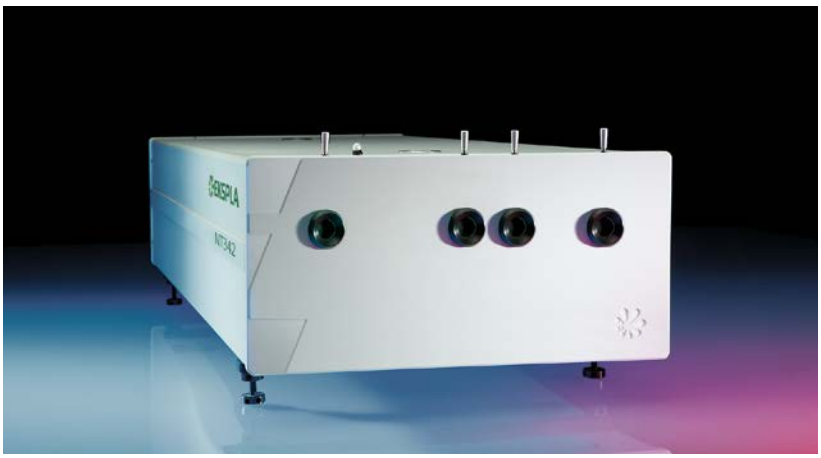
NT340 SERIES

High Energy Broadly Tunable Lasers



BENEFITS

- *The system is widely tunable 192 – 2600 nm and delivers high pulse energy (up to 90 mJ) that allows the investigation of an extensive range of materials*
- *Up to 18 µm customization possibility enables studies of IR vibrations of molecules*
- *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

- *Hands-free no gap wavelength tuning from **192** to **4400 nm***
- *Up to **90 mJ** pulse energy in visible spectral range*
- *Up to **15 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*

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*

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. It can be controlled from remote keypad or PC. The remote keypad features a backlit display that is easy to read even through laser safety googles. 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.

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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
-H, -2H	Separate shared output port for pump laser harmonic (532 or 1064 nm wavelengths)
-AW	Air cooled power supply

SPECIFICATIONS [1]

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

SPECIFICATIONS [1]

Model	NT342B	NT342C	NT342E
PUMP LASER [14]			
Pump wavelength	355 nm		
Typical pump pulse energy	100 mJ	150 mJ	250 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. MIR option is not compatible with SF and DUV option. Inquire for custom IR option with tuning up to 18 µm.

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 210–409 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 optimised 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.

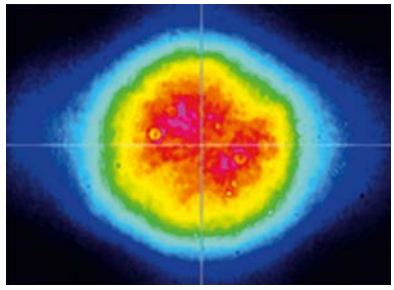

Fig 1. NT340 series laser typical beam profile at 450 nm after ~1.5 m distance from output

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PERFORMANCE

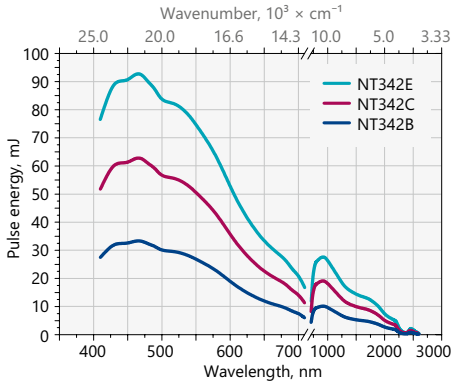

Fig 2. Typical output energy of the NT340 series tunable wavelength systems

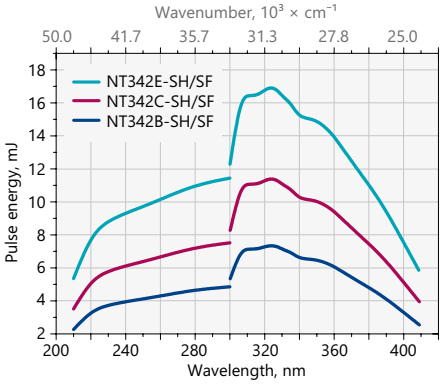

Fig 3. Typical output energy of the NT340 series tunable wavelength systems with SH/SF extension

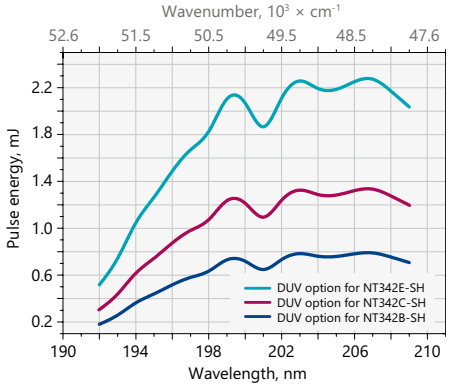

Fig 4. Typical output energy of the NT340 series tunable wavelength systems with SH/DUV extension

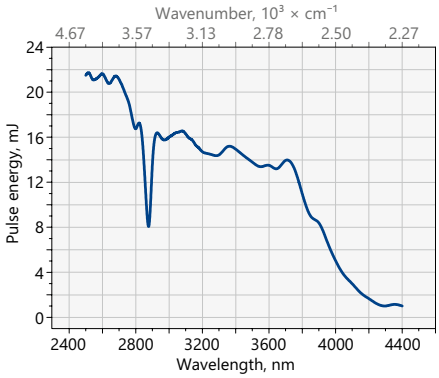

Fig 5. Typical output energy of the NT340 series tunable wavelength systems with MIR extension

OUTLINE DRAWINGS

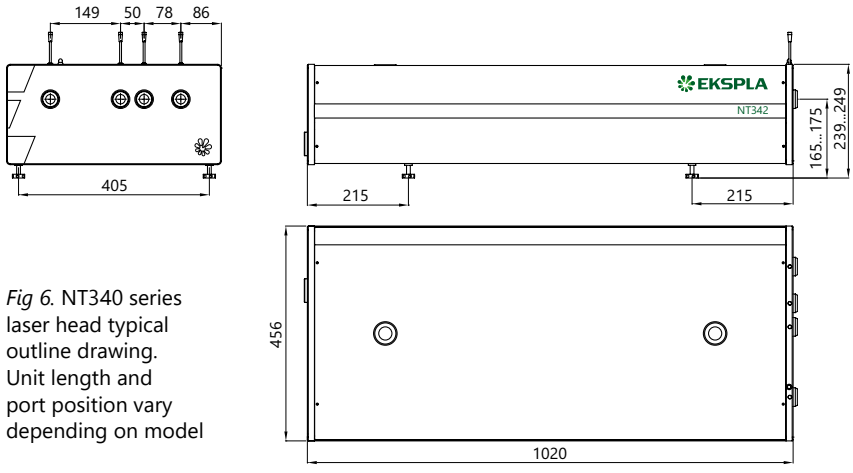

Fig 6. NT340 series laser head typical outline drawing. Unit length and port position vary depending on model

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.

NT342B-SH-10-AW-H/2H

Model

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