HyperRapid NXT 266

Deep UV Picosecond Laser for Industrial Micromachining with Maximum Flexibility

HyperRapid NXT 266 is a high average power deep UV laser based on the proven HyperRapid NXT platform. HyperRapid NXT is Coherent's high power industrial picosecond laser platform, and the benchmark for industrial micromachining applications.

Designed for high power deep UV industrial applications, utilizing the HyperRapid NXT platform for stable DUV power modulation, pulse on demand and variable repetition rates, this laser sets a new standard in micromachining applications with lowest heat affected zone and control of depth.

The HyperRapid NXT 266 is backed up with worldwide service support to match the most demanding uptime and cost-of-ownership requirements.



FEATURES

- Single wavelength output: 266 nm
- Stable DUV power modulation
- Guaranteed FHG module lifetime of over 5.000 hours at full power
- · Compact and light weight
- Worldwide product support options to optimize uptime and cost-of-ownership

APPLICATIONS

- Cutting, drilling, selective removal of complex composite structures from dissimilar materials, including oxides, plastics and organics
- Ideally suited for applications in flat panel display and microelectronics processing
- $\bullet\,$ Glass marking with features sizes well below 5 μm



Single Wavelength Output² (nm) 266 Power* (W) 10 Pulse Repetition Rate Range (kHz) 800 to 4000 Pulse Duration* (ps) <10	Specifications ^{1,2}	
Pulse Repetition Rate Range (kHz) 800 to 4000 Pulse Duration ⁶ (ps) <10 Average Power Stability ⁶ (RMS 1σ, %) ≤1 Maximum Pulse Energy ⁷ (μl) 12.5 Pulse-to-Pulse Energy Stability ⁶ (RMS 1σ, %) ≤2 Beam Quality Parameter ⁶ (M²) ≤1.3 Beam Diameter, 1 m in Front of Laser (mm) 4.0 ±0.3 Beam Divergence, Full Angle (mrad) ≤1 Beam Circularity, 1 m in Front of Laser (%) ≥85 Beam-Pointing Stability (μrad/**C) ≤50 (peak-to-peak) Bore Sight Accuracy, Lateral (Beam to Specified Exit Location) ≤1 mm Bore Sight Accuracy, Angular (Beam to Specified Exit Direction) ≤5 mrad Direction of Polarization (Vertical/Horizontal) V Polarization Ratio 100.1 Electrical Supply 100 to 230 V AC/50 to 60 Hz/2.5 kW Mounting Orientation Horizontal Chiller Water-to-Air or Water-to-Water Dimensions Laser Head 600 x 885 x 245 mm 276 x 230 x 223 Weight Laser Head 567 kgs Power Supply 16 kg SMC Chiller 276 x 230 x 223 Weight Laser Head 43 kg Recirculator 43 kg SMC Chiller 43 kg Recirculator 16 kg Operating Specifications Allowed Temperature Range During Operation +15 °C to +30 °C (Free of Condensation) Humidity [0 to 90]% RH, Non-Condensing, Dew-Point <22 °C	<u> </u>	266
Pulse Duration⁵ (ps) <10	Power ⁴ (W)	10
Average Power Stability* (RMS 1σ, %) ≤1 Maximum Pulse Energy* (μ) 12.5 Pulse-to-Pulse Energy Stability* (RMS 1σ, %) ≤2 Beam Quality Parameter* (M²) ≤1.3 Beam Diameter, 1 m in Front of Laser (mm) 4.0 ±0.3 Beam Divergence, Full Angle (mrad) ≤1 Beam Circularity, 1 m in Front of Laser (%) ≥85 Beam-Pointing Stability (μrad/"C) ≤50 (peak-to-peak) Bore Sight Accuracy, Lateral (Beam to Specified Exit Location) ≤1 mm Bore Sight Accuracy, Lateral (Horizontal) ∨ Polarization Retio ≥100.1 Electrical Supply 100 to 230 V AC/50 to 60 Hz/2.5 kW Mounting Orientation Horizontal Chiller Water-to-Air or Water-to-Water Dimensions 2 aser Head Power Supply 30 u y y rack SMC Chiller 500 x 317 x 615 mm Recirculator 267 kgs Power Supply 16 kg SMC Chiller 43 kg Rescirculator 16 kg Operating Specifications +15 °C to +30 °C (Free of Condensation) Humidity <td< td=""><td>Pulse Repetition Rate Range (kHz)</td><td>800 to 4000</td></td<>	Pulse Repetition Rate Range (kHz)	800 to 4000
Maximum Pulse Energy7 (μ) 12.5 Pulse-to-Pulse Energy Stability8 (RMS 1σ, %) ≤2 Beam Quality Parameter9 (M²) ≤1.3 Beam Diameter, 1 m in Front of Laser (mm) 4.0 ±0.3 Beam Divergence, Full Angle (mrad) ≤1 Beam Circularity, 1 m in Front of Laser (%) ≥85 Beam-Pointing Stability (µrad/*C) ≤50 (peak-to-peak) Bore Sight Accuracy, Lateral (Beam to Specified Exit Location) ≤1 mm Bore Sight Accuracy, Angular (Beam to Specified Exit Direction) √ Direction of Polarization (Vertical/Horizontal) √ Polarization Ratio >100:1 Electrical Supply 100 to 230 V AC/50 to 60 Hz/2.5 kW Mounting Orientation Horizontal Chiller Water-to-Air or Water-to-Water Dimensions Aug. Laser Head 600 x 885 x 245 mm Power Supply 30 19° rack SMC Chiller 500 x 317 x 615 mm Recirculator 45 kg Power Supply 16 kg SMC Chiller 43 kg Recirculator 43 kg Recirculator 45 kg	Pulse Duration ⁵ (ps)	<10
Pulse-to-Pulse Energy Stability® (RMS 1σ, %) ≤2 Beam Quality Parameter® (M²) ≤1.3 Beam Diameter, 1 m in Front of Laser (mm) 4.0 ±0.3 Beam Divergence, Full Angle (mrad) ≤1 Beam Circularity, 1 m in Front of Laser (%) ≥85 Beam-Pointing Stability (µrad/°C) ≤50 (peak-to-peak) Bore Sight Accuracy, Lateral (Beam to Specified Exit Location) ≤1 mm Bore Sight Accuracy, Angular (Beam to Specified Exit Direction) √ Polarization Ratio >100:1 Electrical Supply 100 to 230 V AC/50 to 60 Hz/2.5 kW Mounting Orientation Horizontal Chiller Water-to-Air or Water-to-Water Dimensions 400 x 885 x 245 mm Laser Head 600 x 885 x 245 mm Power Supply 3U 19" rack SMC Chiller 500 x 317 x 615 mm Recirculator 276 x 230 x 223 Weight 16 kg Laser Head 60 x 85 x 245 mm Power Supply 16 kg SMC Chiller 43 kg Recirculator 16 kg Operating Specifications <	Average Power Stability ⁶ (RMS 1σ, %)	≤1
Beam Quality Parameter of (M²) \$1.3	Maximum Pulse Energy ⁷ (μ)	12.5
Beam Diameter, 1 m in Front of Laser (mm) 4.0 ± 0.3 Beam Divergence, Full Angle (mrad) ≤1 Beam Circularity, 1 m in Front of Laser (%) ≥85 Beam-Pointing Stability (µrad/°C) ≤50 (peak-to-peak) Bore Sight Accuracy, Lateral (Beam to Specified Exit Location) ≤1 mm Bore Sight Accuracy, Angular (Beam to Specified Exit Direction) ≤5 mrad Direction of Polarization (Vertical/Horizontal) ∨ Polarization Ratio >100:1 Electrical Supply 100 to 230 V AC/50 to 60 Hz/2.5 kW Mounting Orientation Horizontal Chiller Water-to-Air or Water-to-Water Dimensions 600 x 885 x 245 mm Laser Head 600 x 885 x 245 mm Power Supply 3U 19" rack SMC Chiller 500 x 317 x 615 mm Recirculator 276 x 230 x 223 Weight 43 kg Laser Head 67 kgs Power Supply 16 kg SMC Chiller 43 kg Recirculator 16 kg Operating Specifications Allowed Temperature Range During Operation +15 °C to +30 °C (Free o	Pulse-to-Pulse Energy Stability ⁸ (RMS 1σ, %)	≤2
Beam Divergence, Full Angle (mrad) Beam Circularity, 1 m in Front of Laser (%) Beam-Pointing Stability (µrad/°C) Beam-Pointing Stability (µrad/°C) Bore Sight Accuracy, Lateral (Beam to Specified Exit Location) Bore Sight Accuracy, Angular (Beam to Specified Exit Direction) Direction of Polarization (Vertical/Horizontal) V Polarization Ratio Polarization Ratio Santa 100 to 230 V AC/50 to 60 Hz/2.5 kW Mounting Orientation Horizontal Chiller Water-to-Air or Water-to-Water Dimensions Laser Head Power Supply SMC Chiller Recirculator Weight Laser Head Son x 317 x 615 mm Recirculator Son x 31	Beam Quality Parameter ⁹ (M ²)	≤1.3
Beam Circularity, 1 m in Front of Laser (%) Beam-Pointing Stability (µrad/°C) Bore Sight Accuracy, Lateral (Beam to Specified Exit Location) Bore Sight Accuracy, Angular (Beam to Specified Exit Direction) Direction of Polarization (Vertical/Horizontal) V Polarization Ratio Electrical Supply Mounting Orientation Chiller Water-to-Air or Water-to-Water Dimensions Laser Head Power Supply SMC Chiller Recirculator Weight Laser Head Son x 317 x 615 mm Recirculator Weight Laser Head Son x 317 x 615 mm Recirculator Son X 317 x 615 mm Recirculator Son X 317 x 615 mm Recirculator Weight Laser Head Son X 317 x 615 mm Recirculator Recirculator Weight Laser Head Son X 317 x 615 mm Recirculator Recirculator Weight Laser Head Son X 317 x 615 mm Recirculator Recirculator Recirculator Weight Laser Head Son X 317 x 615 mm Recirculator Recirculator Weight Laser Head Son X 317 x 615 mm Recirculator Recirculator Recirculator Weight Laser Head Son X 317 x 615 mm Recirculator Recirculator Recirculator Weight Laser Head Son X 317 x 615 mm Recirculator	Beam Diameter, 1 m in Front of Laser (mm)	4.0 ±0.3
Beam-Pointing Stability (µrad/°C) Bore Sight Accuracy, Lateral (Beam to Specified Exit Location) Bore Sight Accuracy, Angular (Beam to Specified Exit Direction) Some Sight Accuracy, Angular (Beam to Specified Exit Direction) Direction of Polarization (Vertical/Horizontal) V Polarization Ratio >100:1 Electrical Supply 100 to 230 V AC/50 to 60 Hz/2.5 kW Mounting Orientation Chiller Water-to-Air or Water-to-Water Dimensions Laser Head Power Supply 3U 19" rack SMC Chiller Recirculator Weight Laser Head Some x 245 mm 276 x 230 x 223 Weight Laser Head Some x 245 mm 276 x 230 x 223 Weight Laser Head Some x 245 mm 276 x 230 x 223 Weight Laser Head Some x 245 mm 276 x 230 x 223 Weight Laser Head Some x 245 mm Some x	Beam Divergence, Full Angle (mrad)	≤1
Bore Sight Accuracy, Lateral (Beam to Specified Exit Location) Sore Sight Accuracy, Angular (Beam to Specified Exit Direction) Direction of Polarization (Vertical/Horizontal) V Polarization Ratio Electrical Supply Mounting Orientation Chiller Dimensions Laser Head Power Supply SMC Chiller SMC Chiller Laser Head Ser Head Son x 317 x 615 mm Recirculator Weight Laser Head Sore X 290 x 223 Weight Laser Head Sore X 290 x 223 Weight Laser Head Sore X 290 x 200 x	Beam Circularity, 1 m in Front of Laser (%)	≥85
Bore Sight Accuracy, Angular (Beam to Specified Exit Direction) Direction of Polarization (Vertical/Horizontal) Polarization Ratio >100:1 Electrical Supply 100 to 230 V AC/50 to 60 Hz/2.5 kW Mounting Orientation Horizontal Chiller Water-to-Air or Water-to-Water Dimensions Laser Head Power Supply SMC Chiller SMC Chiller Laser Head Power Supply Weight Laser Head Power Supply SMC Chiller Recirculator Weight Laser Head Power Supply SMC Chiller Recirculator Weight Laser Head Power Supply SMC Chiller Recirculator To ke Stroke Power Supply 16 kg SMC Chiller Recirculator Power Supply 16 kg SMC Chiller Recirculator To ke Stroke Power Supply 16 kg SMC Chiller Recirculator Power Supply 16 kg SMC Chiller 16 kg SMC Chiller 17 Kgs Power Supply 18 kg Recirculator Power Supply 19 Kgs Power Supply 19 Kgs Power Supply 10 to 90% RH, Non-Condensing, Dew-Point <22 °C	Beam-Pointing Stability (μrad/°C)	≤50 (peak-to-peak)
Direction of Polarization (Vertical/Horizontal) V Polarization Ratio >100:1 Electrical Supply 100 to 230 V AC/50 to 60 Hz/2.5 kW Mounting Orientation Horizontal Chiller Water-to-Air or Water-to-Water Dimensions 600 x 885 x 245 mm Laser Head 600 x 885 x 245 mm Power Supply 3U 19" rack SMC Chiller 500 x 317 x 615 mm Recirculator 276 x 230 x 223 Weight ≤67 kgs Laser Head ≤67 kgs Power Supply 16 kg SMC Chiller 43 kg Recirculator 16 kg Operating Specifications Allowed Temperature Range During Operation +15 °C to +30 °C (Free of Condensation) Humidity [0 to 90]% RH, Non-Condensing, Dew-Point <22 °C	Bore Sight Accuracy, Lateral (Beam to Specified Exit Location)	≤1 mm
Polarization Ratio	Bore Sight Accuracy, Angular (Beam to Specified Exit Direction)	≤5 mrad
Electrical Supply 100 to 230 V AC/50 to 60 Hz/2.5 kW Mounting Orientation Horizontal Chiller Water-to-Air or Water-to-Water Dimensions Laser Head 600 x 885 x 245 mm Power Supply 3U 19" rack SMC Chiller 500 x 317 x 615 mm Recirculator 276 x 230 x 223 Weight 45 °C kgs Power Supply 16 kg SMC Chiller 43 kg Recirculator 43 kg Recirculator 16 kg Operating Specifications Allowed Temperature Range During Operation +15 °C to +30 °C (Free of Condensation) Humidity [0 to 90]% RH, Non-Condensing, Dew-Point <22 °C	Direction of Polarization (Vertical/Horizontal)	V
Mounting Orientation Horizontal Chiller Water-to-Air or Water-to-Water Dimensions 600 x 885 x 245 mm Laser Head 600 x 885 x 245 mm Power Supply 3U 19" rack SMC Chiller 500 x 317 x 615 mm Recirculator 276 x 230 x 223 Weight 43 kg Laser Head ≤67 kgs Power Supply 16 kg SMC Chiller 43 kg Recirculator 16 kg Operating Specifications Allowed Temperature Range During Operation +15 °C to +30 °C (Free of Condensation) Humidity [0 to 90]% RH, Non-Condensing, Dew-Point <22 °C	Polarization Ratio	>100:1
Chiller Water-to-Air or Water-to-Water Dimensions 600 x 885 x 245 mm Laser Head 600 x 885 x 245 mm Power Supply 3U 19" rack SMC Chiller 500 x 317 x 615 mm Recirculator 276 x 230 x 223 Weight 43 kg Laser Head ≤67 kgs Power Supply 16 kg SMC Chiller 43 kg Recirculator 16 kg Operating Specifications 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 230 V AC/50 to 60 Hz/2.5 kW
Dimensions Laser Head Power Supply SMC Chiller Recirculator Weight Laser Head Son x 317 x 615 mm 276 x 230 x 223 Weight Laser Head Son x 317 x 615 mm 276 x 230 x 230 Weight Laser Head Son x 317 x 615 mm 276 x 230 x 230 Weight Laser Head Son x 317 x 615 mm 276	Mounting Orientation	Horizontal
Laser Head 600 x 885 x 245 mm Power Supply 3U 19" rack SMC Chiller 500 x 317 x 615 mm Recirculator 276 x 230 x 223 Weight 457 kgs Laser Head ≤67 kgs Power Supply 16 kg SMC Chiller 43 kg Recirculator 16 kg Operating Specifications Allowed Temperature Range During Operation +15 °C to +30 °C (Free of Condensation) Humidity [0 to 90]% RH, Non-Condensing, Dew-Point <22 °C	Chiller	Water-to-Air or Water-to-Water
Laser Head Power Supply SMC Chiller Recirculator Operating Specifications Allowed Temperature Range During Operation Humidity ≤67 kgs 16 kg 18 kg 19 kg 19 kg 19 kg 10 to 90]% RH, Non-Condensing, Dew-Point <22 °C	Laser Head Power Supply SMC Chiller	3U 19" rack 500 x 317 x 615 mm
Allowed Temperature Range During Operation +15 °C to +30 °C (Free of Condensation) Humidity [0 to 90]% RH, Non-Condensing, Dew-Point <22 °C	Laser Head Power Supply SMC Chiller Recirculator	16 kg 43 kg
Humidity [0 to 90]% RH, Non-Condensing, Dew-Point <22 °C		
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Output Window Purging Requirement CDA or Nitrogen. See manual for details.	Humidity	[0 to 90]% RH, Non-Condensing, Dew-Point <22 °C
	Output Window Purging Requirement	CDA or Nitrogen. See manual for details.

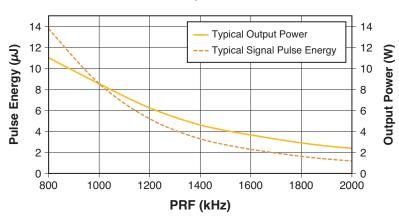
Notes:

- 1. Due to our continuous product improvement program, specifications may change without notice.
- 2. All specifications at 800 kHz.
- 3. After warm-up time, chiller temperature = 23 + /- 0.1°C
- 4. Maximum power with variable attenuator and process shutter at maximum transmission.
- 5. DUV Autocorrelation at 800 kHz operation.
- 6. Over 8 hours, $\pm 1^{\circ}$ C ambient temperature.
- 7. Single-pulse operation (burst number = 1).
- 8. Steady-state (no pulse gating or change of pulse repetition rate).
- 9. Average of M_x^2 and M_y^2 .

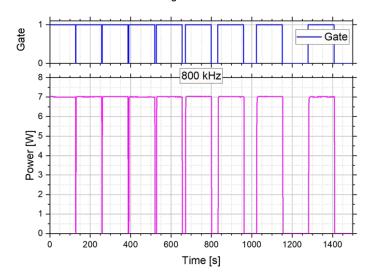


TYPICAL PERFORMANCE DATA

HyperRapid NXT 266 - Typical Single Pulse Energy and Output Power



Measurement of DUV Output Power During Modulation.
Gating Cycle: On-Time: 128 sec / Off-Time
Increasing from 1 to 128 sec





Mechanical Specifications

HyperRapid NXT 266

