

HyperRapid NX

The New Generation of High Power Industrial Picosecond Laser

HyperRapid NX is the newest high power industrial picosecond platform of Coherent extensive industrial short pulse lasers portfolio.

HyperRapid NX delivers up to 250 μ J pulse energy with typically 10 ps duration at repetition rates up to 1 MHz. Output powers are up to 100W in the IR, 50W in the visible and 30W in the UV.

These performances allow to simultaneously feed 2 work stations within one machine, further reducing the TCO for a production process in micromachining applications.

HyperRapid NX enables the most advanced applications with state-of-the-art pulse control and synchronization features.

Pulses can be triggered on-demand with low jitter (<25 ns) and trigger-to-pulse delay. The fast process shutter allows both on/off control and energy attenuation for each individual pulse.

Burst mode can be selected to determine how many 10 ps-pulses with 25 ns separation should be released in an envelope. These 25 ns-bursts enhance the ablation rate in many materials and increase the process efficiency.

The HyperRapid NX laser head is a self-contained system where all optical elements, control electronics and thermo-mechanical management are integrated. It complies with state-of-the-art safety regulation and it is complemented by a selection of off-the-shelf chillers and power supply to offer the greatest flexibility.



Superior Reliability & Performance

HyperRapid NX Advantages:

- **1064 nm, 532 nm or 355 nm**
- **High power and burst mode for high throughput at significantly reduced TCO**
- **High energy at high repetition rates up to 1 MHz**
- **Time and amplitude control of each individual pulse**
- **Extended lifetime performance, even in the UV**
- **Compact and cost effective**
- **Machinery-directive compliant Performance Level e**

HyperRapid NX Applications:

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

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System Specifications^{1,2,3,4,5}

HyperRapid NX

	1064	532	355	1064	532	355
Single Wavelength Output (nm)	1064	532	355	1064	532	355
Amplifier Pulse Repetition Rate (kHz)	200 to 1000		400 to 1000			
Output Pulse Repetition Rate Range (kHz)	0 to 1000					
Pulse Duration (ps)	<15					
Average Power (W)	≥50	≥25	≥15	≥100	≥50	≥30
Average Power Stability ⁶ (RMS 1σ, %)	≤1					
Pulse Energy ⁷ (μJ)	≥250	≥125	≥75	≥250	≥125	≥75
Pulse-to-Pulse Energy Stability (RMS 1σ, %)	≤1	≤2	≤2	≤1	≤2	≤2
Beam Quality Parameter (M ²)	≤1.3					
Beam Diameter, 1m in Front of Laser (mm)	5.0 ±0.5					
Beam Divergence, Full Angle (mrad)	≤1					
Beam Circularity, 1m in Front of Laser (%)	≥85					
Beam-pointing Stability (μrad/°C)	≤50 (peak-to-peak)					
Bore-sight Accuracy (beam to specified exit location)						
Lateral (mm)	≤1					
Angular (mrad)	≤5					
Direction of Polarization (Vertical/Horizontal)	V	H	H	V	H	H
Polarization Ratio	>100:1					
Warm-up Time from Chiller Start (min)	<40					
Allowed Temperature Range During Operation	+15°C to +30°C (free of condensation)					
Humidity	0 to 90% RH, non-condensing, Dew-point <22°C					
Electrical Supply	100 to 230V AC/50 to 60 Hz/2.5 kW					
Mounting Orientation	Horizontal					
Chiller	Water to Air or Water to Water					

¹ At 500 kHz repetition rate, unless stated otherwise.

² Maximum output power (variable attenuator and process shutter at maximum transmission).

³ After warm-up time.

⁴ Steady-state (no pulse gating or PRF change).

⁵ Single-pulse operation (burst number = 1).

⁶ Over 8 hours, ± 1°C ambient temperature.

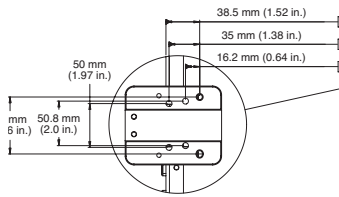
⁷ Specified for lowest amplifier pulse repetition rate.

HyperRapid NX

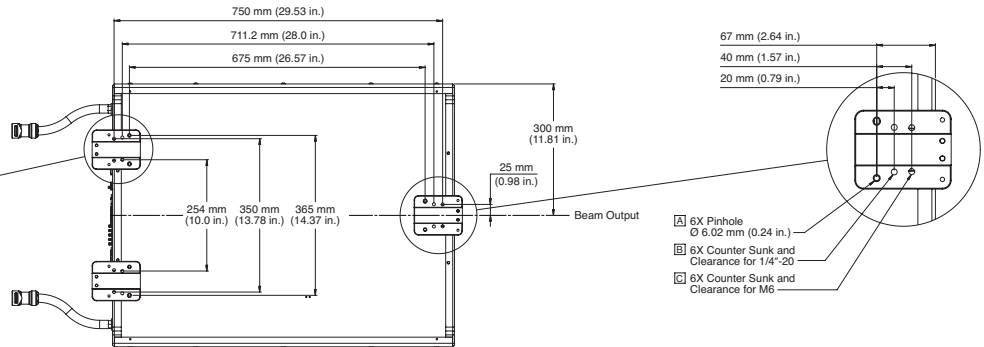
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Mechanical Specifications

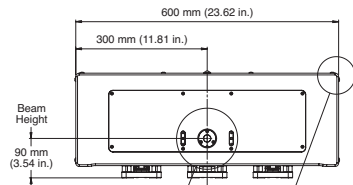
Laser Head



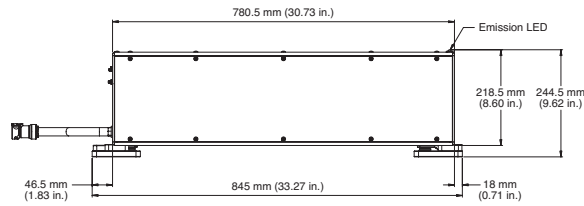
Top View



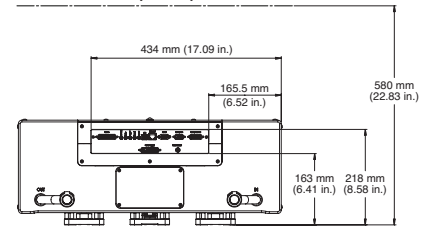
Front View



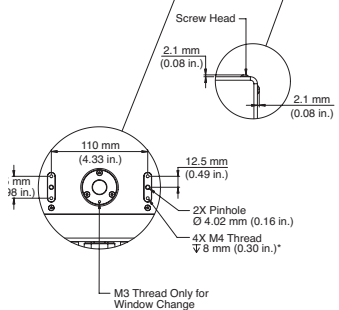
Side View



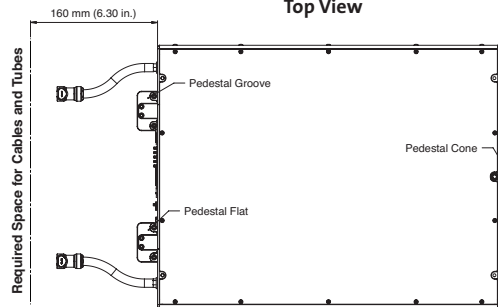
Required Space for Service



Rear View



Top View



*REFER TO THE OPERATOR'S MANUAL FOR LIGHT ACCESSORY REQUIREMENTS



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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.

