

## 1.1.2.7 High Power Thermal Sensors

### 1.1.2.7.3 High Power Water Cooled Thermal Sensors

#### 100W to 11kW

##### Features

- High powers
- Water cooled
- Up to 11kW
- Up to Ø45mm apertures

10K-W-BB-45

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With optional scatter shield

Model	10K-W-BB-45																													
Use	High power up to 11kW																													
Absorber Type	Beam deflector + broadband absorber																													
Spectral Range $\mu\text{m}$ <sup>(a)</sup>	0.8 - 2, 10.6																													
Aperture mm	Ø45mm																													
Power Range	100W – 11kW																													
Power Scales	11kW / 6kW / 600W																													
Power Noise Level	1W																													
Backscattered Power <sup>(b, c)</sup>	~3.5% without Scatter Shield, ~1% with Scatter Shield																													
Maximum Average Power Density kW/cm <sup>2</sup>	See note <sup>(c)</sup> and table <sup>(1)</sup> below																													
Response Time with Meter (0-95%) typ. s	2.7																													
Calibration Uncertainty $\pm\%$	1.9																													
Power Accuracy $\pm\%$	5 <sup>(a)</sup>																													
Linearity with Power $\pm\%$	2																													
Cooling	water <sup>(d)</sup>																													
Minimum Water Flow Rate	8 liter/min at full power <sup>(d)</sup>																													
Water Connectors <sup>(e)</sup>	Quick connector for 3/8" OD nylon tubing																													
Cable Length	5 meters																													
Optional Scatter Shield Accessory <sup>(e)</sup>	10K-W / 15K-W Scatter Shield (P/N 7Z08295)																													
Weight kg	4.5																													
Compliance	CE, UKCA, China RoHS																													
Version	V4																													
Part number	<b>7Z07102</b>																													
IPM-10KW Ruggedized Industrial Version	<b>7Z07106</b> see page 100																													
Note: (a)	Calibrated at 1.07 $\mu\text{m}$ and 10.6 $\mu\text{m}$ . For other wavelengths in the ranges of 0.8 - 0.95 $\mu\text{m}$ & 1.1 - 2 $\mu\text{m}$ add up to $\pm 2\%$ to the calibration error.																													
Note: (b)	When scatter shield is installed, use the NIRS setting to compensate for slightly higher reading. When not installed, use the NIR setting.																													
Note: (c)	For circular beam centered within 1/4 of beam diameter. IMPROPERLY CENTERED BEAM CAN CAUSE DAMAGE TO SENSOR. Maximum tilt angle $\pm 5$ degrees. For rectangular beam please consult Ophir representative.																													
Note: (d)	Water temperature range 18-30°C. Water temperature rate of change <1°C/min. Pressure drop across sensor 0.1MPa. The recommended flow rate can be lowered proportionately at lower than full power but should not be below 3 liter/min. The response time will be optimum with the recommended flow rate. For solutions for prolonged usage with untreated water (tap water, non DI water), please contact Ophir.																													
Note: (e)	Heavy duty stand is available as optional extra. For further information and other options see <b>Accessories for High Power Sensors</b> on pages 113-116																													
Table: (1)	<table border="1"> <thead> <tr> <th rowspan="2">Beam diameter</th> <th rowspan="2">Max power density</th> <th colspan="4">Max energy density</th> </tr> <tr> <th>1ms pulse width</th> <th>3ms pulse width</th> <th>10ms pulse width</th> </tr> </thead> <tbody> <tr> <td>&lt;15mm</td> <td>10kW/cm<sup>2</sup></td> <td>30J/cm<sup>2</sup></td> <td>60J/cm<sup>2</sup></td> <td>150J/cm<sup>2</sup></td> </tr> <tr> <td>15 - 20mm</td> <td>7kW/cm<sup>2</sup></td> <td>20J/cm<sup>2</sup></td> <td>40J/cm<sup>2</sup></td> <td>100J/cm<sup>2</sup></td> </tr> <tr> <td>20 - 40mm</td> <td>5kW/cm<sup>2</sup></td> <td>15J/cm<sup>2</sup></td> <td>30J/cm<sup>2</sup></td> <td>70J/cm<sup>2</sup></td> </tr> <tr> <td>40 - 45mm</td> <td>4kW/cm<sup>2</sup></td> <td>12J/cm<sup>2</sup></td> <td>25J/cm<sup>2</sup></td> <td>60J/cm<sup>2</sup></td> </tr> </tbody> </table>	Beam diameter	Max power density	Max energy density				1ms pulse width	3ms pulse width	10ms pulse width	<15mm	10kW/cm <sup>2</sup>	30J/cm <sup>2</sup>	60J/cm <sup>2</sup>	150J/cm <sup>2</sup>	15 - 20mm	7kW/cm <sup>2</sup>	20J/cm <sup>2</sup>	40J/cm <sup>2</sup>	100J/cm <sup>2</sup>	20 - 40mm	5kW/cm <sup>2</sup>	15J/cm <sup>2</sup>	30J/cm <sup>2</sup>	70J/cm <sup>2</sup>	40 - 45mm	4kW/cm <sup>2</sup>	12J/cm <sup>2</sup>	25J/cm <sup>2</sup>	60J/cm <sup>2</sup>
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