National Institute of Standards & Technology

Specifications

Standard Reference Instrument Series 6013

Standard Reference Optical Radiometer

Description: This standard reference instrument (SRI) is an optical radiometric measurement system including a photometer head, amplifier, temperature controller, and other accessories. The photometer head includes an optical window, precision aperture, photometric filter, and photodiode, is sealed and filled with dry nitrogen gas at one atmosphere. It is temperature-regulated using a thermo-electric cooler. The photometer head is specially designed to be free of interference fringes when it is calibrated using a tunable laser facility at NIST. This SRI has two versions. SRI 6013a is an illuminance measurement system and SRI 6013b is a luminance measurement system. The SRI is designed and packaged at NIST. It is constructed from custom parts and commercially available components.

Design, construction, and technical measurements leading to the production of this SRI were performed by Y. Zong, T. Larason, T. Litorja, Wei Ren, and C. C. Miller, NIST Sensor Science Division.

Support aspects involved in the issuance of this SRI were coordinated through the NIST Office of Reference Materials.

Specifications: The SRI 6013a is calibrated for spectral irradiance responsivity to derive the illuminance responsivity. The SRI 6013b is constructed by attaching a Gershun tube on the SRI 6013a to convert illuminance responsivity to luminance responsivity. The uncertainty of the SRI 6013a is approximately 0.2 % ($k = 2$) and the uncertainty of the SRI 6013b is approximately 0.25 % ($k = 2$). The SRI is designed to have good long-term stability, which can be determined by periodical calibrations at NIST or another SI-traceable metrology lab with a similar calibration uncertainty. Therefore, the purchase of the SRI 6013b includes all the components and calibration reports of the 6013a.

Gerald Fraser, Chief
Sensor Science Division

Steven J. Choquette, Director
Office of Reference Materials

Certificate Issue Date: May 28, 2021

Gaithersburg, MD 20899

Specifications: (continued)

The SRI 6013a is composed of the following components that are subjected to change:

1) One cylindrical photometer head with 63.5 mm in diameter and 70 mm in length
2) One temperature controller with a cable
3) One transimpediance amplifier with the gain from 10^4 to 10^9 V/A
4) One low noise cable for connecting photometer head to the amplifier
5) One +/- 15 V low noise power supply (US version) for the amplifier
6) A shipping/storage case specifically designed for the unit will be provided.

The SRI 6013b is composed of a SRI 6013a plus a Gershun tube, 57 mm in diameter and 120 mm in length.

NIST is providing the illuminance/luminance detector through the SRI program with prices derived such that NIST is reimbursed for all costs associated with duplicating the current design.

This SRI is certified with a NIST Special Calibration Service - 37100S "Special photometric, colorimetric, or radiometric test". The customer will receive a Calibration Report for the specific photometer head.

Delivery: Delivery dates will be determined on a case-by-case basis in coordination with the customer and based on the availability of components and NIST staff.

Shipping: The SRI will be packed and shipped to the customer by the NIST Sensor Science Division. Shipping case dimensions and weight will be included in each quote. Customers are responsible for all customs duties, import fees, and the shipping cost.

Installation: Customer is responsible for setup at their location.

Support: NIST staff will provide technical support when needed through email/call during the setup or initial operation of the optical radiometric measurement system.

Users of this SRI should ensure that the Specifications Certificate in their possession is current. This can be accomplished by contacting the Office of Reference Materials: telephone (301) 975-2200; fax (301) 948-3730; e-mail srminfo@nist.gov; or via the Internet at http://www.nist.gov/sri.