

Thermo Laser Science

VSL-337ND-S Nitrogen Laser

337201-00/01

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Service Manual

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Chapter 1 **GENERAL INFORMATION**

The **VSL-337ND-S** is a high power nitrogen laser utilizing sealed plasma cartridge technology. Pre-aligned resonator optics are an integral part of the plasma cartridge, which eliminates the need for tedious alignment of the laser. The cartridge design produces a constant pulse shape and good pulse stability. The **VSL-337ND-S** nitrogen laser with output of 337nm has several unique capabilities including:

- a 30 Hz pulse rate for synchronization with video cameras
- a 60 Hz pulse rate for timed exposures or photochemical or biological reactions
- flexible triggering and control features for pulse gating or command charging applications
- optically-derived sync pulse for critical timing applications

1.1 Power Supply Dependent Variations

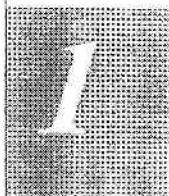
The VSL-337ND-S has two power supply dependent variations:

- 337201-00 (100-120 VAC, 50-60 Hz), 1.5A
- 337201-01 (200-240 VAC, 50-60 Hz), 1.0A

1.2 Applications

The VSL-337ND-S nitrogen laser is designed for many applications including:

- Cell ablation, microsurgery
- Fluorescence excitation
- Micro machining
- Microscopic fluorescent imaging
- Scintillator detector calibration
- Spectroscopy, raman, kinetic
- Stop action photography
- Education, physics, chemistry
- MALDI TOF Mass spectrometry



1.3 Specifications

Table 1. VSL-337ND-S Specifications

Category	Specification
Wavelength	337.1 nm
Spectral bandwidth	.1 nm
Repetition rate	Internal: 0 -30Hz External: 0 - 60 Hz ^{1, 7}
Pulse width (FWHM)	<4 ns
Pulse energy ²	>300 uJ
Pulse to pulse energy stability (10 Hz)	<3.5%, standard deviation as a percent of mean
Peak power	> 75 kW
Average power	> 7.2 mW @ 30 Hz
Beam size (area)	35 sq. mm
Beam divergence (full angle)	.3 mrad
External trigger input ^{3, 7}	TTL, rising edge trigger
External trigger input pulsewidth	100 ns - 1ms
Trigger input, optical pulse delay	< 700 ns
Trigger input, optical pulse temporal jitter	< 40 ns, standard deviation
OptoSync output ⁴	TTL, rising edge trigger, 50 OHM drive capability
OptoSync pulsewidth	10 us, ± 1 us
Optical pulse, Optosync out temporal jitter	< 1 ns, standard deviation
Optical pulse, optosync at delay	≤ 50 ns
Sync output ⁴	TTL, rising edge trigger



Table 1. VSL-337ND-S Specifications

Category	Specification
Sync output pulsewidth	10 us, \pm 1 us
Burst input ^{3,5,7}	TTL level: HI: disable laser firing LO (or float): enable laser firing ⁶
Noise	RFI-EMI shielded
Dimensions	18.20 X 7.62 X 4.62 inches (46.23 cm x 19.36 cm x 11.74 cm)
Weight	16 lbs (7.3 kg)
Power requirements	337201-00: 100-120 VAC, 50-60 Hz, 1.5A 337201-01: 200-240 VAC, 50-60 Hz, 1A
Environmental (temperature operating)	15° C - 35° C

Due to continuous improvement efforts, specifications are subject to change.

1. Above 30 Hz the laser must be operated in burst mode only, externally triggered. From 30 to 45 Hz burst duration must be no longer than 10 seconds, repeated no more than once every 20 seconds. From 45 to 60 Hz, burst duration must be no longer than 10 seconds, repeated no more than once every 30 seconds. Energy roll-off with repetition frequency illustrated in Figure 1.

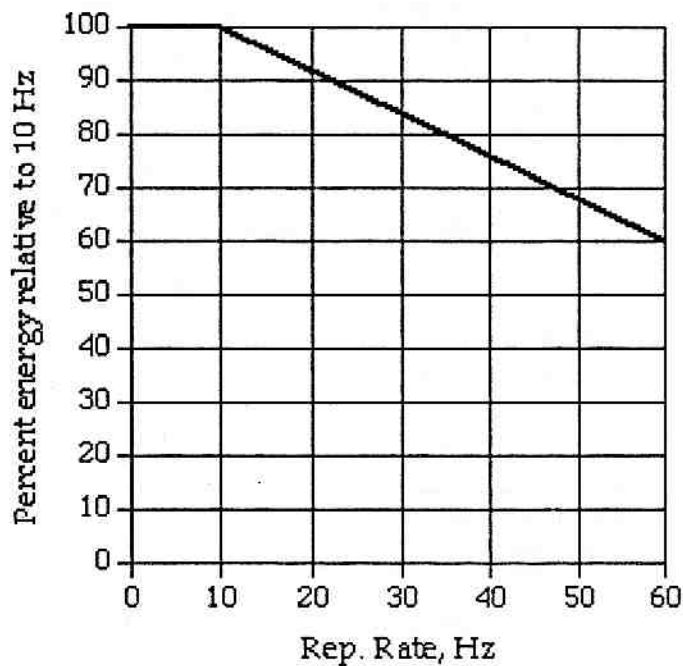


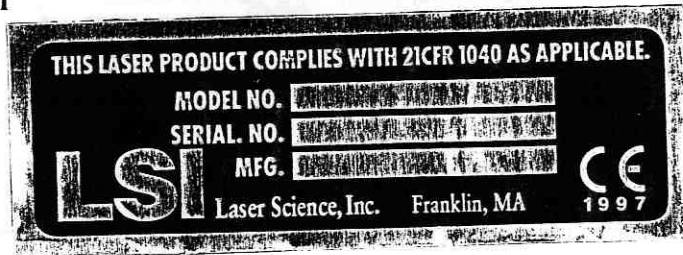
Figure 1. Energy Roll-Off

2. Plasma cartridge is warranted for 20,000,000 pulses or two years. Warranty applies to 70 % of listed energy values.
3. Optoisolated input.
4. Signal available in both external and internal triggering modes.
5. Function can be performed in both external and internal triggering modes.
6. Default condition with no signal applied to input.
7. To externally trigger the laser requires the Burst port be driven HIGH immediately after the Trigger signal's leading edge (which triggers the laser pulse) and held HIGH for the duration desired. The Burst port must be brought LOW prior to the next leading edge of the Trigger signal, with sufficient time to allow the High Volt Power Supply to recharge the laser. The HVPS requires, as a minimum, approximately 15ms to fully charge the laser.

1.4 Labels and Warnings

Per requirements of various federal and multinational regulatory agencies all labels and warnings displayed on, or in, the VSL-337ND-S nitrogen laser are documented herein.

Certification and Identification



High Voltage



The preceding label indicates high voltage: only trained service personnel should service this product.

Class IIIb Laser



Aperture Warning



**Access Panel, Safety
Interlock and
Operator Access
Warning**

