

# HYPER RAPID 100

## High Power Industrial ps-Laser

The HYPER RAPID 100 is a powerful industrial ps-laser offering pulse-on-demand and burst mode operation at output powers up to 100W for high quality micromachining at high throughput. With this laser, the total cost per watt ratio for ps-laser pulses is significantly reduced.

The HYPER RAPID 100 provides high pulse energies of typically 10 ps-pulses at high repetition rates up to 1 MHz. This allows the user to split the beam into 2 beams and simultaneously feed 2 work stations with one machine, further reducing the TCO for a production process in micromachining applications.

The HYPER RAPID ps-laser offers the well-known features of the RAPID series: industrial stability and reliability, high pulse energy, high rep rates, trigger on demand – optical pulses can be triggered individually by electrical TTL pulses from system control, low jitter (<100 ns) between trigger and optical pulse with a delay of ~150 ns – basically instantaneous even for fast moving beam deflection systems like scanners and rotary polygons.

Burst mode can be selected in the software to directly determine how many 10 ps-pulses with 20 ns separation should be released in an envelope by the laser if triggered by one electrical trigger pulse. These 20 ns-bursts enhance the ablation rate in many materials and increase the process efficiency.

The HYPER RAPID 100 uses an AOM as its process shutter which allows both on/off control and energy attenuation for each individual pulse.



**Superior Reliability & Performance**

### **HYPER RAPID 100 Advantages:**

- **High throughput at significantly reduced TCO**
- **High energy at high repetition rates up to 1 MHz**
- **Pulse on demand trigger with <100 ns jitter**
- **20 ns-burst mode capability for increased ablation rate**
- **1064 nm or 532 nm version**
- **AOM process shutter**
- **Efficient micromachining in multiple beam work stations**

### **HYPER RAPID 100 Applications:**

- **Cutting and drilling of strengthened glass, sapphire, ceramics and other tough materials, also composites**
- **Micromachining and structuring of large surfaces with line foci or multiple beams**

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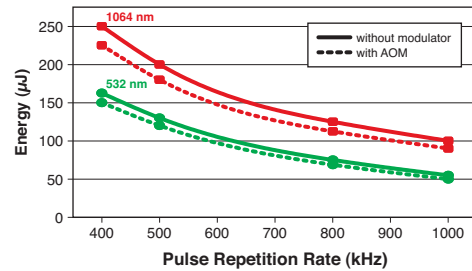
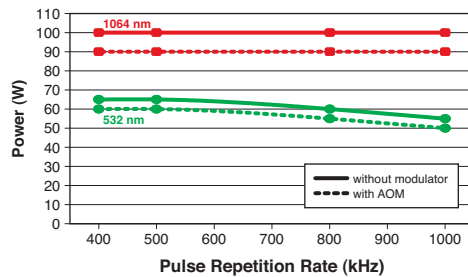
## System Specifications

### HYPER RAPID 100

Wavelength (nm)	1064 (532 and 355 optional)			
Pulse Repetition Rate (kHz)	400 to 1000			
Spatial Mode	TEM <sub>00</sub> (M <sup>2</sup> <1.4)			
Pulse Duration (ps)	<15			
Pulse-to-Pulse Energy Stability (% rms)	<1 at 1064 nm and 500 kHz			
Average Power Stability over 8 hours (% rms)	<1 at 1064 nm and 500 kHz			
Polarization Ratio	>>100:1			
Beam Divergence, Full Angle (mrad)	<1			
Beam Circularity (%)	>85			
Beam-Pointing Stability in Full PRF Range (μrad/°C)	<50			
Electric Supply <sup>1</sup>	100 to 230 VAC/50 to 60 Hz/3.6 kW			
Beam Diameter (μm)	~3000 at 1064 nm			
Bore-Sight Accuracy	±0.5 mm and <5 mrad			
Warm-Up Time (minutes)	<40 from chiller start			
Repetition Rate (kHz)	Average Power (W)			
	No AOM process shutter		With AOM	
PRF	<b>P1064</b>	<b>P532</b>	<b>P1064</b>	<b>P532</b>
400	100	65	90	60
500	100	65	90	60
800	100	60	90	55
1000	100	55	90	50
Repetition Rate (kHz)	Pulse Energy (μJ)			
	No AOM process shutter		With AOM	
PRF	<b>E1064</b>	<b>E532</b>	<b>E1064</b>	<b>E532</b>
400	250	163	225	150
500	200	130	180	120
800	125	75	113	69
1000	100	55	90	50

<sup>1</sup> Transformer can be provided for 110V or 208V operation.

## Typical Data



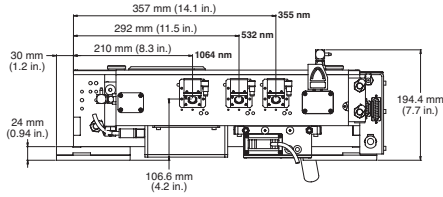
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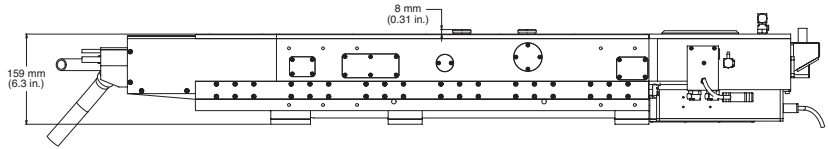
## Mechanical Specifications

### Laser Head

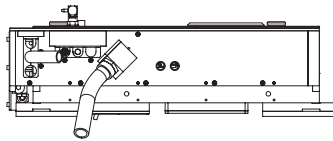
Front View



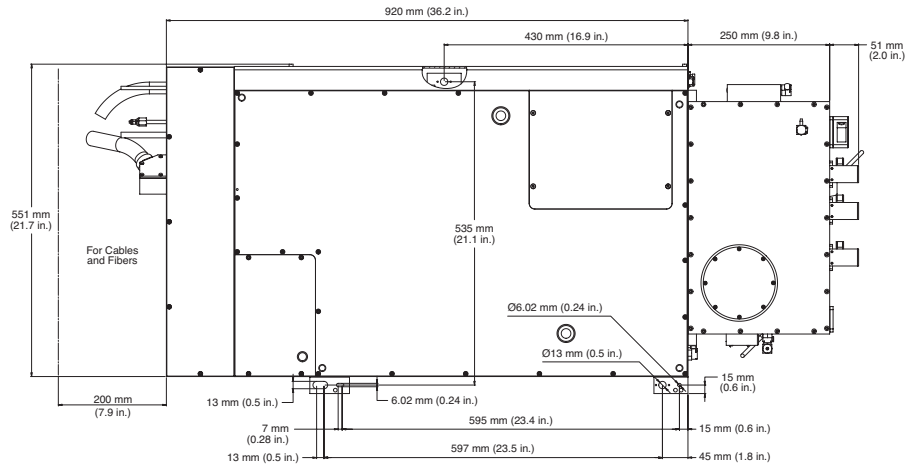
Side View



Rear View



Top View



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

Coherent offers a limited warranty for all HYPER RAPID 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.

