

## **OL 468-39**

# **Wide FOV Automated Integrating Sphere Calibration Standard**

### **GENERAL**

The OL 468-39 Automated Integrating Sphere Calibration Standard is a large area source designed for accurately calibrating instruments such as microphotometers, telephotometers, image intensifiers, cameras, and imaging spectroradiometers that require a source with uniform luminance over a wide field of view. It serves as a highly accurate, large area, uniform, diffusely radiating source with a luminance that can be varied over a range of up to six decades with essentially constant color temperature.

The OL Series 468 consists of a motorized source module (Optics Head) and a microprocessor controlled radiometer/lamp power supply/motor controller (OL 462-C Controller). The sphere is mounted into a rugged support frame with locking casters.

### **OPTICS HEAD**

The Optics Head has a 150-W tungsten-halogen, reflectorized lamp with a motorized microprocessor-controlled variable aperture between the lamp and the entrance port of the integrating sphere. This combination provides for continuous adjustment of the sphere luminance over a range of up to six decades. A precision silicon detector/ filter combination with an accurate photopic response is mounted in the sphere wall and monitors the sphere luminance. All internal surfaces of the sphere are coated with Optolon 2, a durable, hydrophobic, highly reflective diffuse coating. An opal diffuser is mounted at the sphere entrance port to provide uniform illumination of the sphere wall, resulting in exceptional uniformity over a 130 degree field of view at the sphere exit port. The near normal (spatial) uniformity of the exit port is excellent as well. An SMA connector is located adjacent to the monitor detector to allow monitoring of the sphere output with an external fiber coupled device.

A motorized microprocessor-controlled shutter is located between the lamp and the entrance port of the integrating sphere. The luminance/ radiance output can be switched between zero and any desired level without adjustment or changes to the lamp.

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 standard CIE illuminants. In addition to luminance and color temperature, the OL 468-39 can be obtained with a spectral radiance calibration over all or part of the 350 to 2500 nm wavelength range.



### **CONTROLLER**

The microprocessor-based OL 462 Controller performs all the system interface and monitoring functions. An automatic lamp current ramp up/down function eliminates potentially dangerous current surges to the lamp. Luminance, color temperature, lamp current, and operational prompts are displayed on a 2 line by 20 character alphanumeric vacuum-fluorescent display. A 20 key keypad, rotary encoder knob, and main system power switch are also located on the front panel for easy access to all system functions. Luminance is displayed with 5 digit resolution in units specified by the user. As an option, the display can be factory programmed to read in virtually any pertinent units the user desires. DC current supplied to the lamp has a 0.001 ampere resolution with a 0.05% uncertainty. The controller computes the color temperature of the source and displays lamp current or color temperature over the range of 2000 to 3000K.

The luminance, color temperature, and lamp current can also be set by an external computer via the standard RS-232C interface. RS-422 and GPIB (IEEE-488) interfaces are also available. An internal microprocessor controlled elapsed time meter tracks the number of hours the lamp has been in operation.

## OL 468-39 SPECIFICATIONS

### OL 468-39 OPTICS HEAD

Luminance Uncertainty (@ 2856K, 90% max luminance) .....	± 0.5% relative to NIST
Color Temperature Range .....	2000 to 3000 K
Color Temperature Uncertainty .....	± 25 K
Source Stability @ 2856 K	
Short Term .....	± 0.5%
Long Term .....	± 2% 100 hours/ 1 year
Spectral Radiance Uncertainty @ 550 nm .....	± 2% relative to NIST
Sphere Coating .....	Optolon2
Sphere Coating Reflectance .....	> 99% (350 to 1100 nm)
Maximum Luminance (typical) .....	600 fL (3000 K)
.....	380 fL (2856 K)
Angular Uniformity .....	< 2% (130 ° FOV)
Spatial Uniformity .....	< 0.5%
Variable Aperture .....	Automated Micrometer(Motorized)
Shutter .....	Automated (Open/Closed)
Sphere Diameter .....	39.00 in. (99.06 cm)
Exit Port Diameter .....	4.00 in. (10.16 cm)
Wavelength Range .....	350 nm to 1100 nm

### OL 462-C CONTROLLER

Luminance Display (5 digits) .....	fL or cd/m <sup>2</sup> *
Luminance Display Range .....	0.0001 to 50,000 fL (Auto-ranging)
Lamp Current	
Display .....	4 digits
Range .....	0 to 6.500 amperes DC
Power Cycle .....	60 second ramp function
Accuracy .....	± 0.05% @ 6.500 amperes
Regulation .....	± 0.01% for 10% line variation
Temperature Regulation .....	± 0.025% / 10° C
Lamp Timer .....	0 to 1000 hours
Operating Temperature Range .....	15° to 35° C
Operating Humidity Range .....	10% to 85% (noncondensing)
Power (user selectable) .....	115 or 230 VAC ± 10%, 50/60 Hz
Size .....	18 in. x 18 in. x 5¼ in.
Weight .....	39 lbs.
* Luminance can be displayed in other units.	

### CALIBRATION OPTIONS

OL 468-39 .....	luminance, color temperature
OL 468-39-1 .....	luminance, color temperature, <sup>1/</sup> spectral radiance (350 to 1100 nm)
OL 468-39-U .....	uncalibrated
<sup>1/</sup> Spectral radiance measured at a color temperature of ~3000K unless otherwise specified.	