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## DH-3 Series Calibrated Light Sources

### Calibrated Light Sources for the Highest Level of Confidence

The DH-3 and DH-3 *plus* series of calibrated UV-Vis-NIR light sources can be used to calibrate the absolute spectral response of a spectrometer system. Using these new sources and Ocean Optics software, you can determine absolute intensity values -- to a high degree of accuracy -- at wavelengths from 200-2400 nm.

The DH-3 and DH-3 *plus* series is specifically calibrated for use with a cosine corrector. Additionally, these sources are calibrated using a procedure and documentation patterned after the ISO 17025, IEC Guide 115 and JCGM100:2008 (GUM) protocols\*.

### DH-3 *plus* Options

The DH-3 *plus* series offers 4.5% maximum uncertainty and a calibration over the range of 200-1100 nm with the option to select an extended calibration to 2400 nm. These sources also feature an integrated shutter controlled by either TTL pulses or manually on the front of the instrument. The internal shutter blocks light completely from the sampling device, providing the most accurate dark measurements.

\* Our calibration laboratory is not accredited to ISO 17025, IEC Guide 115 or JCGM100:2008 (GUM) protocols. However, we provide rigorous calibration documentation, upon request, for our DH-3 *plus* sources that makes use of measurement protocols for these standards. Therefore, many customers are able to take the documentation we provide and integrate these calibrated sources into their regulated processes.

### DH-3-CAL *plus* UV-Vis-NIR Calibrated Light Source Options

Contact an Ocean Optics Applications Scientist

Specifications Table

DH-3 Spectral Output Graph

DH-3 Balanced Spectral Output Graph

DH-3 Options

DH-3 *plus* Options

Features	DH-3 <i>plus</i> Models			
	DH-3 <i>plus</i> -CAL	DH-3 <i>plus</i> -CAL-EXT	DH-3 <i>plus</i> -BAL-CAL	DH-3 <i>plus</i> -BAL-CAL-EXT
Extended calibration:	No	Yes	No	Yes
Calibrated wavelength range:	200-400 nm & 350-1100 nm	200-400 nm & 350-2400 nm	230-1100 nm	230-2400 nm
Calibrated for:	Absolute irradiance (μW/nm/cm <sup>2</sup> )	Absolute irradiance (μW/nm/cm <sup>2</sup> )	Absolute irradiance (μW/nm/cm <sup>2</sup> )	Absolute irradiance (μW/nm/cm <sup>2</sup> )
Shutter:	Yes	Yes	Yes	Yes
Calibration uncertainties for one standard deviation (k = 1)	DH-3 <i>plus</i> -CAL	DH-3 <i>plus</i> -CAL-EXT	DH-3 <i>plus</i> -BAL-CAL	DH-3 <i>plus</i> -BAL-CAL-EXT
@ 200 nm	7.5	7.5	NA	NA
@ 230 nm	6.4	6.4	7.0	7.0
@ 250 nm	5.7	5.7	5.9	5.9
@ 300 nm	5.3	5.3	5.4	5.4
@ 500 nm	4.1	4.1	4.4	4.4
@ 700 nm	3.7	3.7	4.0	4.0
@ 900 nm	4.2	4.2	4.5	4.5
@ 1500 nm	NA	4.3	NA	4.6
@ 2200 nm	NA	10.6	NA	10.6

### DH-3-CAL Standard UV-Vis-NIR Calibrated Light Source Options

The DH-3 series of light sources offers as low as 10% uncertainty and a calibration over the range of 230-1100 nm with the option to select an extended calibration to 2400 nm.

Features	DH-3 Models			
	DH-3-CAL	DH-3-CAL-EXT	DH-3-BAL-CAL	DH-3-BAL-CAL-EXT
Extended calibration:	No	Yes	No	Yes
Calibrated wavelength range:	200-400 nm & 350-1100 nm	200-400 nm & 350-2400 nm	230-1100 nm	230-2400 nm
Calibrated for:	Absolute irradiance (μW/nm/cm <sup>2</sup> )	Absolute irradiance (μW/nm/cm <sup>2</sup> )	Absolute irradiance (μW/nm/cm <sup>2</sup> )	Absolute irradiance (μW/nm/cm <sup>2</sup> )
Calibration uncertainty for one standard deviation (k = 1) from 400-1600 nm:	10%	10%	10%	10%

Calibration uncertainty for one standard deviation (k = 1) from 200-350 nm:	13%	13%	13%	13%
Shutter:	No	No	No	No
Spectrometer system connection:	cosine corrector	cosine corrector	cosine corrector	cosine corrector

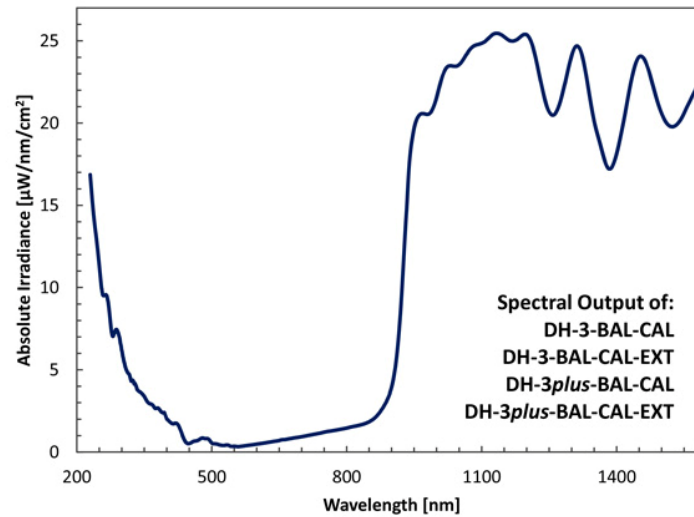
**DH-3-CAL Recalibration Service**

Item	Description
DH-RECAL	Recalibration of DH-3 and DH-3 <i>plus</i> UV-Vis-NIR light sources
DH-EXT-RECAL	Extended-range recalibration of DH-3 and DH-3 <i>plus</i> UV-Vis-NIR light sources

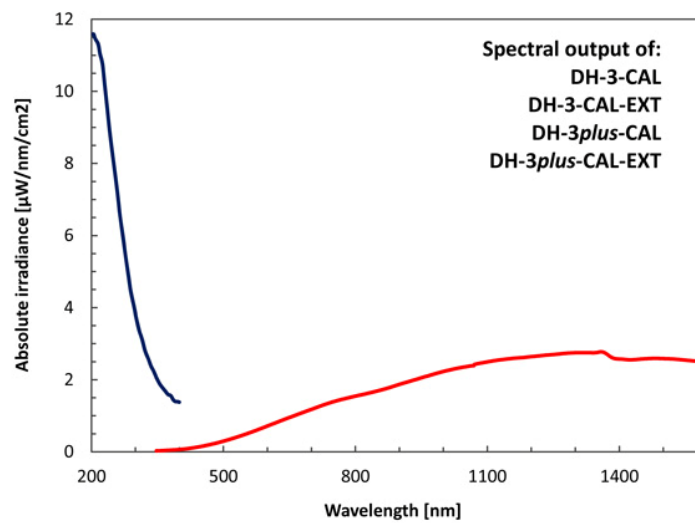
**DH-3-CAL Calibrated Sources -- Specifications**

Calibration valid for:	50 hours
Bulb life:	1500 hours
Time to stabilized output:	~30 minutes
Connector:	CC-3-UV-S or 6.35 mm barrel for cosine corrector

**DH-3-BAL-CAL Balanced Calibrated Source Spectral Output**



**DH-3-CAL Calibrated Source Spectral Output**





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