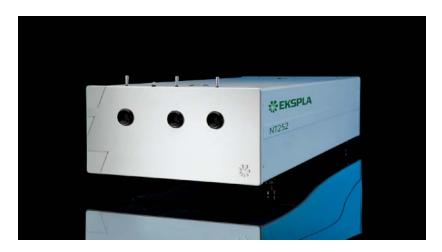
NT260 • NT230 • NT240 • NT250 • NT270 • NT340

NT250 SERIES



BENEFITS

- Hands-free wavelength tuning no need for physical intervention
- ► High repetition rate (1000 Hz) enables fast data collection
- End diode pumping and water-free technology ensure high reliability and low maintenance costs
- ➤ Superior tuning resolution (1 – 2 cm⁻¹) allows recording of high quality spectra
- ► High integration level saves valuable space in the laboratory

- ► In-house design and manufacturing of complete systems, including pump lasers, guarantees on-time warranty and post warranty services and spares supply
- Variety of control interfaces: USB, RS232, LAN and WLAN ensures easy control and integration with other equipment
- Attenuator and fiber coupling options facilitate incorporation of NT250 systems into various experimental environments

NT250 series tunable laser systems integrates into a single compact housing a nanosecond Optical Parametric Oscillator (OPO) and Diode-Pumped Solid–State (DPSS) Q-switched pump laser.

Diode pumping enables fast data acquisition at high pulse repetition rates up to 1 kHz while avoiding frequent flashlamp changes that are common when flashlamp pumped lasers are used. Special cooling technology eliminates the need for tap water, thus further reducing running and maintenance costs.

All lasers feature motorized tuning across the specified tuning range. The output wavelength can be set from control pad with backlit display that is easy to read even while wearing laser safety glasses. Alternatively, the laser can be also controlled from personal computer using supplied LabVIEWTM drivers.

High conversion efficiency, stable output, easy maintenance and compact size make our systems excellent choice for many applications.

Tunable Wavelength UV-NIR Range DPSS Lasers

FEATURES

- Customers recognized reliability
- ► Two years warranty
- ► Integrates DPSS pump laser and OPO into a single housing
- ▶ Dry, no water inside!
- ► Hands-free no-gap wavelength tuning from 335 to 2600 nm*
- ▶ 1000 Hz pulse repetition rate
- ► More than 1.1 mJ output pulse energy in NIR
- ▶ **1–4 ns** pulse duration
- ▶ Remote control via key pad or PC
- * Automatic wavelength scan is programmable

APPLICATIONS

- ▶ Photoacoustic imaging
- Laser-induced fluorescence spectroscopy
- ▶ Pump-probe spectroscopy
- ▶ Photobiology
- Remote sensing
- Metrology

Accessories and Optional Items

Option	Features	
-SH	Tuning range extension in UV range (335 – 670 nm) by second harmonic generation	
-H, -2H	1064 and 532 nm output via separate port	
-FC	Fiber coupled output in 350 – 2000 nm range	
-Attn	Attenuator output in 335 – 2600 nm range	



SPECIFICATIONS 1)

Wavelength range 670−1064 nm Signal 670−1064 nm Idler 1065−2600 nm SH 335−669 nm Pulse energy 1100 μl OPO ® 100 μl SH ® 200 μl Pulse duration ® 1−4 ns Pulse repetition rate 1000 Hz Linewidth ® <10 cm⁻¹ Minimal tuning step ® 5ignal Signal 1 cm⁻¹ Idler 1 cm⁻¹ SH 2 cm⁻¹ Polarization 5ignal Signal horizontal Idler vertical SH horizontal Idler vertical	Model	NT252
Signal 670−1064 nm Idler 1065−2600 nm SH 335−669 nm Pulse energy 1100 μJ OPO ? 1100 μJ SH % 200 μJ Pulse duration 4 1−4 ns Pulse repetition rate 1000 Hz Linewidth % <10 cm⁻¹	ОРО	
Idler 1065 – 2600 nm SH 335 – 669 nm Pulse energy 1100 μJ SH % 200 μJ Pulse duration % 1 – 4 ns Pulse epetition rate 1000 Hz Linewidth % < 10 cm²	Wavelength range	
SH 335–669 nm Pulse energy OPO ²¹ 1100 μJ SH ³⁰ 200 μJ Pulse duration ⁴⁰ 1-4 ns Pulse repetition rate 1000 Hz Linewidth ⁵⁰ 10 cm ⁻¹ Minimal tuning step ⁶⁰ Signal 1 cm ⁻¹ Idler 1 cm ⁻¹ SH 2 cm ⁻¹ Polarization Signal horizontal Idler 2 cm ⁻¹ Polarization Signal horizontal Idler vertical SH 3 6 mm PULMP LASER PUMP LASER PUMP PUMP LASER PUMP pulse energy ⁵⁰ 4 mJ Pulse duration ⁷⁰ 2 - 5 ns Pulse Idler (W × L × H) 456 × 1040 × 297 mm Power supply size (W × L × H) 520 × 400 × 286 mm Umbilical length 2.5 m OPERATING REQUIREMENTS Cooling air-cooled Room temperature Relative humidity 20-80 % (non-condensing) Power requirements 100-240 V AC, single phase 50/60 Hz Prower consumption	Signal	670-1064 nm
Pulse energy OPO ²³ 1100 μ SH ³³ 200 μ Pulse duration ⁴⁰ 1.4 ns Pulse repetition rate 1000 Hz Linewidth ⁵³ 4.10 cm ⁻¹ Minimal tuning step ⁶⁰ Signal 1 cm ⁻¹ Idler 1 cm ⁻¹ SH 2 cm ⁻¹ Polarization Signal horizontal lidler yertical SH horizontal lidler wertical SH horizontal lidler wertical SH horizontal lidler yertical SH horizontal yertical ye	Idler	1065-2600 nm
OPO 20 1100 μJ SH 30 200 μJ Pulse duration 40 1 − 4 ns Pulse repetition rate 1000 Hz Linewidth 50 < 10 cm ⁻¹ Minimal tuning step 40 1 cm ⁻¹ Signal 1 cm ⁻¹ Idler 2 cm ⁻¹ Polarization Signal Signal horizontal Idler vertical SH horizontal Typical beam diameter 70 80 3 × 6 mm PUMP LASER Pump wavelength 50 3 × 6 mm PUMP LASER 532 nm Pupical pump pulse energy 100 4 mJ Pulse duration 100 2 − 5 ns Pulse duration 100 2 − 5 ns Pulse energy stability (StdDev) < 2.5 %	SH	335-669 nm
SH ³⁾ 200 μJ Pulse duration ⁴⁾ 1–4 ns Pulse repetition rate 1000 Hz Linewidth ⁵⁾ < 10 cm ⁴ Minimal tuning step ⁶⁾ Signal 1 cm ⁻¹ Idder 1 cm ⁻¹ SH 2 cm ⁻¹ Polarization Signal horizontal dider vertical SH horizontal idler vertical SH i	Pulse energy	
Pulse duration ⁶ 1–4 ns Pulse repetition rate 1000 Hz Linewidth ⁵⁵ <10 cm ⁻¹ Minimal tuning step ⁶ Signal 1 cm ⁻¹ SH 2 cm ⁻¹ Polarization Signal horizontal diler vertical SH horizontal vertical SH horizontal horizontal interest of mm SH 9 so mm Pulse am diameter ^{77, 69} 3 × 6 mm PUMP LASER Pump wavelength ⁷⁹ 532 nm Typical pump pulse energy ⁷⁰⁵ 4 mJ Pulse duration ⁷¹⁰ 2 − 5 ns Pulse energy stability (StdDev) 2 − 5 ns PHYSICAL CHARACTERISTICS Unit size (W × L × H) 456 × 1040 × 297 mm Power supply size (W × L × H) 520 × 400 × 286 mm Umbilical length 2.5 m OPERATING REQUIREMENTS Relative humidity 20−80 % (non-condensing) Power requirements 100−240 ∨ AC, single phase 50/60 Hz Power consumption 1 cm ⁻¹ 100−240 ∨ AC, single phase 50/60 Hz Power consumption 1 cm ⁻¹ 100−240 ∨ AC, single phase 50/60 Hz Power consumption 1 cm ⁻¹ 100−240 ∨ AC, single phase 50/60 Hz Power consumption 1 cm ⁻¹ 100−240 ∨ AC, single phase 50/60 Hz Power consumption 1 cm ⁻¹ 100−240 ∨ AC, single phase 50/60 Hz Power consumption 1 cm ⁻¹ 100−240 ∨ AC, single phase 50/60 Hz	OPO ²⁾	1100 μJ
Pulse repetition rate 1000 Hz Linewidth 50	SH ³⁾	200 μJ
Linewidth ⁵⁰ <10 cm ⁻¹ Minimal tuning step ⁶⁰ Signal 1 cm ⁻¹ Idler 1 cm ⁻¹ SH 2 cm ⁻¹ Polarization Signal horizontal Idler vertical SH horizontal Idler vertical SH horizontal Idler vertical SH horizontal Typical beam diameter ^{71,80} 3 × 6 mm PUMP LASER Pump wavelength ⁷⁰ 532 nm Typical pump pulse energy ¹⁰⁰ 4 mJ Pulse duration ⁷⁰ 2 − 5 ns Pulse energy stability (StdDev) <2.5 % PHYSICAL CHARACTERISTICS Unit size (W × L × H) 456 × 1040 × 297 mm Power supply size (W × L × H) 520 × 400 × 286 mm Umbilical length 2.5 m OPERATING REQUIREMENTS Cooling air-cooled Room temperature 18 −27 °C Relative humidity 20 −80 % (non-condensing) Power requirements 100 −240 V AC, single phase 50/60 Hz Power consumption <1.5 kW	Pulse duration 4)	1–4 ns
Minimal tuning step ⁶⁾ Signal 1 cm ⁻¹ Idler 1 cm ⁻¹ SH 2 cm ⁻¹ Polarization Signal horizontal Idler vertical SH vertical SH horizontal Idler vertical SH horizontal Idler vertical SH horizontal Typical beam diameter ^{7),8)} 3 × 6 mm PUMP LASER Pump wavelength ⁹⁾ 532 nm Typical pump pulse energy ¹⁰⁾ 4 mJ Pulse duration ¹⁰ 2 − 5 ns Pulse energy stability (StdDev) <2.5 % PHYSICAL CHARACTERISTICS Unit size (W × L × H) 456 × 1040 × 297 mm Power supply size (W × L × H) 520 × 400 × 286 mm Umbilical length 2.5 m OPERATING REQUIREMENTS Cooling air-cooled Room temperature 18−27 °C Relative humidity 20−80 % (non-condensing) Power requirements 100−240 ∨ AC, single phase 50/60 Hz Power consumption <1.5 kW	Pulse repetition rate	1000 Hz
Signal 1 cm ⁻¹ Idler	Linewidth 5)	<10 cm ⁻¹
Idler	Minimal tuning step 6)	
SH	Signal	1 cm ⁻¹
Polarization Signal horizontal Idler vertical SH horizontal Typical beam diameter ^{7) (8)} 3 × 6 mm PUMP LASER Pump wavelength ⁹⁾ 532 nm Typical pump pulse energy ¹⁰⁾ 4 mJ Pulse duration ¹⁰⁾ 2 − 5 ns Pulse energy stability (StdDev) <2.5 % PHYSICAL CHARACTERISTICS Unit size (W × L × H) 456 × 1040 × 297 mm Power supply size (W × L × H) 520 × 400 × 286 mm Umbilical length 2.5 m OPERATING REQUIREMENTS Cooling air-cooled Room temperature 18 − 27 °C Relative humidity 20 − 80 % (non-condensing) Power requirements 100 − 240 ∨ AC, single phase 50/60 Hz Power consumption <1.5 kW	Idler	1 cm ⁻¹
Signal horizontal Idler vertical SH horizontal Typical beam diameter 70 80 3 × 6 mm PUMP LASER Pump wavelength 90 532 nm Typical pump pulse energy 100 4 mJ Pulse duration 10 2 - 5 ns Pulse energy stability (StdDev) < 2.5 % PHYSICAL CHARACTERISTICS Unit size (W × L × H) 456 × 1040 × 297 mm Power supply size (W × L × H) 520 × 400 × 286 mm Umbilical length 2.5 m OPERATING REQUIREMENTS Cooling air-cooled Room temperature 18 - 27 ° C Relative humidity 20 - 80 % (non-condensing) Power requirements 100 - 240 V AC, single phase 50/60 Hz Power consumption < 1.5 kW	SH	2 cm ⁻¹
Idler vertical SH horizontal Typical beam diameter 71-80 3 × 6 mm PUMP LASER Pump wavelength 90 532 nm Typical pump pulse energy 100 4 mJ Pulse duration 110 2 - 5 ns Pulse energy stability (StdDev) <2.5 % PHYSICAL CHARACTERISTICS Unit size (W × L × H) 456 × 1040 × 297 mm Power supply size (W × L × H) 520 × 400 × 286 mm Umbilical length 2.5 m OPERATING REQUIREMENTS Cooling air-cooled Room temperature 18 - 27 °C Relative humidity 20 - 80 % (non-condensing) Power requirements 100 - 240 V AC, single phase 50/60 Hz Power consumption <1.5 kW	Polarization	
SH horizontal Typical beam diameter 71 81 3 × 6 mm PUMP LASER Pump wavelength 91 532 nm Typical pump pulse energy 101 4 mJ Pulse duration 101 2 - 5 ns Pulse energy stability (StdDev) <2.5 % PHYSICAL CHARACTERISTICS Unit size (W × L × H) 456 × 1040 × 297 mm Power supply size (W × L × H) 520 × 400 × 286 mm Umbilical length 2.5 m OPERATING REQUIREMENTS Cooling air-cooled Room temperature 18 - 27 °C Relative humidity 20 - 80 % (non-condensing) Power requirements 100 - 240 V AC, single phase 50/60 Hz Power consumption <1.5 kW	Signal	horizontal
Typical beam diameter ^{7), 8)} 3 × 6 mm PUMP LASER Pump wavelength ⁹⁾ 532 nm Typical pump pulse energy ¹⁰⁾ 4 mJ Pulse duration ¹¹⁾ 2 – 5 ns Pulse energy stability (StdDev) PHYSICAL CHARACTERISTICS Unit size (W × L × H) 456 × 1040 × 297 mm Power supply size (W × L × H) 520 × 400 × 286 mm Umbilical length 2.5 m OPERATING REQUIREMENTS Cooling air-cooled Room temperature 18–27 °C Relative humidity 20–80 % (non-condensing) Power requirements 100–240 V AC, single phase 50/60 Hz Power consumption	Idler	vertical
PUMP LASER Pump wavelength 9) 532 nm Typical pump pulse energy 10) 4 mJ Pulse duration 11) 2 – 5 ns Pulse energy stability (StdDev) <2.5 % PHYSICAL CHARACTERISTICS Unit size (W × L × H) 456 × 1040 × 297 mm Power supply size (W × L × H) 520 × 400 × 286 mm Umbilical length 2.5 m OPERATING REQUIREMENTS Cooling air-cooled Room temperature 18 – 27 °C Relative humidity 20 – 80 % (non-condensing) Power requirements 100 – 240 V AC, single phase 50/60 Hz Power consumption <1.5 kW	SH	horizontal
Pump wavelength ⁹⁾ Typical pump pulse energy ¹⁰⁾ Pulse duration ¹¹⁾ Pulse energy stability (StdDev) PHYSICAL CHARACTERISTICS Unit size (W × L × H) Power supply size (W × L × H) OPERATING REQUIREMENTS Cooling Room temperature Relative humidity Power requirements 100–240 V AC, single phase 50/60 Hz Power consumption 4 mJ 6 mall	Typical beam diameter ^{7) 8)}	3 × 6 mm
Typical pump pulse energy 10) Pulse duration 11) Pulse energy stability (StdDev) PHYSICAL CHARACTERISTICS Unit size (W × L × H) Power supply size (W × L × H) OPERATING REQUIREMENTS Cooling Room temperature Relative humidity Power requirements 100–240 V AC, single phase 50/60 Hz Power consumption 4 mJ 2 – 5 ns 4 mJ 4 mJ 4 mJ 2 – 5 ns 4 mJ 4 mJ 4 mJ 2 – 5 ns 4 mJ 4 mJ 4 mJ 2 – 5 ns 4 mJ 4 mJ 4 mJ 4 mJ 2 – 5 ns 4 mJ 4 mJ 4 nd 4 nd 4 nd 4 mJ 4 nd	PUMP LASER	
Pulse duration ¹¹⁾ Pulse energy stability (StdDev) PHYSICAL CHARACTERISTICS Unit size (W × L × H) Power supply size (W × L × H) OPERATING REQUIREMENTS Cooling Room temperature Relative humidity Power requirements 100–240 V AC, single phase 50/60 Hz Power consumption 2 - 5 ns 4 56 × 1040 × 297 mm 4 56 × 1040 × 297 mm 5 20 × 400 × 286 mm 2 .5 m OPERATING REQUIREMENTS (non-cooled 18–27 °C Relative humidity 100–240 V AC, single phase 50/60 Hz Power consumption < 1.5 kW	Pump wavelength ⁹⁾	532 nm
Pulse energy stability (StdDev) PHYSICAL CHARACTERISTICS Unit size (W × L × H) Power supply size (W × L × H) Umbilical length OPERATING REQUIREMENTS Cooling Room temperature Relative humidity Power requirements 100-240 V AC, single phase 50/60 Hz Power consumption x25 % Power supply size (W × L × H) 520 × 400 × 297 mm 520 × 400 × 286 mm 2.5 m OPERATING REQUIREMENTS Cooling air-cooled 18-27 °C Relative humidity 20-80 % (non-condensing) Power requirements 100-240 V AC, single phase 50/60 Hz x55 kW	Typical pump pulse energy 10)	4 mJ
PHYSICAL CHARACTERISTICS Unit size (W × L × H) 456 × 1040 × 297 mm Power supply size (W × L × H) 520 × 400 × 286 mm Umbilical length 2.5 m OPERATING REQUIREMENTS Cooling air-cooled Room temperature 18–27 °C Relative humidity 20–80 % (non-condensing) Power requirements 100–240 V AC, single phase 50/60 Hz Power consumption <1.5 kW	Pulse duration ¹¹⁾	2 – 5 ns
Unit size (W × L × H) Power supply size (W × L × H) OPERATING REQUIREMENTS Cooling Room temperature Relative humidity Power requirements 100-240 V AC, single phase 50/60 Hz Power consumption 456 × 1040 × 297 mm 456 × 1040 × 297 mm 520 × 400 × 286 mm 2.5 m 2.5 m	Pulse energy stability (StdDev)	<2.5 %
Power supply size (W×L×H) 520×400×286 mm 2.5 m OPERATING REQUIREMENTS Cooling air-cooled Room temperature 18–27 °C Relative humidity 20–80 % (non-condensing) Power requirements 100–240 V AC, single phase 50/60 Hz Power consumption <1.5 kW	PHYSICAL CHARACTERISTICS	
Umbilical length 2.5 m OPERATING REQUIREMENTS Cooling air-cooled Room temperature 18–27 °C Relative humidity 20–80 % (non-condensing) Power requirements 100–240 V AC, single phase 50/60 Hz Power consumption <1.5 kW	Unit size (W × L × H)	456 × 1040 × 297 mm
OPERATING REQUIREMENTS Cooling air-cooled Room temperature 18–27 °C Relative humidity 20–80 % (non-condensing) Power requirements 100–240 V AC, single phase 50/60 Hz Power consumption <1.5 kW	Power supply size (W × L × H)	520 × 400 × 286 mm
Coolingair-cooledRoom temperature18-27 °CRelative humidity20-80 % (non-condensing)Power requirements100-240 V AC, single phase 50/60 HzPower consumption<1.5 kW	Umbilical length	2.5 m
Room temperature 18–27 °C Relative humidity 20–80 % (non-condensing) Power requirements 100–240 V AC, single phase 50/60 Hz Power consumption <1.5 kW	OPERATING REQUIREMENTS	
Relative humidity 20-80 % (non-condensing) Power requirements 100-240 V AC, single phase 50/60 Hz Power consumption <1.5 kW	Cooling	air-cooled
Power requirements 100–240 V AC, single phase 50/60 Hz Power consumption <1.5 kW	Room temperature	18-27 °C
Power consumption <1.5 kW	Relative humidity	20-80 % (non-condensing)
	Power requirements	100-240 V AC, single phase 50/60 Hz
Cleanliness of the room not worse than ISO Class 9	Power consumption	<1.5 kW
	Cleanliness of the room	not worse than ISO Class 9

- Due to continuous improvement, all specifications are subject to change. Parameters marked typical are illustrative; they are indications of typical performance and will vary with each unit we manufacture. Unless stated otherwise, all specifications are measured at 750 nm and for basic system without options.
- ²⁾ Measured at maximum in the interval 700 – 750 nm. See tuning curves for typical outputs at other wavelengths.
- ³⁾ Measured at 400 nm. See tuning curves for typical outputs at other wavelengths.
- Measured at FWHM level with photodiode featuring 1 ns rise time and 300 MHz bandwidth oscilloscope.
- 5) In signal and idler range.

- For manual input from PC. When wavelength is controlled from keypad, tuning resolution is 0.1 nm for signal, 1 nm for idler and 0.05 nm for SH
- Measured at the wavelength indicated in the "Pulse energy" specification row.
- Beam diameter is measured at the 1/e² level at the laser output and can vary depending on the pump pulse energy.
- 9) Separate output port for the 2nd and other harmonic are optional.
- The pump laser pulse energy will be optimized for best OPO performance. The actual pump laser output can vary with each unit we manufacture.
- Measured at FWHM level with photodiode featuring 1 ns rise time and 300 MHz bandwidth oscilloscope.





PERFORMANCE

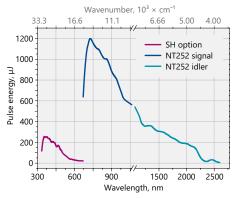


Fig 1. Typical output pulse energy of the NT252-SH tunable laser

OUTLINE DRAWINGS

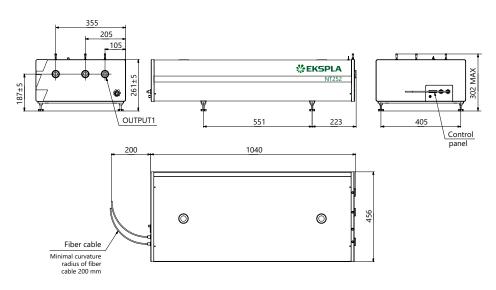
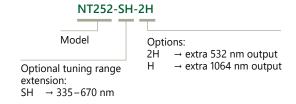


Fig 3. NT252 series laser head dimensions

ORDERING INFORMATION

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





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