

OL Series 462

Automated Integrating Sphere Calibration Standard



GENERAL

The OL Series 462 Automated Integrating Sphere Calibration Standard is designed for accurately calibrating instruments such as microphotometers, telephotometers, image intensifiers, and imaging spectroradiometers for photometric, radiometric, or spectroradiometric response. It serves as a highly accurate, large area, uniform, diffusely radiating source with a near normal luminance that can be varied over 6 decades with essentially constant color temperature.

The OL Series 462 consists of an Optics Head and a separate microprocessor controlled luminance display/lamp power supply/motor controller console (OL 462-C 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 source module/optics head is designed such that it can be configured with integrating spheres having diameters of 4, 6, 8, 12, and 18 inches with exit (radiating) ports of 1, 1½, 2, 3, and 6 inches, respectively.

OPTICS HEAD

The Optics Head has a 150-W tungsten-halogen, reflectorized lamp with a motorized, computer-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 more than 10^6 . A precision silicon detector/filter combination with an accurate photopic response is mounted in the sphere wall and monitors the sphere luminance. The in-line sphere port concept with an intermediate spider baffle provides exceptional high luminance levels while maintaining high uniformity in the near normal luminance across the radiating aperture.

A motorized, computer-controlled shutter is located between the lamp and the entrance port of the integrating sphere. The uminance/ radiance output can 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, de-coupling diffusers etc. for specific user requirements. Spectral shaping filters can be utilized to simulate various sources such as illuminates A, B, C, D65, etc. In addition to luminance and color temperature, the OL Series 462 can be obtained with calibrations for spectral radiance 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 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 enables the user to keep track of the number of hours the lamp has been in operation.

OL SERIES 462 SPECIFICATIONS

OL 462-OH 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 (reflectance)	> 99% (350 to 1100 nm)
Variable Aperture	Automated Micrometer(Motorized)
Shutter.....	Automated (Open/Closed)

OL 462-C CONTROLLER

Luminance Display (5 digits).....	fL or cd/m ² *
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" x 18" x 5¼"
Weight	39 lbs.

* Luminance can be displayed in other units.

LUMINANCE LEVELS (nominal)

Model Number	Sphere Diameter	Exit Port Diameter	Uniformity	Maximum Luminance		Display Resolution
				@ 2856 K	@ 3000 K	
OL 462-4	4"	1"	±0.5%	22,000 fL	35,000 fL	0.0001 fL
OL 462-6	6"	1½"	±0.5%	12,000 fL	20,000 fL	0.0001 fL
OL 462-8	8"	2"	±0.5%	9,000 fL	13,000 fL	0.0001 fL
OL 462-12	12"	3"	±0.5%	4,000 fL	6,400 fL	0.0001 fL
OL 462-18	18"	6"	±1.0%	700 fL	1,100 fL	0.0001 fL

Other configurations available upon request.

CALIBRATION OPTIONS

OL 462-X	luminance, color temperature
OL 462-X-1	luminance, color temperature, ^{1/} spectral radiance (350 to 1100 nm)
OL 462-X-2	luminance, color temperature, ^{1/} spectral radiance (350 to 2500 nm)
OL 462-X-U.....	uncalibrated

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

^{1/}Spectral radiance measured at a color temperature of ~3000K unless otherwise specified.