

# NT350 SERIES



NT352 series tunable laser seamlessly integrates in a compact housing a nanosecond optical parametric oscillator and Nd:YAG Q-switched laser.

Three models with different output pulse energy values are offered. The most powerful model has more than 150 mJ pulse energy at 700 nm.

Narrow linewidth ( $<10 \text{ cm}^{-1}$ ) is nearly constant through whole tuning range, which makes laser suitable for many spectroscopy application.

The device is controlled from the remote keypad or from PC through RS232 interface using LabVIEW™ drivers that are supplied with the system. The remote pad features a backlit display that is easy to read even while wearing laser safety glasses.

System is designed for easy and cost-effective maintenance. Replacement of flashlamps can be done without misalignment of the laser cavity and deterioration of laser performance. OPO pump energy monitoring system helps to increase lifetime of the optical components.

Optional items are available allowing optimization of the laser system for Your application, for example:

- ▶ Fiber coupled output in 350–2000 nm range;
- ▶ Efficient second harmonic generator for 330–530 nm range;
- ▶ Pulse energy attenuator;
- ▶ Water-air cooled power supply.

Please inquire custom-build versions and options.

## High Energy NIR Range Tunable Lasers

### FEATURES

- ▶ Hands-free, automated wavelength tuning from **660 to 2450 nm**
- ▶ Up to **150 mJ** pulse energy in near-IR spectral range
- ▶ Narrow linewidth across tuning range
- ▶ **3–5 ns** pulse duration
- ▶ Remote control pad
- ▶ PC control via RS232 and LabVIEW™ drivers
- ▶ Separate output port for 532 nm beam. Output for 1064 nm is optional
- ▶ OPO pump energy monitoring
- ▶ Replacement of the flashlamps can be done without misalignment of the laser cavity
- ▶ Hermetically sealed oscillator cavity protects non-linear crystals from dust and humidity

### APPLICATIONS

- ▶ Photoacoustic imaging
- ▶ Photobiology
- ▶ Remote sensing
- ▶ Time-resolved spectroscopy
- ▶ Non-linear spectroscopy
- ▶ Other laser spectroscopy applications

**SPECIFICATIONS <sup>1)</sup>**

Model	NT352A	NT352B	NT352C
<b>OPO</b>			
Wavelength range			
Signal	660–1064 nm		
Idler	1065–2450 nm		
SH	330–530 nm		
Output pulse energy <sup>2)</sup>			
OPO	70 mJ	110 mJ	150 mJ
SH	12 mJ	20 mJ	25 mJ
Linewidth <sup>3)</sup>			
<10 cm <sup>-1</sup>			
Tuning resolution <sup>4)</sup>			
Signal (660–1064 nm)	1 cm <sup>-1</sup>		
Idler (1064–2450 nm)	1 cm <sup>-1</sup>		
SH (330–530 nm)	2 cm <sup>-1</sup>		
Pulse duration <sup>5)</sup>			
3–5 ns			
Typical beam diameter <sup>6)</sup>			
	5 mm	7 mm	
Typical beam divergence <sup>7)</sup>			
<2 mrad			
Polarization			
Signal beam	horizontal		
Idler beam	vertical		
SH beam	vertical		
<b>PUMP LASER <sup>8)</sup></b>			
Pump wavelength			
	532 nm		
Max pump pulse energy			
	230 mJ	350 mJ	450 mJ
Pulse duration			
	4–6 ns		
Beam quality			
	Hat-Top in near field. Close to Gaussian in far field		
Beam divergence			
	<0.6 mrad		
Pulse energy stability (StdDev)			
	<2.5 %		
Pulse repetition rate			
	10 or 20 Hz	10 Hz	
<b>PHYSICAL CHARACTERISTICS</b>			
Unit size (W × L × H)			
	456 × 610 × 270 mm	456 × 1020 × 270 mm	
Power supply size (W × L × H)			
	330 × 490 × 585 mm	550 × 600 × 530 mm	
Umbilical length			
	2.5 m		
<b>OPERATING REQUIREMENTS</b>			
Water consumption (max 20 °C) <sup>9)</sup>			
	6 l/min	10 l/min	
Room temperature			
	15–30 °C		
Relative humidity			
	20–80 % (non-condensing)		
Power requirements <sup>10)</sup>			
	208 or 240 V AC, single phase 50/60 Hz		
Power consumption <sup>11)</sup>			
	1.8 / 3.4 kVA	1.8 kVA	

<sup>1)</sup> Due to continuous improvement, all specifications are subject to change without notice. The parameters marked typical are not specifications. They are indications of typical performance and will vary with each unit we manufacture. Unless stated otherwise all specifications are measured at 700 nm and for basic system without options.

<sup>2)</sup> Measured at 700 nm for OPO and 350 nm for SH. See tuning curves for typical outputs at other wavelengths.

<sup>3)</sup> In signal and idler range.

<sup>4)</sup> When wavelength is controlled from PC. When wavelength is controlled from keypad, tuning resolution is 0.1 nm for signal, 1 nm for idler and 0.5 nm for SH.

<sup>5)</sup> FWHM measured with photodiode featuring 1 ns rise time and 300 MHz bandwidth oscilloscope.

<sup>6)</sup> Beam diameter is measured at 700 nm at the 1/e<sup>2</sup> level and can vary depending on the pump pulse energy.

<sup>7)</sup> Full angle measured at the FWHM level at 700 nm.

<sup>8)</sup> Separate output port for the 532 nm beam is standard. Output for 1064 nm beam is optional. Pump laser output will be optimized for OPO operation and specification may vary with each unit we manufacture.

<sup>9)</sup> At 10 Hz pulse repetition rate. Air cooled power supply is available as option.

<sup>10)</sup> Mains voltage should be specified when ordering.

<sup>11)</sup> At 10/20 Hz pulse repetition rate.



PERFORMANCE

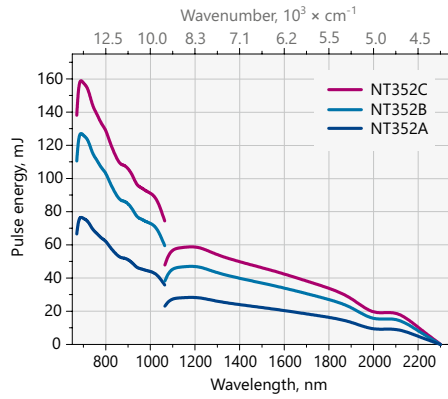


Fig 1. Typical output energy of the NT350 series tunable wavelength systems

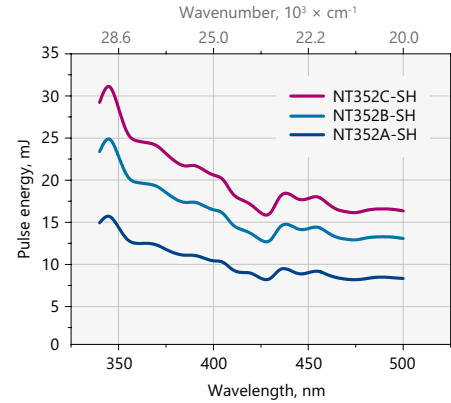


Fig 2. Typical output energy of the NT350 series tunable wavelength systems with SH option

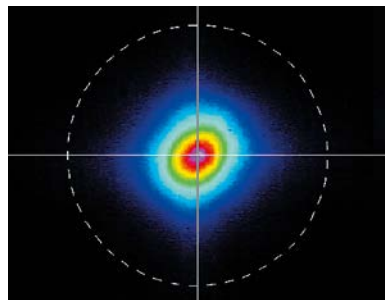


Fig 3. Typical far field beam profile of NT352B laser at 800 nm

ORDERING INFORMATION

**Note:** Laser must be connected to the mains electricity all the time. If there will be no mains electricity for longer than 1 hour then laser (system) needs warm up for a few hours before switching on.

NT352A-10-SH-AW-H

