

OL SERIES 455-SA

Automated Integrating Sphere Calibration Standard

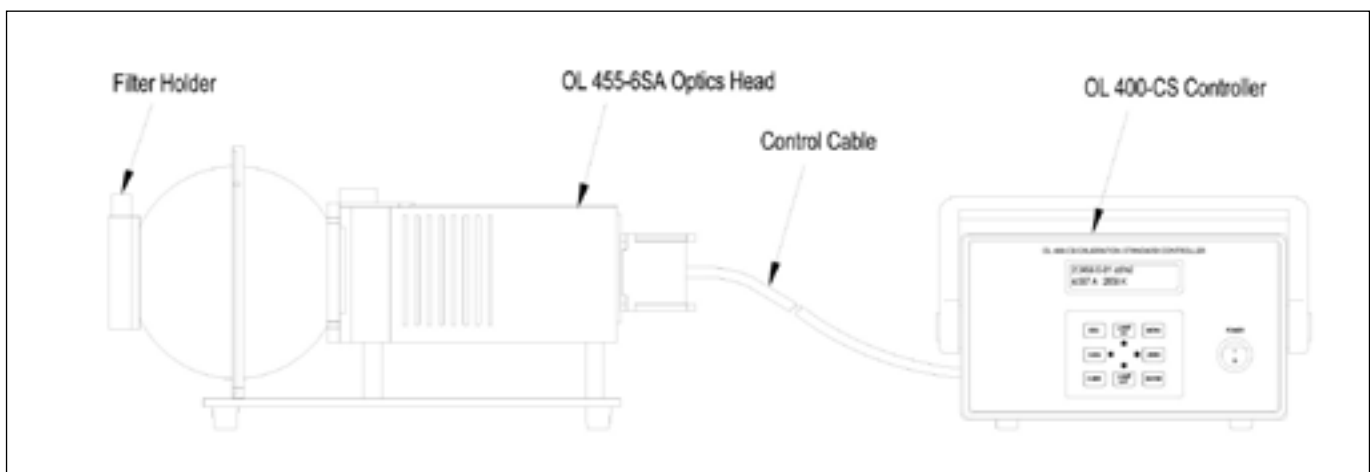
The [OL Series 455-SA Automated Integrating Sphere Calibration Standard](#) is designed for accurately calibrating microphotometers, image intensifiers, telephotometers, and imaging spectroradiometers for photometric, radiometric, and spectroradiometric response. It is a large area, uniform, diffusely radiating source with a near normal luminance that can be varied over many decades without changing the color temperature. The OL Series 455-SA consists of an OL Series 455-SA Optics Head and an OL 400-CS Controller. This enables remote location of either unit which facilitates alignment or positioning of the source with respect to the device to be calibrated. The OL Series 455-SA Optics Head consists of a source module, precision variable aperture, integrating sphere, and temperature stabilized monitor detector.

The source module has a 150-watt tungsten quartz-halogen reflectorized lamp with a motorized variable aperture between the lamp and the integrating sphere. This combination provides for continuous adjustment of the sphere luminance over a range of six decades. The integrating sphere is coated with a highly reflective, diffuse coating and produces a near perfect luminance source.

A precision silicon detector-filter combination with an accurate photopic response is mounted in the 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. The in-line sphere ports design, with an intermediate (center) baffle, provides exceptional luminance levels while maintaining high uniformity in the near normal luminance across the radiating exit port's aperture. A shutter is located between the lamp and the entrance port of the integrating sphere allowing the luminance/radiance output to be switched between zero and any desired level without adjustment or lamp changes. An optional filter holder, mounted at the exit port, accommodates alignment targets, filters, etc. for specific user requirements. Spectral shaping filters can be utilized to simulate various sources such as illuminant A, B, C, D65, etc.

The OL Series 455-SA is designed such that it can be configured with 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 455-OH OPTICS HEAD SPECIFICATIONS	
Luminance Uncertainty at Set Point (@ 2856 K, k=2) <i>(Refer to the report of calibration for luminance set point)</i>	± 0.5% (Relative to NIST) ± 2.0% (2300 K to 3000 K) ± 2.0% to ± 3.5 % (2000 K to 2300 K)
Spectral Radiance Uncertainty (@ 550 nm, k=2)	± 2% (Relative to NIST)
Correlated Color Temperature Range	2000 K to 3000 K
Correlated Color Temperature Uncertainty (k=2)	± 25 K
Luminance Stability (@ 2856 K)	Short Term: ± 0.5% <i>(After 15 Minutes Warm-up)</i> Long Term: ± 2% <i>(100 Hours of Use or 1 Year)</i>
Radiance Stability	± 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>
Sphere Coating (Reflectance)	>99% (350 nm to 1100 nm)
Sphere Luminance Monitor (Built-In)	High Accuracy Silicon Detector with Filtered CIE Photopic Response <i>(Temperature Stabilized)</i>
Variable Aperture	Precision Stepper Motor Controlled
Shutter	Motorized (Open/Close)
Size	OL 455-6SA: 16" L x 11" W x 8" H <i>(40.6 cm x 28 cm x 20.3 cm)</i> OL 455-8SA: 18" L x 12" W x 11" H <i>(45.7 cm x 30.5 cm x 28 cm)</i> OL 455-12SA: 20" L x 14" W x 13" H <i>(50.8 cm x 35.6 cm x 33 cm)</i> OL 455-18SA: 28" L x 20" W x 20" H <i>(71 cm x 50.8 cm x 50.8 cm)</i>
Weight	OL 455-6SA: 16 lbs. (7.3 kg) OL 455-8SA: 19 lbs. (8.6 kg) OL 455-12SA: 33 lbs. (15 kg) OL 455-18SA: 48 lbs. (22 kg)

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

CALIBRATION OPTIONS	
OL 455-XSA	Luminance, Correlated Color Temperature
OL 455-XSA-1	Luminance, Correlated Color Temperature, ¹ / ₁₀ Spectral Radiance <i>(350 to 1100 nm)</i>
OL 455-XSA-2	Luminance, Correlated Color Temperature, ¹ / ₁₀ Spectral Radiance <i>(350 to 2500 nm)</i>
OL 455-XSA-U	Uncalibrated
*Note: "X" designates the diameter of the integrating sphere. ¹ / ₁₀ Spectral radiance measured at a color temperature of ~3000K unless otherwise specified.	

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LABORATORIES

Data Sheet: B118 Dec 2020 | Rev A

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

LUMINANCE LEVELS (NOMINAL) SPECIFICATIONS

MODEL NUMBER	SPHERE DIAMETER	EXIT PORT DIAMETER	UNIFORMITY	MAXIMUM LUMINANCE	
				@ 2856 K	@ 3000 K
OL 455-6SA	6" (15.24 cm)	1.5" (3.81 cm)	±1.0%	12,000 fL	20,000 fL
OL 455-8SA	8" (20.32 cm)	2" (5.08 cm)	±1.0%	9,000 fL	13,000 fL
OL 455-12SA	12" (30.48 cm)	3" (7.52 cm)	±1.0%	4,000 fL	6,400 fL
OL 455-18SA	18" (45.72 cm)	6" (15.24 cm)	±2.0%	700 fL	1100 fL



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