

# NT240 SERIES



## BENEFITS

- ▶ 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  $3 \text{ cm}^{-1}$ ) and superior tuning resolution ( $1 - 2 \text{ cm}^{-1}$ ) 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

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.

## Broadly Tunable kHz Pulsed DPSS Lasers

### FEATURES

- ▶ 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  $\mu\text{J}$  output pulse energy in UV
- ▶ Less than  $5 \text{ cm}^{-1}$  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

### APPLICATIONS

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

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

Model	NT242	NT242-SH	NT242-SF	NT242-SH/SF
<b>OPO</b>				
Wavelength range				
Signal	405–710 nm			
Idler	710–2600 nm			
SH and SF	—	210–300 nm	300–405 nm	210–405 nm
Pulse energy <sup>2)</sup>				
OPO	450 µJ			
SH and SF	—	40 µJ at 230 nm	60 µJ at 320 nm	
Pulse repetition rate	1000 Hz			
Pulse duration <sup>3)</sup>	3–6 ns			
Linewidth <sup>4)</sup>	< 5 cm <sup>-1</sup>			
Tuning resolution <sup>5)</sup>				
Signal	1 cm <sup>-1</sup>			
Idler	1 cm <sup>-1</sup>			
SH and SF	—	2 cm <sup>-1</sup>		
Polarization				
Signal	horizontal			
Idler	vertical			
SH and SF	—	vertical		
Typical beam diameter <sup>6)</sup>	3 × 6 mm			
<b>PUMP LASER</b>				
Pump wavelength <sup>7)</sup>	355 nm		355 / 1064 nm	
Typical pump pulse energy <sup>8)</sup>	3 mJ		3 / 1 mJ	
Pulse duration <sup>3)</sup>	4–6 ns at 1064 nm			
<b>PHYSICAL CHARACTERISTICS</b>				
Unit size (W × L × H)	456 × 1040 × 297 mm			
Power supply size (W × L × H)	520 × 400 × 286 mm			
Umbilical length	2.5 m			
<b>OPERATING REQUIREMENTS</b>				
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			

<sup>1)</sup> 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.

<sup>2)</sup> See tuning curves for typical outputs at other wavelengths.

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

<sup>4)</sup> Linewidth is <8 cm<sup>-1</sup> for 210–405 nm range.

<sup>5)</sup> 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.

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

<sup>7)</sup> Separate output port for the 3rd and other harmonic is optional.

<sup>8)</sup> 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 coupler
-Attn	Attenuator option

**PERFORMANCE**



Near field

Far field

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

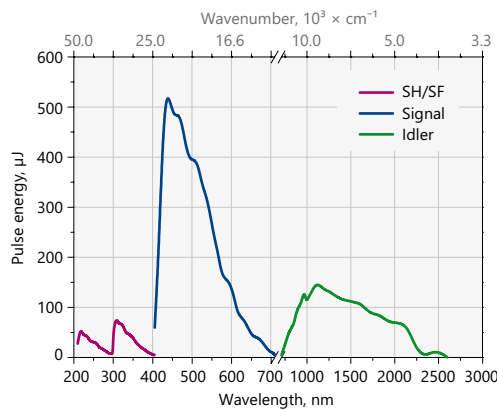


Fig 2. Typical output pulse energy of NT242 series tunable laser

Femtosecond Lasers

Picosecond Lasers

Picosecond Tunable Systems

Nanosecond Lasers

Nanosecond Tunable Lasers

Other Ekspla Products

**OUTLINE DRAWINGS**

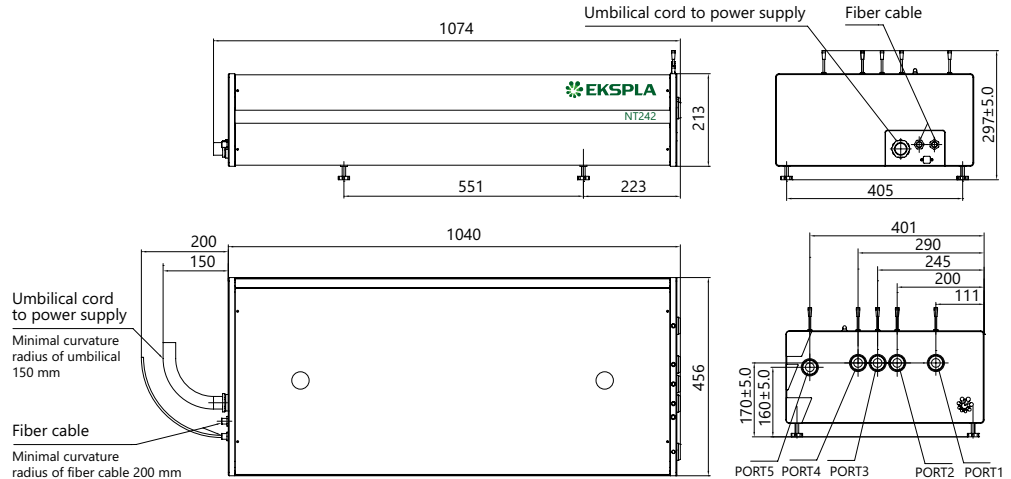


Fig 3. NT242 series laser head dimensions

**ORDERING INFORMATION**

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

**NT242-SH-H-2H-SCU**

Model	Options:
Optional tuning range extension:	H → extra 1064 nm output
SH → 210–300 nm	2H → extra 532 nm output
SF → 300–405 nm	SCU → spectral filtering accessory
SH/SF → 210–405 nm	

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 フォトテクニカ株式会社  
 〒336-0017 埼玉県さいたま市南区南浦和 1-2-17  
 TEL:048-871-0067 FAX:048-871-0068  
 e-mail:voc@phototechnica.co.jp

# NT250 SERIES

**Tunable  
Wavelength  
UV-NIR Range  
DPSS Lasers**



## FEATURES

- ▶ 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

## BENEFITS

- ▶ 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 ( $1 - 2 \text{ cm}^{-1}$ ) 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 coupler
-Attn	Attenuator option

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

Model		NT252
<b>OPO</b>		
Wavelength range		
Signal		670–1064 nm
Idler		1065–2600 nm
SH		335–669 nm
Pulse energy		
OPO <sup>2)</sup>		1100 µJ
SH <sup>3)</sup>		200 µJ
Pulse duration <sup>4)</sup>		1–4 ns
Pulse repetition rate		1000 Hz
Linewidth <sup>5)</sup>		<10 cm <sup>-1</sup>
Tuning resolution <sup>6)</sup>		
Signal		1 cm <sup>-1</sup>
Idler		1 cm <sup>-1</sup>
SH		2 cm <sup>-1</sup>
Polarization		
Signal		horizontal
Idler		vertical
SH		horizontal
Typical beam diameter <sup>7) 8)</sup>		3 × 6 mm
<b>PUMP LASER</b>		
Pump wavelength <sup>9)</sup>		532 nm
Typical pump pulse energy <sup>10)</sup>		4 mJ
Pulse duration <sup>11)</sup>		2 – 5 ns
Pulse energy stability (StdDev)		<2.5 %
<b>PHYSICAL CHARACTERISTICS</b>		
Unit size (W × L × H)		456 × 1040 × 297 mm
Power supply size (W × L × H)		520 × 400 × 286 mm
Umbilical length		2.5 m
<b>OPERATING REQUIREMENTS</b>		
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

<sup>1)</sup> 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.

<sup>2)</sup> Measured at maximum in the interval 700 – 750 nm. See tuning curves for typical outputs at other wavelengths.

<sup>3)</sup> Measured at 400 nm. See tuning curves for typical outputs at other wavelengths.

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

<sup>5)</sup> In signal and idler range.

<sup>6)</sup> 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.

<sup>7)</sup> Measured at the wavelength indicated in the “Pulse energy” specification row.

<sup>8)</sup> Beam diameter is measured at the 1/e<sup>2</sup> level at the laser output and can vary depending on the pump pulse energy.

<sup>9)</sup> Separate output port for the 2nd and other harmonic are optional.

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

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



PERFORMANCE

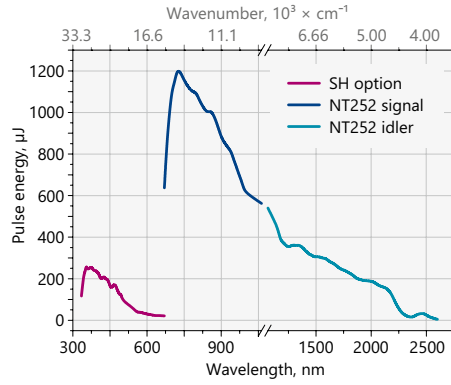


Fig 1. Typical output pulse energy of the NT252-SH tunable laser

OUTLINE DRAWINGS

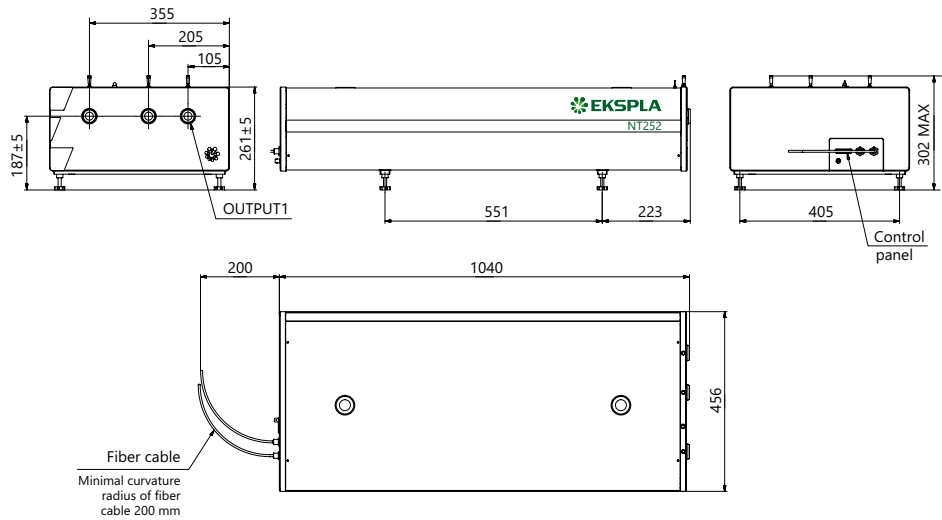
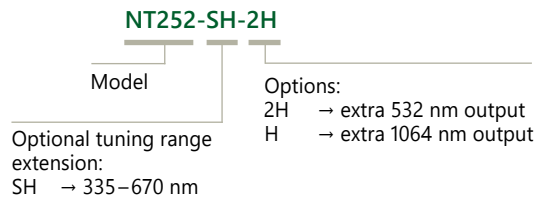


Fig 3. NT252 series laser head dimensions

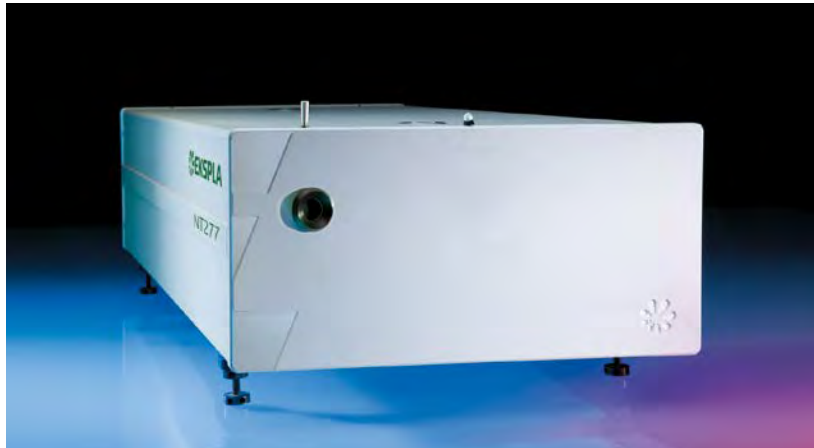
ORDERING INFORMATION

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



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 www.phototechnica.co.jp  
 〒336-0017 埼玉県さいたま市南区南浦和 1-2-17  
 TEL:048-871-0067 FAX:048-871-0068  
 e-mail:voc@phototechnica.co.jp

# NT270 SERIES



## BENEFITS

- ▶ Wide (2500 – 12000 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

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.

## Tunable Wavelength NIR-IR Range DPSS Lasers

### FEATURES

- ▶ 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 12000 nm (depending on model)
- ▶ Narrow linewidth
- ▶ Hands-free tuning
- ▶ <7 ns pulse duration
- ▶ Remote control via key pad or PC
- ▶ Fast wavelength switching

### APPLICATIONS

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

### NT270 series available models

Model	Features
NT277	High pulse repetition rate OPO producing tunable output in 2500 – 4475 nm spectral range
NT277-XIR	Tunable output from NIR to far-IR range, 2500 nm to 12 000 nm



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

Model	NT277	NT277-XIR
<b>OPO</b>		
Wavelength range		
Idler	2500–4475 nm	2500–4475 nm 4476–12000 nm <sup>2)</sup>
Pulse energy <sup>3)</sup>		
Idler	80 µJ at 3000 nm	80 µJ at 3000 nm 20 µJ at 7000 nm
Pulse duration <sup>4)</sup>	5–7 ns	
Pulse repetition rate	1000 Hz	
Linewidth <sup>5)</sup>	<10 cm <sup>-1</sup>	<12 cm <sup>-1</sup>
Tuning resolution <sup>6)</sup>		
Idler	1 cm <sup>-1</sup>	
Polarization	vertical	2500–4475 nm vertical 4476–12000 nm horizontal
Typical beam diameter <sup>7) 8)</sup>	4 mm	6 mm
<b>PUMP LASER</b>		
Pump wavelength	1064 nm	
Typical pump pulse energy <sup>9)</sup>	1.9 mJ	
Pulse duration <sup>10)</sup>	<10 ns	
Beam quality	fit to Gaussian >90%	
Pulse energy stability (StdDev)	<0.5 %	
<b>PHYSICAL CHARACTERISTICS</b>		
Unit size (W × L × H)	305 × 701 × 270 mm	
Power supply size (W × L × H)	449 × 376 × 140 mm	
Umbilical length	2.5 m	
<b>OPERATING REQUIREMENTS</b>		
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	

<sup>1)</sup> 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 for NT277, NT277-XIR unit and at 7000 nm for NT277-XIR units and for basic system without options.

<sup>2)</sup> Available wavelength range. Custom tuning ranges are available.

<sup>3)</sup> See tuning curves for typical outputs at other wavelengths.

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

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

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

<sup>7)</sup> Measured at the wavelength indicated in the “Pulse energy” specification row.

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

<sup>9)</sup> 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.

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



PERFORMANCE

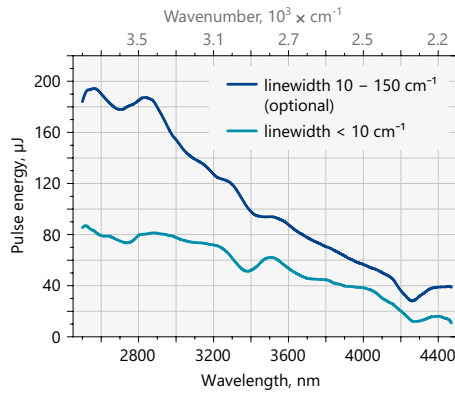


Fig 1. Typical output pulse energy of the NT277 and NT277-XIR tunable laser

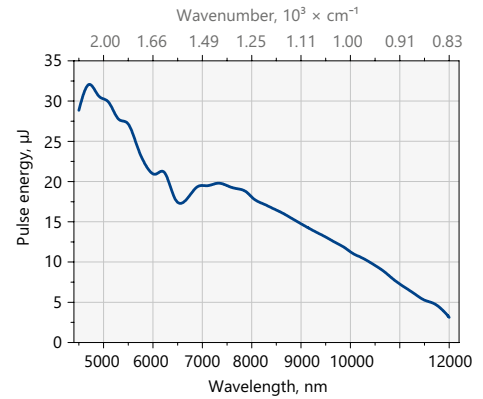


Fig 2. Typical output pulse energy of the NT277-XIR tunable laser

OUTLINE DRAWINGS

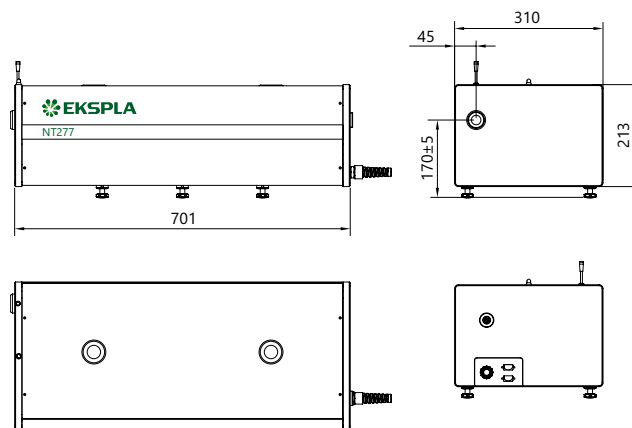
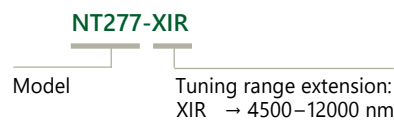


Fig 3. NT277 series laser head dimensions

ORDERING INFORMATION

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



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 e-mail:voc@phototechnica.co.jp