NT342 SERIES. NANOSECOND OPO.

Applications

- Laser-induced fluorescence
- Flash photolysis
- Photobiology
- Remote sensing
- Time-resolved spectroscopy
- Non-linear spectroscopy

Features

- Hands-free no gap wavelength tuning from 192 to 2600 nm
- Up to 50 mJ pulse energy in visible spectral range
- Up to 10 mJ pulse energy in UV spectral range
- Less than 5 cm^{-1} linewidth
- 3–5 ns pulse duration
- Up to 30 Hz pulse repetition rate
- Remote control pad
- PC control via RS232 and LabVIEW™ drivers
- Optional separate shared output port for 355/532/1064 nm beam
- OPO pump energy monitoring
- Replacement of flashlamps without misalignment of the laser cavity

Specifications [1)]

Model	**NT342C**
Wavelength range[2)]	
Signal	410–710 nm[3)]
Idler	710–2600 nm
SH/SF generator (optional)	210–410 nm
Output pulse energy	
OPO [4)]	50 mJ
SH/SF generator (optional) [6)]	10 mJ
Linewidth	<5 cm^{-1} [8)]
Tuning resolution [9)]	
Signal (410–710 nm)	1 cm^{-1}
Idler (710–2600 nm)	1 cm^{-1}
SH/SF/DUV beam (192–410 nm)	2 cm^{-1}

Pulse duration [10)]	3–5 ns
Typical beam diameter [11)]	7 mm
Typical beam divergence [12)]	<2 mrad
Beam pointing stability [13)]	≤ 50 µrad rms
Polarization	
Signal beam	horizontal
Idler beam	vertical
SH/SF/DUV beam	horizontal
Pump laser [14)]	
Pump wavelength	**355 nm**
Typical pump pulse energy	150 mJ
Pulse duration	4–6 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 Hz
Nominal lifetime for pump laser flash lamps	3×10^7 shots
Typical warm-up time [16)]	5 min
Physical characteristics	
Unit size (w × L × H) [17)]	456 × 821 × 270 mm
Power supply size (w × L × H)	330 × 490 × 585 mm
Umbilical length	2.5 m
Maximal weight	
Laser head (without options)	55 kg ±10%
Power supply	35 kg ±10%
Operating requirements	
Water consumption (max 20 °c) [18)]	6 l/min
Room temperature	15–30 °C
Relative humidity	20–80 % (non-condensing)
Power requirements	208 or 240 v ac, single phase 50/60 Hz
Power consumption [19)]	1.8 / 3.4 kVA
Cleanness 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.*
Any order will be carried out according to our general terms and conditions of sale you will find on http://www.ekspla.com/wp-content/uploads/GSC.pdf. We do not accept customer's general terms and conditions of purchasing and supply deviating therefrom. Unless stated otherwise, all specifications are measured at 450 nm.
2) Hands-free tuning range is from 192 nm to 2600 nm.

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 300–409 nm range. See tuning curves for typical outputs at other wavelengths.
7) Measured at 200 nm.
8) Linewidth is <8 cm^{-1} for 210–409 nm range.
9) For manual input from PC.
10) FWHM measured with photodiode featuring 1 ns rise time and 300 MHz bandwidth oscilloscope.
11) Beam diameter is measured at 450 nm at the $1/e^2$ level and can vary depending on the pump pulse energy.
12) Full angle measured at the FWHM level at 450 nm.
13) Beam pointing stability is evaluated as movement of the beam centroid in the focal plane of a focusing element.
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 OPO operation and specifications may vary with each unit we manufacture.
15) 30 Hz version is available. Inquire for pulse energy specifications.
16) Starting from 22°C.
17) Please refer to dimensions table bellow.
18) At 10 Hz pulse repetition rate. Air cooled power supply is available.
19) At 10/20 Hz pulse repetition rate.

Typical beam profile

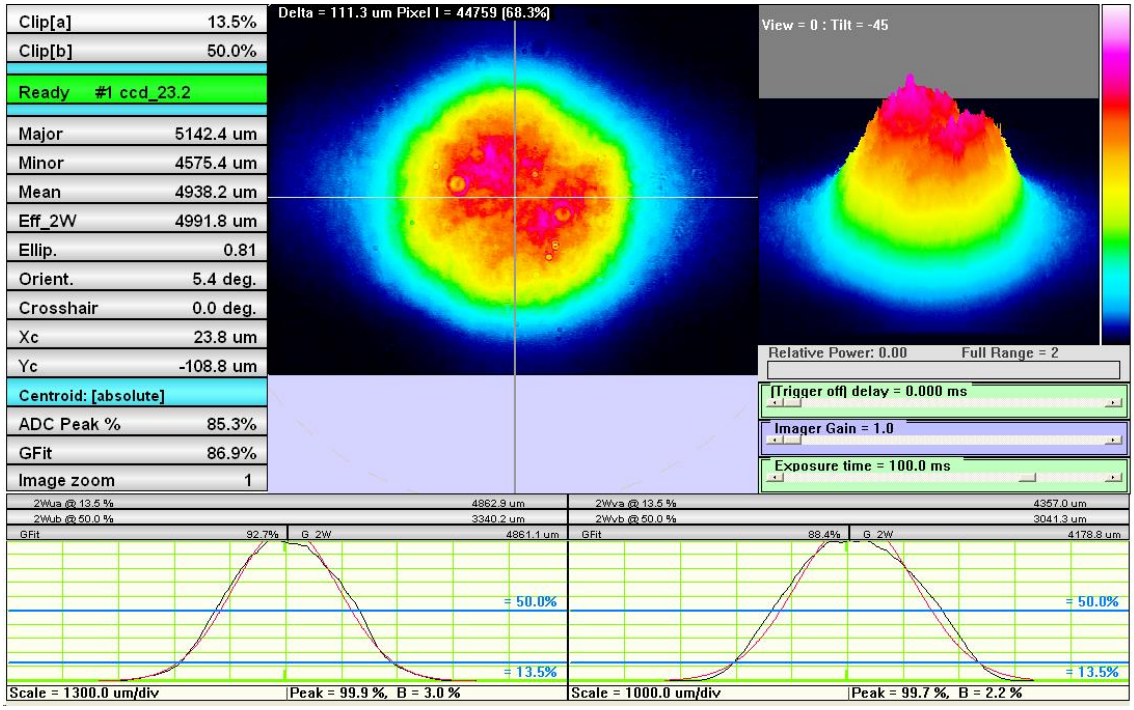

Fig1. NT342 series laser beam profile at 450 nm in near field

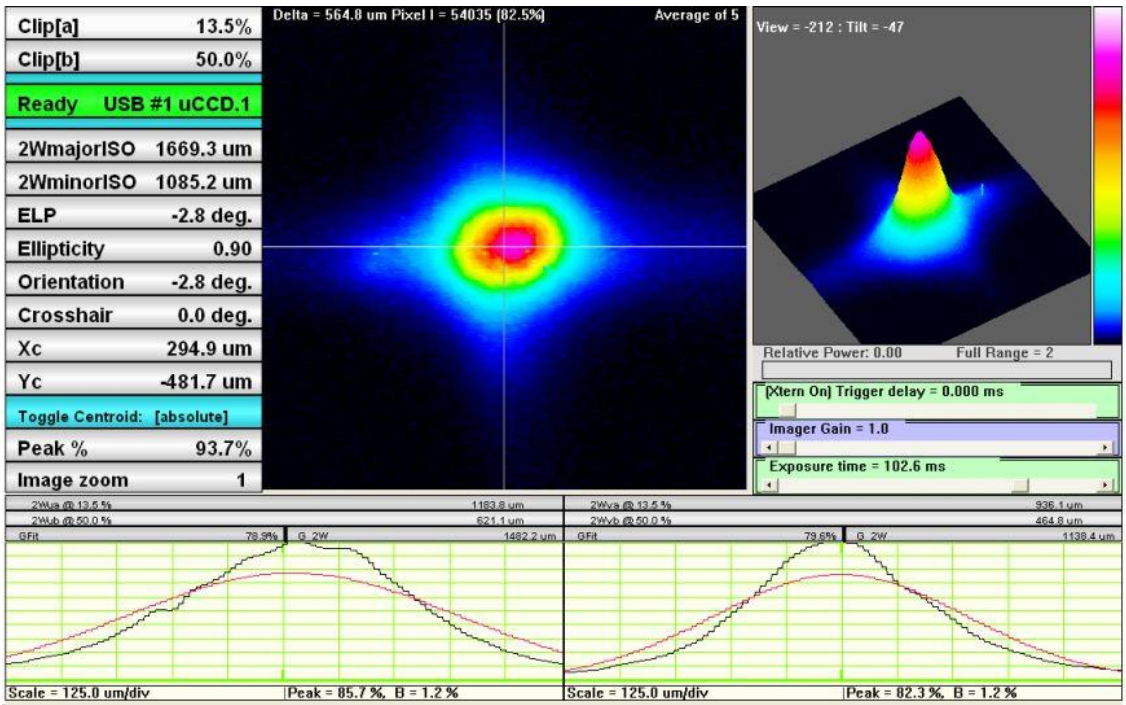

Fig2. NT342 series laser beam profile at 450 nm in far field

OUTPUT ENERGY

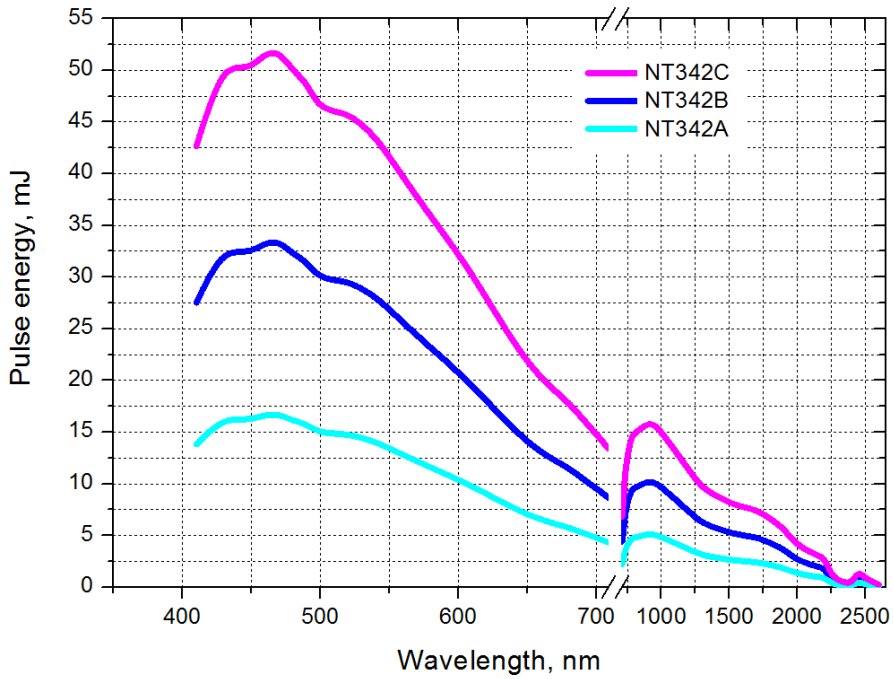

Fig. 3. Typical (smoothed) NT342A, B, C laser tuning curves in signal (410 – 709 nm) and idler (710 – 2600 nm) ranges.

FEATURES

a) Laser head

- Precision machined monolithic aged aluminum alloy chassis.
- Flash lamp pumped pump laser with short unstable resonator and variable reflectivity output coupler.
- High efficiency ceramic diffuse pumping chamber.
- Easily changeable flashlamps.

b) Power supply/Cooling cabinet

- Includes control, communication, power units.
- Compact case. The front panel includes:
  - Emergency circuit breaker.
- Microprocessor control unit for laser operation control via remote control pad or PC interface.
- Single channel power unit for laser cavity powering. Controls included:
  - Voltage level adjustment;
  - Ready, Simmer and Error (occurring against events of interlock or power supply faults) status monitoring.
- Simmer power supply decreasing EMI noise and improving lamp lifetime.
- Power supply for harmonic generators' crystal heaters.
- PC interface module with RS232 interface, remote control through Windows DLL function calls.

Communication module* adds the following interfaces:

- USB - virtual serial port, ASCII commands
- RS232 - ASCII commands
- LAN - REST API
- WLAN - REST API

- Closed loop of deionized water for flashlamps and rods.
- Water to water stainless steel heat exchanger.

**Communication module allows control from Windows and non-Windows OS machines: Windows, Windows CE, Linux, LabVIEW RT and etc.*

c) Remote Control Pad functions

- Internal operation mode:
- Laser operation control (ON/OF);
- Internal or external triggering mode setting;
- Flash lamp and Q-switch timing control;
- Frequency divider mode (laser pulses at repetition rate can be reduced from 2 to 99 times);

- Q-switch burst mode (from 1 to 9999 pulses in the burst);
- Q-switch off mode (no laser output beam, flash lamps operating);
- Single shot mode;
- Sync output pulse delay tuning by 125 ns step within ±7.5 ms relatively to the optical pulse;
- Laser routine/servicing mode setting.
- External operation mode using one external sync pulse (one BNC type input):
- Flash lamp and Q-switch triggering with rise and fall fronts of sync pulse respectively;
- Control of delay between flash lamp and Q-switch triggering done by adjusting the duration of sync pulse.

d) Software

- Installable control, diagnostic and servicing Windows executable utility.

Remote control implemented through DLL calls. To support customer development, LabVIEW and C++ applications together with source codes are provided:

- LabVIEW drivers,
- Control panel application, Windows executable control application together with C++ sources.
- Some Delphi and Visual Basic examples that are not product specific and intended for demonstration of concept.

Safety

- Laser complies to IEC60825 and IEC61010 safety standards;
- Laser is class IV product according to IEC60825-1.

OPTIONS.

-SH/SF GENERATOR

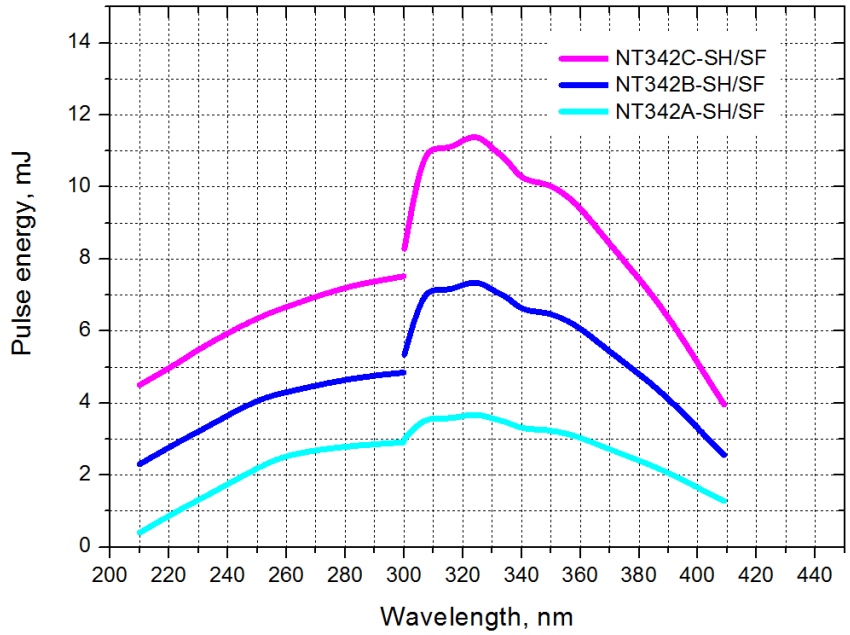

Fig. 4. Typical (smoothed) NT342A, B, C laser tuning curves in SH/SF (210-410 nm) ranges.

- H/2H OPTION

- Provides fundamental and/or second harmonic output from pump laser*.
- Shared output port (one wavelength at the time 1064/532/355 nm).
- Manual reconfiguration of output wavelength using flip-flop mirrors.
- Harmonics output is NOT simultaneous with OPO output.

***** *Inquire for pulse energy specifications.*

-ATTN1 OPTION

Motorized attenuation of output in 410-709 nm spectral range.
Transmission range 1%-80% from input in 410-709 nm range.
Beam pointing – same as for NT342x laser.
Labview based software for transmission setting.

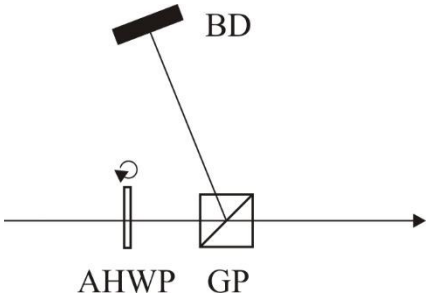

Fig. 5. Optical layout of attenuator ATTN1. AHWP- achromatic waveplate, GP- Glan prism, BD- beam dump.

-ATTN2 OPTION

Motorized attenuation of output in 350-2600 nm spectral range.
Beam deviation <800 µrad.
Labview based software for transmission setting.
Max Transmission:
350-1200 nm: >80%.
1200-2000 nm: >65%.
2000-2600 nm: AS IS
Min Transmission:
350-2600 nm: <0.5%.

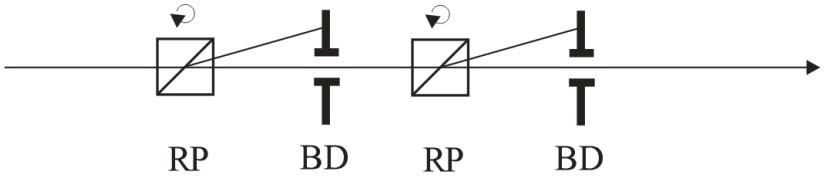

Fig. 6. Optical layout of attenuator ATTN2. RP- Roshon prism, BD- beam dump.

PICTURES

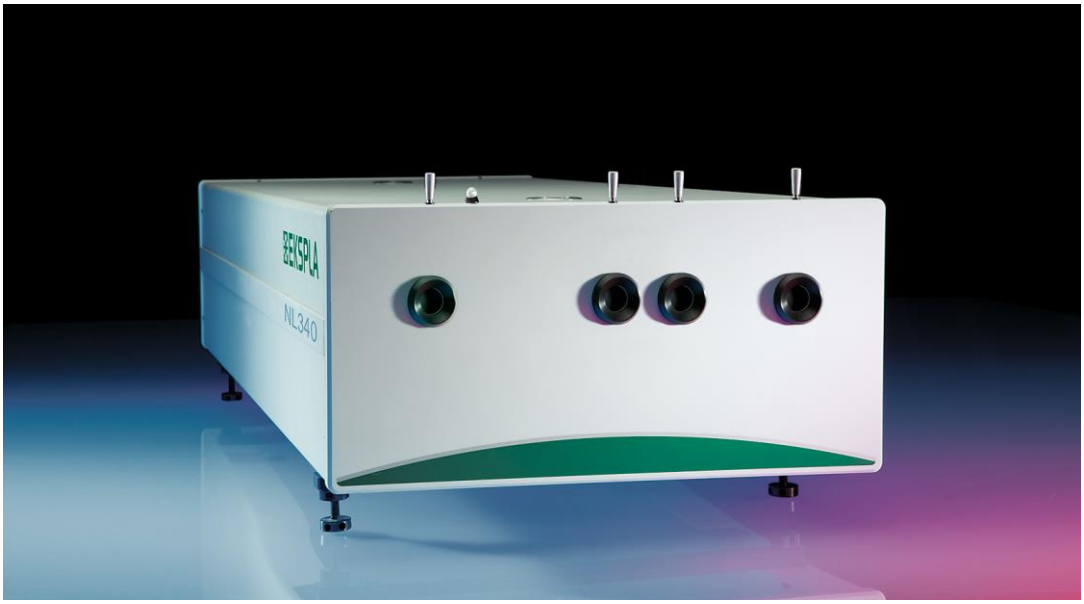

Fig.7. Outside view of the NT342 series laser.

Dimensions of laser

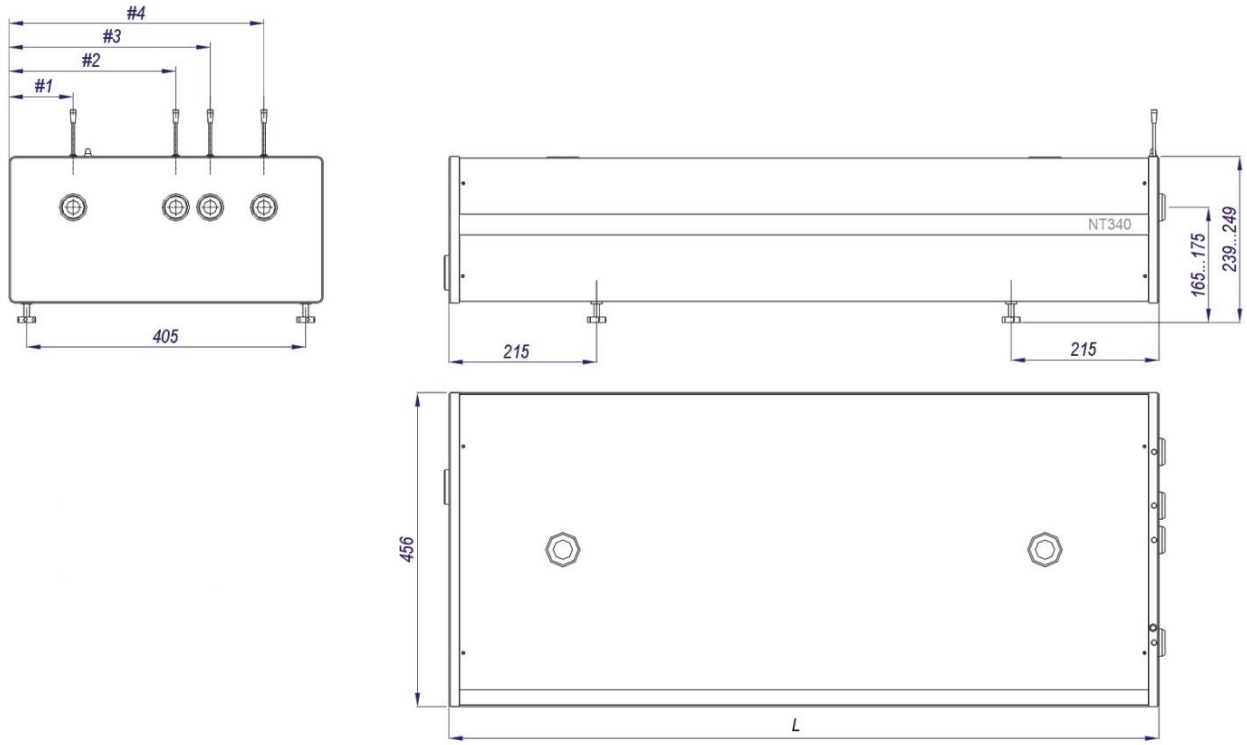

Fig.8. External dimensions of NT342 series laser.

Dimensions table:

Model	Length L, mm
NT342 NT342-1H(2H), NT342-SH-1H(2H), NT342-SF-1H(2H), NT342-SH/SF-1H(2H)	*821 mm*
NT342-FC NT342-ATTN1 NT342-ATTN1/FC NT342-ATTN2/FC NT342-SH-DUV-1H(2H), NT342-SH/SF-DUV-1H(2H)	*1020 mm*
NT342-SH (-SH/SF)-FC NT342--SH (-SH/SF)-ATTN1 NT342--SH (-SH/SF)-ATTN1/FC NT342--SH (-SH/SF)-ATTN2/FC	*1220 mm*

DIMENSIONS OF POWER SUPPLY CABINET

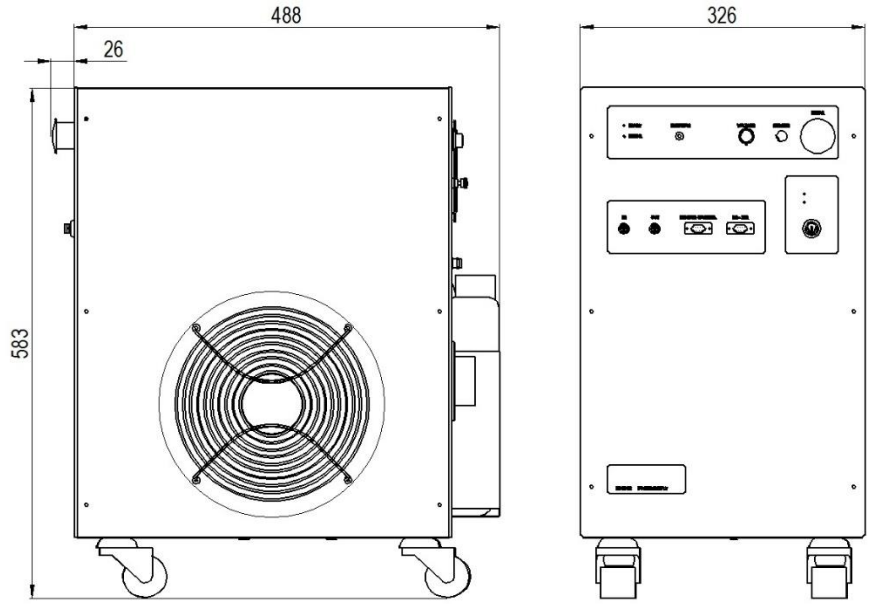

Fig.9. Dimensions of the NT342 laser power supply/cooling rack.