

1.1.2.6 Medium - High Power Thermal Sensors

1.1.2.6.1 Medium - High Power BeamTrack-Power / Position / Size Sensors

150mW to 1000W

Features (see introduction in pages 110-112)

- All the features of standard power sensors plus...
- Accurate tracking of beam position to fractions of a mm
- Monitoring of the laser beam size

FL250A-BB-50-PPS



1000W-BB-34-QUAD



| Model   | FL250A-BB-50-PPS <sup>(a)</sup>                   | 1000W-BB-34-QUAD <sup>(a)</sup>        |
|---|---|--|
| Use   | General purpose                                   | General purpose                        |
| Functions   | Power / Energy / Position / Size                  | Power / Energy / Position              |
| Absorber Type   | Broadband   | Broadband                              |
| Spectral Range $\mu\text{m}$                          | 0.19 - 20   | 0.19 - 20                              |
| Aperture mm   | $\varnothing 50\text{mm}$                         | $\varnothing 34\text{mm}$              |
| Power Mode  |   |  |
| Power Range   | 150mW - 250W <sup>(b)</sup>                       | 5W - 1000W                             |
| Power Scales  | 250W / 30W  | 1000W / 200W                           |
| Power Noise Level                                     | 15mW  | 200mW                                  |
| Maximum Average Power Density $\text{kW}/\text{cm}^2$ | 10 at 250W, 12 at 150W                            | 10 at 500W, 7 at 1000W                 |
| Response Time with Meter (0-95%) typ. s               | 2.8   | 2.5                                    |
| Calibration Uncertainty $\pm\%$                       | 1.9   | 1.9                                    |
| Power Accuracy $\pm\%$                                | 3   | 3 <sup>(f)</sup>                       |
| Linearity with Power $\pm\%$                          | 1.5   | 2                                      |
| Energy Mode   |   |  |
| Energy Range  | 80mJ - 300J                                       | 500mJ - 300J                           |
| Energy Scales   | 300J / 30J / 3J                                   | 300J / 30J                             |
| Minimum Energy mJ                                     | 80  | 500mJ                                  |
| Maximum Energy Density $\text{J}/\text{cm}^2$         |   |  |
| <100ns  | 0.3   | 0.3                                    |
| 1 $\mu\text{s}$                                       | 0.4   | 0.4                                    |
| 0.5ms   | 5   | 5                                      |
| 2ms   | 10  | 10                                     |
| 10ms  | 30  | 30                                     |
| Beam Tracking Mode                                    |   |  |
| Position  |   |  |
| Beam Position Accuracy                                | 0.2mm + 5% of distance from center <sup>(c)</sup> | 0.5mm <sup>(h)</sup>                   |
| Beam Position Resolution mm                           | 0.1   | 0.1                                    |
| Min Power for Position Measurement                    | 2W  | 10W                                    |
| Size <sup>(d)</sup>                                   |   |  |
| Size Accuracy mm <sup>(e)</sup>                       | $\pm 5\%$ for centered beam                       | NA                                     |
| Size Range mm (4 $\sigma$ beam diameter)              | $\varnothing 5\text{-}35$                         | NA                                     |
| Min Power Density for Size Measurement                | 3W/ $\text{cm}^2$                                 | NA                                     |
| Cooling   | Fan   | Water                                  |
| Minimum and Recommended Water Flow Rate at Full Power | NA  | 3 liter/min 6 liter/min <sup>(g)</sup> |
| Fiber Adapter Available (see page 119)                | ST, FC, SMA, SC                                   | Consult Ophir representative           |
| Accessories for High Power Sensors                    | NA  | See pages 97-101                       |
| Weight kg   | 0.9   | 0.9                                    |
| Compliance  | CE, UKCA, China RoHS                              | CE, UKCA, China RoHS                   |
| Version   |   |  |
| Part number   | 7Z07902   | 7Z07936                                |

Note: (a) The BeamTrack features are supported by Centauri, StarBright, StarLite, Nova II and Vega meters, Juno, Juno+, Juno-RS and EA-1 interfaces and StarLab application. Position and Size measurements work only in Power mode (but not in single shot Energy mode).

Note: (b) For powers up to 30W it is recommended to work with the fan off and then the noise level is ~3 times lower. It is also recommended to measure energy with the fan off.

Note: (c) Position accuracy for the central 20mm of the aperture as limited by beam position resolution. Position can be tracked with  $\pm 1\text{mm}$  accuracy over central 32mm of the aperture. Accuracy is reduced by a factor of 3 at minimum power. Position measuring center corresponds to geometrical center within <1mm. Position center can be software reset to geometric center or other desired position with Centauri, StarBright or StarLab.

Note: (d) Assumes laser beam with Gaussian (TEM<sub>00</sub>) distribution. For other modes, size measurement is relative.

Note: (e) Accuracy spec will be maintained for beams from 6 to 35mm not deviating from center more than 15% of beam diameter.

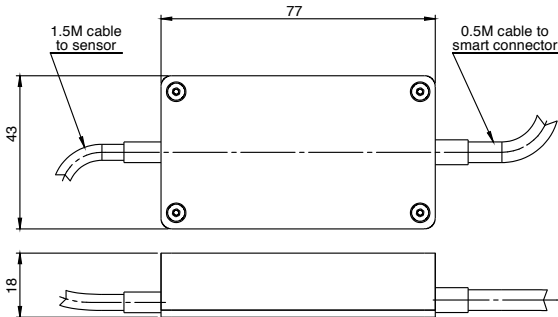
Note: (f) Calibrated for ~0.8 $\mu\text{m}$ , 1.064 $\mu\text{m}$  and 10.6 $\mu\text{m}$

Note: (g) Water temperature range 18-30°C, Water temperature rate of change <1°C/min. Pressure drop across sensor 0.03MPa.

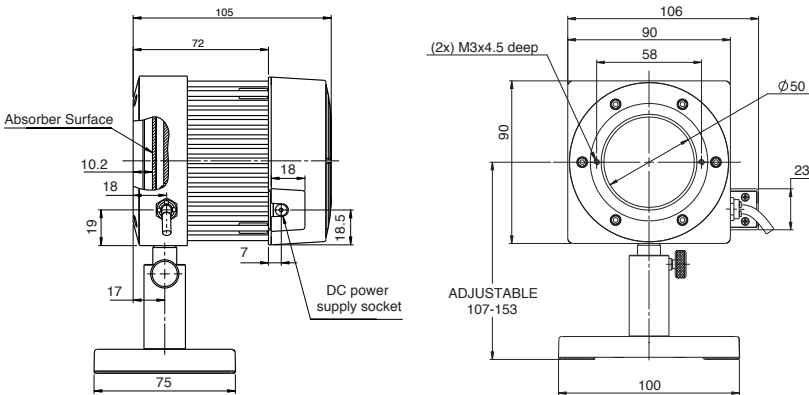
Note: (h) Position accuracy for the central 10 mm of the aperture as limited by beam position resolution. Position measuring center corresponds to geometrical center within <1mm. Position center can be software reset to geometric center or other desired position with Centauri, StarBright or StarLab.

\* For drawings please see page 77

Interface Module on cable



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