



# nano series\* Industrial DPSS Lasers

## Reliable. Functional. Modular.

The nano series of diode-pumped solid-state lasers is designed to perfectly fit today's requirements for industrial laser processing systems. The sealed cavity, modular design, fully detachable umbilicals and industrial grade connectors make this laser a rugged tool with exceptional performance and reliability.

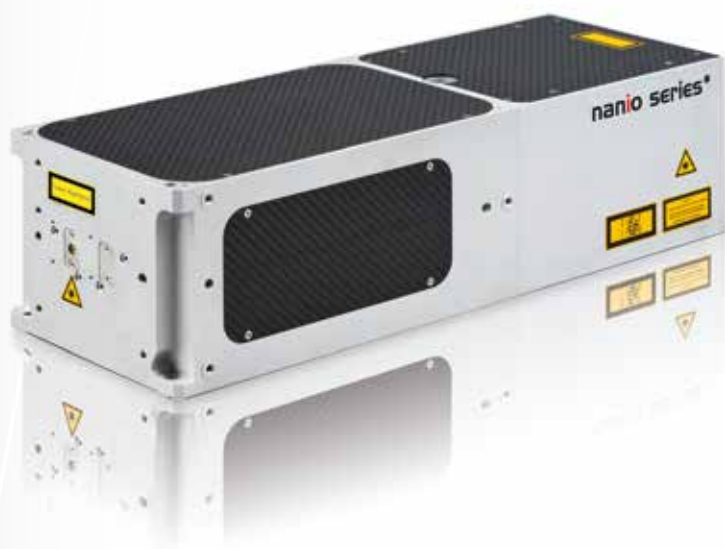
Besides customer needs, reliability was the main driving force during the development of the nano series. Our clean room production and the use of highest quality components ensures consistent quality and longest laser lifetime.

## Applications

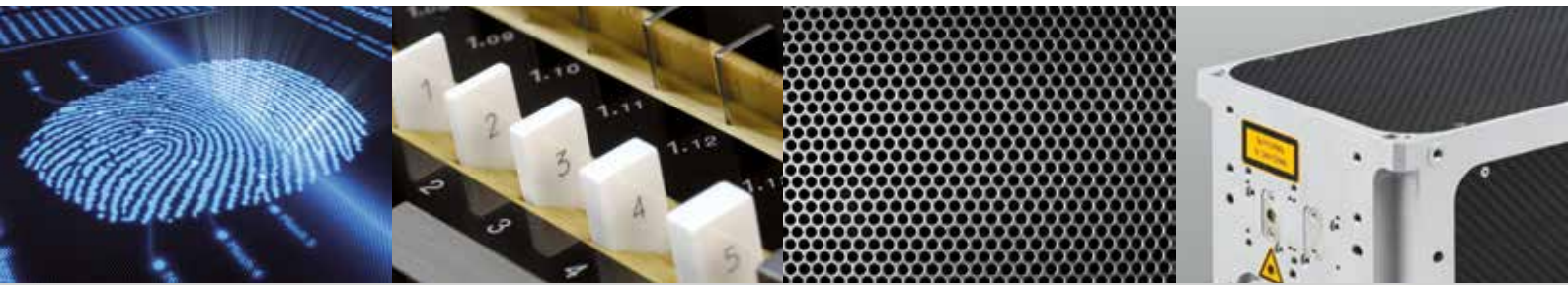
- \* ID Card Marking
- \* LED Back Light
- \* PCB Cutting
- \* PV Manufacturing
- \* Diamond Cutting

## Features

- \* Superior pulse-to-pulse stability
- \* High peak power and short pulse width
- \* Modular industrial design
- \* Easy integration and service
- \* Field proven long life pump diode modules

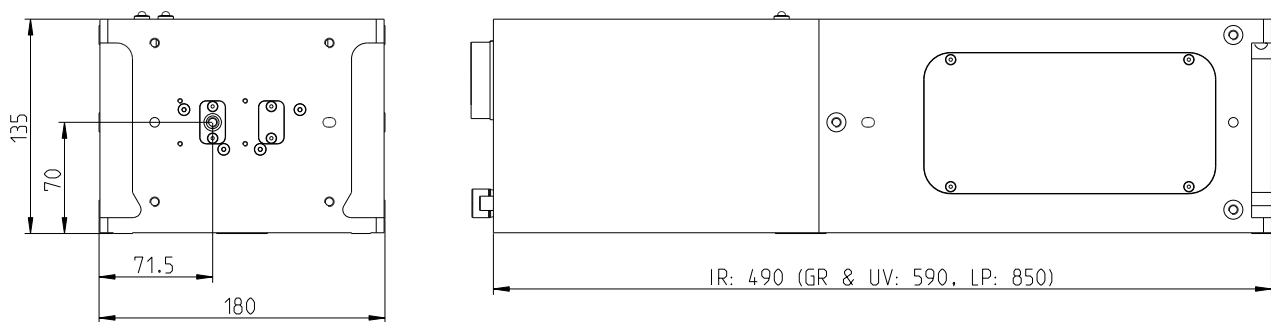


**( i )** The modular design of the nano series lasers simplifies servicing and minimizes downtime. Every field replaceable component can be exchanged within minutes without dismantling the laser head. So the beam path in your machine remains aligned.

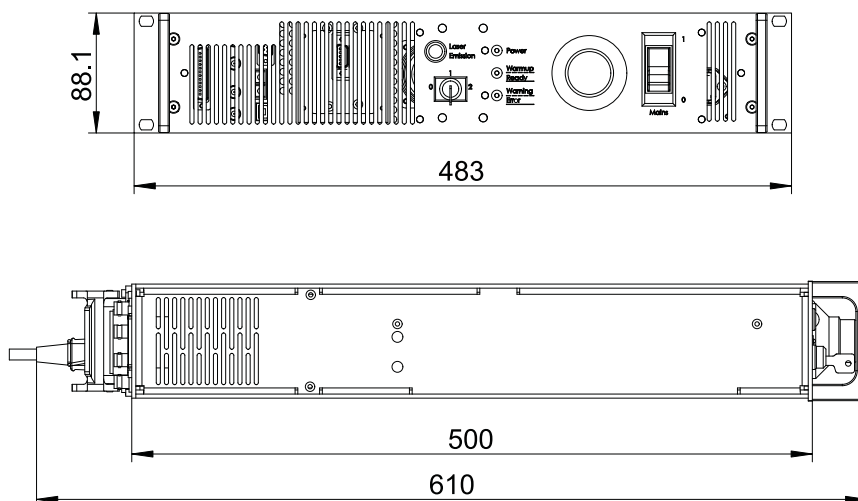


## Technical Drawing

### Laser Head



### Power Supply





## Specifications

### NANIO 355

Model	355-8-V-60	355-6-V-80
Laser Medium	Nd:YVO <sub>4</sub>	Nd:YVO <sub>4</sub>
Wavelength	355 nm	355 nm
Nominal Power	8 W @ 60 kHz	6 W @ 80 kHz
Repetition Rate	Single Shot to 300 kHz	Single Shot to 300 kHz
Pulse Width	< 25 ns @ 60 kHz	< 35 ns @ 80 kHz
Pulse Energy	133 μJ @ 60 kHz	75 μJ @ 80 kHz
Peak Power	> 5.3 kW @ 60 kHz	> 2.1 kW @ 80 kHz
Pulse-to-Pulse Stability	< 2% @ 60 kHz	< 2% @ 80 kHz
Power Stability (rms, 8h)	< 2%	< 2%
Spatial Mode	M <sup>2</sup> < 1.4, TEM <sub>00</sub>	M <sup>2</sup> < 1.3, TEM <sub>00</sub>
Nominal Beam Diameter (at waist)	0.24 mm	0.24 mm
Nominal Waist Location (from output)	-333 mm	-333 mm
Beam Divergence (full angle)	2.6 mrad	2.4 mrad
Nominal Beam Diameter (at output)	0.9 mm	0.85 mm
Polarization	Vertical, > 100:1	Vertical, > 100:1
Circularity	> 90%	> 90%
Warm-up Time	< 15 min	< 15 min
Operating Voltage	115-230 VAC ± 10%, 50-60 Hz	115-230 VAC ± 10%, 50-60 Hz
Laser Power Consumption	< 500 W	< 500 W
Cooling	Water-to-Water or Water-to-Air	Water-to-Water or Water-to-Air
Ambient Temperature	15-40 °C, non-condensing	15-40 °C, non-condensing
External Control	RS232, USB, TTL and Analog Q-Switch Control	RS232, USB, TTL and Analog Q-Switch Control
Dimensions Laser Head (L x W x H)	590 x 180 x 135 mm	590 x 180 x 135 mm
Dimensions Power Supply (L x W x H)	500 x 447 x 88.1 mm, 19" system, 2 RU high	500 x 447 x 88.1 mm, 19" system, 2 RU high
Weight Laser Head	19 kg	19 kg
Weight Power Supply	12 kg	12 kg



<b>355-3-V-150</b>	<b>355-3-V</b>	<b>355-1-V-400</b>
Nd:YVO <sub>4</sub>	Nd:YVO <sub>4</sub>	Nd:YVO <sub>4</sub>
355 nm	355 nm	355 nm
3 W @ 150 kHz	3 W @ 40 kHz	1 W @ 400 kHz
Single Shot to 300 kHz	Single Shot to 300 kHz	Single Shot to 500 kHz
< 35 ns @ 150 kHz	< 35 ns @ 40 kHz	< 60 ns @ 400 kHz
20 μJ @ 150 kHz	75 μJ @ 40 kHz	2.5 μJ @ 400 kHz
> 0.57 kW @ 150 kHz	> 2.1 kW @ 40 kHz	> 0.04 kW @ 400 kHz
< 2% @ 150 kHz	< 2% @ 40 kHz	< 4% @ 400 kHz
< 2%	< 2%	< 2%
M <sup>2</sup> < 1.3, TEM <sub>00</sub>	M <sup>2</sup> < 1.3, TEM <sub>00</sub>	M <sup>2</sup> < 1.4, TEM <sub>00</sub>
0.24 mm	0.35 mm	0.16 mm
-333 mm	-333 mm	-280 mm
2.4 mrad	1.8 mrad	3.9 mrad
0.85 mm	0.66 mm	1.2 mm
Vertical, > 100:1	Vertical, > 100:1	Vertical, > 100:1
> 90%	> 90%	> 85%
< 15 min	< 15 min	< 15 min
115-230 VAC ± 10%, 50-60 Hz	115-230 VAC ± 10%, 50-60 Hz	115-230 VAC ± 10%, 50-60 Hz
< 500 W	< 500 W	< 500 W
Water-to-Water or Water-to-Air	Water-to-Water or Water-to-Air	Water-to-Water or Water-to-Air
15-40 °C, non-condensing	15-40 °C, non-condensing	15-40 °C, non-condensing
RS232, USB, TTL and Analog Q-Switch Control	RS232, USB, TTL and Analog Q-Switch Control	RS232, USB, TTL and Analog Q-Switch Control
590 x 180 x 135 mm	590 x 180 x 135 mm	490 x 180 x 135 mm
500 x 447 x 88.1 mm, 19" system, 2 RU high	500 x 447 x 88.1 mm, 19" system, 2 RU high	500 x 447 x 88.1 mm, 19" system, 2 RU high
19 kg	19 kg	17 kg
12 kg	12 kg	12 kg

InnoLas follows a policy of continuous product improvement. All specifications are subject to change without notice. Rev. 2.2, 06/2015.  
InnoLas Photonics GmbH is DIN EN ISO 9001 certified.

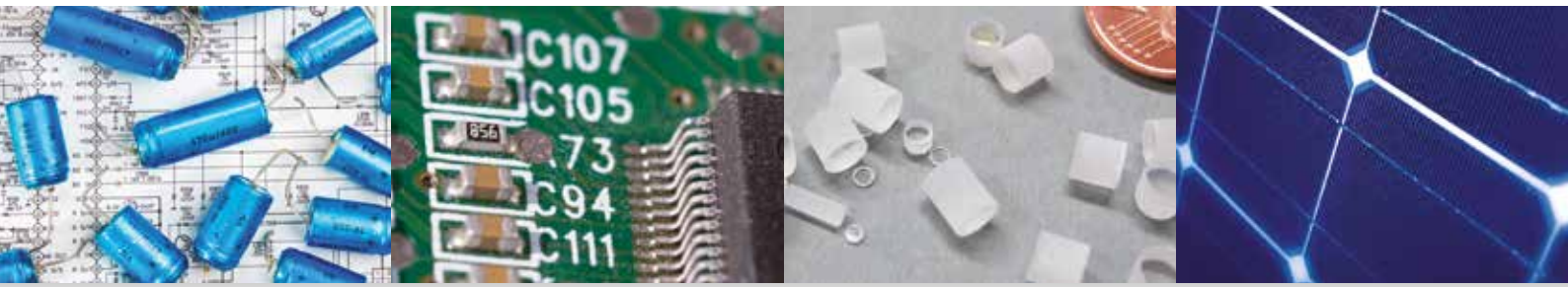




## Specifications

### NANIO 532

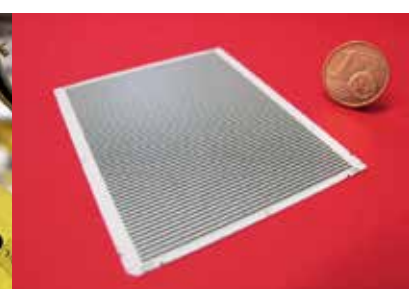
Model	532-20-V	532-20-V-100	532-10-V
Laser Medium	Nd:YVO <sub>4</sub>	Nd:YVO <sub>4</sub>	Nd:YVO <sub>4</sub>
Wavelength	532 nm	532 nm	532 nm
Nominal Power	20 W @ 40 kHz	20 W @ 100 kHz	10 W @ 40 kHz
Repetition Rate	Single Shot to 500 kHz	Single Shot to 500 kHz	Single Shot to 300 kHz
Pulse Width	< 20 ns @ 40 kHz	< 40 ns @ 100 kHz	< 30 ns @ 40 kHz
Pulse Energy	500 μJ @ 40 kHz	200 μJ @ 100 kHz	250 μJ @ 40 kHz
Peak Power	> 25 kW @ 40 kHz	> 5 kW @ 100 kHz	> 8.3 kW @ 40 kHz
Pulse-to-Pulse Stability	< 1% @ 40 kHz	< 1% @ 100 kHz	< 1% @ 40 kHz
Power Stability (rms, 8h)	< 2%	< 2%	< 2%
Spatial Mode	M <sup>2</sup> < 1.3, TEM <sub>00</sub>	M <sup>2</sup> < 1.4, TEM <sub>00</sub>	M <sup>2</sup> < 1.2, TEM <sub>00</sub>
Nominal Beam Diameter (at waist)	0.4 mm	0.4 mm	0.5 mm
Nominal Waist Location (from output)	-324 mm	-292 mm	-324 mm
Beam Divergence (full angle)	2.2 mrad	2.3 mrad	1.6 mrad
Nominal Beam Diameter (at output)	0.8 mm	0.8 mm	0.7 mm
Polarization	Horizontal, > 100:1	Horizontal, > 100:1	Horizontal, > 100:1
Circularity	> 90%	> 85%	> 90%
Warm-up Time	< 15 min	< 15 min	< 15 min
Operating Voltage	115-230 VAC ± 10%, 50-60 Hz	115-230 VAC ± 10%, 50-60 Hz	115-230 VAC ± 10%, 50-60 Hz
Laser Power Consumption	< 500 W	< 500 W	< 500 W
Cooling	Water-to-Water or Water-to-Air	Water-to-Water or Water-to-Air	Water-to-Water or Water-to-Air
Ambient Temperature	15-40 °C, non-condensing	15-40 °C, non-condensing	15-40 °C, non-condensing
External Control	RS232, USB, TTL and Analog Q-Switch Control	RS232, USB, TTL and Analog Q-Switch Control	RS232, USB, TTL and Analog Q-Switch Control
Dimensions Laser Head (L x W x H)	590 x 180 x 135 mm	590 x 180 x 135 mm	590 x 180 x 135 mm
Dimensions Power Supply (L x W x H)	500 x 447 x 88.1 mm, 19" system, 2 RU high	500 x 447 x 88.1 mm, 19" system, 2 RU high	500 x 447 x 88.1 mm, 19" system, 2 RU high
Weight Laser Head	19 kg	19 kg	19 kg
Weight Power Supply	12 kg	12 kg	12 kg



532-10-V-20	532-10-V-SP	532-18-Y
Nd:YVO <sub>4</sub>	Nd:YVO <sub>4</sub>	Nd:YAG
532 nm	532 nm	532 nm
10 W @ 20 kHz	10 W @ 40 kHz	18 W @ 10 kHz
Single Shot to 300 kHz	Single Shot to 300 kHz	Single Shot to 100 kHz
< 10 ns @ 20 kHz	< 20 ns @ 40 kHz	< 40 ns @ 10 kHz
500 µJ @ 20 kHz	250 µJ @ 40 kHz	1800 µJ @ 10 kHz
> 50 kW @ 20 kHz	> 12.5 kW @ 40 kHz	> 45 kW @ 10 kHz
< 1% @ 20 kHz	< 1% @ 40 kHz	< 1.5% @ 10 kHz
< 2%	< 2%	< 2%
M <sup>2</sup> < 1.2, TEM <sub>00</sub>	M <sup>2</sup> < 1.2, TEM <sub>00</sub>	M <sup>2</sup> < 1.3, TEM <sub>00</sub>
0.3 mm	0.2 mm	0.5 mm
-324 mm	-320 mm	-324 mm
2.7 mrad	4.4 mrad	1.7 mrad
0.9 mm	1.4 mm	0.8 mm
Horizontal, > 100:1	Horizontal, > 100:1	Horizontal, > 100:1
> 90%	> 90%	> 85%
< 15 min	< 15 min	< 15 min
115-230 VAC ± 10%, 50-60 Hz	115-230 VAC ± 10%, 50-60 Hz	115-230 VAC ± 10%, 50-60 Hz
< 500 W	< 500 W	< 500 W
Water-to-Water or Water-to-Air	Water-to-Water or Water-to-Air	Water-to-Water or Water-to-Air
15-40 °C, non-condensing	15-40 °C, non-condensing	15-40 °C, non-condensing
RS232, USB, TTL and Analog Q-Switch Control	RS232, USB, TTL and Analog Q-Switch Control	RS232, USB, TTL and Analog Q-Switch Control
590 x 180 x 135 mm	490 x 180 x 135 mm	590 x 180 x 135 mm
500 x 447 x 88.1 mm, 19" system, 2 RU high	500 x 447 x 88.1 mm, 19" system, 2 RU high	500 x 447 x 88.1 mm, 19" system, 2 RU high
19 kg	17 kg	19 kg
12 kg	12 kg	12 kg

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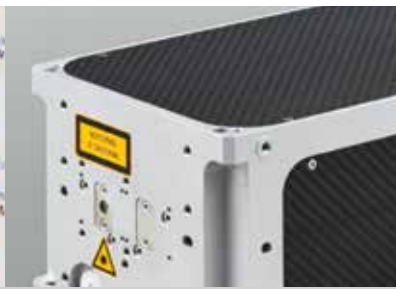
## Q-SWITCHED LASERS



### Specifications

## NANIO 1064

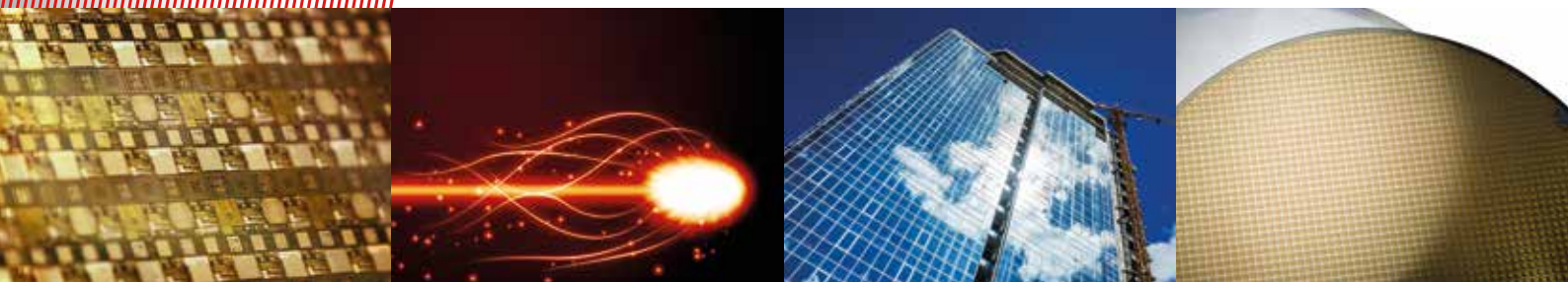
Model	1064-25-V	1064-20-V-20
Laser Medium	Nd:YVO <sub>4</sub>	Nd:YVO <sub>4</sub>
Wavelength	1064 nm	1064 nm
Nominal Power	23 W @ 50 kHz	20 W @ 20 kHz
Repetition Rate	Single Shot to 300 kHz	Single Shot to 60 kHz
Pulse Width	< 40 ns @ 50 kHz	< 10 ns @ 20 kHz
Pulse Energy	460 μJ @ 50 kHz	1000 μJ @ 20 kHz
Peak Power	> 11.5 kW @ 50 kHz	> 100 kW @ 20 kHz
Pulse-to-Pulse Stability	< 0.5% @ 50 kHz	< 1% @ 20 kHz
Power Stability (rms, 8h)	< 1%	< 1%
Spatial Mode	M <sup>2</sup> < 1.2, TEM <sub>00</sub>	M <sup>2</sup> < 1.2, TEM <sub>00</sub>
Nominal Beam Diameter (at waist)	0.7 mm	0.6 mm
Nominal Waist Location (from output)	-49 mm	-89 mm
Beam Divergence (full angle)	2.3 mrad	2.7 mrad
Nominal Beam Diameter (at output)	0.7 mm	0.7 mm
Polarization	Vertical, > 100:1	Vertical, > 100:1
Circularity	> 90%	> 90%
Warm-up Time	< 15 min	< 15 min
Operating Voltage	115-230 VAC ± 10%, 50-60 Hz	115-230 VAC ± 10%, 50-60 Hz
Laser Power Consumption	< 500 W	< 500 W
Cooling	Water-to-Water or Water-to-Air	Water-to-Water or Water-to-Air
Ambient Temperature	15-40 °C, non-condensing	15-40 °C, non-condensing
External Control	RS232, USB, TTL and Analog Q-Switch Control	RS232, USB, TTL and Analog Q-Switch Control
Dimensions Laser Head (L x W x H)	490 x 180 x 135 mm	490 x 180 x 135 mm
Dimensions Power Supply (L x W x H)	500 x 447 x 88.1 mm, 19" system, 2 RU high	500 x 447 x 88.1 mm, 19" system, 2 RU high
Weight Laser Head	17 kg	17 kg
Weight Power Supply	12 kg	12 kg



<b>1064-16-V</b>	<b>1064-16-V-LP</b>	<b>1064-20-Y</b>
Nd:YVO <sub>4</sub>	Nd:YVO <sub>4</sub>	Nd:YAG
1064 nm	1064 nm	1064 nm
14 W @ 50 kHz	15 W @ 50 kHz	18 W @ 10 kHz
Single Shot to 300 kHz	Single Shot to 150 kHz	Single Shot to 50 kHz
< 45 ns @ 50 kHz	< 100 ns @ 50 kHz	< 40 ns @ 10 kHz
280 µJ @ 50 kHz	300 µJ @ 50 kHz	1800 µJ @ 10 kHz
> 6.2 kW @ 50 kHz	> 3 kW @ 50 kHz	> 45 kW @ 10 kHz
< 0.5% @ 50 kHz	< 1% @ 50 kHz	< 1% @ 10 kHz
< 1%	< 1%	< 1%
M <sup>2</sup> < 1.2, TEM <sub>00</sub>	M <sup>2</sup> < 1.2, TEM <sub>00</sub>	M <sup>2</sup> < 1.2, TEM <sub>00</sub>
0.7 mm	1.2 mm	0.6 mm
-49 mm	-273 mm	-57 mm
2.3 mrad	1.3 mrad	2.7 mrad
0.7 mm	1.3 mm	0.6 mm
Vertical, > 100:1	Vertical, > 100:1	Vertical, > 100:1
> 90%	> 90%	> 90%
< 15 min	< 15 min	< 15 min
115-230 VAC ± 10%, 50-60 Hz	115-230 VAC ± 10%, 50-60 Hz	115-230 VAC ± 10%, 50-60 Hz
< 500 W	< 500 W	< 500 W
Water-to-Water or Water-to-Air	Water-to-Water or Water-to-Air	Water-to-Water or Water-to-Air
15-40 °C, non-condensing	15-40 °C, non-condensing	15-40 °C, non-condensing
RS232, USB, TTL and Analog Q-Switch Control	RS232, USB, TTL and Analog Q-Switch Control	RS232, USB, TTL and Analog Q-Switch Control
490 x 180 x 135 mm	850 x 180 x 135 mm	490 x 180 x 135 mm
500 x 447 x 88.1 mm, 19" system, 2 RU high	500 x 447 x 88.1 mm, 19" system, 2 RU high	500 x 447 x 88.1 mm, 19" system, 2 RU high
17 kg	22 kg	17 kg
12 kg	12 kg	12 kg

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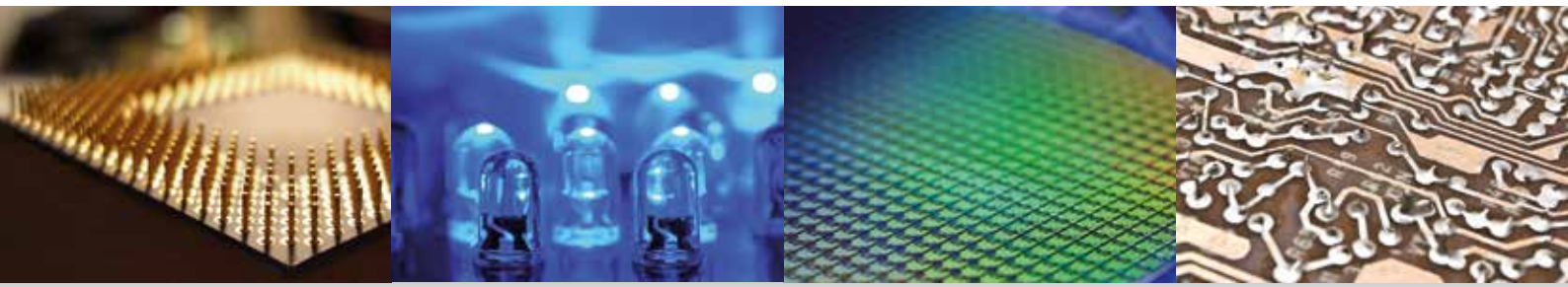


## Specifications

# NANIO 1342

Model	1342-8-V
Laser Medium	Nd:YVO <sub>4</sub>
Wavelength	1342 nm
Nominal Power	8 W @ 20 kHz
Repetition Rate	Single Shot to 50 kHz
Pulse Width	< 80 ns @ 20 kHz
Pulse Energy	400 μJ @ 20 kHz
Peak Power	> 5 kW @ 20 kHz
Pulse-to-Pulse Stability	< 2.0% @ 20 kHz
Power Stability (rms, 8h)	< 1%
Spatial Mode	M <sup>2</sup> < 1.2, TEM <sub>00</sub>
Nominal Beam Diameter (at waist)	0.7 mm
Nominal Waist Location (from output)	-49 mm
Beam Divergence (full angle)	2.3 mrad
Nominal Beam Diameter (at output)	0.7 mm
Polarization	Vertical, > 100:1
Circularity	> 90%
Warm-up Time	< 15 min
Operating Voltage	115-230 VAC ± 10%, 50-60 Hz
Laser Power Consumption	< 500 W
Cooling	Water-to-Water or Water-to-Air
Ambient Temperature	15-40 °C, non-condensing
External Control	RS232, USB, TTL and Analog Q-Switch Control
Dimensions Laser Head (L x W x H)	490 x 180 x 135 mm
Dimensions Power Supply (L x W x H)	500 x 447 x 88.1 mm, 19" system, 2 RU high
Weight Laser Head	17 kg
Weight Power Supply	12 kg

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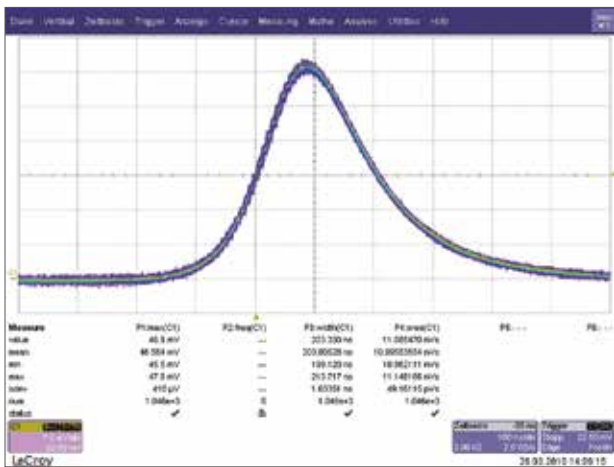


## Options & Customization



### Available Options

- \* Water/air & water/water chiller
- \* Failsafe safety shutter & electronics
- \* Umbilical length 1-20 m
- \* Beam expander box
- \* Variable attenuator box
- \* Scan head adapter flanges
- \* Constant pulse energy mode



### Customization

- \* Customized laser performance
- \* Pulse picker AOM
- \* Power supply front panel design
- \* Laser interfacing
- \* Branded laser control software
- \* Special chillers
- \* Special laser developments

**(i)** Since today's demanding applications deserve optimized laser parameters, we do not only sell off-the-shelf products. We can tailor our laser performance, design, interfacing or software to perfectly fit your individual application needs.

