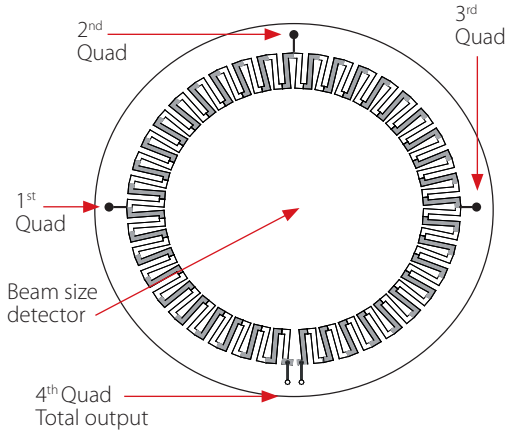


BeamTrack Power / Position / Size sensors

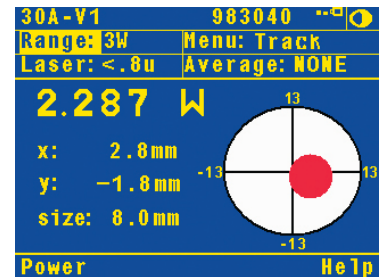
Ophir now has the new BeamTrack line of thermal sensors that can measure beam position and beam size while measuring power. This innovative device will provide an additional wealth of information on your laser beam – centering, beam position, beam wander, beam position and wander, beam size as well as power and single shot energy. The BeamTrack sensor is illustrated schematically here and works as follows: the signal coming from the sensor is divided into 4 quadrants so by measuring and comparing the output from the 4 sections we can determine the position of the center of the beam to a high degree of accuracy. In addition to the 4 quadrants, there is now a special patented beam size detector. After processing outputs from these various detectors, the user is presented with the beam position as well as beam size. Note that the beam size is calibrated only for Gaussian beams but for other beams it will give relative size information and will indicate if the beam is changing size.



Operation of BeamTrack Sensors

BeamTrack sensors look similar to Ophir thermal sensors of the same type except that there is a small electronics module on the cable from the sensor head to the smart plug. When BeamTrack sensors are plugged into compatible displays or PC interfaces (Nova II, Vega and Juno), along with the power measurement, there is a visual display of the beam position and beam size. The beam position can be accurately tracked and logged for beam wander measurements.

The beam size is calibrated only for Gaussian beams but other beams may be measured and the sensor will give a repeatable measurement of the relative beam size for tracking changes in the size of the beam over time.



BeamTrack-Power / Position / Size Sensors

40mW to 150W

Features

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

50(150)A-BB-26-PPS



F150A-BB-26-PPS



Model	50(150)A-BB-26-PPS	F150A-BB-26-PPS
Use	General purpose	General purpose
Absorber Type	Broadband	Broadband
Spectral Range μm	0.19 - 20	0.19 - 20
Aperture mm	ϕ 26mm	ϕ 26mm
Power Mode		
Power Range	40mW - 150W	50mW - 150W ^(a)
Maximum Intermittent Power	150W for 1.5min, 100W for 2.2min, 50W continuous	NA
Power Scales	150W / 50W / 5W	150W / 30W / 3W
Power Noise Level	2mW	3mW
Maximum Average Power Density kW/cm ²	12 at 150W, 17 at 50W	12 at 150W, 17 at 50W
Response Time with Display (0-95%) typ. s	1.5	1.5
Power Accuracy +/-%	3	3
Linearity with Power +/-%	1.5	1
Energy Mode		
Energy Range	20mJ - 100J	20mJ - 100J
Energy Scales	100J / 30J / 3J / 300mJ	100J / 30J / 3J / 300mJ
Minimum Energy mJ	20	20
Maximum Energy Density J/cm ²		
<100ns	0.3	0.3
0.5ms	5	5
2ms	10	10
10ms	30	30
Beam Tracking Mode		
Position		
Beam Position Accuracy mm ^(b)	0.1	0.1
Beam Position Resolution mm	0.05	0.05
Min Power for Position Measurement	100mW	100mW
Size^(c)		
Size Accuracy mm ^(d)	$\pm 5\%$ for beam centered to within 1mm of center of aperture	$\pm 5\%$ for beam centered to within 1mm of center of aperture
Size Range mm (4 σ beam diameter)	$\phi 3 - 20$	$\phi 3 - 20$
Min Power Density for Size Measurement	1 W/cm ²	1 W/cm ²
Cooling	convection	fan
Fiber Adapter Available (see page 43)	ST, FC, SMA, SC	ST, FC, SMA, SC
Weight Kg	0.4	0.45
Version		
Part number	7Z07900	7Z07901

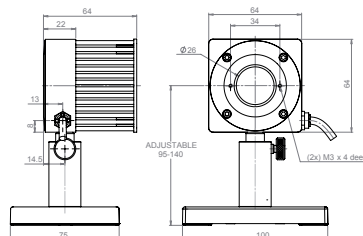
Notes: (a): For powers up to 30W it is recommended to work with the fan off and then the noise level is ~3 times lower. It is also recommended to measure energy with the fan off.

Notes: (b): Position accuracy for the central 10mm of the aperture. Position can be tracked with ± 1 mm accuracy over the entire aperture. Accuracy is reduced by a factor of 2 below 3X minimum power.

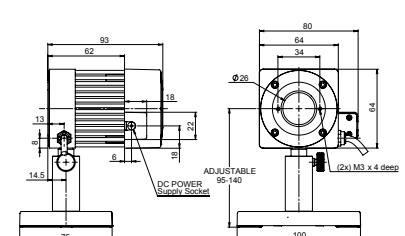
Notes: (c): Assumes laser beam with Gaussian (TEM00) distribution. For other modes, size measurement is relative.

Notes: (d): $\pm 15\%$ for beam centered to within 1/3 of its diameter.

50(150)A-BB-26-PPS



F150A-BB-26-PPS



BeamTrack-Power / Position / Size Sensors

150mW to 400W

Features

- 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-35-PPS



FL400A-BB-50-PPS



Model	FL250A-BB-35-PPS ^(a)	FL400A-BB-50-PPS ^(a)
Use	General purpose	General purpose
Absorber Type	Broadband	Broadband
Spectral Range μm	0.19 - 20	0.19 - 20
Aperture mm	ϕ 35mm	ϕ 50mm
Power Mode		
Power Range ^(b)	150mW - 250W	300mW - 400W
Maximum Power		
Power Scales	250W / 30W	400W / 50W
Power Noise Level	15mW	25mW
Maximum Average Power Density kW/cm ²	10 at 250W, 12 at 150W	8 at 400W, 12 at 150W
Response Time with Display (0-95%) typ. s	2	2.5
Power Accuracy +/-%	3	3
Linearity with Power +/-%	1.5	1.5
Energy Mode		
Energy Range	50mJ - 300J	75mJ - 600J
Energy Scales	300J / 30J / 3J	600J / 60J / 6J
Minimum Energy mJ	50	75
Maximum Energy Density J/cm ²		
<100ns	0.3	0.3
0.5ms	5	5
2ms	10	10
10ms	30	30
Beam Tracking Mode		
Position		
Beam Position Accuracy mm ^(c)	0.2	0.4
Beam Position Resolution mm	0.1	0.2
Min Power for Position Measurement	500mW	1W
Size^(d)		
Size Accuracy mm ^(e)	\pm 5% for beam within 1mm of center	\pm 7% for beam within 1mm of center
Size Range mm (4 σ beam diameter)	5-30	5-45
Min Power Density for Size Measurement	1 W/cm ²	1 W/cm ²
Cooling	fan	fan
Fiber Adapter Available (see page 43)	ST, FC, SMA, SC	ST, FC, SMA, SC
Weight Kg	0.5	1.0
Version		
Part number	7Z07902	7Z07903

Notes: (a): Expected release: end of 2011

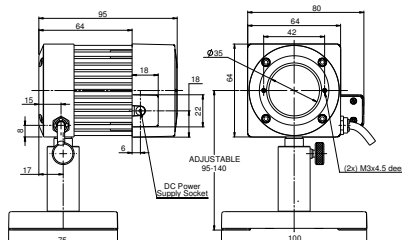
Notes: (b): For powers up to 30W (up to 50W with the FL400A-50-PPS) it is recommended to work with the fan off and then the noise level is ~3 times lower. It is also recommended to measure energy with the fan off.

Notes: (c): Position accuracy for the central 10mm of the aperture. Position can be tracked with \pm 1mm accuracy over the entire aperture. Accuracy is reduced by a factor of 2 below 3X minimum power.

Notes: (d): Assumes laser beam with Gaussian (TEM00) distribution. For other modes, size measurement is relative.

Notes: (e): \pm 15% for beam centered to within 1/3 of its diameter.

FL250A-BB-35-PPS



FL400A-BB-50-PPS

