

# OL SERIES 426-SA

*Automated Integrating Sphere Calibration Standard*

The [OL Series 426-SA Automated Integrating Sphere Calibration Standard](#) is designed for accurately calibrating very sensitive microphotometers, image intensifiers, telephotometers, and imaging spectroradiometers for photometric or spectroradiometric response at moderate to extremely low light levels. It serves as a highly accurate, large area, uniform, diffusely radiating source with a near normal luminance that can be varied over nearly six decades with essentially constant color temperature. The OL Series 426-SA consists of an OL Series 426-SA Optics Head and an OL 400-CS Controller. This enables remote location of either unit that facilitates alignment or positioning of the source with respect to the device to be calibrated.

In order to achieve very low radiance levels that can be tracked accurately with a monitor detector, the instrument is based on a dual integrating sphere design. The arrangement of these spheres is in series, with the exit port of the first (primary) sphere producing a uniform beam into the entrance port of the exit (secondary) sphere.

The instrument is based on the OL 455-SA Integrating Sphere Calibration Standard with a secondary sphere that varies in diameter depending on the radiating port size required. The primary sphere is 6 inches in diameter with a 1.5-inch exit port. A baffle tube connects the exit port of this sphere to the entrance port of the secondary sphere. The source module has a 150-watt tungsten quartz-halogen reflectorized lamp with a motorized variable aperture between the lamp and the integrating sphere. A precision silicon detector-filter combination with an accurate photopic response is mounted in the primary sphere wall and monitors the sphere luminance. The detector is thermally stabilized at a constant temperature to reduce settling time and non-linearity as you increase or decrease the luminance output.

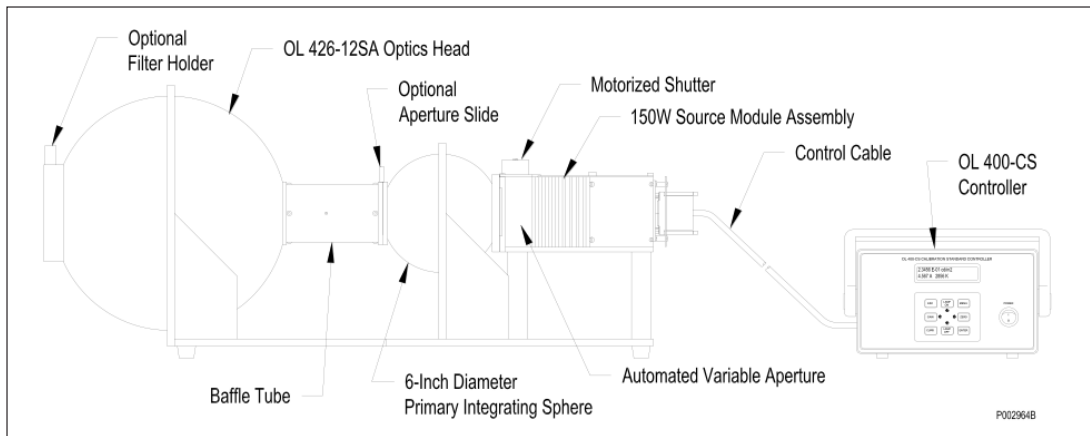
A motorized shutter is located between the lamp and the entrance port of the primary sphere allowing the luminance/radiance output to be switched between zero and any desired level without adjustment or lamp changes.

An optional factory installed aperture in the baffle tube determines how much light will be allowed into the secondary sphere. The size of the aperture in the baffle tube between the primary and secondary spheres determines the attenuation between the spheres, and essentially this can range over many decades, depending on the size of the aperture installed. This aperture is not used to determine the true radiance of the secondary sphere radiating port, but merely to scale it by the desired amount. The actual radiance of the secondary sphere radiating port is calibrated via measurements.

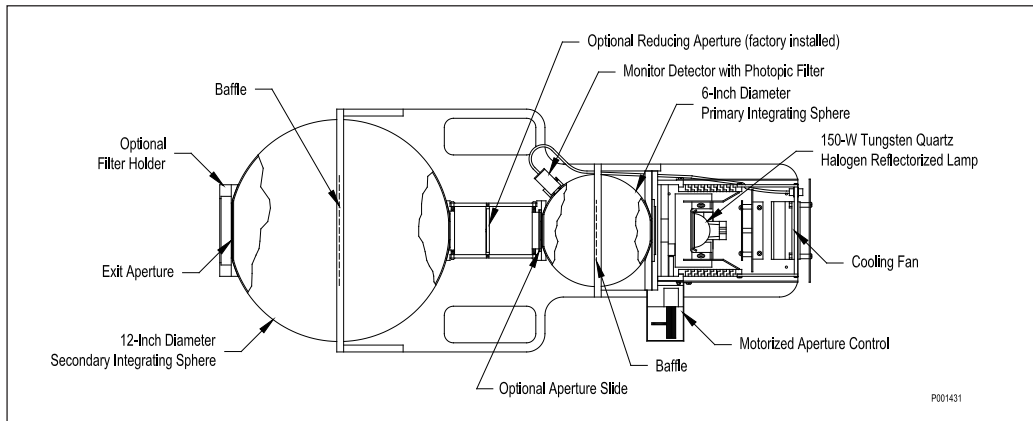
Optional user interchangeable aperture slides at the exit port of the primary sphere can be supplied with a calibration for each aperture. This provides a very broad range of luminance/radiance levels that can be selected by insertion of the aperture slides. The photopic monitor detector on the primary sphere tracks the luminance in the primary sphere and the OL 400-CS Controller display is scaled to indicate the luminance at the exit port of the secondary/exit sphere. When optional aperture slides for the exit port of the intermediate sphere are supplied, unique calibration factors are supplied for each aperture.

The OL Series 426-SA is designed such that it can be configured with secondary integrating spheres having diameters of 6, 8, 12, or 18 inches with exit (radiating) ports of 1.5, 2, 3, and 6 inches diameter respectively.

## OL 426-12SA Integrating Sphere Calibration Standard



## OL 426-12SA Integrating Sphere Calibration Standard (Top View)



### LUMINANCE LEVELS (NOMINAL) SPECIFICATIONS

MODEL NUMBER	EXIT SPHERE DIAMETER	EXIT PORT DIAMETER	UNIFORMITY	MAXIMUM LUMINANCE	
				@ 2856 K	@ 3000 K
<b>OL 426-6SA</b>	6" (15.24 cm)	1.5" (3.81 cm)	±1.0%	40 fL	70 fL
<b>OL 426-8SA</b>	8" (20.32 cm)	2" (5.08 cm)	±1.0%	29 fL	40 fL
<b>OL 426-12SA</b>	12" (30.48 cm)	3" (7.52 cm)	±1.0%	14 fL	23 fL
<b>OL 426-18SA</b>	18" (45.72 cm)	6" (15.24 cm)	±2.0%	4 fL	7 fL

*\*Other configurations available upon request.*

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**Data Sheet: B118 Dec 2020 | Rev B**

As part of our policy of continuous product improvement, we reserve the right to change specifications at any time.

OL 426-OH OPTICS HEAD SPECIFICATIONS	
<b>Luminance Uncertainty</b> <i>(Refer to the Report of Calibration for Luminance Set Point)</i>	± 0.5% <i>(Relative to NIST @ Set Point)</i> ± 2.0% <i>(2300 K to 3000 K)</i> ± 2.0% to ± 3.5 % <i>(2000 K to 2300 K)</i>
<b>Spectral Radiance Uncertainty</b> <i>(@ 550 nm, k=2)</i>	± 2% <i>(Relative to NIST)</i>
<b>Correlated Color Temperature Range</b>	2000 K to 2950 K <i>(± 50 K)</i>
<b>Correlated Color Temperature Uncertainty</b> <i>(k=2)</i>	Less than ± 25 K
<b>Luminance Stability</b> <i>(@ 2856 K)</i>	Short Term: ± 0.5% <i>(After 15 Minutes Warm-up)</i> Long Term: ± 2% <i>(100 Hours of Use or 1 Year)</i>
<b>Radiance Stability</b>	± 0.5% <i>(After 15 Minutes Warm-up)</i> ± 4% @ 350 nm <i>(100 Hours of Use or 1 Year)</i> ± 2% @ 550 nm <i>(100 Hours of Use or 1 Year)</i> ± 3% @ 1000 nm <i>(100 Hours of Use or 1 Year)</i>
<b>Sphere Coating</b> <i>(Reflectance)</i>	>99% <i>(350 nm to 1100 nm)</i>
<b>Sphere Luminance Monitor</b> <i>(Built-In)</i>	High Accuracy Silicon Detector with Filtered CIE Photopic Response <i>(Temperature Stabilized)</i>
<b>Variable Aperture</b>	Automated Precision Motor Controlled
<b>Shutter</b>	Motorized <i>(Open/Close)</i>
<b>Size</b>	<b>OL 426-6SA:</b> 23.74" x 10.33" x 8.38" <i>(65.38 cm x 26.24 cm x 21.29 cm)</i> <b>OL 426-8SA:</b> 27.70" x 10.39" x 9.25" <i>(70.36 cm x 26.37 cm x 23.50 cm)</i> <b>OL 426-12SA:</b> 32.00" x 13.25" x 14.00" <i>(81.28 cm x 33.66 cm x 35.56 cm)</i> <b>OL 426-18SA:</b> 39.23" x 21.27" x 20.25" <i>(97.10 cm x 54.02 cm x 51.44 cm)</i>
<b>Weight</b>	<b>OL 426-6SA:</b> 24 lbs. <i>(10.89 kg)</i> <b>OL 426-8SA:</b> 30 lbs. <i>(13.60 kg)</i> <b>OL 426-12SA:</b> 35.5 lbs. <i>(16.10 kg)</i> <b>OL 426-18SA:</b> 42 lbs. <i>(19.05 kg)</i>

OL 400-CS CONTROLLER SPECIFICATIONS	
CURRENT SOURCE	
<b>Range</b>	0.001 A to 6.600 A
<b>Resolution</b>	0.001 A
<b>Accuracy</b>	0.02 % of Full-Scale
<b>Stability</b>	10 ppm After Warm-up
<b>Line Voltage Sensitivity</b>	< 2 ppm / V
<b>Temperature Sensitivity</b>	< 25 ppm / °C
PHOTOMETER	
<b>Ranges</b>	2E <sup>-10</sup> to 2E <sup>-3</sup> A
<b>Resolution</b>	4 ½ Digits (0.0001 E <sup>-x</sup> A)
<b>Accuracy</b>	E <sup>-3</sup> to E <sup>-7</sup> Ranges...0.05 % + 1 Digit E <sup>-8</sup> to E <sup>-9</sup> Ranges...0.10 % + 1 Digit E <sup>-10</sup> Range...0.50 % + 2 Digits
<b>Range Selector</b>	Auto, Manual or Software Selectable
<b>Response Time</b>	0.1 to 10.0 Seconds
PHYSICAL	
<b>Size</b>	13.25" D x 9.38" W x 5.38" H <i>(33.65 cm x 23.83 cm x 13.67 cm)</i>
<b>Weight</b>	17.5 lb. <i>(7.9 kg)</i>
<b>Power Input</b>	100/115/230 VAC, 3.2/3.2/2 A, 50/60 Hz
<b>Operating Temperature Range</b>	15°C to 35°C
<b>Operating Humidity Range</b>	10 % to 85 % <i>(Non-condensing)</i> ± 2 % @ 550 nm, 100 hours of use or 1 year ± 3 % @ 1100 nm, 100 hours of use or 1 year

CALIBRATION OPTIONS	
<b>OL 426-XSA</b>	Luminance, Correlated Color Temperature
<b>OL 426-XSA-1</b>	Luminance, Correlated Color Temperature, <sup>1</sup> Spectral Radiance <i>(350 to 1100 nm)</i>
<b>OL 426-XSA-2</b>	Luminance, Correlated Color Temperature, <sup>1</sup> Spectral Radiance <i>(350 to 2500 nm)</i>
<b>OL 426-XSA-U</b>	Uncalibrated

\*Note: "X" designates the diameter of the integrating sphere.

<sup>1</sup>Spectral radiance measured at a color temperature of ~3000K unless otherwise specified.

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