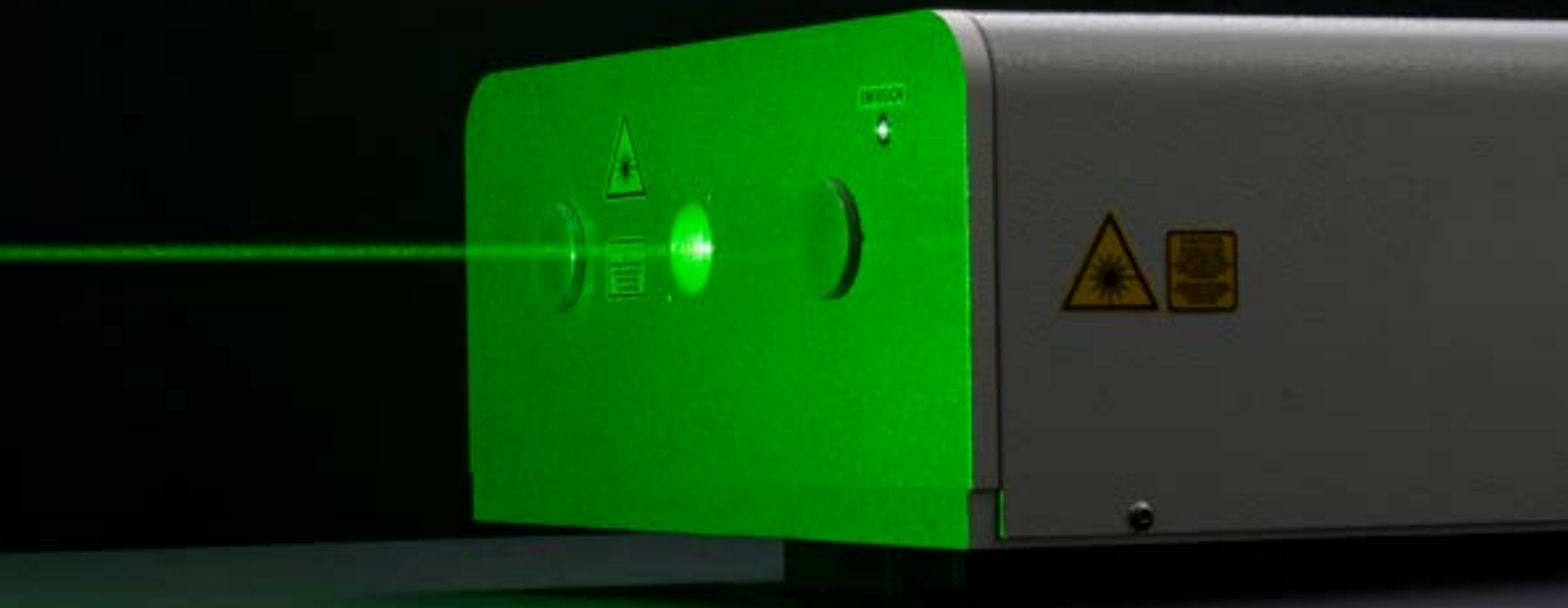




LASERS FOR PIV

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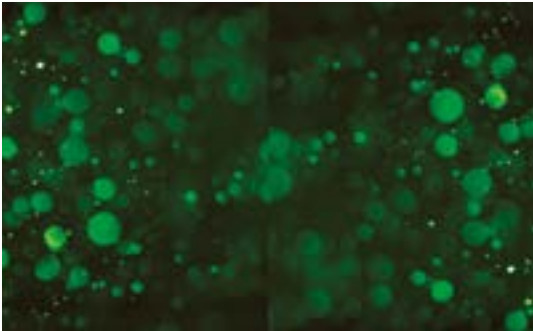


Lasers for PIV



Litron offers an extensive range of flashlamp-pumped and diode-pumped PIV laser systems. Output energies of up to 425mJ per laser per pulse and repetition rates of up to 200Hz for flashlamp systems and up to 50kHz for diode pumped systems are available.

All of the systems are twin head devices, meaning that the PIV laser head contains two totally independent lasers. The range of PIV systems is based around both the ultra-compact Nano series and the larger Invar-stabilised LPY and LD PIV series. The overriding factor that sets Litron's products apart is quality. This is evidenced not only in the product design and construction, but also in its performance.



In any imaging application the beam quality is of paramount importance as this determines the light sheet characteristics. By choosing a suitable resonator configuration the output beam quality can be controlled to give a very smooth spatial profile which remains homogeneous as it propagates through to the far field. Such resonators are almost always stable or stable-telescopic configuration.

Super-Gaussian-coupled resonators are not in general ideal for visualisation applications. These resonators produce very good super-Gaussian spatial profiles with low divergence in the far field, however, in the near to intermediate fields (within 10m of the laser output) the beam spatial profile often has significant structure. This phenomenon is typical of this resonator design and is a result of the physics of the system, making it unsuitable for forming uniform light sheets.



It is our philosophy to provide a laser system that suits an application. A 'one system fits all' approach, as offered by most manufacturers, does not allow the customer to optimise their process. For applications such as PIV, Litron has developed resonators that yield extremely uniform light sheets whose pulse to pulse structure remains constant. These are all based around our stable and stable-telescopic resonators.

The Nano PIV Series

Compact Lasers for PIV Applications



FEATURES

- **Compact dual head design**
- **Dedicated PIV laser head**
- **Stable resonator design**
- **Telescopic versions for low divergence**
- **Rugged for industrial environments**
- **3rd and 4th harmonics available for LIF and dual colour PIV**
- **Repetition rates up to 100Hz**
- **Energies up to 425mJ at 532nm**

Nano PIV

The construction of the Nano series of PIV laser systems is extremely robust. They have been developed as industrial tools that can be handled without worry of misalignment or damage. The PIV head is formed by an aluminium gauge-plate onto which two standard Nano series heads are mounted.

The output beams are combined by dielectric polarisers and then frequency doubled, and if desired can be frequency tripled, quadrupled or quintupled. Many of the Nano PIV systems are powered by a single power supply unit, making the overall package both powerful and portable.

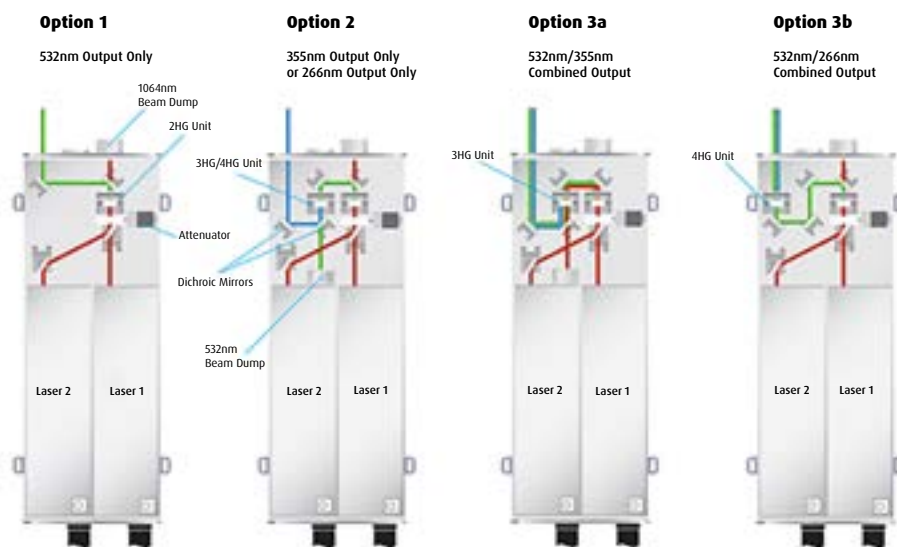
There are two twin power supplies available, the LPU450 and the LPU550, the latter allowing outputs of up to 200mJ at 532nm at 15Hz from each laser. The laser systems are controlled via a remote controller or via RS232 interface. All trigger and synchronisation signals are TTL compatible and each laser is controllable entirely independently.

All Nano laser heads have a verified electronic intracavity safety shutter as standard, which ensures that the lasers cannot be started with the shutter open – an important safety feature.

The Nano L PIV range also includes high repetition rate models giving energies of up to 50mJ per pulse at 100Hz from each laser using two power supplies that are completely air cooled.

The Nano T PIV range has been designed incorporating stable telescopic resonators, giving very low divergence output beams that allow thinner light sheets to be formed than from conventional stable resonators.

For large area illumination, high energies are achieved with the birefringence-compensated TRL PIV range, which achieves output energies of up to 425mJ per pulse at 532nm, 10Hz. The footprint of the head is an extremely compact at 908mm x 270mm. These systems are supported either by twin LPU1000 power supplies or by a single 16U Rackmount.



Schematic showing the Nano PIV laser harmonic generation options.

TECHNICAL DATA

| Model | Nano S 65-15 PIV | Nano S 30-15 PIV | Nano S 50-20 PIV | Nano S 30-30 PIV |
|---|--------------------|--------------------|--------------------|--------------------|
| Repetition Rate (Hz) | 0-15 | 0-15 | 0-20 | 0-30 |
| Pulse Energy Per Head (mJ) ⁽¹⁾ | 65 | 30 | 50 | 30 |
| Parameter | | | | |
| Pulse Stability (±%) ⁽²⁾ | 2 | 2 | 2 | 2 |
| Beam Diameter (mm) | 4 | 3 | 4 | 3 |
| Beam Divergence (mrad) | ~2.5 | ~2.0 | ~2.5 | ~2.0 |
| Pulse Width @ 1064nm (ns) | 6-8 | 5-8 | 6-8 | 5-8 |
| Pointing Stability (μrad) | <100 | <100 | <100 | <100 |
| Resonator Type | Stable | Stable | Stable | Stable |
| Lamp Life (pulses) | >5x10 ⁷ | >5x10 ⁷ | >5x10 ⁷ | >5x10 ⁷ |
| Timing Jitter (ns) | <0.5 | <0.5 | <0.5 | <0.5 |
| Services | | | | |
| Voltage (VAC) ⁽³⁾ | 90-250 | 90-250 | 90-250 | 90-250 |
| Frequency (Hz) ⁽⁴⁾ | 47-63 | 47-63 | 47-63 | 47-63 |
| Power | Single Phase | Single Phase | Single Phase | Single Phase |
| Ambient (°C) ⁽⁵⁾ | 5-35 | 5-35 | 5-35 | 5-35 |
| Consumption (W) | <350 | <350 | <350 | <350 |
| Cooling | Air | Air | Air | Air |
| Power Supply | LPU450 | LPU450 | LPU450 | LPU550 |

All data provided for each laser head, unless specified otherwise.

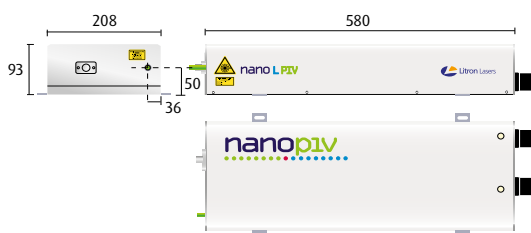
- (1) At maximum repetition rate.
- (2) Peak-to-Peak Energy - 99% of pulses.
- (3) 110VAC option requires autotransformer to be specified on order.
- (4) 50 or 60Hz to be specified on order.
- (5) 0 to 80% non-condensing atmosphere.

| Model | Nano L 200-15 PIV | Nano L 145-15 PIV | Nano L 150-20 PIV | Nano L 100-50 PIV | Nano L 50-50 PIV | Nano L 50-100 PIV |
|---|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Repetition Rate (Hz) | 0-15 | 0-15 | 0-20 | 0-50 | 0-50 | 0-100 |
| Pulse Energy Per Head (mJ) ⁽¹⁾ | 200 | 145 | 150 | 100 | 50 | 50 |
| Parameter | | | | | | |
| Pulse Stability (±%) ⁽²⁾ | 2 | 2 | 2 | 2 | 2 | 2 |
| Beam Diameter (mm) | 6.5 | 5 | 6.5 | 4 | 4 | 4 |
| Beam Divergence (mrad) | ~3.0 | ~3.0 | ~3.0 | ~2.0 | ~2.0 | ~2.0 |
| Pulse Width @ 1064nm (ns) | 6-9 | 6-9 | 6-9 | 5-8 | 5-8 | 5-8 |
| Pointing Stability (μrad) | <100 | <100 | <100 | <100 | <100 | <100 |
| Resonator Type | Stable | Stable | Stable | Stable | Stable | Stable |
| Lamp Life (pulses) | >5x10 ⁷ | >5x10 ⁷ | >5x10 ⁷ | >5x10 ⁷ | >5x10 ⁷ | >5x10 ⁷ |
| Timing Jitter (ns) | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Services | | | | | | |
| Voltage (VAC) ⁽³⁾ | 90-250 | 90-250 | 90-250 | 220-250 | 90-250 | 220-250 |
| Frequency (Hz) ⁽⁴⁾ | 47-63 | 47-63 | 47-63 | 47-63 | 47-63 | 47-63 |
| Power | Single Phase | Single Phase | Single Phase | Single Phase | Single Phase | Single Phase |
| Ambient (°C) ⁽⁵⁾ | 5-35 | 5-35 | 5-35 | 5-35 | 5-35 | 5-35 |
| Consumption (W) | <800 | <650 | <800 | <2500 | <800 | <2500 |
| Cooling | Air | Air | Air | Air | Air | Air |
| Power Supply | LPU550 | LPU550 | LPU550 | 2 x LPU1000 | LPU550 | 2 x LPU1000 |

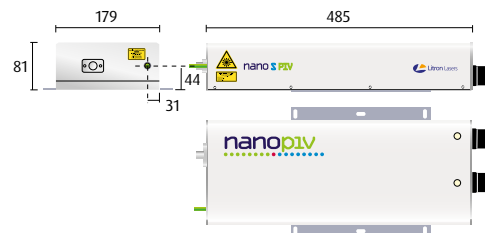
MECHANICAL DATA

All dimensions shown in mm

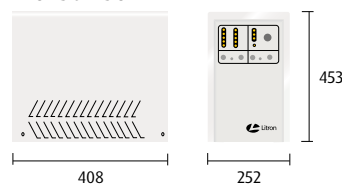
Nano L PIV Laser Head



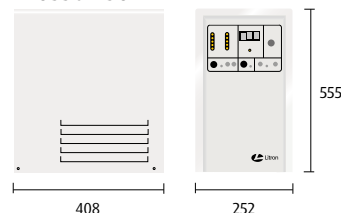
Nano S PIV Laser Head



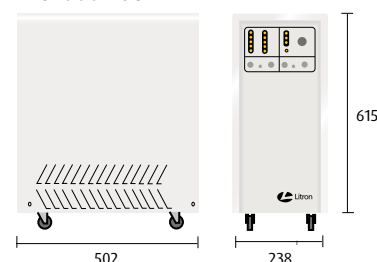
LPU450 PSU



LPU550 PSU



LPU1000 PSU



TECHNICAL DATA

| Model | Nano T 180-15 PIV | Nano T 135-15 PIV |
|---|--------------------|--------------------|
| Repetition Rate (Hz) | 15 | 15 |
| Pulse Energy Per Head (mJ) ⁽¹⁾ | 180 | 135 |
| Parameter | | |
| Pulse Stability (±%) ⁽²⁾ | 2 | 2 |
| Beam Diameter (mm) | 6.35 | 5 |
| Beam Divergence (mrad) | 0.8 | 0.8 |
| Pulse Width @ 1064nm (ns) | 7-9 | 7-9 |
| Pointing Stability (μrad) | 100 | 100 |
| Resonator Type | Telescopic | Telescopic |
| Lamp Life (pulses) | >5x10 ⁷ | >5x10 ⁷ |
| Timing Jitter (ns) | 0.5 | 0.5 |
| Services | | |
| Voltage (VAC) ⁽³⁾ | 90-250 | 90-250 |
| Frequency (Hz) ⁽⁴⁾ | 47-63 | 47-63 |
| Power | Single Phase | Single Phase |
| Ambient (°C) ⁽⁵⁾ | 5-35 | 5-35 |
| Consumption (W) | <800 | <650 |
| Cooling | Air | Air |
| Power Supply | LPU550 | LPU550 |

All data provided for each laser head, unless specified otherwise.

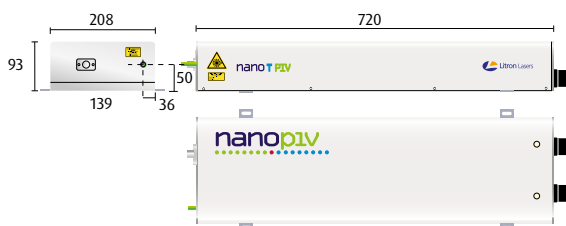
- (1) At maximum repetition rate.
- (2) Peak-to-Peak Energy - 99% of pulses.
- (3) 110VAC option requires autotransformer to be specified on order.
- (4) 50 or 60Hz to be specified on order.
- (5) 0 to 80% non-condensing atmosphere.
- (6) 200VAC available on request.

| Model | TRL 425-10 PIV | TRL 350-10 PIV | TRL 400-15 PIV | TRL 400-20 PIV | TRL 300-20 PIV | TRL 250-20 PIV |
|---|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Repetition Rate (Hz) | 10 | 10 | 15 | 20 | 20 | 20 |
| Pulse Energy Per Head (mJ) ⁽¹⁾ | 425 | 350 | 400 | 400 | 300 | 250 |
| Parameter | | | | | | |
| Pulse Stability (±%) ⁽²⁾ | 3 | 3 | 3 | 3 | 3 | 3 |
| Beam Diameter (mm) | 9.5 | 8 | 9.5 | 9.5 | 9.5 | 6.35 |
| Beam Divergence (mrad) | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 |
| Pulse Width @ 1064nm (ns) | 9-12 | 9-12 | 9-12 | 9-12 | 9-12 | 9-12 |
| Pointing Stability (μrad) | 100 | 100 | 100 | 100 | 100 | 100 |
| Resonator Type | Telescopic | Telescopic | Telescopic | Telescopic | Telescopic | Telescopic |
| Lamp Life (pulses) | >5x10 ⁷ | >5x10 ⁷ | >5x10 ⁷ | >5x10 ⁷ | >5x10 ⁷ | >5x10 ⁷ |
| Timing Jitter (ns) | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Services | | | | | | |
| Voltage (VAC) ⁽³⁾ | 220-250 ⁽⁴⁾ | 220-250 ⁽⁴⁾ | 220-250 ⁽⁴⁾ | 220-250 ⁽⁴⁾ | 220-250 ⁽⁴⁾ | 220-250 ⁽⁴⁾ |
| Frequency (Hz) ^(4,6) | 50-60 ⁽⁵⁾ | 50-60 ⁽⁵⁾ | 50-60 ⁽⁵⁾ | 50-60 ⁽⁵⁾ | 50-60 ⁽⁵⁾ | 50-60 ⁽⁵⁾ |
| Power | Single Phase | Single Phase | Single Phase | Single Phase | Single Phase | Single Phase |
| Ambient (°C) ⁽⁵⁾ | 5-35 | 5-35 | 5-35 | 5-35 | 5-35 | 5-35 |
| Consumption (W) | <2500 | <2500 | <4500 | <5500 | <2500 | <2500 |
| Cooling | Air | Air | Water | Water | Water | Air |
| Power Supply | 2 x LPU1000 | 2 x LPU1000 | 16U Rack | 16U Rack | 16U Rack | 2 x LPU1000 |

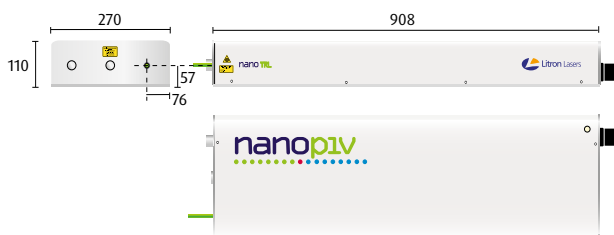
MECHANICAL DATA

All dimensions shown in mm.

Nano T PIV Laser Head



TRL PIV Laser Head



Rack-mount PSU



The Bernoulli PIV Series

Ultra Ruggedised Laser for PIV Applications in Demanding Environments



FEATURES

- **Vibration and shock proof**
- **Fully sealed laser head**
- **2 year warranty**
- **Ability to operate in all orientations**
- **Compact size**
- **Fast connections and start-up**
- **Motorised attenuator**
- **High frequency options**

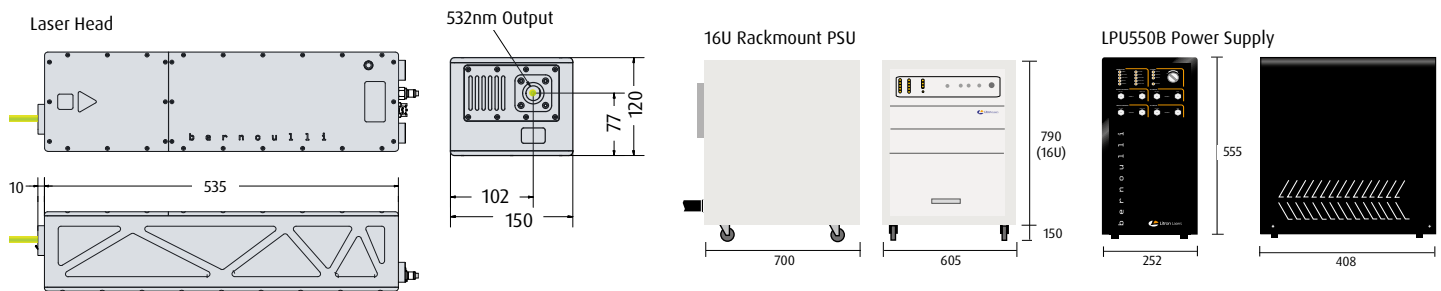
Bernoulli PIV

The Bernoulli PIV from Litron is the most advanced plug and play PIV laser system available today. It benefits from Litron's years of experience and the expertise gained from being the world's leading PIV laser manufacturer.

Thanks to its true turnkey operation and rugged, industrial construction, Bernoulli PIV is suited to operation in almost any environment.

MECHANICAL DATA

All dimensions shown in mm



TECHNICAL DATA

| Model | Bernoulli 200-15 PIV | Bernoulli 145-15 PIV | Bernoulli 120-20 PIV | Bernoulli 100-25 PIV | Bernoulli 100-50 PIV | Bernoulli 50-100 PIV |
|---------------------------------------|----------------------|----------------------|----------------------|----------------------|-------------------------|-------------------------|
| Wavelength (nm) | 532 | 532 | 532 | 532 | 532 | 532 |
| Repetition Rate (Hz) | 0-15 | 0-15 | 0-20 | 0-25 | 50 | 100 |
| Pulse Energy (mJ) ⁽¹⁾ | 200 | 145 | 120 | 100 | 100 | 50 |
| Parameter | | | | | | |
| Pulse Stability (±%) ⁽²⁾ | 2 | 2 | 2 | 2 | 2 | 2 |
| Pulse Width (ns) ⁽³⁾ | 6-9 | 6-9 | 6-9 | 6-9 | 5-8 | 5-8 |
| Beam Diameter (mm) | 6.5 | 5 | 5 | 5 | 4 | 4 |
| Beam Divergence (mrad) ⁽⁴⁾ | <3.5 | <3.5 | <3.5 | <3.5 | <3.5 | <3.5 |
| Pointing Stability (μrad) | <100 | <100 | <100 | <100 | <100 | <100 |
| Far Field Beam Overlap (μrad) | ±100 | ±100 | ±100 | ±100 | ±100 | ±100 |
| Near Field Beam Overlap (μm) | ±100 | ±100 | ±100 | ±100 | ±100 | ±100 |
| Polarisation | Linear | Linear | Linear | Linear | Linear | Linear |
| Spectral Purity (%) | >99.5 | >99.5 | >99.5 | >99.5 | >99.5 | >99.5 |
| Services | | | | | | |
| Voltage (VAC) | 110-250 | 110-250 | 110-250 | 110-250 | 220-250 | 220-250 |
| Frequency (Hz) ⁽⁵⁾ | 50-60 ⁽⁶⁾ | 50-60 ⁽⁶⁾ | 50-60 ⁽⁶⁾ | 50-60 ⁽⁶⁾ | 50 or 60 ⁽⁶⁾ | 50 or 60 ⁽⁶⁾ |
| Power | Single Phase | Single Phase | Single Phase | Single Phase | Single Phase | Single Phase |
| Operating Ambient (°C) | 5-35 | 5-35 | 5-35 | 5-35 | 5-35 | 5-35 |
| System Data | | | | | | |
| Laser Head Sealing ⁽⁶⁾ | IP67 | IP67 | IP67 | IP67 | IP67 | IPU67 |
| Laser PSU Sealing | IP21 | IP21 | IP21 | IP21 | IP21 | IP21 |
| Power Supply | LPU550B | LPU550B | LPU550B | LPU550B | 16U Rack | 16U Rack |
| Cooling | Air | Air | Air | Air | Air | Air |

(1) Per laser at maximum rep. rate.
 (2) Peak-to-Peak Energy - 99% of pulses.
 (3) At maximum energy 532nm (FWHM)

(4) Full angle for 90% of the output energy.
 (5) 50 or 60Hz to be specified on order.
 (6) With suitable connector set as an option, not suitable for full immersion.

The Plasma PIV Series

0-200Hz Pulsed Diode Pumped Nd:YAG Lasers for PIV Applications



FEATURES

- **0-200Hz operation**
- **$M^2 < 10$**
- **Fully diode pumped**
- **Long diode life**
- **Fully independent laser operation and timing**
- **Smooth homogeneous profile**
- **Optimised for high brightness light-sheets**

Plasma PIV

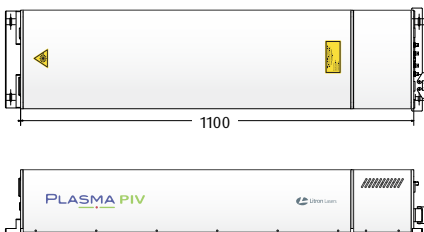
The Plasma PIV system is a fully diode-pumped dual-cavity laser system designed specifically for PIV applications. It comprises two fully independent frequency-doubled Nd:YAG lasers, beam combined to a common beam axis. These lasers each produce 532nm outputs of 100mJ per pulse up to 100Hz or 60mJ at 200Hz with pulse widths of ~10ns.

Pulsed diode pumping, ultra-stable mechanics, damage resistant optics and innovative design make the Plasma PIV system highly reliable. Offering a circular homogenous beam with a low M^2 , it is an ideal tool for high brightness, high homogeneity light-sheet formation. With no services required except the mains electrical input, the Plasma PIV is a stand-alone turnkey system with an output suited to a huge range of PIV applications.

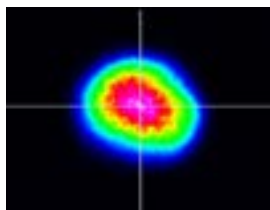
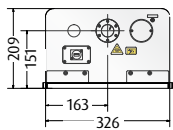
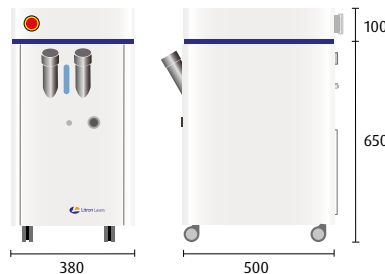
MECHANICAL DATA

All dimensions shown in mm

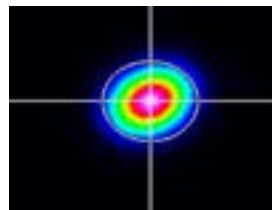
PIV Laser Head



Free Standing PSU



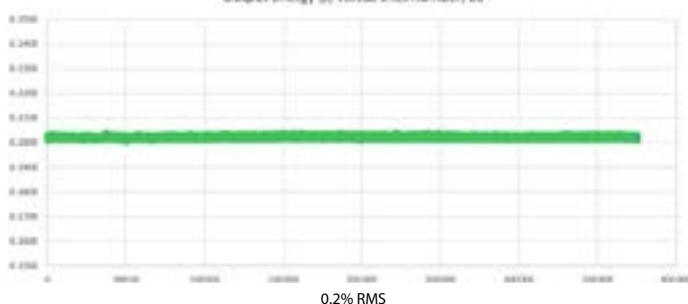
Near field 532nm profile at 100Hz



Far field 532nm profile at 100Hz

Pulse-to-Pulse Stability 532nm

Output energy (J) versus shot number/20



0.2% RMS

TECHNICAL DATA

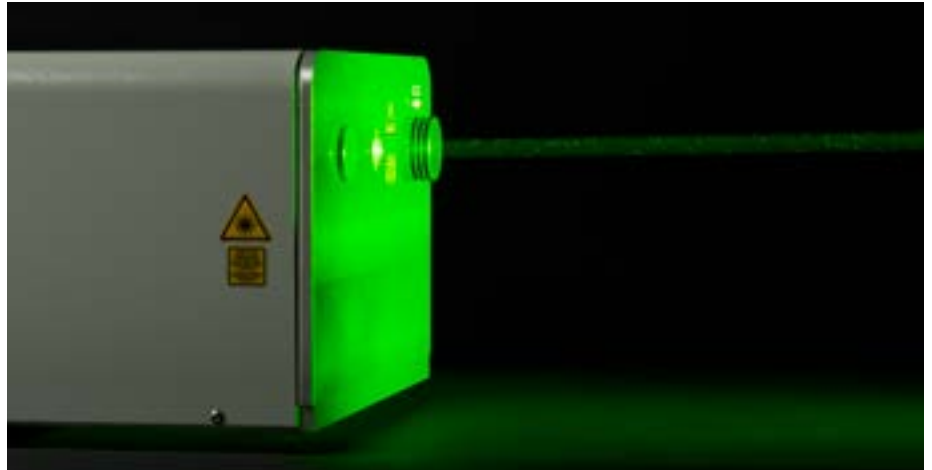
| Model | Plasma 75-100 PIV |
|--|---------------------|
| Repetition Rate (Hz) | 0-200 |
| Wavelength (nm) | 532 |
| Pulse Energy (mJ) | |
| 10-100Hz | 75 |
| 200Hz | 60 |
| Parameter @ 100Hz | |
| M^2 | <10 |
| Pulse Stability ($\pm\%$) ⁽¹⁾ | <1.5 |
| Beam Diameter (mm) ⁽²⁾ | 5 |
| Beam Divergence (mrad) ⁽³⁾ | 0.9 |
| Pulse Width (ns) ⁽⁴⁾ | 7-11 |
| Pointing Stability (μ rad) | <70 |
| Timing Jitter (ns) ⁽⁵⁾ | <0.5 |
| Polarisation | Linear |
| Approx. Diode Life (pulses) | >10x10 ⁹ |
| Operation Control ⁽⁶⁾ | RS232 |
| Q-switch Trigger and Sync ⁽⁷⁾ | TTL |
| Services | |
| Voltage (VAC) | 220-250 |
| Frequency (Hz) | 50 or 60 |
| Power | Single Phase |
| Ambient ($^{\circ}$ C) ⁽⁸⁾ | 5-35 |
| Cooling ⁽⁹⁾ | Air |
| Power Supply | Free Standing |

All data provided for each laser head, unless specified otherwise.

- (1) Peak-to-Peak Energy - 99% of pulses.
- (2) 100% beam diameter at laser exit port.
- (3) Full angle at specified beam diameter.
- (4) FWHM - Fast photodiode and >1GHz oscilloscope.
- (5) RMS with respect to Q-switch trigger input.
- (6) Full software suite and programming tools supplied.
- (7) Each laser head independently triggerable.
- (8) 0 to 80% non-condensing atmosphere.
- (9) Standard air-cooled or optional water-cooled chiller.

The LPY PIV Series

High Energy & High Repetition Rate Lasers for PIV



LPY.PIV . .

FEATURES

- **Dedicated PIV laser head**
- **Up to 200Hz repetition rates**
- **High pulse energies up to 425mJ**
- **True TEM₀₀ output available**
- **Stable resonator design**
- **Telescopic versions for low divergence**
- **3rd and 4th harmonics available for LIF and dual colour PIV**
- **Line narrowed versions**
- **Rugged industrial design**
- **Motorised attenuator**

LPY PIV

For higher energy systems or systems where very low divergences are required, Litron offers twin configurations of its Invar-stabilised LPY series. Output energies of up to 425mJ per pulse of 532nm at repetition rates of up to 20Hz are available as standard, as are outputs of 100mJ at 532nm at 200Hz.

The LPY PIV series are based around a rugged, self-supporting, Invar rail. This imparts a large degree of mechanical and thermal stability, ideal for use in both research and industrial applications with little need for maintenance. The LPY PIV series can have a stable or a stable-telescopic resonator design, with the intra-cavity telescope yielding a lower divergence output.

All LPY700 series systems feature a birefringence compensating twin-rod design to give the best possible beam homogeneity, essential for the formation of uniform light sheets. The modular construction of the LPY series laser heads allow for easy customisation of systems. Options include line-narrowing etalons, injection seeding and third, fourth and fifth harmonic outputs.

TECHNICAL DATA

| Model | LPY 300-20 PIV | LPY 400-20 PIV | LPY 200-30 PIV | LPY 325-15 PIV | LPY 425-15 PIV |
|-------------------------------------|---------------------------|-------------------|-------------------|-------------------|-------------------|
| Repetition Rate (Hz) | 20 | 20 | 30 | 15 | 15 |
| Pulse Energy Per Head (mJ) | 300 | 400 | 200 | 325 | 425 |
| Parameter | | | | | |
| Pulse Stability (±%) ⁽¹⁾ | <3 | <3 | <3 | <3 | <3 |
| Beam Diameter (mm) | 8 | 9 | 6.5 | 8 | 9 |
| Beam Divergence (mrad) | 0.8 | ~3 | 0.8 | 0.8 | ~3 |
| Pulse Width (ns) | 7-11 | 7-11 | 7-11 | 7-11 | 7-11 |
| Pointing Stability (μrad) | <70 | <70 | <70 | <70 | <70 |
| Lamp Life (pulses) | 5x10 ⁷ | 5x10 ⁷ | 5x10 ⁷ | 5x10 ⁷ | 5x10 ⁷ |
| Timing Jitter (ns) | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Services | | | | | |
| Voltage (VAC) ⁽²⁾ | 220-250 | 220-250 | 220-250 | 220-250 | 220-250 |
| Frequency (Hz) ⁽³⁾ | 50 or 60 | 50 or 60 | 50 or 60 | 50 or 60 | 50 or 60 |
| Power | Single Phase | Single Phase | Single Phase | Single Phase | Single Phase |
| Water Temp Max. (°C) | Air Cooled ⁽⁴⁾ | 20 | 20 | 20 | 20 |
| Inlet Pressure (bar) | - | <2 | <2 | <2 | <2 |
| Cooling | Air | Water | Water | Water | Water |
| Power Supply | 2 x LPU1000 | 16U Rack | 16U Rack | 16U Rack | 16U Rack |

All data provided for each laser head, unless specified otherwise.

(1) Peak-to-Peak Energy - 99% of pulses.

(2) 110VAC option requires autotransformer to be specified on order.

(3) 50 or 60Hz to be specified on order.

(4) Ambient temperature 5-35°C, 0 to 80% non-condensing atmosphere.

TECHNICAL DATA

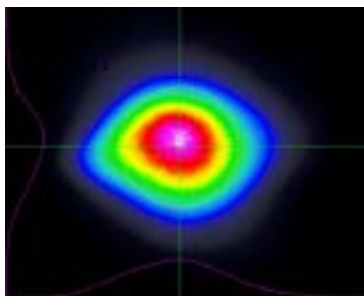
| Model | LPY 100-100 PIV | LPY 50-200 PIV | LPY 200-100 PIV | LPY 100-200 PIV |
|--|-----------------|-----------------|-----------------|-----------------|
| Repetition Rate (Hz) | 100 | 200 | 100 | 200 |
| Pulse Energy Per Head (mJ) | 100 | 50 | 200 | 100 |
| Parameter | | | | |
| Pulse Stability ($\pm\%$) ⁽¹⁾ | <3 | <3 | <3 | <3 |
| Beam Diameter (mm) | 6.5 | 4 | 6.5 | 6.5 |
| Beam Divergence (mrad) | ~3 | ~3 | ~3 | ~3 |
| Pulse Width (ns) | 10-12 | 10-12 | 10-12 | 10-12 |
| Pointing Stability (μ rad) | <70 | <70 | <70 | <70 |
| Lamp Life (pulses) | 10 ⁸ | 10 ⁸ | 10 ⁸ | 10 ⁸ |
| Timing Jitter (ns) | <0.5 | <0.5 | <0.5 | <0.5 |
| Services | | | | |
| Voltage (VAC) ⁽²⁾ | 220-250 | 220-250 | 220-250 | 220-250 |
| Frequency (Hz) ⁽³⁾ | 50 or 60 | 50 or 60 | 50 or 60 | 50 or 60 |
| Power | Single Phase | Single Phase | Single Phase | Single Phase |
| Water Temp Max. (°C) | 20 | 20 | 20 | 20 |
| Inlet Pressure (bar) | <2 | <2 | <2 | <2 |
| Cooling | Water | Water | Water | Water |
| Power Supply | 16U Rack | 16U Rack | 2 x 16U Rack | 2 x 16U Rack |

All data provided for each laser head, unless specified otherwise.

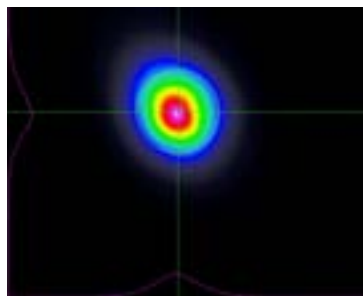
(1) Peak-to-Peak Energy - 99% of pulses.

(2) 110VAC option requires autotransformer to be specified on order.

(3) 50 or 60Hz to be specified on order.



Near field 532nm profile at 200Hz

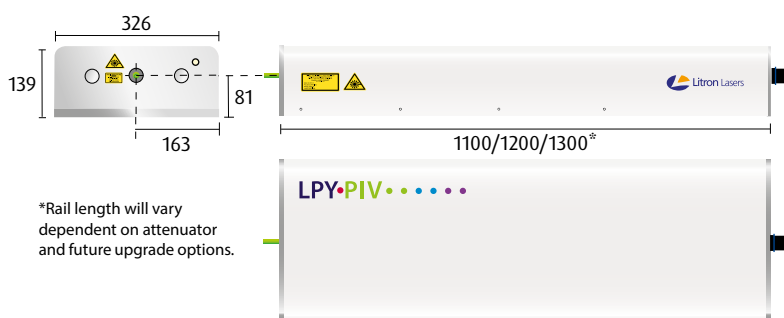


Far field 532nm profile at 200Hz

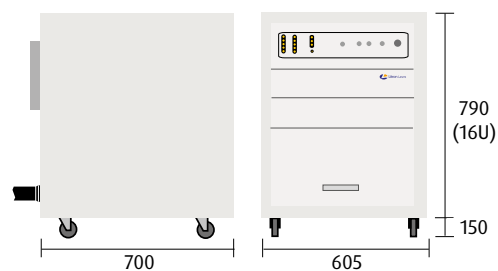
MECHANICAL DATA

All dimensions shown in mm

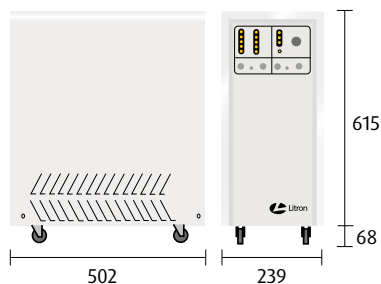
PIV Laser head Unit



16U Rackmount PSU



LPU1000 PSU



The LD-527 PIV Series

527nm Nd:YLF Lasers for High Speed Imaging Applications



LD527•PIV

FEATURES

- **Improved beam quality for brighter light sheets**
- **Short pulse width**
- **Independent motorised attenuators to balance pulse energies**
- **Small footprint**
- **Efficient Q-switching**
- **Lightweight conduit**

The LD-527 PIV Series

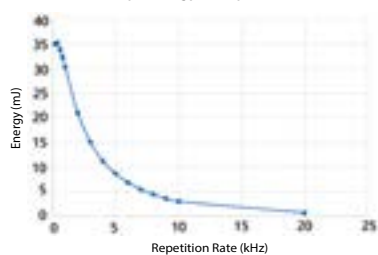
The LD-527 PIV series lasers are diode-pumped, intra-cavity doubled, dual-cavity, Nd:YLF laser systems ideally suited to imaging applications such as PIV and pump applications. Output energies of up to 30mJ, 527nm per cavity at 1kHz are available.

The lasers are built around a rugged self-supporting Invar rail that bestows excellent mechanical and optical stability. This, coupled with the proprietary resonator design, leads to excellent output beams that are spatially and temporally extremely smooth and stable. The resultant light sheets offer almost identical shot-to-shot illumination.

Motorised Optical Attenuators are fitted to both lasers as standard. The attenuators are controlled independently, allowing pulse energy to be varied precisely to balance outputs. The attenuators use a half-wave plate and polariser, which means the spatial and temporal profiles, the M^2 and the pulse width are unchanged.

PERFORMANCE DATA

LD30-527 PIV Output Energy vs. Repetition Rate at 527nm

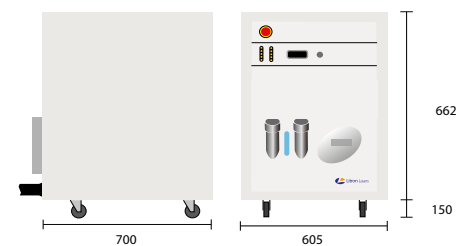


MECHANICAL DATA

PIV Laser Head



Rackmount PSU



TECHNICAL DATA

| Model | LD10-527 PIV | LD15-527 PIV | LD20-527 PIV | LD25-527 PIV | LD30-527 PIV |
|--|----------------------|--------------|--------------|--------------|--------------|
| Repetition Rate ⁽¹⁾ | Single shot to 20kHz | | | | |
| Pulse Energy @ 1kHz (mJ) | 10 | 15 | 20 | 25 | 30 |
| Pulse Stability ($\pm\%$) ⁽²⁾ | 1 | 1 | 1 | 1 | 1 |
| Beam Diameter (mm) ⁽³⁾ | 5 | 5 | 5 | 5 | 5 |
| Beam Divergence (mrad) ⁽⁴⁾ | <2.5 | <2.5 | <2.5 | <2.5 | <2.5 |
| Pulse Width @ 1kHz (ns) | <210 | <160 | <180 | <140 | <120 |
| M^2 | <12 | <12 | <12 | <12 | <12 |

All data provided for each laser head, unless specified otherwise.

(1) Operation below 200Hz with first pulse suppression activated.

(2) Peak-to-Peak - 99% of pulses.

(3) Beam diameter is achieved with output telescope.

Standard diameters quoted. Other diameters are available on request. In all cases M^2 is unchanged.

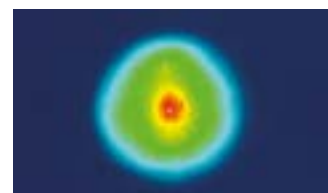
(4) At specified beam diameter.

(5) 110VAC option requires autotransformer to be specified on order.

(6) 50 or 60Hz to be specified on order.

(7) 0 to 80% non-condensing atmosphere.

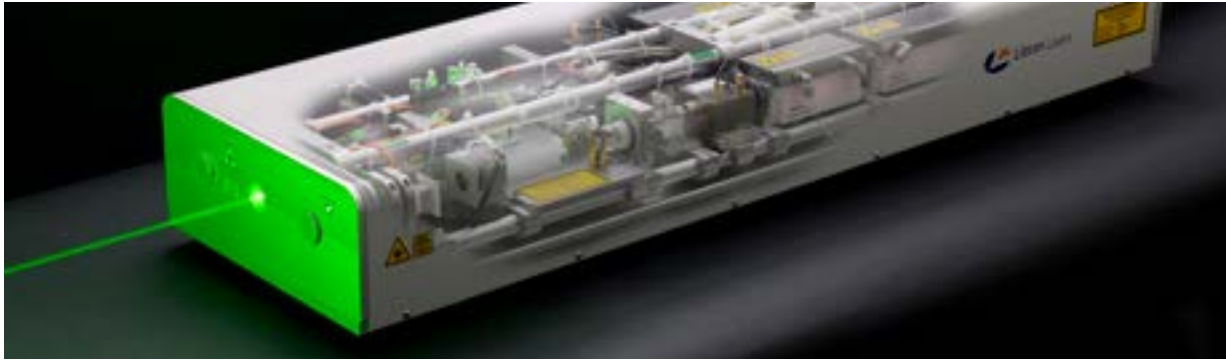
| All Models | |
|---|--------------|
| Services | |
| Voltage (VAC) ⁽⁵⁾ | 220-250 |
| Frequency (Hz) ⁽⁶⁾ | 50 or 60 |
| Power | Single Phase |
| Ambient ($^{\circ}\text{C}$) ⁽⁷⁾ | 5-35 |
| Power Supply | 13U Rack |



Near field 527nm profile at 1kHz

The LD60-532 PIV Series

High Repetition Rate DPSS Nd:YAG Laser for Time Resolved PIV Applications



LD60•532PIV

FEATURES

- **6mJ at 10kHz**
- **Repetition rates of 50kHz with individual pulses**
- **<0.5% RMS stability**
- **Fully independent operation and timing**
- **Circular beam profile**
- **Optimised for high brightness light-sheets**

LD60-532 PIV

The LD60-532 PIV is a dual laser head system ideal for PIV applications. The system comprises two fully independent intra-cavity doubled Nd:YAG lasers, each giving outputs of 60W at 532nm, that are combined to a common beam axis. Both lasers are independently triggerable and controllable. The Invar rail around which the system is constructed ensures exceptional stability and the sealed head enclosure delivers continuous reliable operation in non-ideal environments.

The power supplies and chiller are fully integrated in a single unit. With no services required except the mains electrical input, the LD60-532 PIV is a stand-alone turnkey system with an output suited to many time-resolved PIV applications.

TECHNICAL DATA

| Model | LD60-532 PIV |
|--|--------------|
| Total Output Power (W) ⁽¹⁾ | 120 |
| Repetition Rate (kHz) | 5-50 |
| Pulse Energy @ 10kHz (mJ) | 6.0 |
| Parameters @ 10kHz | |
| Pulse Stability (±%) ⁽²⁾ | 1 |
| Beam Diameter (mm) ⁽³⁾ | 5 |
| Beam Divergence (mrad) ⁽⁴⁾ | <4 |
| Beam Circularity (%) | >85 |
| Pulse Width (ns) | <170 |
| Pointing Stability (µrad) | <25 |
| Long Term Stability (%rms) | 1 |
| Polarisation ⁽⁵⁾ | Linear |
| Operation Control ⁽⁶⁾ | RS232 |
| Q-switch Trigger and Sync ⁽⁷⁾ | TTL |
| Services | |
| Voltage (VAC) | 220-250 |
| Frequency (Hz) | 50 or 60 |
| Power | Single Phase |
| Ambient (°C) ⁽⁸⁾ | 5-35 |
| Power Supply & Integrated Chiller | 16U Rack |

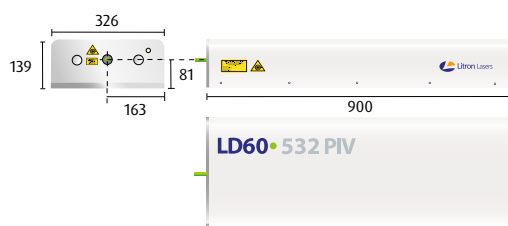
All data provided for each laser head, unless specified otherwise.

- (1) Total output both laser heads.
- (2) Peak-to-Peak Energy - 99% of pulses.
- (3) Beam diameter is achieved with output telescope. Standard diameters quoted. Other diameters are available on request.
- (4) At specified beam diameter.
- (5) Lasers 1 and 2 have orthogonal polarisations at 532nm.
- (6) Full software suite and programming tools supplied.
- (7) Each laser head triggered independently.
- (8) 0 to 80% non-condensing atmosphere.

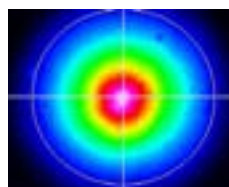
MECHANICAL DATA

All dimensions shown in mm

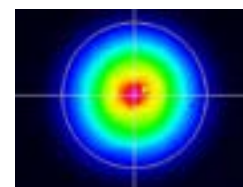
PIV laser head



Rackmount PSU



Near field 532nm profile at 10kHz



Far field 532nm profile at 10kHz



Our policy is to improve the design and specification of our products. The details given in this document are not to be regarded as binding.



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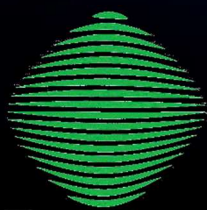
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