

Continuous-Wave Laser Source for Interferometric Measurements

Description: A continuous wave (CW) laser operating at a center wavelength of 532 nm is needed for interferometric measurements of optical phenomena. The laser shall be relatively compact and include all necessary electronics and the associated power supply for operation.

Required Features of the Laser Source:

- Required spatial beam profile: Spatial transverse electric and magnetic (TEM) mode of laser shall be of TEM_{0,0} quality.
- Required polarization state of laser beam: Output laser beam shall be linearly polarized.
- Required longitudinal mode operation: Laser shall operate with single longitudinal mode at 532 nm.
- Required output wavelength: Laser shall produce CW beam at 532 nm.
- Required output power: Laser shall have a continuous output power of 300 mW.
- Required size: Laser head shall be compact and contained within Width×Height×Length dimensions of 6-inch×6-inch×6-inch. Laser power supply and controlling electronics must be contained within Width×Height×Length dimensions of 8-inch×8-inch×8-inch.
- Laser power supply and controlling electronics required for operation of laser shall be included. All necessary cables for operation shall also be included.
- Laser power supply shall operate off of standard 100-240 VAC power connection.
- Required warranty: Laser shall have a 1-year service warranty.

Laser Source Shall Meet or Exceed these Performance Specifications:

- Laser linewidth: Linewidth < 0.01 pm (10 MHz)
- Laser spatial mode: TEM_{0,0}
- Laser output power: 300 mW with CW operation.
- Laser power stability: $\leq \pm 1\%$ (in an 8 hour period)
- Laser noise: < 0.2% (RMS, 20 Hz – 20 MHz)
- Laser beam quality: $M^2 < 1.2$
- Laser beam roundness/ellipticity: $< 1 \pm 0.1$
- Laser beam diameter: < 1 mm
- Laser beam polarization: Linear vertical polarization
- Laser warm up time: < 10 minutes
- Laser system shall have a 1-year service warranty.