

Vantage[®] TLB-7100

TUNABLE EXTERNAL CAVITY DIODE LASER – LITTROW

The Vantage TLB-7100 Tunable Diode Laser is the latest addition to the New Focus™ family of lasers. An external cavity diode laser, the Vantage adopts the popular Littrow design to offer higher power at a variety of wavelengths to meet your experimental needs. Each laser unit is optimized to a user specified wavelength to deliver top performance and mode-hop-free piezo tuning while providing the option to manually coarse tune to another wavelength. The narrow linewidth measured over 50 ms, exceptional mode-hop-free tuning range, and power and wavelength stability make the Vantage a first in class Littrow.

The Vantage TLB-7100 comes standard with the premium low noise TLB-6800-LN controller with laser head recognition to automatically set the diode temperature and current upper limit to ensure maximum performance and diode lifetimes. The TLB-6800-LN includes an internal function generator, variable piezo gain, USB and RS232 communication, feed forward capability, and intuitive digital interface with real buttons to make your lab life easy.

The Vantage TLB-7100 Advantage

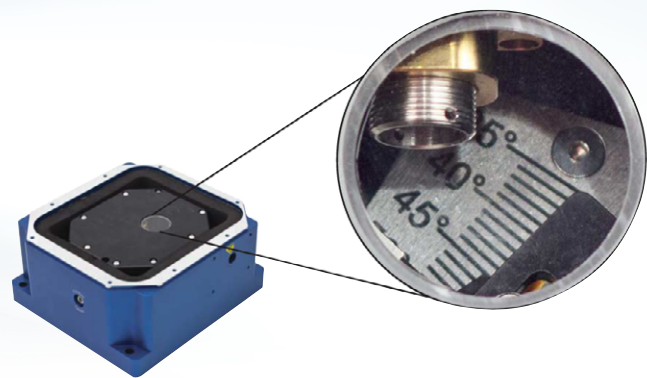
- *Narrow linewidth*
- *Wide and fine tuning*
- *Magnetic damping for mechanical stability*
- *Automatic laser head recognition*
- *Tuning arm viewing window*



Vantage laser head and TLB-6800-LN controller.

Applications

- *Atomic spectroscopy*
- *Laser cooling*
- *BEC and MOT*
- *Interferometry*
- *Atomic clocks*
- *Quantum applications*

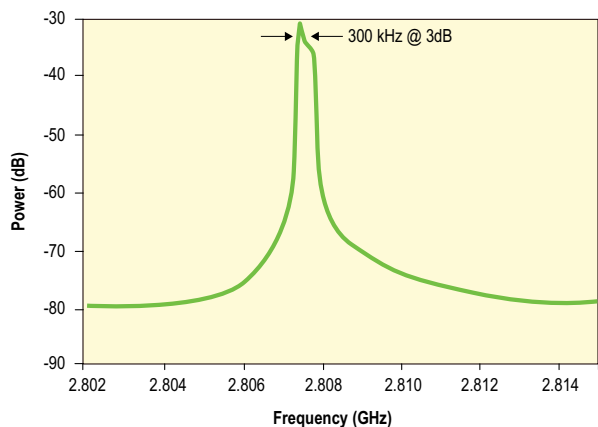


Viewing window on Vantage lid reveals coarse wavelength tuning micrometer.

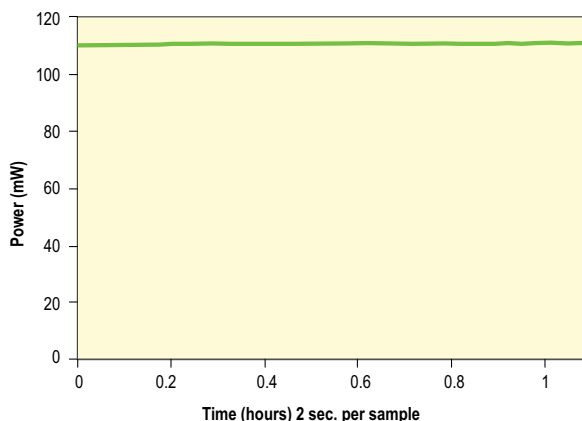
Vantage TLB-7100

Vantage TLB-7100 Typical Performance

Heterodyne beatnote of two Vantage TLB-7100 lasers, 50 ms integration. Deconvoluted linewidth <math>< 300\text{ kHz}</math>¹

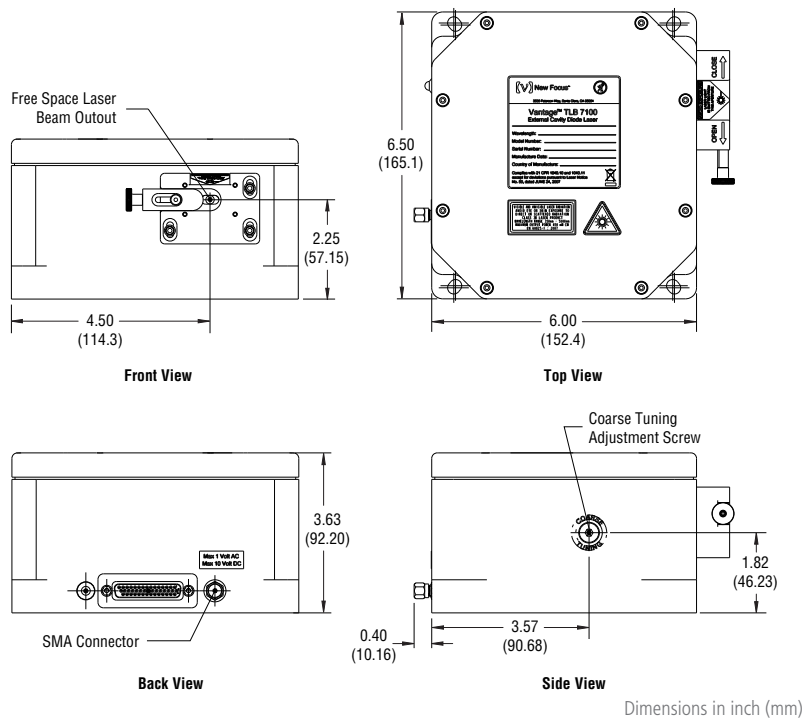


Power stability measurement of the Vantage TLB-7115-01¹

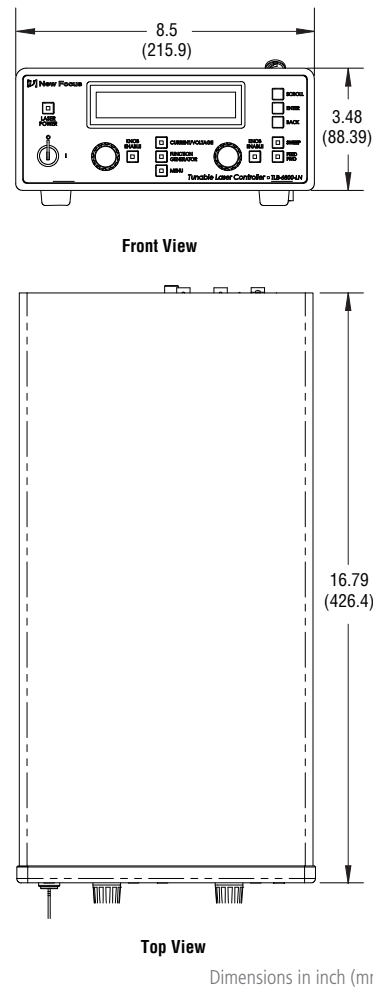


1. Typically measured performance; not a guaranteed or warranted specification.

Vantage TLB-7100 Dimensions



TLB-6800-LN Controller Dimensions



Vantage TLB-7100

Specifications¹

	Tuning Range (Wide) ²	Mode-Hop-Free Tuning Range (Fine)	Free-Space Output Power
TLB-7102-01	392–400 nm	10 GHz (5 pm)	15 mW @ 397 nm
TLB-7102-02	421–423 nm	5 GHz (3 pm)	10 mW @ 423 nm
TLB-7104-02	650–659 nm	10 GHz (15 pm)	15 mW @ 655 nm
TLB-7104-01	671–673 nm	15 GHz (20 pm)	20 mW @ 671 nm
TLB-7113-02	695–703 nm	10 GHz (15 pm)	25 mW @ 702 nm
TLB-7113-01	765–782 nm	50 GHz (100 pm)	90 mW @ 780 nm
TLB-7115-01	830–867 nm	50 GHz (120 pm)	90 mW @ 852 nm
TLB-7115-02	895–920 nm	50 GHz (130 pm)	20 mW @ 895 nm
TLB-7121-01	1051–1075 nm	15 GHz (90 pm)	50 mW @ 1060 nm

Specifications¹

	Value
Linewidth	<300 kHz (integrated over 50 ms)
Wavelength Stability	2 pm (over 1 hour $\pm 2^{\circ}\text{C}$)
Power Stability	<1% (over 1 hour $\pm 2^{\circ}\text{C}$)
Fine Tuning Resolution ³	0.01% of full PZT tuning range
Fine Frequency Modulation Bandwidth	>100 Hz (100% amplitude) >1.5 kHz (20% amplitude)
Fine Frequency Modulation Bandwidth (internal generator)	0.1–100 Hz (100% amplitude)
Current Modulation Bandwidth	DC–1 MHz (through controller) 50 kHz–100 MHz (directly to diode) ⁴
Longitudinal Mode	Single
Transverse Mode	TEM ₀₀
Beam Pointing Stability	<50 μrad ($\pm 2^{\circ}\text{C}$)
Beam Size, typical	2–4 mm
Beam Ellipticity, typical	1:1–3:1
Polarization	Vertical
Optical Output	Free-space
User Interface	Controller front panel, RS-232, USB
Power Supply Requirement	100–240 VAC (50–60 Hz), power consumption <170 W
Environment Temperature, operating	15–30°C
Environment Temperature, storage	0–50°C
Environment Humidity	Non-condensing

1. Due to our continuous product improvement program, specifications are subject to change without notice.
2. Manual wide tuning and PZT fine tuning. Contact us for all available wavelengths. Specifications guaranteed when factory optimized. Select optimized wavelength within tuning range to 0.01 nm in vacuum and contact us for power at specific wavelength.
3. Resolution is 10 mV in PZT (0.01% of full PZT tuning range) through controller front panel or command. When tuning PZT using an external voltage source through External Frequency Modulation input, resolution is dependent on voltage source.
4. Current modulation directly to diode through laser head SMA port.



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