

1.1.1.6 LED measurement – UV, VIS, NIR

Introduction

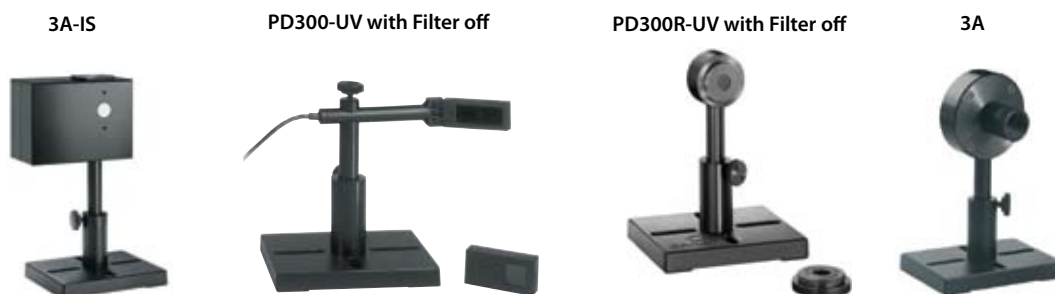
UV, VIS and IR LEDs are replacing traditional light sources and thus enabling new applications. Ophir offers a number of choices for LED measurement. There are a number of sources for measuring the power of divergent LED beams as presented in section 1.1.1.5.1. There are also radiometer sensors for measuring the irradiance of large area illumination in units of Watts/cm² as presented in section 1.1.1.5.2

1.1.1.6.1 LED Power Sensors

20pW to 3W

Features

- 20pW to 3W
- 200nm to 1100nm
- Photodiode detectors – spectrally calibrated for LEDs and lasers
- Thermal sensors – power measurement is insensitive to wavelength
- Fiber or free space input
- Compatible with all Ophir meters, acquisition devices and StarLab PC software

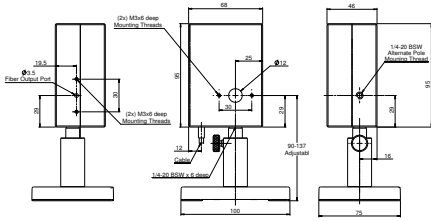


Model	3A-IS	PD300-UV	PD300R-UV	3A		
Use	Compact integrating sphere	Standard photodiode sensor for UV-NIR	Round photodiode sensor for UV-NIR	Thermal sensor. Flat spectrum response. For fiber coupled source		
Detector Type	Silicon	Silicon	Silicon	Thermal		
Input Port Aperture mm	Ø12	10x10	Ø10	Ø9.5		
Filter Mode		Filter out	Filter in			
Spectral Range µm	0.35 – 1.1	0.2-1.1	0.22-1.1	0.19-20		
Power Range	1µW – 3W	3mW-20pW	300mW-2µW	10µW-3W		
Power Scales	3W to 3µW and dBm	3mW to 3nW and dBm	300mW to 300µW and dBm	3W-300µW		
Resolution nW	1	0.001	100	100		
Maximum Power	3W	3mW	300mW	3W		
Accuracy (including error due to temp variations)						
% Error vs Wavelength nm	±5 350 – 1000 ±10 1000 – 1100	±6 200-270 ±3 270-950 ±5 950-1100	±10 220-400 ±5 400-950 ±7 950-1100	±6 200-270 ±3 270-950 ±5 950-1100	±10 220-400 ±5 400-950 ±7 950-1100	±3%
Damage Threshold W/cm ²	200	10	50	10	50	1000
Max Pulse Energy	5mJ	0.4 µJ	15 µJ	0.4 µJ	15 µJ	2J
Noise Level for Filter Out	20nW	1pW		1pW		2µW
Response Time with Meter s	0.2	0.2		0.2		1.8
Beam Position Dependence	N.A.	±2%		±2%		±2%
Linearity with Power +/-%	1	0.5		0.5		1.5
Fiber Adapters Available (see page 68-69)	SMA (a), FC, ST, SC	SMA, FC, ST, SC		SMA, FC, ST, SC		SMA, FC, ST, SC
Weight kg	0.6	0.07		0.11		0.2
Version	V1					
Part Number	7Z02404	7Z02413		7Z02438		7Z02621

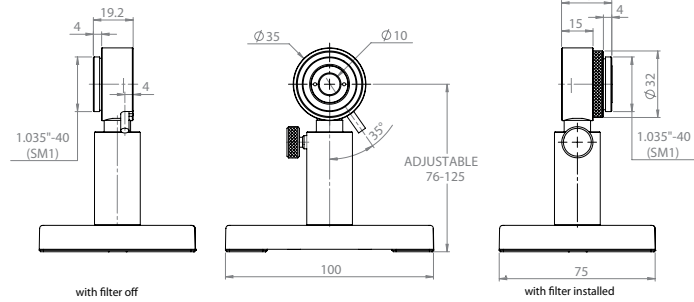
Notes: (a) One fiber output port available with output = 2E-4 of input power/mm² of fiber area.

* For sensors drawings please see page 32

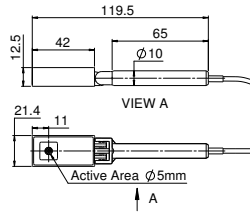
3A-IS



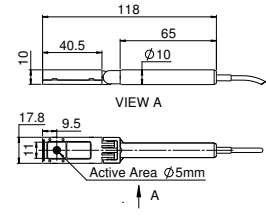
PD300R-UV



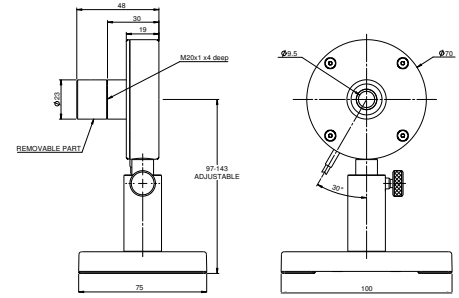
PD300-UV/PD300-IR Filter installed
(Ø5mm for PD300-IR only)



PD300-UV/PD300-IR Filter off
(Ø5mm for PD300-IR only)



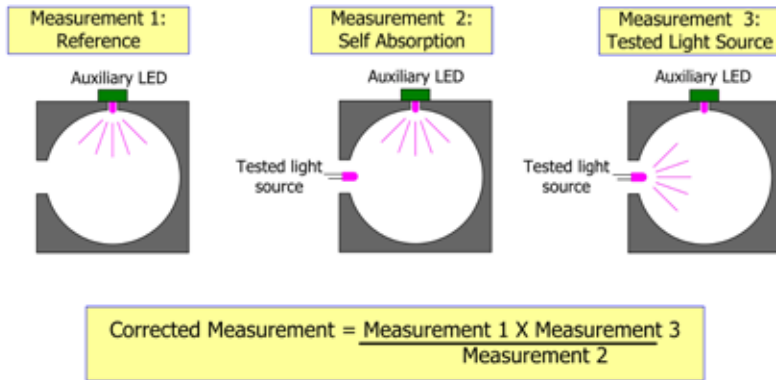
3A



Self-Absorption Calibration Accessory for the 3A-IS Integrating Sphere (AUX-LED)

The detector inside the 3A-IS is calibrated for operation with the aperture unobstructed. Diffused light that reaches the aperture from inside the sphere freely exits. This will also hold true when the light source is mounted on an absorbing surface and placed in front of the sphere. The effect of self-absorption is noticed when part of the aperture is blocked by a reflective material or if the light source protrudes into the sphere. In these examples, the geometry and reflectance of the sphere are changed, leading to errors of up to ±20%. This effect can be corrected for by using the AUX-LED self-absorption auxiliary light source as shown in the following illustration. A reading is taken of the 390nm Auxiliary LED output with the light source to be measured installed and then again with it not installed. From these measurements we can get a measurement corrected for the effect of the light source as shown in the formula below. The AUX-LED emits at 390nm, and thus is optimized for measuring UV LEDs in the range of 365nm-400nm. For other LED wavelengths, please contact Ophir. The accessory is attached to the 3A-IS using two screws.

Self-Absorption correction procedure



3A-IS with AUX-LED and VEGA meter



AUX-LED Specifications

Standard wavelength	390nm
Operation voltage	6V-10V, the LED is current regulated
Dimensions	36.5x44.5x34.5mm
Part number	7Z08292

