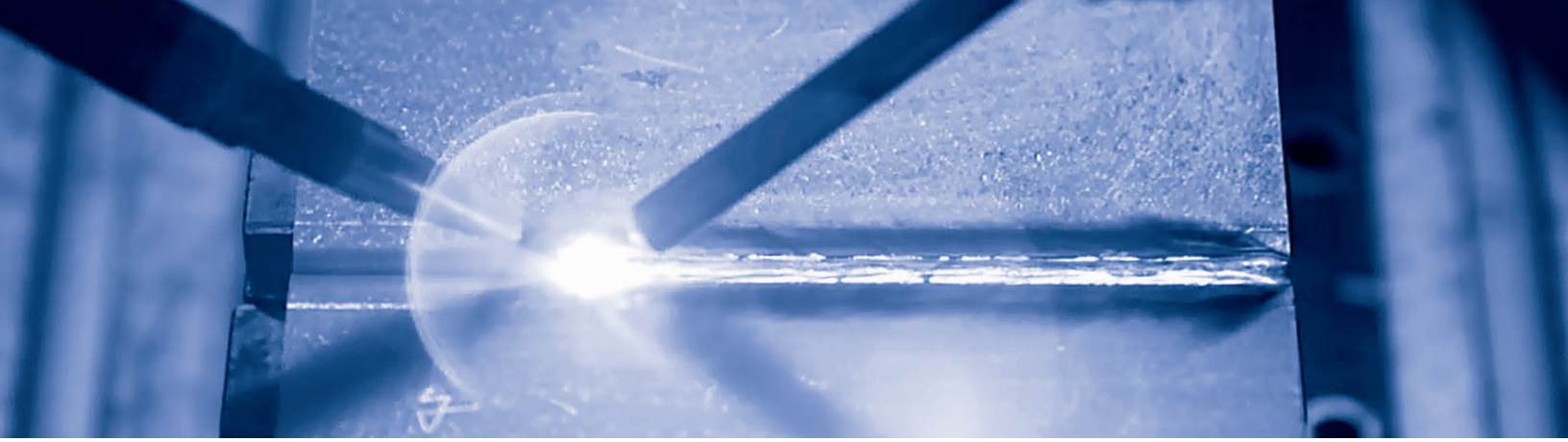


PowerMax BB+ kW Sensors

Large Area Water-Cooled kW Thermopile Sensors with BB+ Coatings

This line of high power water-cooled kW thermopiles incorporates the BB+ broadband coating, which provides a higher power density threshold than previous kW sensors. These sensors can sustain power densities up to 14 kW/cm^2 at 1 kW and up to 2.3 kW/cm^2 at 6 kW. There are several models available with maximum power limits of 1 kW, 3 kW, and 6 kW in USB, RS-232, and DB25 cable configurations (DB25 cables are used with Coherent's stand-alone power meters).

FEATURES & BENEFITS

- Power handling up to 6 kW (model dependent)
- BB+ Coating with high power density threshold
- Broadband coating from 190 nm to 11 microns
- Large 50 mm diameter active area
- USB, RS-232, and DB25 configurations

APPLICATIONS

- Laser power monitoring of CW or modulated lasers
- Manufacturing, QA, and Engineering Applications
- Commercial OEM integration

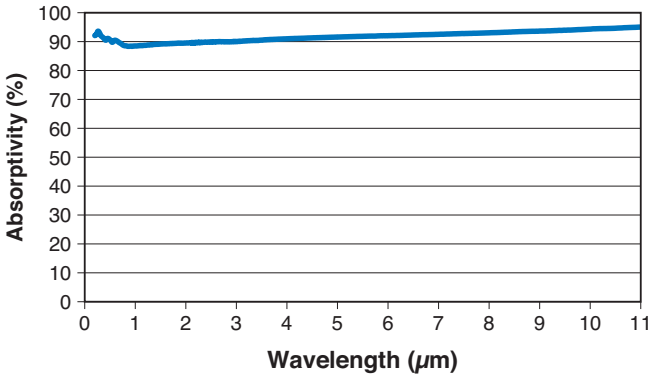
COHERENT®
Superior Reliability & Performance

SPECIFICATIONS	PM1K+	PM3K+	PM6K+
Wavelength Range (µm)	0.19 to 11	0.19 to 11	0.19 to 11
Power Range[1,2] (W)	5 to 1000	5 to 3000	10 to 6000
Max. Intermittent Power (<5 min.)	2000	3000	6000
Noise Equivalent Power[3] (mW)	<100	<100	<100
Maximum Power Density (kW/cm^2)	20 at 500 W 10 at 1 kW	12 at 1 kW 5.8 at 2 kW 3.8 at 3 kW	14 at 1 kW 4.7 at 3 kW 2.3 at 6 kW
Recommended Minimum Beam Size (mm)	2.6 at 100 W 5 at 500 W 7 at 1 kW	6 at 1 kW 10 at 2 kW 15 at 3 kW	8 at 1 kW 17 at 3 kW 31 at 6 kW
Minimum Water Flow Rate[4] (GPM)	0.75 at 1 kW (1 GPM recommended)	2 at 3 kW	2.5 at 5 kW 3 at 6 kW
Response time (0 to 95%) Speed-up On (seconds) Speed-up Off (seconds)	 5 14	 5 15	 5 20
Maximum Energy Density (mJ/cm^2) (1064 nm, 10 ns)	600	600	600
Detector Coating	BB+	BB+	BB+
Detector Element	Thermopile	Thermopile	Thermopile
Diffuser	None	None	None
Detector Diameter (mm)	50	50	50
Calibration Uncertainty (%)	±3	±3	±3
Power Linearity (%)	±2	±2	±2
Spectral Compensation Accuracy (%)	±1.5	±1.5	±1.5
Calibration Wavelength (nm)	1070 and 10,600	1070 and 10,600	1070 and 10,600
Cooling Method	Water	Water	Water
Cable Type	PM DB25, USB, RS-232 models	PM DB25, USB, RS-232 models	PM DB25, USB, RS-232 models
Cable Length (m) DB25 USB RS-232	 2.0 2.5 2.5	 2.0 2.5 2.5	 2.0 2.5 2.5
Part Number DB25 USB RS-232	 1409621 1409622 1409623	 1409627 1409628 1409629	 1402728 1402729 1402730

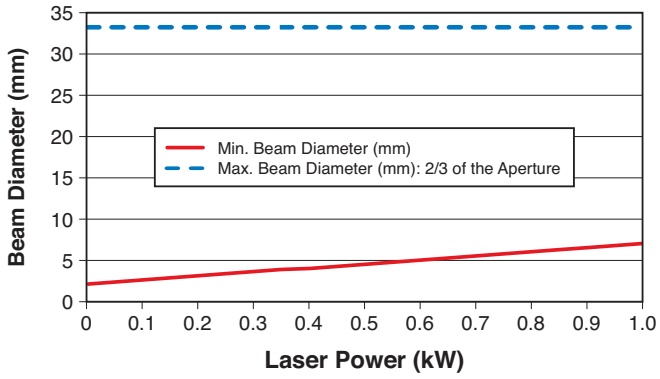
1 Lower power measurements are possible for short durations (down to ~20x electrical NEP) or when water temp is very stable. Minimum power reflects typical water flow variation with chiller in lab environment.
2 Max power is beam size dependent at ~5 mm/kW. See Power Level by Beam Size plots.
3 NEP is pure electrical noise without water.
4 Water temperature should be stable to <1°C change per minute and <2% variation in flow rate per minute for greatest accuracy. Expect ~5 PSI pressure drop at 2.5 GPM and 10 PSI at 3 GPM.

TYPICAL PERFORMANCE DATA

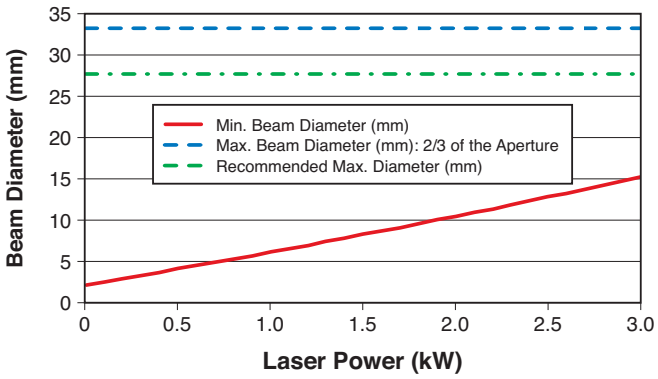
BB+ Absorber Coating Optical Absorptivity



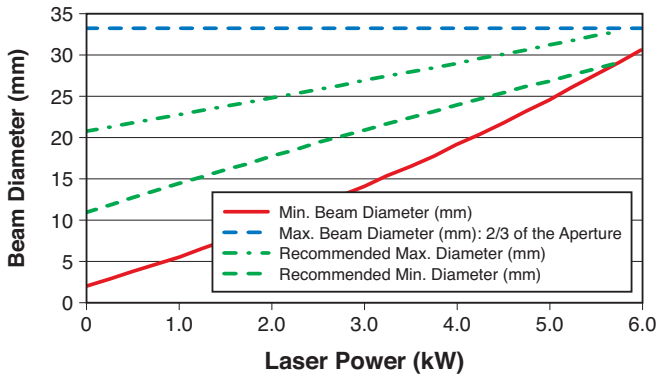
PM1K+ Beam Size[1,2] vs Power Plot



PM3K+ Beam Size[1,3] vs Power Plot



PM6K+ Beam Size[1,4] vs Power Plot

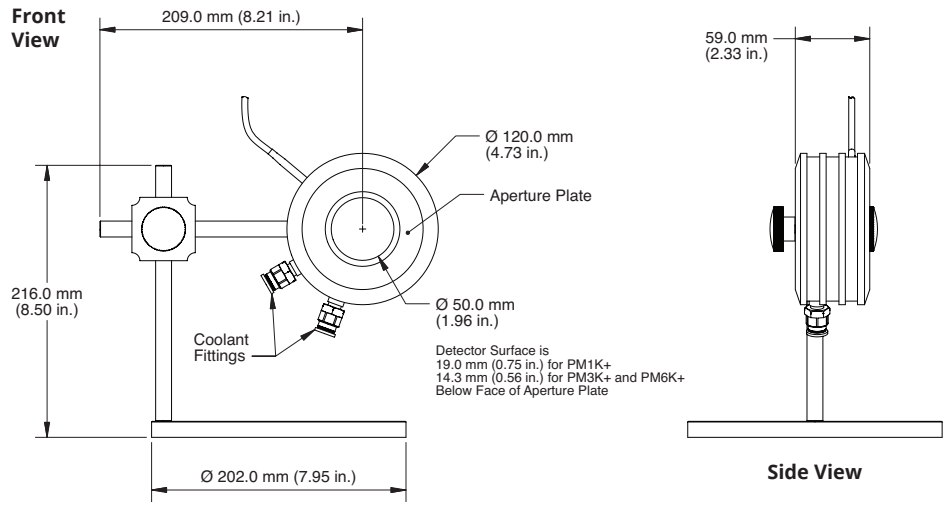


NOTES:

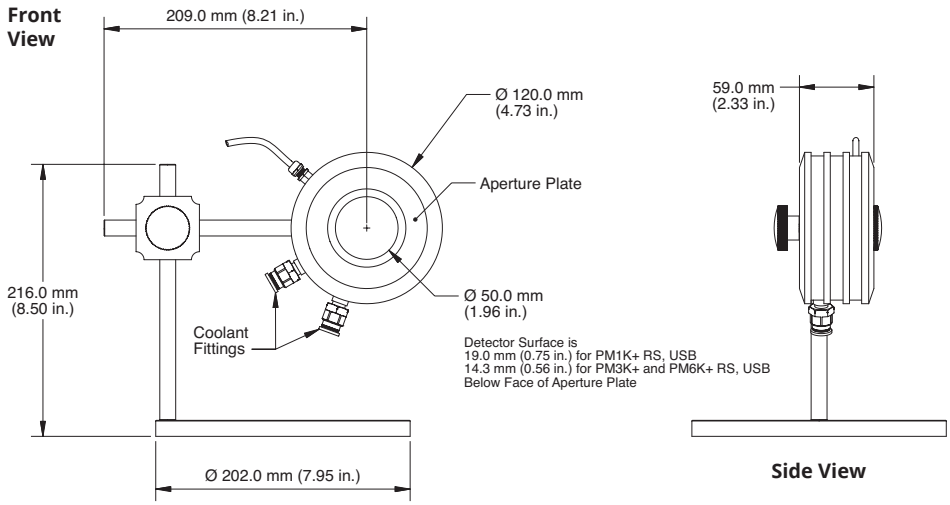
1. Beam diameters are for Gaussian beams.
2. Choose a beam size smaller than Recommended Max. Diameter and larger than Min. Beam Diameter for greatest accuracy and to avoid laser damage.
3. Choose a beam size smaller than Recommended Max. Diameter and larger than Min. Beam Diameter for greatest accuracy. Beam size must be larger than Min. Beam Diameter to avoid laser damage.
4. Choose a beam size between the Recommended Max. and Min. Diameter curves for greatest accuracy. Beam size must be larger than Min. Beam Diameter to avoid laser damage.

MECHANICAL SPECIFICATIONS

PowerMax BB+ DB25 kW Sensor



PowerMax BB+ USB/RS-232 kW Sensor



Coherent, Inc.,
5100 Patrick Henry Drive Santa Clara, CA 95054
p. (800) 527-3786 | (408) 764-4983
f. (408) 764-4646

tech.sales@coherent.com **www.coherent.com**