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Data Sheet

August 12, 2026

HP / AGILENT

HP / Agilent 5501B Laser Head

The 5501B is a two-frequency Helium-Neon laser head for laser-interferometer positioning systems. It is the form/fit/function replacement for the 5501A with the same polarization, cabling, and electrical power interface, plus improved accuracy and serviceability. The head includes an automatically tuned HeNe laser, control circuits, and a reference optical receiver. It is a Class 2 laser product per 21 CFR 1040.10/1040.11. Instrument Type: Laser Head (Interferometer) Alias: 5501B; Agilent 5501B; HP 5501B; Keysight 5501B Laser type: Helium-Neon, CW, two-frequency Vacuum wavelength accuracy (3 sigma, lifetime): +/-0.1 ppm



MODEL

HP / Agilent 5501B

CALIBRATION

Available on request

CONDITION

Used

STATUS

In stock

RFQ / SKU

5501B

LISTING

<https://aumictechlabs.com/products/5501b-2/>

NIST-traceable cal

SAM registered

30-day returns

NAICS 423690 · 811210 · 541380

This unit

The HP/Agilent 5501B is a two-frequency helium-neon laser head engineered for high-precision metrology and interferometry systems. This continuous-wave (CW) source delivers 180 μ W to 1 mW of optical power at 632.991 nm with exceptional wavelength stability and accuracy. The 5501B automatically maintains frequency lock for reliable performance in demanding measurement applications requiring sub-ppm stability over extended operational lifetimes. Technical Specifications Optical Output Wavelength: 632.991 nm (vacuum wavelength: 632.991372 nm) Beam power: 180 μ W (minimum) to 1 mW (maximum) Beam diameter: 6 mm typical Wavelength accuracy: ± 0.1 ppm (3 sigma, lifetime) Wavelength stability: ± 0.002 ppm (1 hour typical); ± 0.02 ppm (lifetime typical) Reference frequency: 1.55 MHz to 2.4 MHz (varies by

unit configuration) Electrical Requirements Supply voltage: +15 V $\pm$ 0.3 V at 0.79 A max; -15 V $\pm$ 0.3 V at 0.67 A max Operating power: 23 W Warmup power: 35 W Laser tube anode: 1.2 kV to 12 kV DC Physical & Environmental Weight: 3.4 kg (7.5 lb) Warmup time: <10 minutes (5 minutes typical) Magnetic field (non-operating): <5.25 milligauss at 4.6 m distance Cabling clearance: 10.16 cm (4 in) recommendedKey Features Class II laser product (21 CFR 1040.10/1040.11 compliant) Two-frequency CW output for interferometric applications Automatic frequency stabilization Sub-0.002 ppm short-term stability Safety Class I electrical design with protective earth terminalTypical Applications Laser interferometry and displacement measurement Precision positioning and calibration systems Advanced metrology instrumentation Applications demanding ppm-level wavelength accuracyCompatibility & Integration The 5501B integrates into systems requiring dual-frequency laser sources with stable, locked optical output. Dual $\pm$ 15 V supplies and thermal stabilization circuits are required. High voltage hazard present; service restricted to trained personnel.

Features & description

From manufacturer datasheet

Features

- CW two-frequency HeNe laser with automatic tuning
- Built-in reference optical receiver
- Front shutter and cover interlock for laser safety
- NEMA Type 12 enclosure class
- Same interface as 5501A for retrofit applications

Applications

- Laser interferometer linear and angular positioning metrology
- Drop-in replacement for 5501A systems
- Precision machine-tool and stage measurement with HP/Keysight optics

5501B Characteristics / Specifications

PARAMETER	VALUE
Model	5501B
Manufacturer	HP / Agilent
Instrument Type	Laser Head (Interferometer)
Alias	5501B; Agilent 5501B; HP 5501B; Keysight 5501B
Laser type	Helium-Neon, CW, two-frequency
Nominal vacuum wavelength	632.991372 nm
Vacuum wavelength stability one hour	+/-0.002 ppm typical
Vacuum wavelength stability lifetime	+/-0.02 ppm typical
Beam diameter	6 mm typical
Minimum beam power	120 uW (manual); 180 uW (Keysight laser/optics overview)
Maximum beam power	1 mW
Reference frequency	1.5 to 2.0 MHz
Maximum power dissipation	21.9 W
Dimensions	32.5 × 13.2 × 12.7 cm
Weight	3.4 kg (7.5 lb)
Cabling clearance behind unit	7.5 cm
Operating temperature	0 to 40 C
Storage temperature	-40 to +75 C
Operating humidity	0 to 95% RH non-condensing
Safety class	Class 2 Laser Product Notes Specs from HP 5501B Operating and Service Manual and Keysight Optics and Laser Heads technical overview 5964-6190. Confirm beam power sticker and power-supply rails on the installed system.
Wavelength stability	one hour: +/-0.002 ppm typical
Humidity	0 to 95% RH non-condensing
Warm-up time	less than 10 minutes (5 minutes typical)

General Specifications & Supplementary Characteristics

PARAMETER	VALUE
Storage temperature	40 to +75 C
Operating temperature	0 to 40 C
Operating Temperature	0 to 40 C
Humidity	0 to 95% RH non-condensing
Operating humidity	0 to 95% RH non-condensing
Safety class	Class 2 Laser Product Notes Specs from HP 5501B Operating and Service Manual and Keysight Optics and Laser Heads technical overview 5964-6190. Confirm beam power sticker and power-supply rails on the installed system.

Full OEM specifications

Complete technical content extracted from the manufacturer datasheet. Sparse OEM tables are reconstructed as tables below; other text is preserved as paragraphs.

Specifications	
Specifications	
PARAMETER	VALUE
Model	5501B
Manufacturer	HP / Agilent
Instrument Type	Laser Head (Interferometer)
Alias	5501B; Agilent 5501B; HP 5501B; Keysight 5501B
Laser type: Helium-Neon, CW, two-frequency Nominal vacuum wavelength: 632.991372 nm Vacuum wavelength accuracy (3 sigma, lifetime): +/-0.1 ppm Vacuum wavelength accuracy with MIL-STD 45662 cal: +/-0.02 ppm	
Specifications	
PARAMETER	VALUE
Vacuum wavelength stability one hour	+/-0.002 ppm typical
Vacuum wavelength stability lifetime	+/-0.02 ppm typical
Beam diameter	6 mm typical
Minimum beam power	120 uW (manual); 180 uW (Keysight laser/optics overview)
Maximum beam power	1 mW
Reference frequency	1.5 to 2.0 MHz
Warm-up time: less than 10 minutes (5 minutes typical) Power +15 V: +/-0.3 V at 0.79 A max (manual also lists 0.8 A) Power -15 V: +/-0.3 V at 0.67 A max (manual also lists 0.7 A)	
Specifications	
PARAMETER	VALUE
Maximum power dissipation	21.9 W
Dimensions	32.5 x 13.2 x 12.7 cm
Weight	3.4 kg (7.5 lb)
Cabling clearance behind unit	7.5 cm
Operating temperature	0 to 40 C
Storage temperature	-40 to +75 C

PARAMETER	VALUE
Operating humidity	0 to 95% RH non-condensing
Safety class	Class 2 Laser Product

Notes

Specs from HP 5501B Operating and Service Manual and Keysight Optics and Laser Heads technical overview 5964-6190. Confirm beam power sticker and power-supply rails on the installed system.

Laser Safety

laser safety - NEMA Type 12 enclosure class - Same interface as 5501A for retrofit applications Technical Specifications Model: 5501B Manufacturer: HP / Agilent Instrument Type: Laser Head (Interferometer) Alias: 5501B; Agilent 5501B; HP 5501B; Keysight 5501B Laser type: Helium-Neon, CW, two-frequency Nominal vacuum wavelength: 632.991372 nm Vacuum wavelength accuracy (3 sigma, lifetime): +/-0.1 ppm Vacuum

Available from Aumictech

Used and refurbished unit evaluated in-house. Calibration: Available on request. Used · In stock.

Request a quote: sales@aumictech.com · +1 (484) 841-9341

Aumictech

788 S 500 E, Pleasant Grove, UT 84062
sales@aumictech.com · +1 (484) 841-9341
<https://aumictechlabs.com>

NIST-traceable calibration · SAM registered ·
30-day returns
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Technical content from manufacturer specifications. Unit photo/stock from Aumictech listing when available. Specifications subject to OEM documentation and unit condition.