



AVIA 355-20

The AVIA™ 355-20 is a diode-pumped, all-solid-state Q-switched UV laser designed to produce over 20W of 355 nm output at 100 kHz. This performance, combined with the excellent beam quality characteristics of the AVIA family, make the AVIA 355-20 the perfect tool for high-throughput micro-machining applications, such as silicon dicing and via-drilling in printed circuit boards.

The laser system includes a sealed, water-cooled laser head and a compact air-cooled power supply. Novel system architecture, consisting of fiber-coupled laser diode modules mounted in the laser head, combines ease of integration (the umbilical can be completely detached from the head and power supply) with the benefits of field-replaceable pump diode modules.

The AVIA 355-20 utilizes the same field proven laser technologies as the entire AVIA family of industrial, pulsed UV laser systems. These technologies include PermaAlign™, a proprietary solder-bonding technology used to secure all resonator optics firmly in place, eliminating the risk of resonator misalignment; AAA™ - Aluminium-free Active Area laser diodes; HGX™ for enhanced UV harmonic crystal lifetime; and Total Pulse Control, the most comprehensive suite of pulse control features available on the market, including: first-pulse suppression, ThermEQ™, PulseEQ™, and PulseTrack™.

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System Specifications¹	Wavelength	355 nm
	Pulse Repetition Rate Range	
	Nominal	Single shot to 300 kHz
	Optimized	100 kHz to 150 kHz
	Pulse Width	<40 ns at 100 kHz <50 ns at 150 kHz
	Pulse-to-Pulse Stability (rms 1 σ)	<5% at 100 kHz <10% at 150 kHz
	Average Power Stability	< \pm 2% over 8 hours
	Average Output Power	\geq 20W at 100 kHz \geq 12W at 150 kHz
	Polarization Ratio ²	>100:1 Horizontal
	Spatial Mode ²	TEM ₀₀ (M ² <1.3)
	Beam Divergence Full Angle ²	<0.3 mrad
	Beam-Pointing Drift ³	<25 μ rad/°C
	1/e ² Beam Diameter ²	3.5 mm \pm 10%
	Beam Circularity	>85%
Warm-up Time (typical)	<15 minutes from standby mode <60 minutes from cold start	
Bore-Sight Accuracy (unit-to-unit)	\pm 0.5 mm and \pm 5 mrad referenced to mounting features on laser head	
Utility and Environmental Requirements	Single-Phase Operating Voltage	100-240 VAC auto ranging
	Line Frequency	50-60 Hz auto ranging
	Laser Power Consumption	800W typical 1.3 kW maximum
	Cooling Requirements	
	Power Supply	Air-cooled (400W max. heat load)
	Laser Head ⁴	Water-cooled (800W max. heat load)
	Ambient Temperature Range	+15 to +35°C (operating) -25 to +65°C (non-operating, short term)
	Relative Humidity	10-80% (non-condensing)
	Weight of Laser Head	50 kg (110 lbs.)
	Weight of Power Supply	24.9 kg (55 lbs.)
Umbilical Length	5m (15 ft.)	

¹ Measured with the laser optimized at 100 kHz and 20W unless otherwise stated.

² Applies over the repetition rate range 100 to 150 kHz.

³ Referenced to baseplate temperature.

⁴ Recommended flow rate is 5.7 to 7.6 l/min.

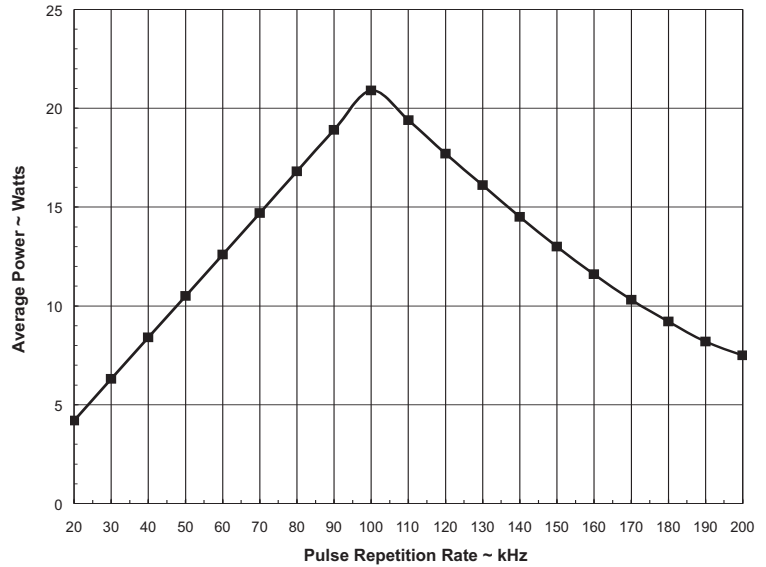
Solid-State Q-Switched Ultraviolet Lasers

FEATURES

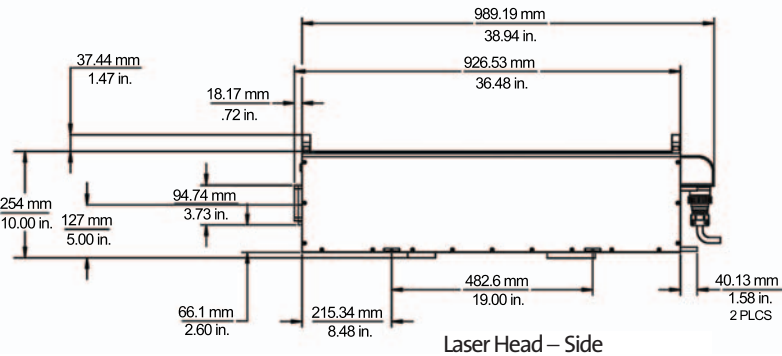
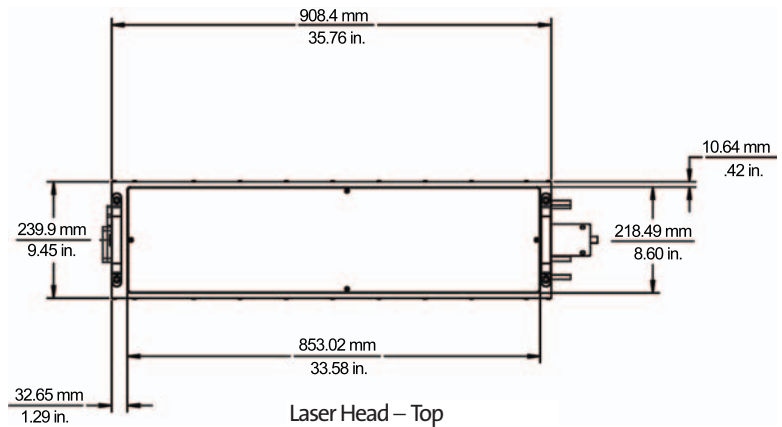
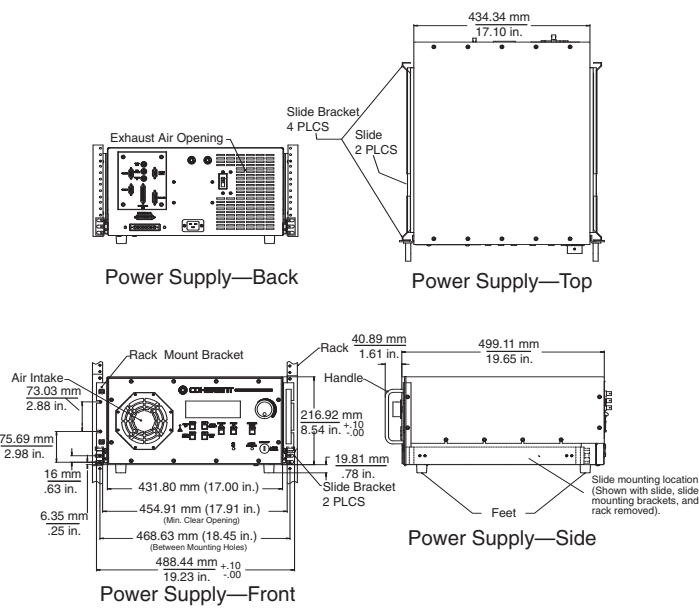
- **20W of 355 nm at 100 kHz**
- **Excellent beam quality**
- **PermaAlign solder-bonded optics technology**
- **Sealed laser head**
- **Ultra-long-life AAA laser diode material**
- **Field-replaceable pump diode modules**
- **Fully detachable umbilical for easy installation**
- **Smart power supply with RS-232 interface**
- **Total Pulse Control system**
- **HGX UV generation technology**
- **ThermEQ for uniform pulse energy across a burst of pulses**
- **PulseEQ for locked pulse energy across a range of pulse repetition rates**
- **PulseTrack for pulse energy control on-the-fly**

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Solid-State Q-Switched Ultraviolet Lasers



Mechanical Specifications



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Coherent follows a policy of continuous product improvement. Specifications are subject to change without notice.

Coherent's scientific and industrial lasers are certified to comply with Federal Regulations (21 CFR Subchapter J) as administered by the Center for Devices and Radiological Health on all systems ordered for shipment after August 2, 1976.

Coherent offers a limited warranty for all its AVIA systems. For full details on warranty coverage, please refer to the Service section at www.Coherent.com, or contact your local Sales or Service Representative.

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