EKSPLA

Advanced Laser Technologies

Nanosecond
Lasers & Laser Systems

2025

Rev# 250611

About Company

Background

EKSPLA focuses on the design and manufacturing of advanced lasers & systems and employs 30 years' experience as well as a close partnership with the scientific community. 80 out of the 100 top universities use EKSPLA lasers. The company is leading in the global market for scientific picosecond lasers.

Clients like CERN, NASA, ELI, Max Planck Institutes, Cambridge University and Massachusetts Institute of Technology have chosen Ekspla as their partner.

For scientist who needs unique instrument for research, we provide parameter tailored laser systems that enable customer to perform complex experiments. In-house design and manufacturing ensures operative design, manufacturing and customization of new products.

Highly stable and reliable EKSPLA lasers combined with our own subsidiaries in the US, UK and China as well as more than 20 approved representative offices with properly trained laser engineers worldwide, ensure short response time and fast laser service as well as maintenance.

History

EKSPLA was founded about 30 years ago by a small team of engineers united around the idea of making the most advanced lasers in the world. EKSPLA was independent company with little money, but lots of creativity, and a deep technical understanding of lasers and how useful they could be for research and industry. From the start, the whole team had a deep mutual respect and believed in and supported each other. The first laser was sold at its first launch event, at an international exhibition in Germany. Soon after, the innovation was noticed by partners in Japan, and supply of the systems to leading universities there has been started. The concept of continuous improvement was admired and embraced, so it has become one of the key principles that apply to everything is done.

Contents

Nanosecond Tunable Wavelength Lasers

NT series tunable lasers offer tunable, automated wavelength output from UV to IR out of the one small-footprint box. Integrated into a single compact housing, the diode or flash-lamp pumped Q-switched Nd:YAG laser and OPO offer hands-free, no-gap tuning across the specified 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 controlled also from personal computer using supplied LabVIEW™ drivers.

Most of the pump lasers do not require water for cooling, thus further reducing running and maintenance costs. A built-in OPO pump energy monitor allows monitoring of pump laser performance without the use of external power meters.

Wide range of available options, accessories and modifications enable to tailor laser to better fit for your requirement. High conversion efficiency, stable output, easy maintenance, robust design and compact size make NT series systems an excellent choice for many applications including laser induced fluorescence, flash photolysis, photobiology, metrology, remote sensing and many others.

In the year 2011 the NT series systems has received the Photonics Oscar – Prism Award for Photonics Innovation in Scientific lasers category.

SHORT SELECTION GUIDE

For Your convenience, table contains all available options and highest parameter values. Not all output specifications are available at the same time simultaneously. Please refer to the catalog page for exact specifications and available options.

Model	Output wavelength range	Repetition rate, up to	Pump laser	Special feature	Page
NT260	192–2600 nm	10 kHz	Diode pumped solid state	Narrow linewidth at kHz repetition rate	4
NT230	192–2600 nm	100 Hz	Diode pumped solid state	High, up to 15 mJ pulse energy from OPO	8
NT240	210–2600 nm	1000 Hz	Diode pumped solid state	Broadly tunable kHz pulsed DPSS lasers	12
NT250	335–2600 nm	1000 Hz	Diode pumped solid state	UV-NIR range DPSS lasers	16
NT270	2500–4475 nm	1000 Hz	Diode pumped solid state	Wide IR tuning range at kHz repetition rate	19
NT340	192–4400 nm	20 Hz	Flash-lamp pump laser	Wide range of modifications to tailor for specific applications	22

NT260 SERIES

Narrow Linewidth 10 kHz Tunable Lasers

BENEFITS

- *Hands-free wavelength tuning – no need for physical intervention*
- *High 10 kHz pulse repetition rate – fast data collection*
- *Narrow linewidth (~2 times better than traditional OPO) – high resolution of recorded spectrum*
- *Small M2 beam parameter (~2 times better than traditional OPO) – tight focusing of the beam*
- *Excellent stability (~2 times better than traditional OPO) – fast acquisition of data*
- *Lower generation threshold – increased reliability*
- *Motorized output shutters – increased safety*
- *Clean air purging for prolonged lifetime of optics*
- *Wavelength set in nm and cm^{-1} – easy operation of experiment*
- *High tuning resolution 1-2 cm^{-1} – high quality spectra*
- *Variety of control interfaces: USB, RS232, LAN and WLAN – easy integration with other equipment*
- *PC control using text commands – simple control from any OS*

FEATURES

- *Pioneering patented Q-switched/ mode-locked operation technology*
- *Hands-free no gap wavelength tuning in 192 – 2600 nm range*
- *10 kHz repetition rate*
- *Up to 0.7 W output*
- *Down to 1.5 cm^{-1} linewidth*
- *Integrated monitoring of pump and output power*
- *Integrated fast wavelength scan*
- *Monolithic rugged frame*
- *Transportation handles*
- *Flexible control from keypad or PC*
- *Two years warranty*

APPLICATIONS

- *Metrology & equipment calibration*
- *Alignment of a hyperspectral camera*
- *Time-of-flight mass spectrometry (TOF)*
- *Semiconductor inspection*
- *Evaluation of optical filters*
- *Photoacoustic microscopy*
- *Laser-induced luminescence spectroscopy*
- *Environment monitoring, LIDAR*

NT262 is a unique narrow linewidth 10 kHz OPO. Pioneering patented technology enables powerful up to 0.7 W output in 192 – 2600 nm wavelengths range while maintaining < 3 cm^{-1} (typically < 2 cm^{-1} at most wavelengths) linewidth that is highly beneficial for traditional and specific applications requiring narrow linewidth and high spectral brightness pulses. Thus, besides the most of popular applications, like fluorescence and pump-probe, the system is also suitable for such demanding applications where high resolution and narrow linewidth are required, like the calibration of detectors and spectroradiometers, metrology or gas spectroscopy. High 10 kHz repetition rate and hands-free wavelength tuning makes easy and fast experiment data collection as never before. The system is highly stable, ensures excellent short and long-term energy and power stability, has smaller M^2 value if compared with traditional OPO systems.

In addition to superior specifications, the laser is highly reliable due to low generation threshold and easy running regime. The system fits into monolithic, rugged housing that ensure high reliability and low costs of maintenance.

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SPECIFICATIONS [1]

Model	NT262
OPO	
Wavelength range [2]	
Signal	405 – 710 nm
Idler	710 – 2600 nm
SH/SF generator (optional)	210 – 405 nm
DUV generator (optional)	192 – 210 nm
Output pulse energy/ average power	
OPO [3]	70 µJ / 700 mW
SH/SF generator (optional) [4]	6 µJ / 60 mW
DUV generator (optional) [5]	1 µJ / 1 mW
Minimal tuning step	
Signal (405 – 710 nm)	1 cm^{-1}
Idler (710 – 2600 nm)	1 cm^{-1}
SH/SF (210 – 405 nm)	2 cm^{-1}
DUV (192 – 210 nm)	2 cm^{-1}
Pulse and beam parameters	
Pulse duration [6]	~7 ns
Linewidth [7]	<3 cm^{-1}
Typical beam diameter [8]	4.5 mm × 2.5 mm
Beam pointing stability [9]	≤ 50 µrad RMS
Polarization	
Signal beam	Horizontal
Idler beam	Horizontal
SH/SF	Horizontal
DUV	Vertical
PUMP LASER [10]	
Pump wavelength	355 nm
Typical pump pulse energy	0.3 mJ
Pulse duration	~7 ns
Beam quality	Near Gaussian in near and far fields
Beam divergence	< 1.5 mrad
Pulse energy stability (StdDev)	< 2.5 %
Pulse repetition rate	10 kHz
Nominal lifetime for pump diodes	20 000 hours
Typical warm-up time [11]	15 min
PHYSICAL CHARACTERISTICS	
Laser head size (W × L × H)	400 × 790 × 166 ± 3 mm
Power supply unit size (W × L × H)	553 × 510 × 529 ±3 mm
Umbilical length	3 m
OPERATING REQUIREMENTS	
Cooling [12]	Built-in chiller
Clean air purge	Built-in
Room temperature	18 – 27 °C
Ambient temperature stability	±2°C
Relative humidity	20 – 80 % (non-condensing)
Power requirements	100 – 240 VAC, single phase 50/60 Hz
Power consumption	<1 kW
Cleanliness of the room	Not worse than ISO Class 9

1) 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 450 nm.

2) Hands-free tuning range is from 210 nm to 2600 nm. Wavelengths values at margins are rounded.

3) Measured at 450 nm. See tuning curves for typical outputs at other wavelengths.

4) Measured at 230 nm. See tuning curves for typical outputs at other wavelengths.

5) Measured at the peak of tuning curve. See tuning curves for typical outputs at other wavelengths.

6) FWHM measured with photodiode featuring 1 ns rise time and 300 MHz bandwidth oscilloscope.

7) In signal and idler range. Linewidth is <5 cm^{-1} for 210 – 480 nm range.

8) Beam diameter is measured at 450 nm at the $1/e^2$ level and can vary depending on the pump pulse energy.

9) Beam pointing stability is evaluated as movement of the beam centroid in the focal plane of a focusing element.

10) Laser output will be optimized for OPO operation and specifications may vary with each unit we manufacture.

11) Starting from 22 ºC and stand-by mode.

12) Air cooled. Water cooled under request.

Note: The laser and auxiliary units must be settled in such a place void of dust and aerosols. It is advisable to operate the laser in air conditioned room, provided that the laser is placed at a distance from air conditioning outlets. The laser should be positioned on a solid and flat worktable in horizontal position. Access from one side should be ensured. Intensive sources of vibration should be avoided near the laboratory (ex. railway station or similar).

OPTIONS

Option	Features
-SH/SF	Tuning range extension in 210 – 405 nm range by combining second harmonics and sum-frequency generator outputs for maximum possible pulse energy
-DUV	Deep UV option for 192 – 210 nm range output
-FC	Fiber coupled output in 350 – 2000 nm range
-ATTN	Attenuator output in 210 – 2600 nm range
-SCU	Spectral filtering accessory for improved spectral purity of pulses

PERFORMANCE

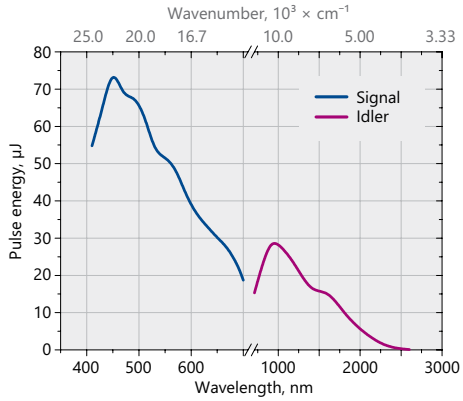

Fig 1. Typical (smoothed) NT262 laser tuning curves in signal (405 – 710 nm), idler (710 – 2600 nm) ranges

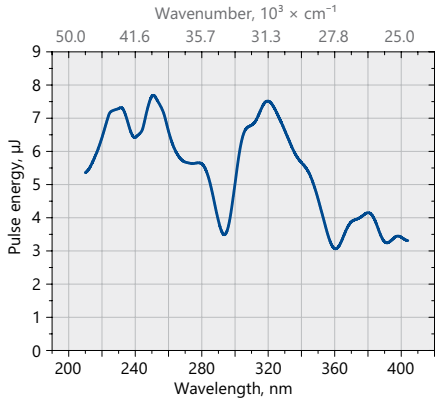

Fig 2. Typical (smoothed) NT262 laser output with –SH/SF option (210 – 405 nm) range

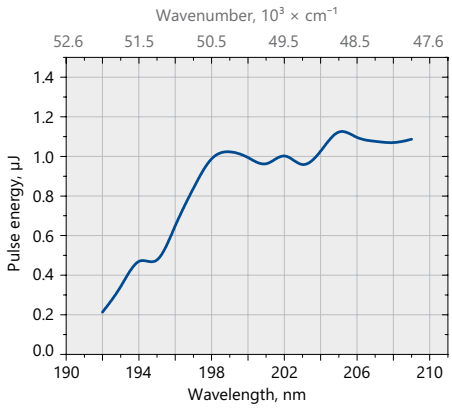

Fig 3. Typical (smoothed) NT262 laser output with –DUV option (192 – 210 nm) range

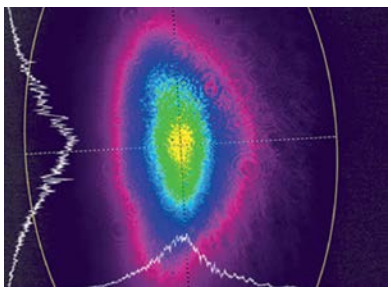

Fig 4. NT262 series laser beam profile at 450 nm in near field

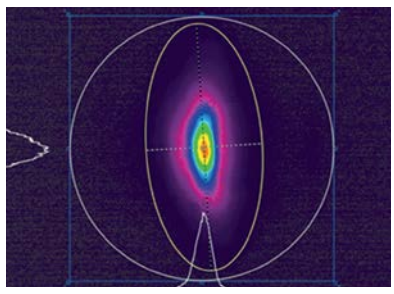

Fig 5. NT262 series laser beam profile at 450 nm in far field

OUTLINE DRAWINGS

Fig 5. For easier transportation and integration NT262 features removable handles

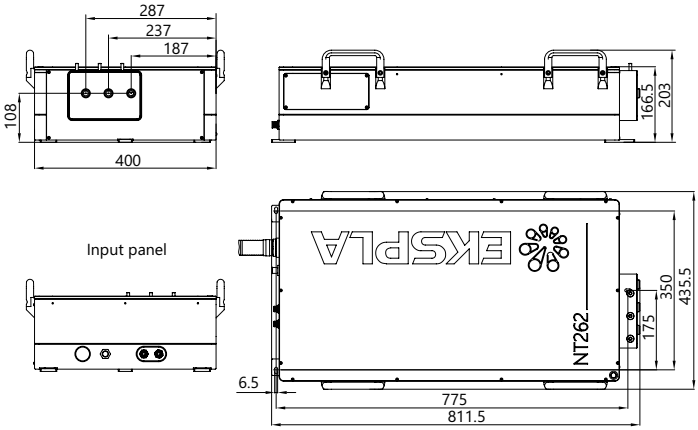

Fig 6. NT262 series laser head dimensions (without options)

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.

NT262-SH/SF-FC-ATTN

Model

Optional tuning range extension:
SH/SF → 210–405 nm
DUV → 192–210 nm

Options:
FC → fiber coupled output
ATTN → attenuator output
SCU → spectral filtering accessory
H → extra 1064 nm output

NT230 SERIES

High Energy Broadly Tunable DPSS Lasers

BENEFITS

- *Hands-free wavelength tuning – no need for physical intervention*
- *The system is widely tunable; 192 – 2600 nm and delivers high pulse energy (up to 15 mJ) which allows investigation of an extensive range of materials*
- *High repetition rate (up to 100 Hz) and output power enable fast data collection and intensive excitation of materials*
- *Narrow linewidth (down to 3 cm^{-1}) and superior tuning resolution (1 – 2 cm^{-1}) allow recording of high quality spectra*
- *High integration level saves valuable space in the laboratory*
- *Diode pumping reduces maintenance frequency*
- *Automatic electromechanical output shutters ensure high level of safety*
- *User friendly extendable handles ease transportation and repositioning of laser*
- *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 NT230 systems into various experimental environments*

FEATURES

- *Customers recognized reliability*
- *Two years warranty*
- *Integrates DPSS pump laser and OPO into a single housing*
- *Hands-free no-gap wavelength tuning **from 192 to 2600 nm****
- *Up to **15 mJ** pulse energy from OPO*
- *Up to **100 Hz** pulse repetition rate*
- *Up to **2 mJ** output pulse energy **in UV***
- *Less than **5 cm^{-1}** linewidth*
- ***2–5 ns** pulse duration*
- *Electromechanical output shutters*
- *Transportation handles*
- *355 nm & 1064 nm laser outputs*
- *532 nm output (optional)*
- *Remote control via key pad or PC*

** Automatic wavelength scan is programmable*

APPLICATIONS

- *Laser-induced fluorescence*
- *Flash photolysis*
- *Photobiology*
- *Remote sensing*
- *Metrology*
- *Non-linear spectroscopy*
- *Photo acoustic imaging*

NT230 series lasers deliver high up to 10 mJ energy pulses at 100 Hz pulse repetition rate, tunable over a broad spectral range. Integrated into a single compact housing, the diode pumped Q-switched Nd:YAG laser and Optical Paramteric Oscillator (OPO) offers hands free, no-gap tuning from 192 to 2600 nm. With its 100 Hz repetition rate, the NT230 series laser establishes itself as a versatile tool for many laboratory applications, as laser induced fluorescence, flash photolysis, photobiology, metrology, remote sensing, etc.

Due to the innovative diode pumped design, NT230 series lasers feature maintenance-free laser operation for an extended period of time and improved stability (compared with flash-lamp pumped counterparts).

NT230 series systems can be controlled from a remote control pad or/and a computer. The control pad allows easy control of all parameters and features on a backlit system display that is easy to read even with laser safety eyewear.

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SPECIFICATIONS [1]

Model	NT230-50	NT230-100
OPO		
Wavelength range		
Signal	405–710 nm	
Idler	710–2600 nm	
SH and SF	210–405 nm [2]	
DUV	192–210 nm	
Pulse energy [3]		
OPO	15 mJ	10 mJ
SH and SF [4]	1.8 mJ	1.3 mJ
DUV	0.4 mJ	0.27 mJ
Pulse repetition rate	50 Hz	100 Hz
Pulse duration [5]	2–5 ns	
Linewidth [6]	<5 cm^{-1}	
Minimal tuning step [7]		
Signal	1 cm^{-1}	
Idler	1 cm^{-1}	
SH/SF/DUV	2 cm^{-1}	
Polarization		
Signal	horizontal	
Idler	vertical	
SH/SF	horizontal	
DUV	vertical	
OPO beam divergence [8]	<2 mrad	
Typical beam diameter [9]	5 mm	
PUMP LASER		
Pump wavelength [10]	355 nm	
Typical pump pulse energy [11]	50 mJ	35 mJ
Pulse duration [6]	2–5 ns	
PHYSICAL CHARACTERISTICS		
Unit size (W × L × H)	451 × 705 × 172 mm	
Power supply size (W × L × H)	449 × 376 × 140 mm	
External chiller	inquire	
Umbilical length	2.5 m	
OPERATING REQUIREMENTS		
Cooling	external chiller	
Room temperature	18–30 °C	
Relative humidity	20–80 % (non-condensing)	
Power requirements	100–240 V AC, single phase, 50/60 Hz	
Power consumption	<1.8 kW	
Cleanliness of the room	not worse than ISO Class 9	

1) 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 450 nm and for basic system without options.

2) Separate –SH and –SF options are available.

3) See tuning curves for typical outputs at other wavelengths.

4) Measured at 260 nm wavelength.

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

6) Linewidth is <8 cm^{-1} for 210 – 405 nm range.

7) 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 0.05 nm for SH, SF and DUV.

8) Full angle measured at the FWHM level at 450 nm.

9) Beam diameter is measured at 450 nm at the $1/e^2$ level and can vary depending on the pump pulse energy.

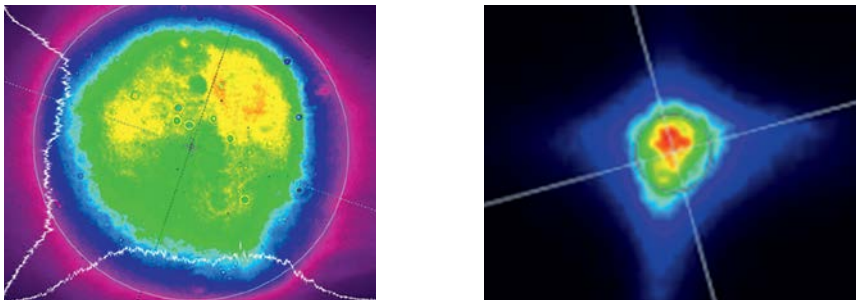
10) Separate output port for the fundamental and 3rd harmonic beam is standard. Output ports for other harmonic are optional.

11) The pump laser pulse energy will be optimized for best OPO performance and can vary with each unit we manufacture.

Accessories and optional items

Option	Features
-SH	Tuning range extension in UV range (210–405 nm) by second harmonic generation
-SF	Tuning range extension in 300–405 nm range by sum-frequency generation
-SH/SF	Tuning range extension in 210–405 nm range by combining second harmonic and sum-frequency generator outputs for maximum possible pulse energy
-DUV	Deep UV option for 192 – 210 nm range output
-2H	532 nm output
-FC	Fiber coupled output in 350–2000 nm range
-ATTN	Attenuator output in 350–2600 nm range
-SCU	Spectral filtering accessory for improved spectral purity of pulses
-FWS	Fast wavelength scanning for signal or idler ranges, wavelength shift time <30 ms

PERFORMANCE



Near field Far field

Fig 1. Typical beam profiles of NT230 series lasers at 450 nm

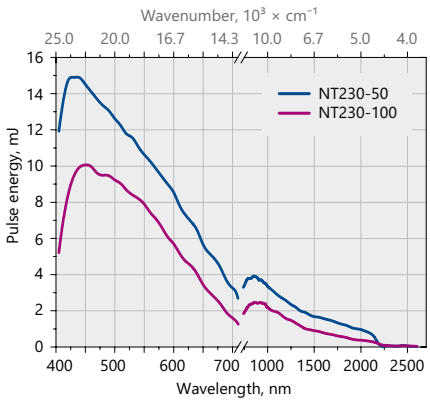


Fig 2. Typical output pulse energy of NT230 laser

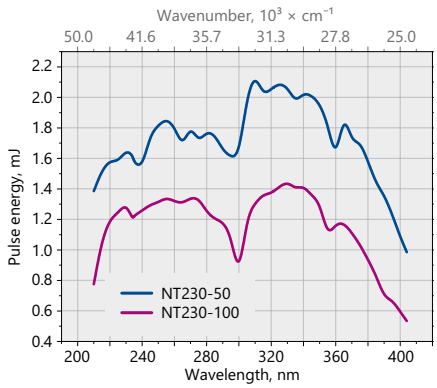


Fig 3. Typical output pulse energy of NT230 laser with SH/SF extension

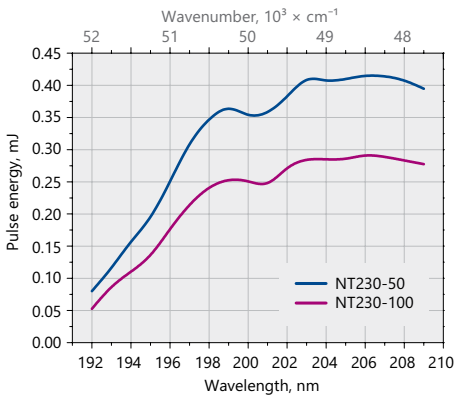


Fig 4. Typical output pulse energy of NT230 laser with DUV extension

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OUTLINE DRAWINGS

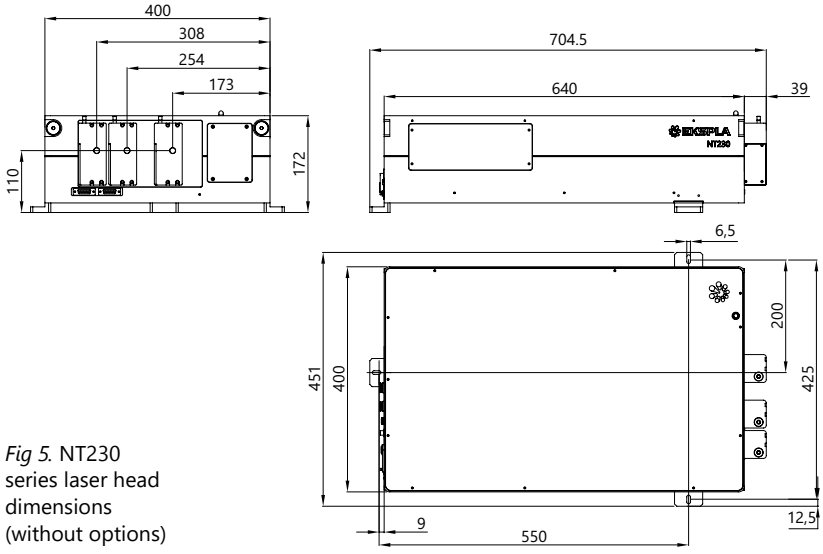


Fig 5. NT230 series laser head dimensions (without options)

Fig 6. For easier transportation laser features integrated carrying handles, which can be hidden inside, when not in need

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.

NT230-50-SH-2H-SCU

- Model
- Pulse repetition rate in Hz
- Optional tuning range extension:
  - SH → 210–405 nm
  - SF → 300–405 nm
  - SH/SF → 210–405 nm
  - DUV → 192–210 nm
- Options:
  - 2H → extra 532 nm output
  - SCU → spectral filtering accessory

Prism award nominee

NT240 SERIES

Broadly Tunable kHz Pulsed DPSS Lasers

BENEFITS

- *Hands-free wavelength tuning – no need for physical intervention*
- *High repetition rate 1000 Hz enables fast data collection*
- *End pumping with diode technology ensures high reliability and low maintenance costs*
- *Narrow linewidth (down to 3 cm^{-1}) and superior tuning resolution (1 – 2 cm^{-1}) allow 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 NT240 systems into various experimental environments*

FEATURES

- *Customers recognized reliability*
- *Two years warranty*
- *Integrates DPSS pump laser and OPO into a single housing*
- *Hands-free no-gap wavelength tuning from **210** to **2600 nm****
- ***1000 Hz** pulse repetition rate*
- *More than **60 µJ** output pulse energy in UV*
- *Less than **5 cm^{-1}** linewidth*
- ***3–6 ns** pulse duration*
- *Remote control via key pad or PC*
- *Optional separate output for the OPO pump beam 355 nm, 532 nm or 1064 nm*

** Automatic wavelength scan is programmable*

APPLICATIONS

- *Laser-induced fluorescence spectroscopy*
- *Pump-probe spectroscopy*
- *Non-linear spectroscopy*
- *Time-resolved spectroscopy*
- *Photobiology*
- *Remote sensing*
- *Determination of the telescope throughput*

NT240 series lasers produce pulses at an unprecedented 1 kHz pulse repetition rate, tunable over a broad spectral range. Integrated into a single compact housing, the diode pumped Q-switched Nd:YAG laser and OPO offers hands-free, no-gap tuning from 210 to 2600 nm. With its 1000 Hz repetition rate, the NT240 series laser establishes itself as a versatile tool for many laboratory applications, including laser induced fluorescence, flash photolysis, photobiology, metrology, remote sensing, etc.

NT240 series systems can be controlled from a remote control pad or/and a computer using supplied LabVIEW™ drivers. The control pad allows easy control of all parameters and features on a backlit display that is easy to read even with laser safety eyewear.

Thanks to a DPSS pump source, the laser requires little maintenance. It is equipped with air-cooled built-in chiller, which further reduces running costs. A built-in OPO pump energy monitor allows monitoring of pump laser performance without the use of external power meters. The optional feature provides a separate output port for the 1064, 532 or 355 nm beam.

SPECIFICATIONS [1]

Model	NT242	NT242-SH	NT242-SF	NT242-SH/SF
OPO				
Wavelength range				
Signal	405–710 nm			
Idler	710–2600 nm			
SH and SF	—	210–300 nm	300–405 nm	210–405 nm
Pulse energy [2]				
OPO	450 µJ			
SH and SF	—	40 µJ at 230 nm	60 µJ at 320 nm	
Pulse repetition rate	1000 Hz			
Pulse duration [3]	3–6 ns			
Linewidth [4]	< 5 cm^{-1}			
Minimal tuning step [5]				
Signal	1 cm^{-1}			
Idler	1 cm^{-1}			
SH and SF	—	2 cm^{-1}		
Polarization				
Signal	horizontal			
Idler	vertical			
SH and SF	—	vertical		
Typical beam diameter [6]	3 × 6 mm			
PUMP LASER				
Pump wavelength [7]	355 nm		355 / 1064 nm	
Typical pump pulse energy [8]	3 mJ		3 / 1 mJ	
Pulse duration [3]	4–6 ns at 1064 nm			
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	built-in chiller			
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			
Cleanliness of the room	not worse than ISO Class 9			

1) 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 450 nm and for basic system without options.

2) See tuning curves for typical outputs at other wavelengths.

3) Measured at FWHM level with photodiode featuring 1 ns rise time and 300 MHz bandwidth oscilloscope.

4) Linewidth is <8 cm^{-1} for 210–405 nm range.

5) 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 and SF.

6) Beam diameter is measured at 450 nm at the $1/e^2$ level and can vary depending on the pump pulse energy.

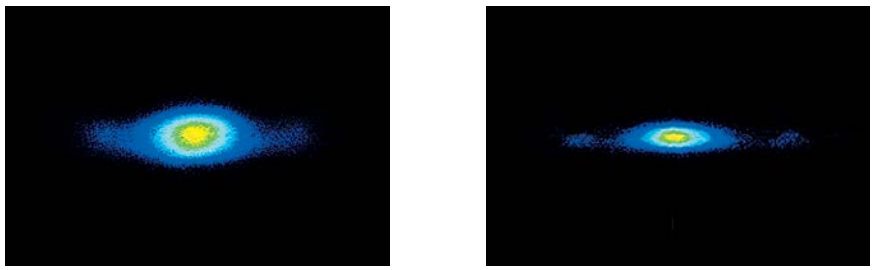
7) Separate output port for the 3rd and other harmonic is optional.

8) The pump laser pulse energy will be optimized for best OPO performance. The actual pump laser output can vary with each unit we manufacture.

Accessories and optional items

Option	Features
-SH	Tuning range extension in UV range (210–300 nm) by second harmonic generation
-SF	Tuning range extension in 300–405 nm range by sum-frequency generation
-SH/SF	Tuning range extension in 210 – 405 nm range by combining second harmonics and sum-frequency generator outputs for maximum possible pulse energy
-SCU	Spectral filtering accessory for improved spectral purity of pulses
-H, -2H, -3H	1064, 532 and 355 nm output via separate port
-FC	Fiber coupled output in 350 – 2000 nm range
-Attn	Attenuator output in 210 – 2600 nm range

PERFORMANCE



Near field Far field

Fig 1. Typical beam profiles of NT242 series lasers at 500 nm

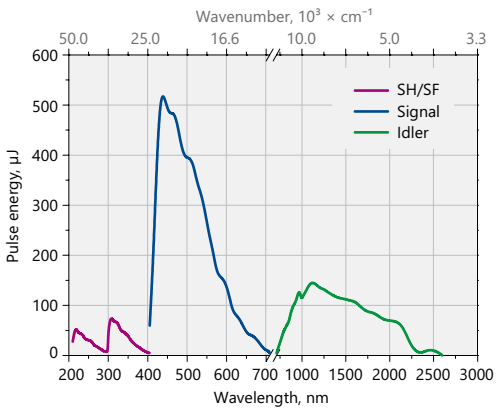


Fig 2. Typical output pulse energy of NT242 series tunable laser

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OUTLINE DRAWINGS

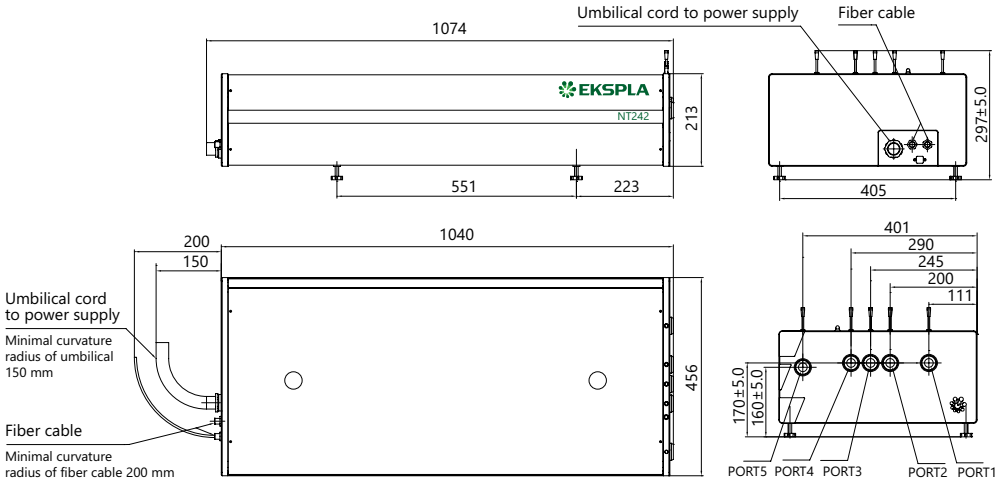


Fig 3. NT242 series laser head dimensions

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.

NT242-SH-H-2H-SCU

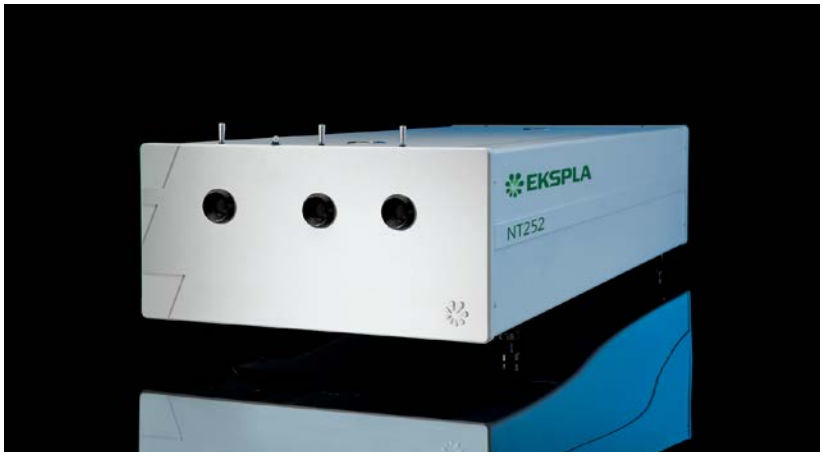
Model

Optional tuning range extension:
SH → 210–300 nm
SF → 300–405 nm
SH/SF → 210–405 nm

Options:
H → extra 1064 nm output
2H → extra 532 nm output
SCU → spectral filtering accessory

NT250 SERIES

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*

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*

APPLICATIONS

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

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 LabVIEW™ drivers.

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

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]

Model	NT252
OPO	
Wavelength range	
Signal	670–1064 nm
Idler	1065–2600 nm
SH	335–669 nm
Pulse energy	
OPO [2]	1100 µJ
SH [3]	200 µJ
Pulse duration [4]	1–4 ns
Pulse repetition rate	1000 Hz
Linewidth [5]	<10 cm^{-1}
Minimal tuning step [6]	
Signal	1 cm^{-1}
Idler	1 cm^{-1}
SH	2 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 [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
Cleanliness of the room	not worse than ISO Class 9

1) 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.

4) Measured at FWHM level with photodiode featuring 1 ns rise time and 300 MHz bandwidth oscilloscope.

5) In signal and idler range.

6) 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.

7) Measured at the wavelength indicated in the "Pulse energy" specification row.

8) Beam diameter is measured at the $1/e^2$ 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.

10) The pump laser pulse energy will be optimized for best OPO performance. The actual pump laser output can vary with each unit we manufacture.

11) Measured at FWHM level with photodiode featuring 1 ns rise time and 300 MHz bandwidth oscilloscope.

PERFORMANCE

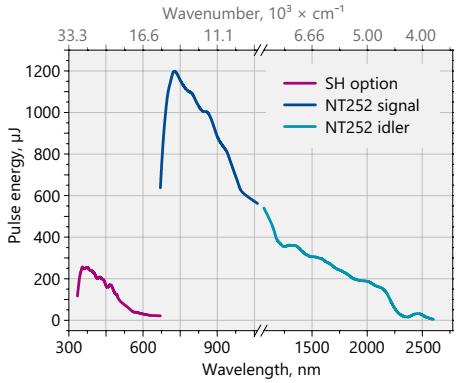


Fig 1. Typical output pulse energy of the NT252-SH tunable laser

OUTLINE DRAWINGS

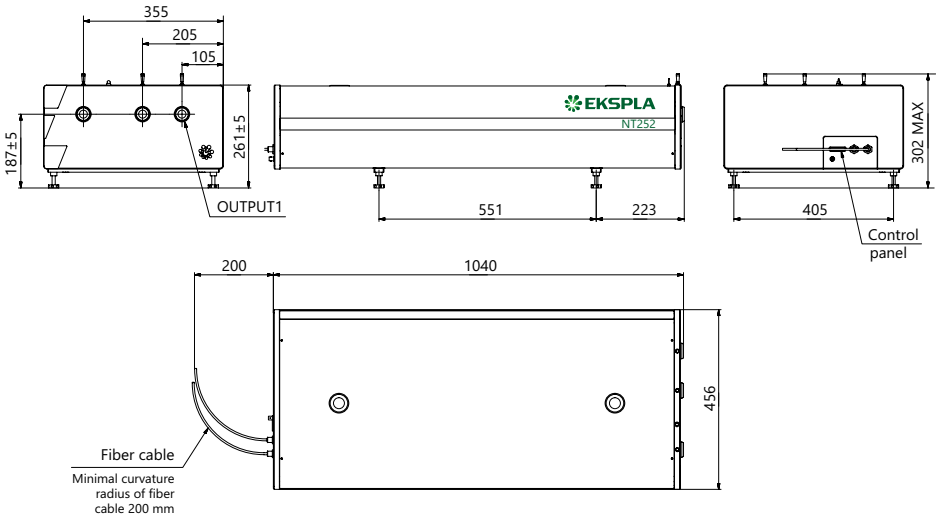


Fig 3. NT252 series laser head dimensions

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.

NT252-SH-2H

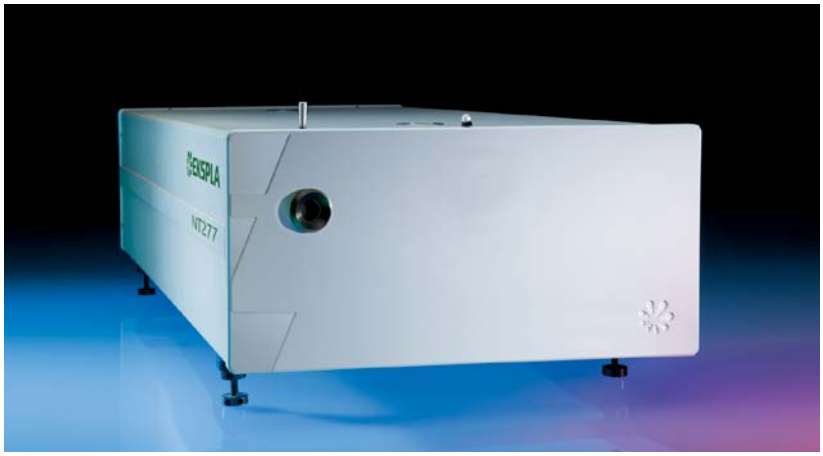
Model

Optional tuning range extension:
SH → 335–670 nm

Options:
2H → extra 532 nm output
H → extra 1064 nm output

NT270 SERIES

Tunable Wavelength NIR-MIR Range DPSS Lasers



FEATURES

- *Customers recognized reliability*
- *Two years warranty*
- *Integrates DPSS pump laser and OPO into single housing*
- *Separate output ports for the pump laser and OPO beams*
- *OPO output wavelength range from **2500 nm** to **4475 nm***
- *Narrow linewidth*
- *Hands-free, fast wavelength tuning**
- ***<7 ns** pulse duration*
- *Remote control via key pad or PC*

* *Including automatic wavelength scan*

BENEFITS

- *Hands-free wavelength tuning – no need for physical intervention*
- *Wide (2500 – 4475 nm) tuning range is highly useful for s-SNOM and other IR applications*
- *NT270 is the cost effective solution covering a wide tuning range from a single source*
- *End pumping with diode technology ensures high reliability and lots of fired shots leading to low maintenance costs*
- *High integration level saves valuable space in the laboratory*
- *Air cooling eliminates the need for water, ensuring easy operation and simple installation or integration*
- *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*

APPLICATIONS

- *Scanning Near-field Optical Microscopy (s-SNOM) microscopy*
- *Single molecule vibrational spectroscopy*
- *IR spectroscopy*
- *Gas spectroscopy*

NT270 series tunable laser systems integrate 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.

The pump lasers do not require water for cooling, 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 controlled also from personal computer using supplied LabVIEW™ drivers.

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

SPECIFICATIONS [1]

Model	NT277
OPO	
Wavelength range [2]	
Idler	2500–4475 nm
Pulse energy [3]	
Idler	80 µJ at 3000 nm
Pulse duration [4]	5–7 ns
Pulse repetition rate	1000 Hz
Linewidth [5]	<10 cm^{-1}
Minimal tuning step [6]	
Idler	1 cm^{-1}
Polarization	vertical
Typical beam diameter [7] [8]	4 mm
PUMP LASER	
Pump wavelength	1064 nm
Typical pump pulse energy [9]	1.9 mJ
Pulse duration [10]	<10 ns
Beam quality	fit to Gaussian >90%
Pulse energy stability (StdDev)	<0.5 %
PHYSICAL CHARACTERISTICS	
Unit size (W × L × H)	305 × 701 × 270 mm
Power supply size (W × L × H)	449 × 376 × 140 mm
Umbilical length	2.5 m
OPERATING REQUIREMENTS	
Cooling	by air
Room temperature	18–27 °C
Relative humidity	20–80 % (non-condensing)
Power requirements	100–240 V AC, single phase 50/60 Hz
Power consumption	< 0.5 kW
Cleanliness of the room	not worse than ISO Class 9

1) 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 3000 nm and for basic system without options.

2) Available wavelength range. Inquire for custom IR option with tuning up to 12 µm.

3) See tuning curves for typical outputs at other wavelengths.

4) Measured art FWHM level with photodiode featuring 1 ns rise time and 300 MHz bandwidth oscilloscope.

5) Higher energy 10 – 150 cm^{-1} option is available for 2500 – 4475 nm tuning range. Narrow linewidth (<10 cm^{-1}) operation mode is impossible with this option.

6) For manual input from PC. When wavelength is controlled from keypad, tuning resolution is 1 nm.

7) Measured at the wavelength indicated in the "Pulse energy" specification row.

8) Beam diameter is measured at the $1/e^2$ level at the laser output and varies depending on the wavelength.

9) The pump laser pulse energy will be optimized for the best OPO performance. The actual pump laser output can vary with each unit we manufacture.

10) Measured at FWHM level with photodiode featuring 1 ns rise time and 300 MHz bandwidth oscilloscope.

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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PERFORMANCE

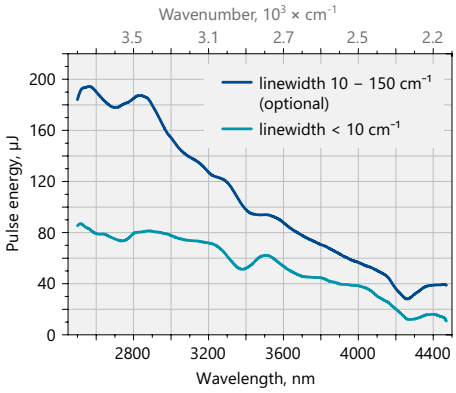


Fig 1. Typical output pulse energy of the NT277 and NT277-XIR tunable laser

OUTLINE DRAWINGS

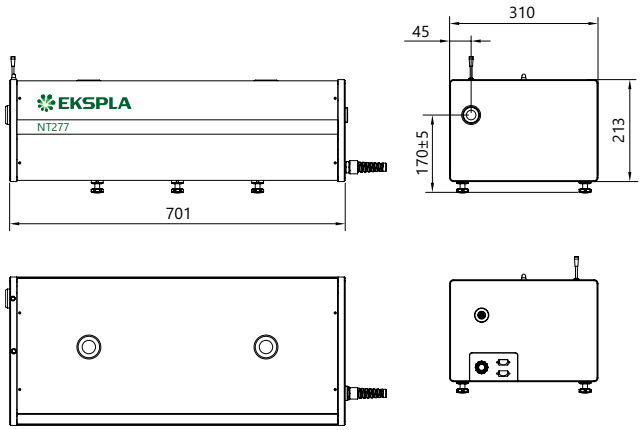
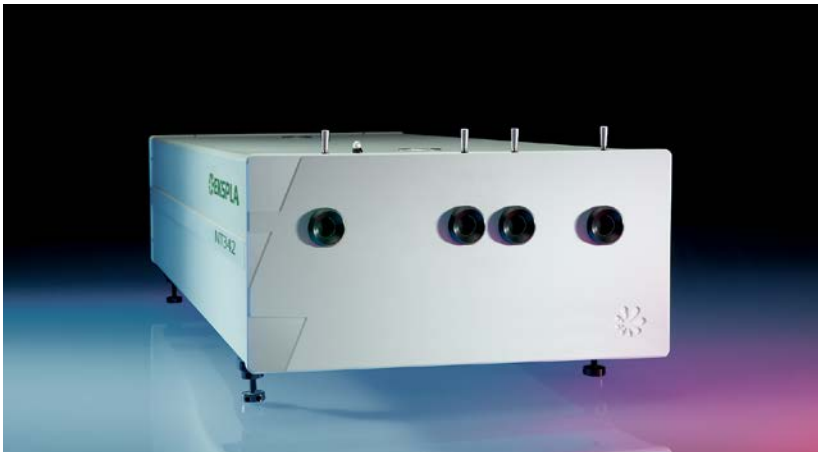


Fig 3. NT277 series laser head dimensions

A dream box with the widest tuning in the market

NT340 SERIES

High Energy Broadly Tunable Lasers



BENEFITS

- *Hands-free wavelength tuning – no need for physical intervention*
- *The system is widely tunable 192 – 4400 nm and delivers high pulse energy (up to 150 mJ) that allows the investigation of an extensive range of materials*
- *Narrow linewidth (down to 3 cm^{-1}) and superior tuning resolution (1 – 2 cm^{-1}) allows recording of high quality spectra*
- *Flashlamps replacement without misalignment of the laser cavity saves on maintenance costs*
- *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 and optional LAN, WLAN ensures easy control and integration with other equipment*
- *Attenuator and fiber coupling options facilitate incorporation of NT340 systems into various experimental environments*

FEATURES

- *Customers recognized reliability*
- *Two years warranty*
- *Hands-free no gap wavelength tuning from **192** to **4400 nm** **
- *Up to **150 mJ** pulse energy in visible spectral range*
- *Up to **22 mJ** pulse energy in UV spectral range*
- *Up to **20 mJ** pulse energy in MIR spectral range*
- ***3 – 5 ns** pulse duration*
- *Up to **20 Hz** pulse repetition rate*
- *Remote control via key pad or PC*
- *Optional separate shared output port for 532/1064 nm beam (separate output port for the 355 nm beam is standard)*
- *OPO pump energy monitoring*
- *Hermetically sealed oscillator cavity protects non-linear crystals from dust and humidity*

** Automatic wavelength scan is programmable*

The NT340 series tunable wavelength nanosecond laser seamlessly integrates the nanosecond optical parametric oscillator and the Nd:YAG Q-switched nanosecond laser – all in a compact housing.

The main system features are: hands-free wavelength tuning from UV to IR, high conversion efficiency, optional fiber-coupled output and separate output port for pump laser beam.

NT340 has a linewidth of less than 5 cm^{-1}, which is ideal for many spectroscopic applications.

The laser is designed for convenient use. The OPO pump energy monitoring system helps to control pump laser parameters. Replacement of laser flashlamps can be done without misalignment of the laser cavity and/or deterioration of laser performance.

APPLICATIONS

- *Laser-induced fluorescence*
- *Flash photolysis*
- *Photobiology*
- *Remote sensing*
- *Time-resolved spectroscopy*
- *Non-linear spectroscopy*
- *Vibrational spectroscopy*
- *Cavity ring-down CRDS, cavity ring-down laser absorption CRLAS spectroscopy*
- *Infrared spectroscopy*
- *Gas spectroscopy*

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Tuning range extending optional add-ons

Option	Features
-SH	Second harmonic generator for 210–410 nm range
-SF	Sum-frequency generator for 300–410 nm range with high pulse energy
-SH/SF	Combined option for highest pulse energy in 210–410 nm range
-DUV	Deep UV option for 192–210 nm range output
-MIR	Mid infrared option for 2500–4400 nm range output

Accessories and other optional add-ons

Option	Features
-FC	Fiber coupled output in 350–2000 nm range
-ATTN	Attenuator output in 350–2600 nm range
-H, -2H	Separate shared output port for pump laser harmonic (532 or 1064 nm wavelengths)
-AW	Air cooled power supply
-FWS	Fast wavelength scanning option for all ranges (excluding between ranges), wavelength shift on laser shot

SPECIFICATIONS [1]

New!

Model	NT342B	NT342C	NT342E	NT342H
OPO				
Wavelength range [2]				
Signal	410–710 nm [3]			
Idler	710–2600 nm			
SH generator (optional)	210–410 nm			
SH/SF generator (optional)	210–410 nm			
DUV generator (optional)	192–210 nm			
MIR generator (optional)	n/a	2500–4400 nm	n/a	
Output pulse energy				
OPO [4]	30 mJ	60 mJ	90 mJ	150 mJ
SH generator (optional) [5]	4 mJ	6.5 mJ	10 mJ	15 mJ
SH/SF generator (optional) [6]	6 mJ	10 mJ	15 mJ	22 mJ
DUV generator (optional) [7]	0.6 mJ	1.2 mJ	2 mJ	3 mJ
MIR generator (optional) [8]	n/a	20 mJ	n/a	
Linewidth	< 5 cm^{-1} [9]			
Minimal tuning step [10]				
Signal (410–710 nm)	1 cm^{-1}			
Idler (710–2600 nm)	1 cm^{-1}			
SH/SF/DUV (192–410 nm)	2 cm^{-1}			
MIR (2500–4400 nm)	n/a	1 cm^{-1}	n/a	
Pulse duration [11]	3–5 ns			
Typical beam diameter [12]	5 mm	8 mm	10 mm	12 mm
Typical beam divergence [13]	< 2 mrad			
Polarization				
Signal	horizontal			
Idler	vertical			
SH/SF	horizontal			
DUV	vertical			
MIR	n/a	horizontal	n/a	

SPECIFICATIONS [1]

New!

Model	NT342B	NT342C	NT342E	NT342H
PUMP LASER [14]				
Pump wavelength	355 nm			
Typical pump pulse energy	100 mJ	150 mJ	250 mJ	400 mJ
Pulse duration	4–7 ns			
Beam quality	Hat-top in near field, without hot spots			
Beam divergence	< 0.6 mrad			
Pulse energy stability (StdDev)	< 3.5 %			
Pulse repetition rate	10 or 20 Hz	10 Hz		
PHYSICAL CHARACTERISTICS				
Unit size (W × L × H) [15]	456 × 821 × 270 mm			
Power supply size (W × L × H)	330 × 490 × 585 mm			
Umbilical length	2.5 m			
OPERATING REQUIREMENTS				
Water consumption (max 20 °C) [16]	< 10 l/min			
Room temperature	18–27 °C			
Relative humidity	20–80 % (non-condensing)			
Power requirements	200 – 240 VAC, single phase, 50/60 Hz			
Power consumption	< 1.5 kVA			
Cleanliness of the room	not worse than ISO Class 9			

1) 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 450 nm and for basic system without options.

2) Hands-free tuning range is from 192 nm to 4400 nm. Up to 2500 nm idler tuning with MIR option.

3) Tuning range extension to 400 – 709 nm is optional.

4) Measured at 450 nm. See tuning curves for typical outputs at other wavelengths.

5) Measured at 260 nm. See tuning curves for typical outputs at other wavelengths.

6) Measured at 340 nm. SF generator is optimized for maximum output in 300 – 410 nm range. See tuning curves for typical outputs at other wavelengths.

7) Measured at 200 nm. See tuning curves for typical outputs at other wavelengths.

8) Measured at 2700 nm. See tuning curves for typical outputs at other wavelengths.

9) Linewidth is <8 cm^{-1} for 210–410 nm, 2500–4400 nm ranges.

10) When wavelength is controlled from PC. When wavelength is controlled from keypad, tuning resolution is 0.1 nm for signal, 1 nm for idler, MIR and 0.05 nm for SH, SF and DUV.

11) FWHM measured with photodiode featuring 1 ns rise time and 300 MHz bandwidth oscilloscope.

12) Beam diameter is measured at 450 nm at the FWHM level. It is approximate and can vary depending on the pump pulse energy and wavelength.

13) Full angle measured at the FWHM level at 450 nm, < 5 mrad at 3000 nm with MIR option.

14) Separate output port for the 355 nm beam is standard. Outputs for 1064 nm and 532 nm beams are optional. Laser output will be optimized for the best OPO operation and specifications may vary with each unit we manufacture.

15) Length from 821 to 1220 mm depending on configuration.

16) Air cooled power supply is available as an option.

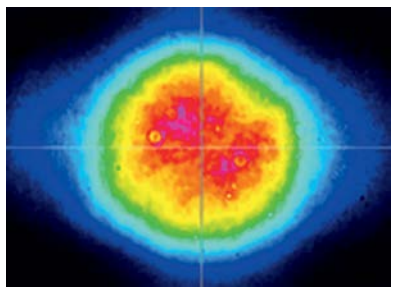


Fig 1. NT340 series laser typical beam profile at 450 nm after ~1.5 m distance from output

PERFORMANCE

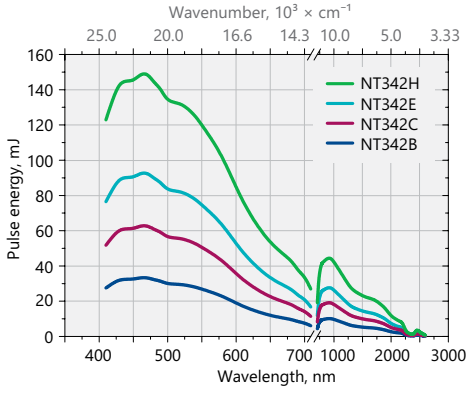


Fig 2. Typical output energy of the NT340 series tunable wavelength systems

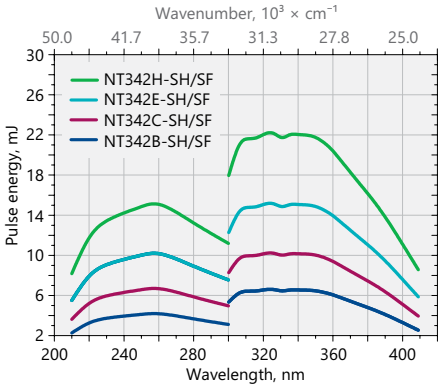


Fig 3. Typical output energy of the NT340 series tunable wavelength systems with SH/SF extension

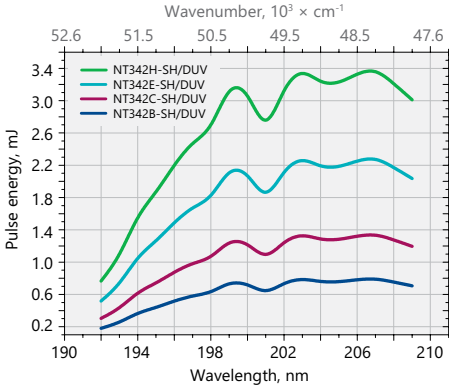


Fig 4. Typical output energy of the NT340 series tunable wavelength systems with SH/DUV extension

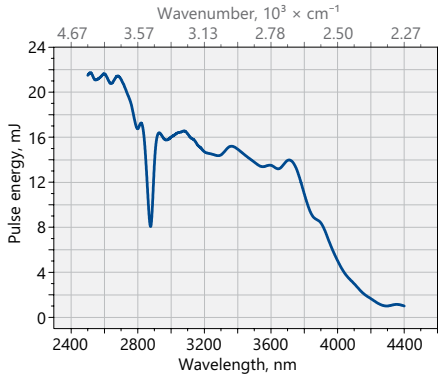


Fig 5. Typical output energy of the NT340 series tunable wavelength systems with MIR extension

OUTLINE DRAWINGS

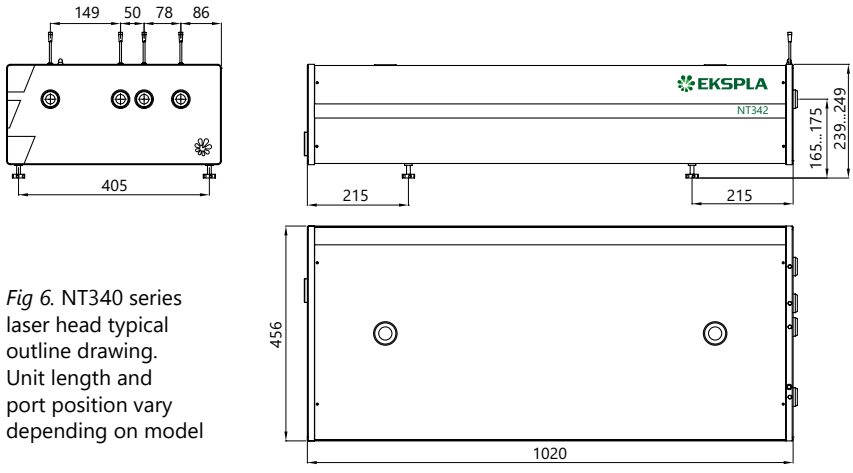


Fig 6. NT340 series laser head typical outline drawing. Unit length and port position vary depending on model

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.

NT342C-SH-10-AW-H/2H

Model

Output pulse energy:
B → 30 mJ
C → 50 mJ
E → 90 mJ
H → 150 mJ

Pulse repetition rate, in Hz

Optional tuning range extension
SH → 210–410 nm
DUV → 192–210 nm
MIR → 2500–4400 nm

Options:
AW → water-air heat exchanger
H → 1064 nm output
2H → 532 nm output

Nanosecond Lasers

Short pulse duration, wide range of customization options and high stability are distinctive features of EKSPLA nanosecond lasers. Employing latest achievements in laser technologies, team of dedicated engineers designed wide range of products tailored for specific applications: from compact, simple and robust DPSS NL200 series lasers for OEM manufacturers to high energy customized flash-lamp or diode pumped multijoule systems for research laboratories.

The laser can be controlled from remote control pad with backlit display that is easy to read even while wearing laser safety glasses. Alternatively, the laser can be operated also from personal computer using supplied LabVIEW™ drivers.

Second (532 nm), third (355 nm), fourth (266 nm) and fifth (213 nm) (where available) harmonic options combined with various accessories and customization possibilities make these lasers well suited for many OEM and laboratory applications like OPO, OPCPA, Ti:Sapphire and dye laser pumping, spectroscopy, remote sensing, plasma research ...

SHORT SELECTION GUIDE

For Your convenience, table contains all available options and highest parameter values. Not all output specifications are available at the same time simultaneously. Please refer to the catalog page for exact specifications and available options.

Model	Max. pulse energy at fundamental wavelength	Repetition rate, up to	Pumping	Pulse duration	Special feature	Page
NL200	4 mJ at 1064 nm	10 – 2500 Hz	Diode pumped solid state	<10 ns	Compact and robust	28
NL230	190 mJ at 1064 nm	100 Hz	Diode pumped solid state	3–6 ns	Diode pumped only	31
NL300	1100 mJ at 1064 nm	20 Hz	Flash-lamp pumped	3–6 ns	Versatile, compact nanosecond laser	34

World leading reliability

NL200 SERIES

Compact Q-switched DPSS Lasers

BENEFITS

- *Continuous tuning of repetition rate while maintaining constant pulse energy, superior beam pointing and energy stability make the laser the first choice for micromachining, marking, thin film removing applications*
- *Close to Gaussian smooth beam profile with low value M^2 < 1.3 and good focusability is beneficial for such applications, as LCD and OLED display repair*
- *Compactness and lightness make a laser easy transportable, saves on valuable laboratory space*
- *Fast wavelength selection is superior for applications where alternating wavelengths are required, like material ablation, LIBS*
- *Air cooling, cheap and reliable end-pumping technology, amplifiers free DPSS design guarantee easy operation and alignment of laser, simple installation and low life-time ownership cost*
- *Variety of control interfaces USB, RS232, LAN, WLAN ensure easy control and integration of laser with laboratory or OEM equipment*

FEATURES

- *Customers recognized reliability*
- *Two years warranty*
- *Up to **4 mJ** pulse energy at **1064 nm***
- *Up to **2500 Hz** variable repetition rate*
- ***532 nm, 355 nm, 266 nm, 213 nm** wavelengths as standard options*
- ***<10 ns** pulse duration at 1064 nm*
- *Electro-optical Q-switching*
- *Turn-key operation*
- *Rugged sealed cavity*
- *Compact size*
- *Simple and robust*
- *Air cooled*
- *External TTL triggering*
- *Remote control via keypad and/or any controller running on any OS using REST API commands*

APPLICATIONS

- *Material processing*
- *LCD and OLED display panel repair*
- *Marking*
- *Micromachining*
- *Engraving*
- *Laser deposition*
- *Laser cleaning*
- *Ablation*
- *Spectroscopy*
- *OPO pumping*
- *Remote sensing*

NL200 series DPSS air-cooled nanosecond lasers offer high pulse energy at kHz repetition rates. End-pumped design makes this laser compact and easy to integrate into various laser equipment both industrial and R&D. Featuring short nanosecond pulse duration, variable repetition rate and external TTL triggering, nanosecond diode pumped NL200 series Q-switched lasers are excellent and cost-effective sources for specific applications, when higher pulse energy is required, like material processing, LCD and OLED display panel repair, ablation, marking, engraving, laser cleaning, laser deposition and many more.

This laser can be equipped with harmonic generation modules for 532 nm, 355 nm, 266 nm and 213 nm wavelengths. Excellent energy stability and a wide range of wavelength options make this laser a perfect tool for spectroscopy, photoacoustic imaging and remote sensing applications. The mechanically stable and hermetically sealed design ensures reliable operation and long lifetime of the laser components.

EKSPLA SAVANORIU AV. 237, LT-02300 VILNIUS, LITHUANIA TEL +370 5 2649629 E-MAIL SALES@EKSPLA.COM WWW.EKSPLA.COM
REV. 250611

SPECIFICATIONS [1]

Model [2]	NL201 [3]	NL202 [4]	NL204 [4]
Pulse energy			
at 1064 nm	0.9 mJ	2.0 mJ	4.0 mJ
at 532 nm	0.3 mJ	0.9 mJ	2.0 mJ
at 355 nm	0.2 mJ	0.6 mJ	1.3 mJ
at 266 nm	0.08 mJ	0.2 mJ	0.6 mJ
at 213 nm	0.04 mJ	0.1 mJ	0.2 mJ
Pulse to pulse energy stability (StdDev) [5]			
at 1064 nm	<0.5 %		
at 532 nm	<2.5 %		
at 355 nm	<3.5 %		
at 266 nm	<4 %		
at 213 nm	<5 %		
Typical pulse duration [6]	7 – 10 ns		
Power drift [7]	± 2 %		
Pulse repetition rate	0–2500 Hz	0–1000 Hz	
Beam spatial profile	close to Gaussian in near and far fields		
Ellipticity	0.9–1.1 at 1064 nm		
M^2	<1.3		
Beam divergence [8]	<3 mrad		
Polarization	linear		
Typical beam diameter [9]	0.7 mm		
Beam pointing stability (RMS) [10]	≤10 µrad		
Optical jitter (StdDev) [11]	<0.5 ns		

PHYSICAL CHARACTERISTICS	
Laser head (W × L × H) [12]	164 × 320 × 93 mm
Power supply unit (W × L × H)	470 × 390 × 140 mm
Umbilical length	3 m

OPERATING REQUIREMENTS	
Cooling	air cooled
Ambient temperature	18–30 °C
Realtive humidity	20–80 % (non-condensing)
Power requirements	100–240 V AC, single phase, 50/60 Hz
Power consumption	<600 W
Cleanliness of the room	not worse than ISO Class 9

1) 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 1064 nm and maximal pulse repetition rate and for basic system without options.

2) Please indicate clearly if 1064 nm output is required in case harmonics options are ordered (except H200STHC module). In such a case, the energy of 1064 nm is optimized for harmonics generation and may differ from specified in the table.

3) Unless stated otherwise all specifications are measured at 2500 Hz pulse repetition rate.

4) Unless stated otherwise all specifications are measured at 1000 Hz pulse repetition rate.

5) Averaged from pulses emitted during 30 sec time interval.

6) FWHM at 1064 nm.

7) Measured over 8 hours period after 20 min warm-up when ambient temperature variation is less than ± 2 °C and humidity <± 5%.

8) Full angle measured at the $1/e^2$ level at 1064 nm.

9) Beam diameter is measured at 1064 nm at the $1/e^2$ level.

10) Beam pointing stability is evaluated as movement of the beam centroid in the focal plane of a focusing element.

11) With respect to QSW IN or SYNC OUT pulse.

12) Without optional harmonic module.

PERFORMANCE

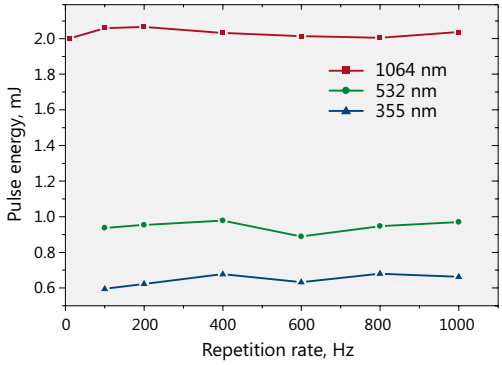


Fig 1. Typical performance data of model NL202 laser

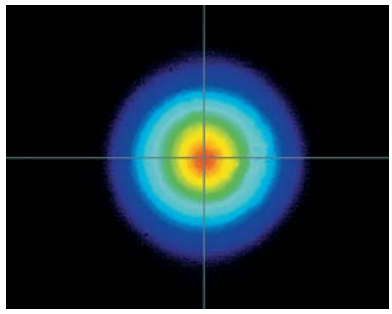


Fig 2. Typical beam intensity profile in the far field

OUTLINE DRAWINGS

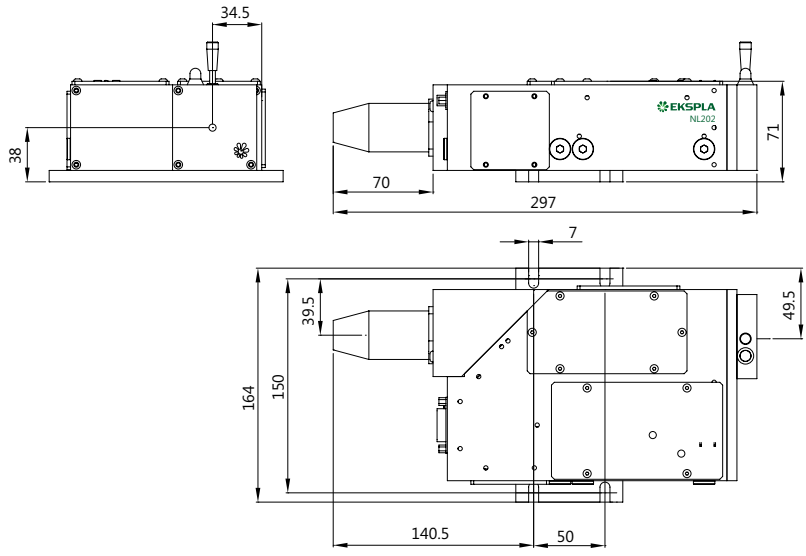


Fig 3. NL202 laser head drawing

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.

NL201-H200SHC

Model

Harmonic generator options:
H200SHC → second harmonic
H200THC → third harmonic
H200FHC → fourth harmonic

NL230 SERIES

High Energy Q-switched DPSS Nd:YAG Lasers

BENEFITS

- *Short duration 3 – 6 ns pulses ensures strong interaction with material, are highly suitable for LIBS*
- *User selectable wavelength single axis output is superior for experiments, where alternating wavelengths are required, like material ablation, LIBS*
- *Rugged, monolithic design enables laser usage in hash environment*
- *Diode pumped design provides quiet operation, eliminates the irritation of flash light*
- *Variety of interfaces USB, RS232, LAN, WLAN ensures easy control and integration with other equipment*

FEATURES

- *Customers recognized reliability*
- *Two years warranty*
- *Diode-pumped*
- *Rugged sealed laser cavity*
- *Up to **190 mJ** at **1064 nm** pulse energy*
- *Up to **100 Hz** pulse repetition rate*
- *Short pulse duration in the **3–6 ns** range*
- *Variable reflectivity output coupler for low-divergence beam*
- *Quiet operation: no more flashlamp firing sound*
- *Remote control via keypad and/or any controller running on any OS using REST API commands*
- *Optional temperature-stabilized second and third harmonic generators*
- *Electromechanical shutter (optional)*
- *Easy replaceable output window*

The NL230 series diode-pumped short nanosecond lasers are designed to produce high-intensity, high-brightness pulses and are targeted for applications such as material ablation, Light Detection And Ranging (LIDAR), remote sensing, mass spectroscopy, OPO, Ti:Sapphire or dye laser pumping and many more. Diode pumping allows maintenance-free laser operation for an extended period of time - more than 3 years for an estimated eight working hours per day.

Because laser head components are placed in a robust, sealed and precisely machined monolithic aluminium block, this laser can reliably work in a harsh industrial environment with applications such as laser-induced breakdown spectroscopy (LIBS).

Second and third harmonic options allows for an expanded range of applications, where high pulse energy and high pulse to pulse stability are required.

For easy and seamless control and integration with other industrial equipment, the NL230 series laser is equipped with USB/RS232 interfaces and can be externally triggered with a jitter as low as < 0.5 ns StDev.

NL230 series lasers are designed to work reliably 24/7 in an industrial environment.

APPLICATIONS

- *LIBS (Light Induced Breakdown Spectroscopy)*
- *Material ablation*
- *OPO pumping*
- *Remote Sensing*
- *LIDAR (Light Detection And Ranging)*
- *Mass Spectroscopy*
- *LIF (Light Induced Fluorescence)*

SPECIFICATIONS [1]

Model	NL231-50	NL231-100
Pulse energy (not less than) [2]		
at 1064 nm	190 mJ	150 mJ
at 532 nm	110 mJ	90 mJ
at 355 nm	55 mJ	40 mJ
at 266 nm	3 mJ	1.2 mJ
Pulse energy stability (StdDev) [3]		
at 1064 nm	< 1 %	
at 532 nm	< 2.5 %	
at 355 nm	< 3.5 %	
at 266 nm	< 5 %	
Pulse repetition rate	50 Hz	100 Hz
Power drift [4]	< ±3 %	
Pulse duration [5]	3 – 6 ns	
Linewidth	< 1 cm^{-1} at 1064 nm	
Beam profile [6]	"Top Hat" in near field and close to Gaussian in far field	
Beam divergence [7]	< 0.8 mrad	
Beam pointing stability (RMS) [8]	≤ 60 µrad	
Polarization	linear, > 90 % at 1064 nm	
Typical beam diameter [9]	5 mm	
Optical pulse jitter (StDev)		
Internal triggering regime	< 0.5 ns	
External triggering regime	< 0.5 ns	
Typical warm-up time	10 min	
PHYSICAL CHARACTERISTICS		
Laser head size (W × L × H)	251 × 290 × 167 ± 3 mm	
Power supply unit (W × L × H)		
Desktop case	449 × 390 × 140 ± 3 mm	
19" module	483 × 390 × 140 ± 3 mm	
External chiller	inquire	
Umbilical length	3 m	
OPERATING REQUIREMENTS		
Cooling (air cooled) [10]	external chiller	
Ambient temperature	18 – 30 °C	
Relative humidity (non-condensing)	20 – 80 %	
Power requirements	100 – 240 V AC, single phase, 50/60 Hz	
Power consumption	< 1.0 kW	
Cleanliness of the room	not worse than ISO Class 9	

1) Due to continuous improvement, all specifications are subject to change. The parameters marked typical may vary with each unit we manufacture. Unless stated otherwise all specifications are measured at 1064 nm and for basic system without options.

2) Outputs are not simultaneous. Inquire for higher energy (up to 350 mJ at 50 Hz, 250 mJ at 100 Hz) custom models.

3) Averaged from pulses, emitted during 30 sec time interval.

4) Measured over 8 hours period after 20 min warm-up when ambient temperature variation is less than ± 2 °C and humidity < ± 5%.

5) FWHM.

6) Near field (at the output aperture) TOP HAT fit is >80%.

7) Full angle measured at the $1/e^2$ level.

8) Beam pointing stability is evaluated as movement of the beam centroid in the focal plane of a focusing element.

9) Beam diameter is measured at 1064 nm at the $1/e^2$ level.

10) Adequate room air conditioning should be provided.

PERFORMANCE

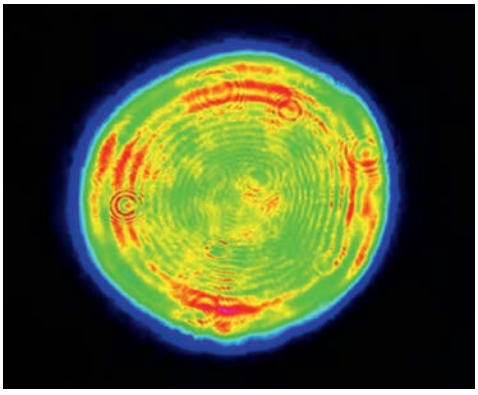


Fig 1. NL230 series laser typical near field beam profile

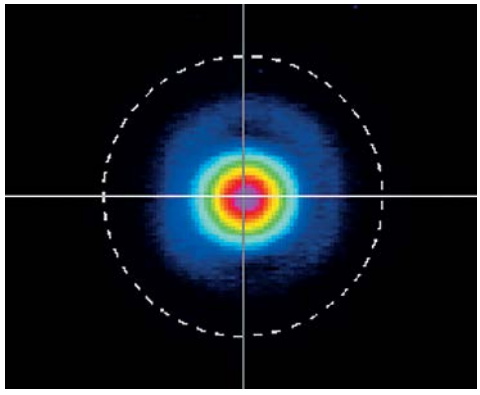


Fig 2. NL230 series laser typical far field beam profile

Measure	P1.ddelay	P2.width	P3.area
value	72.011 ns	5.507 ns	2.358455 mVs
mean	72.044 ns	5.482 ns	2.355738 mVs
min	71.456 ns	5.167 ns	2.277066 mVs
max	72.552 ns	5.970 ns	2.409653 mVs
sdev	156.11 ps	81.27 ps	16.89196 pVs
num	4.697 × 10^3	4.697 × 10^3	4.697 × 10^3

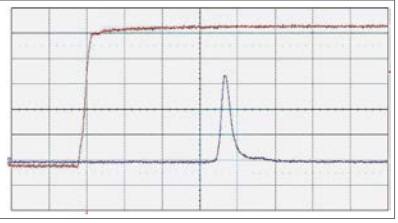


Fig 3. NL230 laser pulse waveform

OUTLINE DRAWINGS

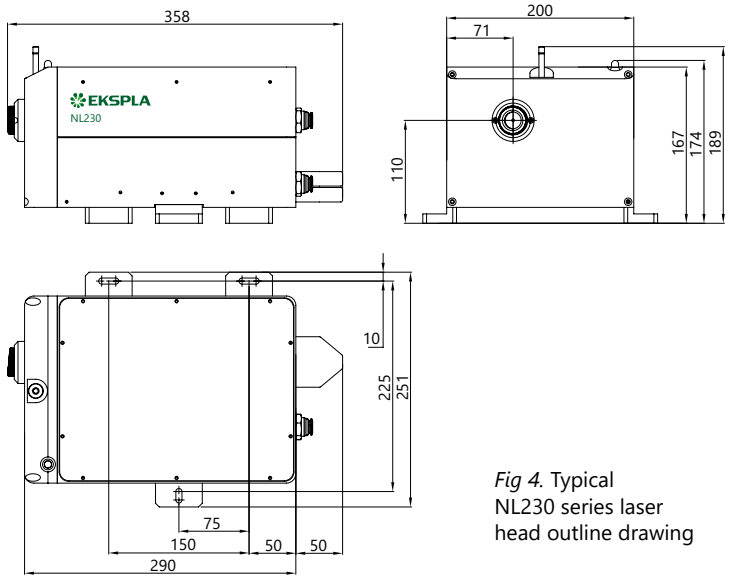


Fig 4. Typical NL230 series laser head outline drawing

ORDERING INFORMATION

NL231-H230THC

Model

Optional harmonic generator modules

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.

NL300 SERIES

Compact Flash-Lamp Pumped Q-switched Nd:YAG Lasers

BENEFITS

- *High pulse energy (up to 1100 mJ at 1064 nm, 700 mJ at 532 nm and 450 mJ at 355 nm) and short pulse duration about 4 ns ensure strong interaction with material which is excellent for LIBS and material ablation applications*
- *Small size saves valuable space in the laboratory room*
- *Fast flashlamp replacement without realignment of laser cavity ensures easy maintenance*
- *Cost-effective, single-cavity design with no amplifiers for easy alignment, high reliability and low maintenance costs*
- *Air cooling enables simple installation, easy operation and low maintenance costs*
- *Variety of interfaces: USB, RS232, optional LAN and WLAN ensures easy integration with other equipment*

FEATURES

- *Customers recognized reliability*
- *Two years warranty*
- *Rugged sealed laser cavity*
- *Up to **1100 mJ** pulse energy*
- *Better than 1 % StDev pulse energy stability*
- ***5–20 Hz** pulse repetition rate*
- ***3–6 ns** pulse duration*
- *Thermo stabilized second, third, fourth and fifth harmonic generator modules*
- *Optional attenuators for fundamental and/or harmonic wavelengths*
- *Water-to-water or water-to-air cooling options*
- *Replacement of flashlamps without misalignment of laser cavity*
- *Remote control via keypad and/or RS232/USB port*

APPLICATIONS

- *Material ablation*
- *LIBS (Light Induced Breakdown Spectroscopy)*
- *OPO pumping*
- *Remote Sensing*
- *LIDAR (Light Detection And Ranging)*
- *Mass Spectroscopy*
- *LIF (Light Induced Fluorescence)*

NL300 series electro-optically Q-switched nanosecond Nd:YAG lasers produce high energy pulses with 3–6 ns duration. Pulse repetition rate can be selected in range of 5–20 Hz. NL30×HT models are designed for maximum energy extraction from the active element. Up to 1100 mJ pulse energy can be produced at a 5 Hz pulse repetition rate.

A wide range of harmonic generator modules for generation up to a 5th harmonic is available. Harmonic generators can be combined with attenuators that allow smooth output energy adjustment without changing other laser parameters, i.e. pulse duration, pulse-to-pulse stability, divergence or beam profile. For a more detailed description of harmonic and attenuator modules please check our harmonic generators selection guide on the page 36.

The extremely compact laser head is approximately 480 mm long and can be fitted into tight spaces. The laser power supply has a 330 × 490 mm footprint. Easy access to the water tank from the back side of the power supply facilitates laser maintenance. Replacement of flashlamp does not require removal of pump chamber from the laser cavity and does not lead to possible misalignment.

The powering unit can be configured with water-to-water or water-to-air heat exchangers. The latter option allows for laser operation without the use of tap water for cooling.

For customer convenience the laser can be controlled via PS with LabView™ drivers (included) or a remote control pad. Both options allow easy control of laser settings.

EKSPLA SAVANORIU AV. 237, LT-02300 VILNIUS, LITHUANIA TEL +370 5 2649629 E-MAIL SALES@EKSPLA.COM WWW.EKSPLA.COM REV. 250611

SPECIFICATIONS [1]

Model	NL303HT		NL305HT	
Pulse repetition rate	10 Hz	20 Hz	10 Hz	5 Hz
Pulse energy:				
at 1064 nm	800 mJ	800 mJ	1000 mJ	1100 mJ
at 532 nm [2]	400 mJ	400 mJ	650 mJ	700 mJ
at 355 nm [3]	250 mJ	250 mJ	400 mJ	450 mJ
at 266 nm [4]	80 mJ	60 mJ	100 mJ	120 mJ
at 213 nm [5]	13 mJ	10 mJ	20 mJ	25 mJ
Pulse energy stability (StdDev) [6]				
at 1064 nm	1 %			
at 532 nm	1.5 %			
at 355 nm	3 %			
at 266 nm	3.5 %			
at 213 nm	6 %			
Power drift [7]	±2 %			
Pulse duration [8]	3–6 ns			
Polarization	vertical, >90 %			
Optical pulse jitter [9]	<0.5 ns StDev			
Linewidth	<1 cm^{-1}			
Beam profile [10]	Hat-Top in near and near Gaussian in far fields			
Typical beam diameter [11]	~8 mm		~10 mm	
Beam divergence [12]	<0.6 mrad			
Beam pointing stability [13]	50 µrad RMS			
Beam height	68 mm			
PHYSICAL CHARACTERISTICS				
Laser head size (W × L × H) [14]	154 × 475 × 128 mm			
Power supply unit (W × L × H)	330 × 490 × 585 mm			
Umbilical length	2.5 m			
OPERATING REQUIREMENTS				
Water consumption (max 20 °C) [15]	<8 l/min	<12 l/min	<10 l/min	<6 l/min
Ambient temperature	15–30 °C			
Relative humidity	20–80 % (non-condensing)			
Power requirements [16] [17]	208–240 V AC, single phase 50/60 Hz			
Power consumption [18]	<1 kVA	<1.5 kVA	<1.5 kVA	<1 kVA
Cleanliness of the room	not worse than ISO Class 9			

1) 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 1064 nm and for basic system without options.

2) With H300SH, H300S or H300SHC harmonic generator modules. See harmonic generator selection guide on the page 36 for more detailed information.

3) With H300THC harmonic generator modules. See harmonic generator selection guide on the page 36 for more detailed information.

4) With H300SH and H400FHC harmonic generator modules. See harmonic generator selection guide on the page 36 for more detailed information.

5) With H300FiHC harmonic generator module. See harmonic generator selection guide on the page 36 for more detailed information.

6) Averaged from pulses, emitted during 30 sec time interval.

7) Measured over 8 hours period after 20 min warm-up when ambient temperature variation is less than ± 2 °C and humidity <± 5%.

8) FWHM.

9) With respect to SYNC OUT pulse.

10) Near field (at the output aperture) TOP HAT fit is >70%.

11) Beam diameter is measured at 1064 nm at the $1/e^2$ level.

12) Full angle measured at the $1/e^2$ level.

13) Beam pointing stability is evaluated as movement of the beam centroid in the focal plane of a focusing element.

14) See harmonic generator selection guide on the page 36 for harmonic generators units sizes.

15) For water cooled version. Air cooled version does not require tap water for cooling.

16) Power requirements should be specified when ordering.

17) 110 V AC powering is available, please inquiry for details.

18) Required current rating can be calculated by dividing power value by mains voltage value.

OPTIONS

- **Option -AW** – air-cooled power supply option. An adequate air conditioner should be installed in order to keep room temperature stable.
- **Harmonic generator options** – an extensive selection of harmonic generators up to 5th harmonic.
- **Attenuator options** allow a smooth change of laser pulse energy, while other laser pulse parameters, such as pulse duration, jitter, pulse-to-pulse stability, beam divergence and profile remain the same.

OPTIONAL HARMONIC GENERATOR AND ATTENUATOR MODULES

Module	Description	Output ports	Output pulse energy specifications	Dimensions W×L×H, mm	Extension possible?	Notes
H300A	Attenuator for 1064 nm beam	Port 1: 1064 nm beam	Transmission in 5–90% range at 1064 nm		No	Integrated into a laser head
H300SH	Second harmonic generator	Port 1: 1064, 532 nm	n/d	154×160×128	Yes	
H300S	532 nm beam separator	Port 1: 532 nm Port 2: residual 1064 nm	See NL300 specifications for 532 nm beam	154×160×128	No	Should be used with H300SH
H300SHC	Second harmonic generator with 532 nm beam separator	Port 1: 532 nm Port 2: residual 1064 nm	See NL300 specifications for 532 nm beam	154×210×128	No	
H300SHA	Second harmonic generator, beam separator and attenuator for 532 nm beam	Port 1: 532 nm Port 2: residual 532 nm	Transmission in 5–90% range at 532 nm	154×260×128	No	
H300THC	Third harmonic generator with 355 nm beam separator	Port 1: 355 nm Port 2: residual 1064 & 532 nm	See NL300 specifications for 355 nm beam	154×210×128	No	Should be used with H300SH
H300THA	Third harmonic generator, beam separator and attenuator for 355 nm beam	Port 1: 355 nm Port 2: residual 355 nm	Transmission in 5–90% range at 355 nm	154×260×128	No	Should be used with H300SH
H300FHC	Fourth harmonic generator with 266 nm beam separator	Port 1: 266 nm Port 2: residual 532 nm	See NL300 specifications for 266 nm beam	154×260×128	No	Should be used with H300SH
H300FHA	Fourth harmonic generator, beam separator and attenuator for 266 nm beam	Port 1: 266 nm Port 2: residual 266 nm	Transmission in 5–75% range at 266 nm	154×430×128	No	Should be used with H300SH
H300FiHC	Fifth harmonics generator with 213 nm beam separator	Port 1: 213 nm Port 2: residual 1064, 532 & 266 nm	See NL300 specifications for 213 nm beam	154×350×128	No	

OUTLINE DRAWINGS

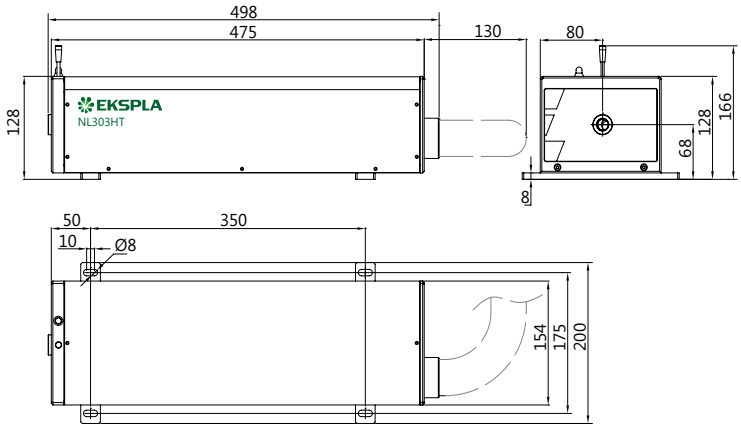


Fig 1. Typical NL300 series laser head outline drawing

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.

NL303HT-10-AW-H300SH-H300THC

- Model
- Pulse repetition rate in Hz
- Options: AW → water-air heat exchanger
- Optional harmonic generator modules and other accessories

HARMONIC GENERATORS & ATTENUATORS

For NL300 Series Lasers

Nanosecond Q-switched lasers enable simple and cost effective laser wavelength conversion to shorter wavelengths through harmonic generation. EKSPLA offers a broad selection of wavelength conversion accessories for NL300 series lasers. The purpose of this guide is to help configure available harmonic generator and attenuator modules for NL300 series lasers for optimal performance.

The harmonic module uses a modular design that allows reconfiguration of laser output for the appropriate experiment wavelength. A typical module houses a non-linear crystal together with a set of dichroic mirrors for separating the harmonic beam from the fundamental wavelength. Nonlinear crystals used for the purpose of wavelength conversion are kept at an elevated temperature in a thermo-stabilized oven.

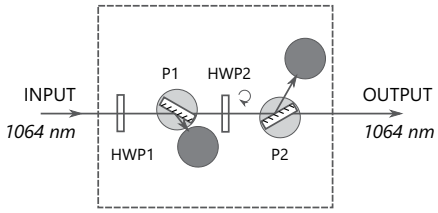
Two or more modules can be joined together for higher harmonic generation: attaching one extra module to a second harmonic generator allows for the generation of 3rd or 4th harmonic wavelengths. It should be noted that only modules with a single output port can be joined together: it is possible to attach a H300S module to a H300SH unit for 532 nm beam separation, or a H300FHC module for 4th harmonic generation (see detailed description below). Modules with two output ports (e.g., H300SHC) cannot be attached to extra units.

FEATURES

- *Compact harmonic modules*
- *Thermo stabilized crystals for long lifetime*
- *Dichroic mirrors*
- *AR coatings on crystals*
- *Phase matching by mechanical adjustment*
- *High conversion efficiency*
- *Wide selection of different configurations*
- *Smooth adjustment of output pulse energy with attenuator*

H300A attenuator

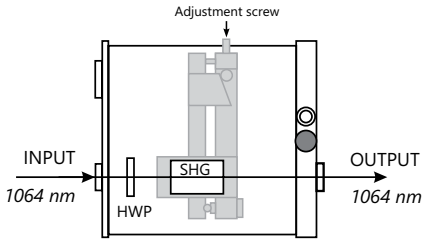
The H300A1 module is integrated into the laser head and designed to attenuate a **1064 nm**. Beam (the length of the laser head extends to 619 mm). Optical layout includes half-wave plates HWP1, HWP2 and polarizers P1, P2. Rotation of the HWP2 half-wave plate changes the polarization of the laser beam and its transmission factor via the P2 polarizer.



H300A

H300SH harmonic generators

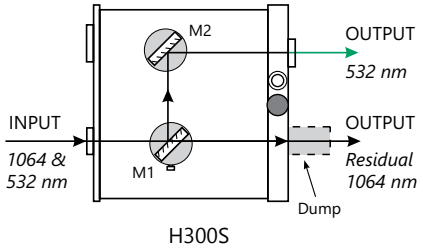
H300SH module contains a SH crystal with a half-wave plate for input polarization adjustment. The output of the H300SH module has both **532 nm** and **1064 nm** wavelengths.



H300SH

H300S harmonic separator

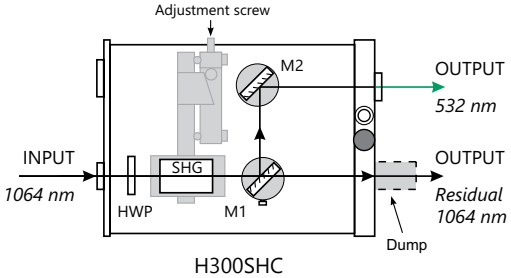
The H300S module has two output ports for the separation of **1064 nm** and **532 nm** wavelengths.



H300S

H300SHC harmonic generator

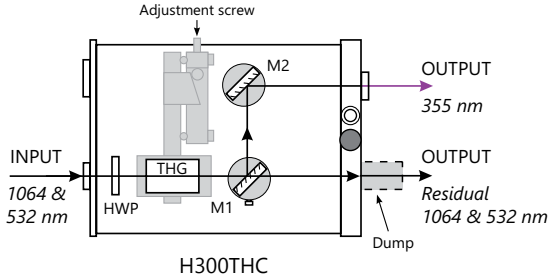
The most cost-effective solution for customers who need a **532 nm** wavelength only, the H300 SHC module combines a SHG crystal and beam separators and has two output ports for **532 nm** and **1064 nm** beams.



H300SHC

H300THC harmonic generator

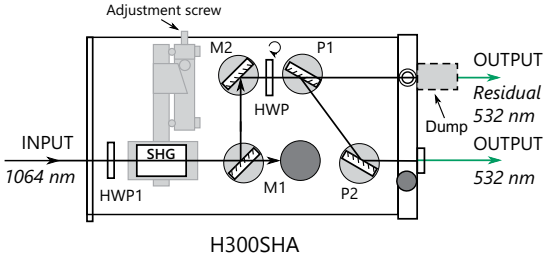
The H300THC module is a third harmonic generator and beam separator with two output ports for a 355 nm beam, and for a residual **532 nm + 1064 nm** beam. This module should be used with the H300SH module.



H300THC

H300SHA harmonic generator & attenuator

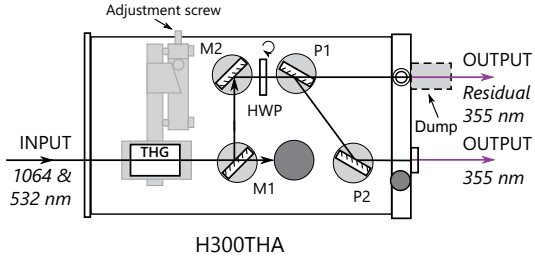
The cost-effective solution for customers who need an attenuated **532 nm** wavelength, the H300SHA module combines a SHG generator with attenuator.



H300SHA

H300THA harmonic generator & attenuator

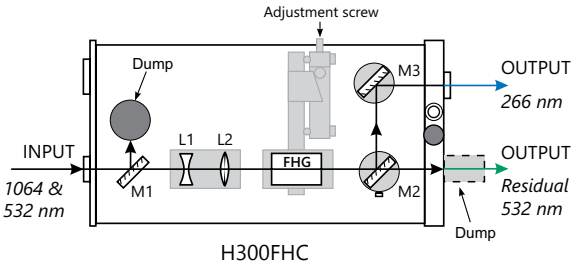
The cost-effective solution for customers who need an attenuated **355 nm** wavelength, the H300THA module combines a THG generator with attenuator.



H300THA

H300FHC harmonic generator

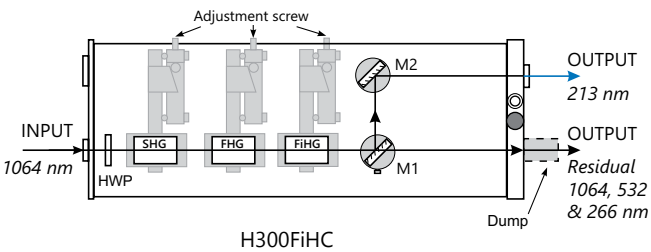
The H300FHC module is a fourth harmonic generator and beam separator for a 266 nm wavelength, with two output ports for a **266 nm** beam, and for a residual **532 nm** beam. This module should be used with the H300SH module.



H300FHC

H300FiHC harmonic generator

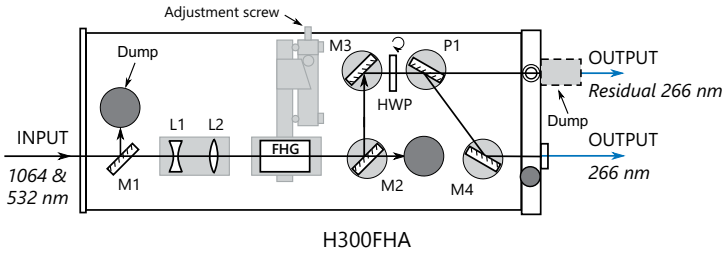
The H300FiHC module is designed to produce a 5th harmonic output. As it requires only a 1064 nm input, the unit contains SH, FH and FiH crystals together with a beam separator for a **213 nm** beam.



H300FiHC

H300FHA harmonic generator & attenuator

The cost-effective solution for customers who need an attenuated **266 nm** wavelength, the H300FHA module combines a FHG generator with attenuator.



H300FHA

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Notes

EKSPLA SAVANORIU AV. 237, LT-02300 VILNIUS, LITHUANIA TEL +370 5 2649629 E-MAIL SALES@EKSPLA.COM WWW.EKSPLA.COM REV. 250611

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EKSPLA
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Find local distributor at
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Savanorių Av. 237
LT-02300 Vilnius
Lithuania

ph. +370 5 264 96 29
fax +370 5 264 18 09
sales@ekspla.com
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