

# MATRIX 355

## Solid-State, Q-Switched Laser

MATRIX lasers are optimized for cost-sensitive applications requiring high throughput without compromising process quality. The MATRIX portfolio is manufactured utilizing Coherent's PermAlign technology, a special process for optimal adjustment and fixation of optical components by a soldering process. This guarantees best optical alignment and stability over the whole lifetime of the product.

For pumping, Coherent's AAA (Aluminum-free Active Area) pump diodes with MTBFs >40,000 hours are applied. The MATRIX lasers are manufactured in cleanrooms and then hermetically sealed. The result is reliable, hands- and maintenance-free operation over thousands of hours.

The MATRIX UV portfolio features power levels from 0.5W to 8W. The unique multi-pass harmonics enable lower power density inside the frequency conversion crystal, resulting in longer system life, outstanding pointing stability and the lowest pulse-to-pulse noise commercially available.

The MATRIX UV BE model (= MATRIX UV with internal Beam Expander) is designed to adapt directly to laser scan heads to ease integration for most marking applications.



**Superior Reliability & Performance**

### **MATRIX 355 Features:**

- **Superior optical performance**
- **Complete control over pulse energy and timing**
- **PermAlign solder-bonded optics technology**
- **Robot-assisted, cleanroom-built and hermetically sealed**
- **AAA pump diodes for unmatched lifetime**
- **Virtually no downtime, maintenance-free operation over thousands of hours**

### **MATRIX 355 Applications:**

- **Marking of Complex Plastic Structures**
- **Laser Trimming of Embedded Passives with Diode-Pumped Solid-State Lasers**
- **Inside Glass Marking**
- **Laser Direct Patterning**
- **LED Package Marking**
- **Solar P1 to P3**
- **Thin-film Scribing**
- **Rapid Prototyping**

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System Specifications	MATRIX 355-0.5-60	MATRIX 355-1-60	MATRIX 355-1.5-70	MATRIX 355-5-50	MATRIX 355-8-50	MATRIX 355-1-60-BE <sup>1</sup>
Average Power (W)	0.5 at 60 kHz	1 at 60 kHz	1.5 at 70 kHz	5 at 50 kHz	8 at 50 kHz	1 at 60 kHz
Recommended Power Range (W)	70 to 100%	50 to 100%	50 to 100%	50 to 100%	70 to 100%	50 to 100%
Pulse Repetition Rate (kHz)	up to 100	up to 100	up to 100	up to 150	up to 150	up to 100
Pulse Duration <sup>2</sup> (ns)	<30	<25	<30	<30	<25	<25
Pulse-to-Pulse Stability <sup>2</sup> (%) (rms)	<5	<4	<4	<4	<4	<4
Beam Parameters (nominal)	0.23 mm and <2.8 mrad	0.23 mm and <2.8 mrad	0.23 mm and <2.8 mrad	0.23 mm and <2.8 mrad	0.23 mm and <2.8 mrad	2.2 mm and <0.5 mrad
Circularity (%)	>90	>90	>90	>85	>85	>90
Spatial Mode	TEM <sub>00</sub>					
Output Power Stability (%) (8h/±3°)	<2					
Temperature Range (baseplate)	15°C to 50°C (59°F to 122°F)					
Maximum Heat Load (W)	<350	<350	<350	<450	<450	<350
Static Alignment	±0.2 mm, ±2 mrad					
Maximum Warm-up Times						
from cold start	<20 minutes					
from warm start	<5 minutes					
<b>Environmental Specifications</b>						
Temperature						
Operating	15°C to 40°C	15°C to 40°C	15°C to 40°C	15°C to 35°C	15°C to 30°C	15°C to 40°C
Non-operating	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C	-20°C to 50°C
Altitude						
Operating	0 to 10,000 ft.					
Non-operating	0 to 45,000 ft.					
Relative Humidity (%) (non-condensing)						
Operating	0 to 90					
Non-operating	0 to 95					
Shock						
Operating	±1g dynamic EN 60068-2-6					
Non-operating	±10g EN 60068-2-26					
<b>Power Supply Specifications</b>						
Power Supply Dimensions (H x W x D)	100 x 131 x 335 mm (3.9 x 5.2 x 13.2 in.) open-frame PCB; can be mounted in 3HE 19-in. rack mount					
External Control	RS-232 interface, TTL QS control					
Input Power Requirements						
Input Voltage (VAC)	90 to 240, 50 to 60 Hz					
Input Power	maximum					
Power Supply (VA)	750					
	typical					
	≤350					

<sup>1</sup> AVIA Ultra 2000 compatible beam parameters through internal beam expander (BE).

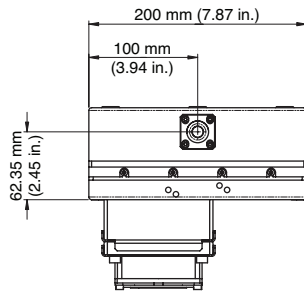
<sup>2</sup> At specified rep. rate.

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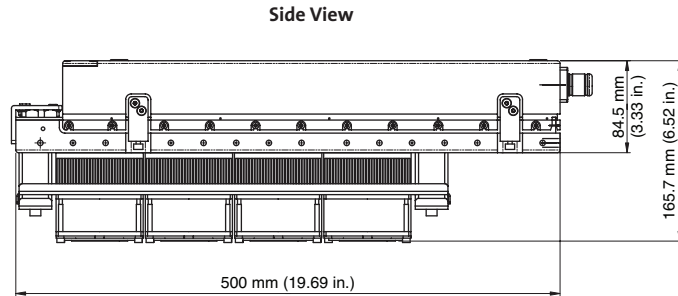
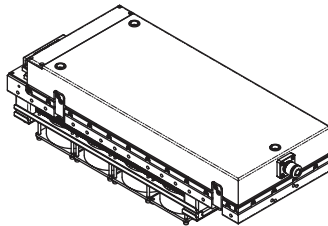
Solid-State, Q-Switched Laser

## Mechanical Specifications

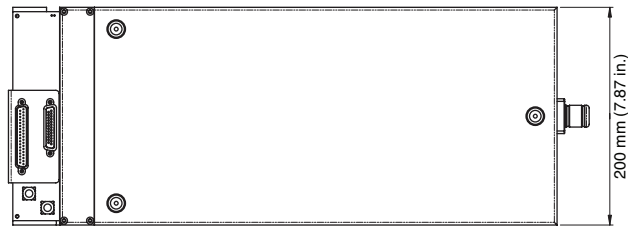
### Laser Head



Front View



Side View



Top View



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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 the 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 MATRIX lasers. For full details of this warranty coverage, please refer to the Service section at [www.Coherent.com](http://www.Coherent.com) or contact your local Sales or Service Representative.

