

# HyperRapid 50

## High Power Industrial ps-Laser

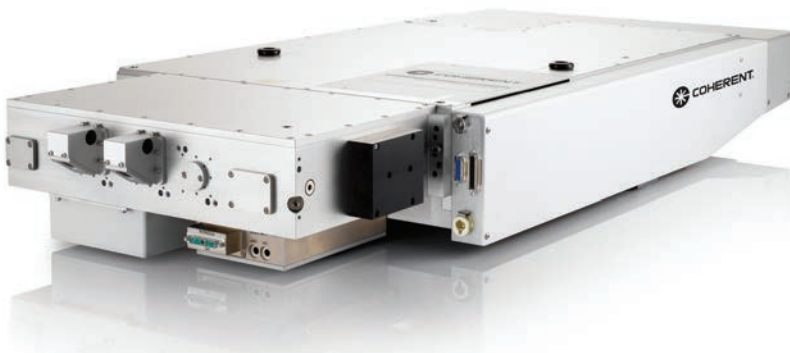
The HYPER RAPID 50 is a powerful industrial ps-laser offering pulse-on-demand and burst mode operation at output powers up to 50W for high quality micro-machining at high throughput. With this laser, the total cost per watt ratio for ps-laser pulses is significantly reduced.

The HYPER RAPID 50 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 micro-machining applications.

The HYPER RAPID 50 ps-laser offers the well-known features of the RAPID series: industrial stability and reliability, high pulse energy, high repetition rates, trigger on demand – optical pulses can be triggered individually by electrical TTL pulses from system control - and low jitter (<20 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 50 uses an AOM as its process shutter which allows both on/off control and energy attenuation for each individual pulse.



**Superior Reliability & Performance**

### **HyperRapid 50 Advantages:**

- **1064 nm, 532 nm or 355 nm version**
- **High throughput at significantly reduced TCO**
- **High energy at high repetition rates up to 1 MHz**
- **Pulse on demand trigger with <20 ns jitter**
- **20 ns-burst mode capability for increased ablation rate**
- **Efficient micromachining in multiple beam work stations**

### **HyperRapid 50 Applications:**

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

# HyperRapid 50

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## System Specifications

	HyperRapid 50			HyperRapid 50 HE		
Center Wavelength (nm)	1064	532	355	1064	532	355
Maximum Average Power (W)	50	25	16	45	26	12.5
Maximum Energy (μJ)	125	63	40	210	130	60
Output Repetition Rate (kHz)	0 to 1000					
Spatial Mode <sup>1</sup>	TEM <sub>00</sub> (M <sup>2</sup> <1.4)					
Pulse Duration (ps)	<15					
Pulse-to-Pulse Energy Stability <sup>1</sup> (% rms, constant temperature)	<1	<1.5	<1.7	<1	<1.5	<1.7
Average Power Stability over 8 hours <sup>1</sup> (% rms, constant temperature)	<1					
Polarization Ratio	>>100:1					
Beam Diameter 2w (x,y) at Output (μm)(typical)	2400	1350	1650	2400	1100	2000
Beam Divergence, Full Angle (mrad)	<1					
Beam Circularity <sup>1</sup> (%)	>85					
Beam Pointing Stability in Full PRF Range (μrad/°K)	<50					
Bore-sight Accuracy	±0.5 mm and <5 mrad					
Warm-up Time (minutes)	<40					
Electric Supply <sup>2</sup>	230 VAC for 3.5 kW/50 to 60 Hz					
Head Weight	115 kg (253.5 lbs)					

## HyperRapid 50

Repetition Rate (kHz)	Average Power (W)		
	1064 nm	532 nm	355 nm
400	50	25	16
500	50	23	16
800	50	17	11
1000	50	14	8

Repetition Rate (kHz)	Pulse Energy (μJ)		
	1064 nm	532 nm	355 nm
400	125	63	40
500	100	46	32
800	63	21	14
1000	50	14	8

## HyperRapid 50 HE

Repetition Rate (kHz)	Average Power (W)		
	1064 nm	532 nm	355 nm
200	42	26	12
250	43	24	12.5
400	44	21	9.5
500	45	20	7.5

Repetition Rate (kHz)	Pulse Energy (μJ)		
	1064 nm	532 nm	355 nm
200	210	130	60
250	172	96	50
400	110	53	24
500	90	40	15

## Operating Specifications

Temperature	+15°C to 27°C (59°F to 80°F)
Relative Humidity	<60%, non-condensing

## Shipping Specifications

Temperature	+5°C to +50°C (41°F to 122°F)
Relative Humidity	10 to 90%, non-condensing

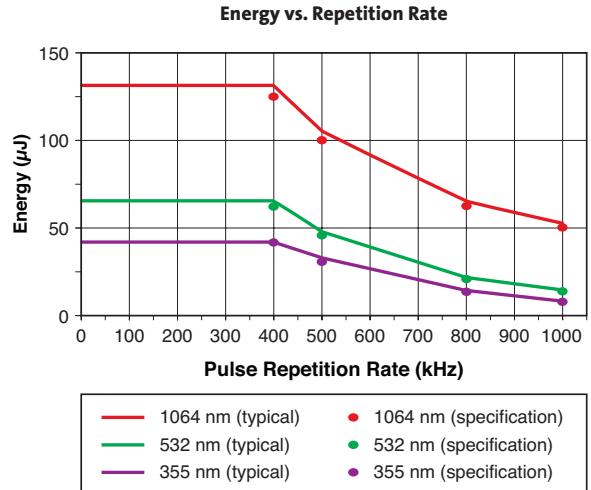
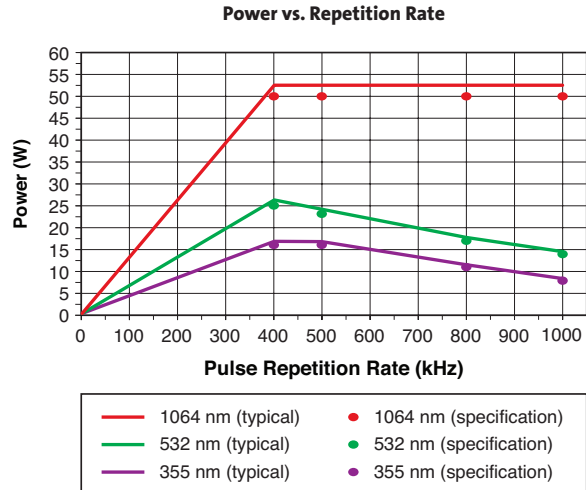
<sup>1</sup> Specified at default repetition rate = 500 kHz for Hyper Rapid 50 and 250 kHz for Hyper Rapid 50 HE.

<sup>2</sup> Transformer can be provided for 110V or 208V operation.

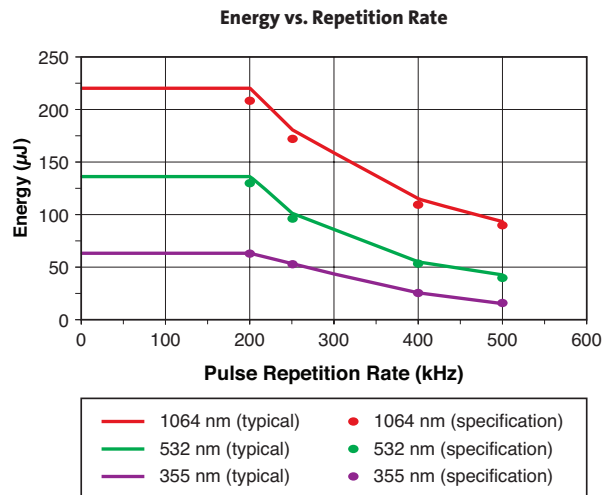
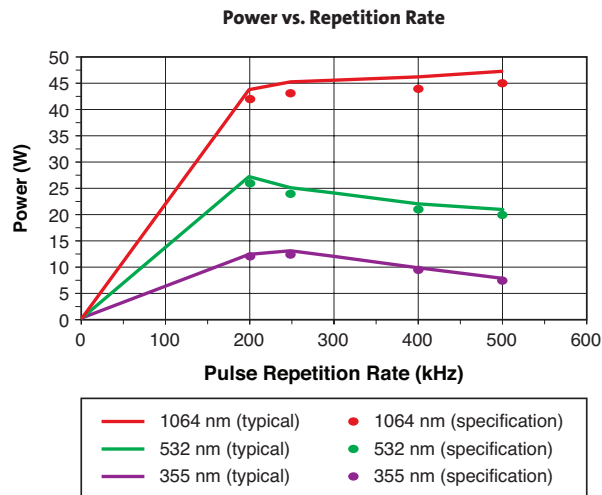
# HyperRapid 50

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## HyperRapid 50



## HyperRapid 50 HE



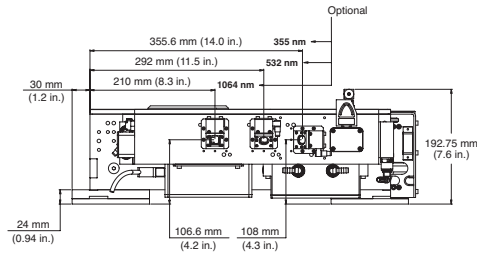
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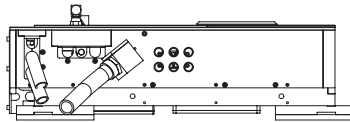
### Mechanical Specifications

#### Laser Head

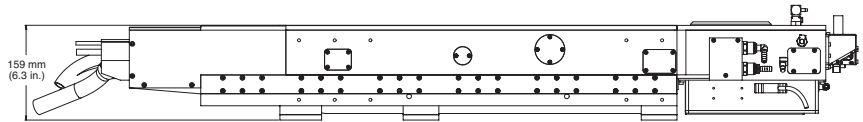
##### Front View



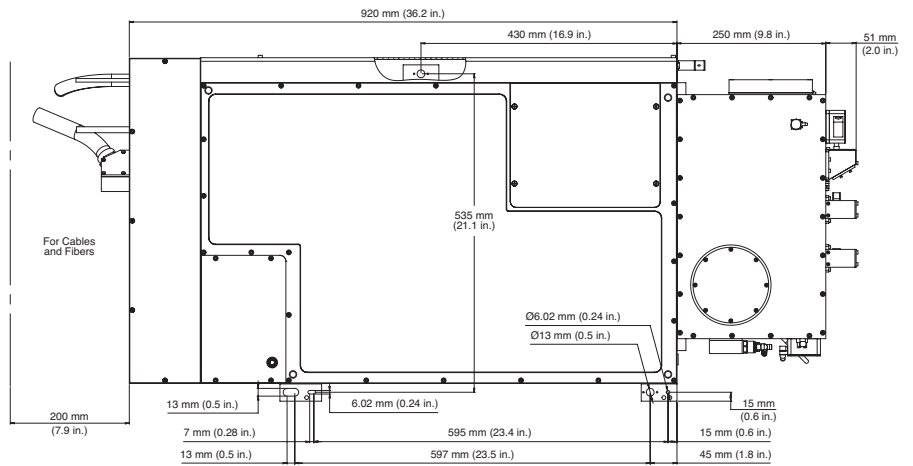
##### Rear View



##### Side View



##### Top View



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

Coherent offers a limited warranty for all HyperRapid lasers. For full details of this warranty coverage, please refer to the Service section at www.Coherent.com or contact your local Sales or Service Representative.

