Photonics Industries
International, Inc.

# DP Series High Pulse Energy Nanosecond Lasers

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Photonics Industries' DP Series diode-pumped solid-state (DPSS), Q-Switched, high energy, short pulse width lasers combine up to 20mJ pulse energy levels, $TEM_{00}$ output, and exceptional power efficiency with 10X lower heat load vs. closest competitors. With the ability to select and/or blend multiple wavelengths, the DP Series is an ideal, compact air-cooled package for industrial applications, from intra-marking glass, to repairing displays. Scientific applications also benefit where the high pulse energies align well for atomic excitation research or spectroscopy systems.


**Features**

- **High pulse energy, $TEM_{00}$ output, with low pulse widths:**
  Up to 20 mJ at 6-8 ns pulse width range
- **Extremely efficient with 5X to 10X lower heat vs. the competition**
  5% to 10% conversion from wall power.
- **Reliable, low COO, non-consumable design**
  Patented intracavity harmonic UV & Green generation, with no indexing of the harmonic crystals
- **Small, air-cooled form factor**
  Rad-cooling™ option available for high repetition rate kHz operation
- **Multiwavelength Selectable (MWS) & Multiwavelength Blended (MWB) options**
  Select and/or blend IR, Green, UV, & DUV
- **Continuously variable pulse repetition rates**
  1 Hz to 100 Hz, 200 Hz, 300 Hz, or up to 1 kHz
- **Superior beam pointing stability:**
  < 25 µrad
- **Total Pulse Control for ideal integration into systems:**
  Duty Control
  PEC (Power or Pulse Energy Control)

**Applications**

- **Cutting, drilling, welding, scribing, marking, intra-marking, patterning,**
- **dielectric grooving, de-paneling, annealing, repair**
- **Ion Generation Systems, Atomic Excitation, Atomic/Quantum Physics Research**
- **Flat Panel Display Repair Systems, LCD/LED/OLED ZAP Repair**
- **Laser Induced Breakdown Spectroscopy (LIBS), Spectroscopy Systems**
- **Non-destructive Testing (NDT), Laser Ultrasonics, Acoustic Microscopy, Photoacoustics,**
- **Pulsed Laser Deposition (PLD)**
- **OPO pumping**

## Specifications – **DP Series High Pulse Energy Nanosecond Lasers**

| | | DP5 | DP20 | DP1k-5 | DP1k-15 |
|---|---|---|---|---|---|
| **Beam and output specifications** | | | | | |
| Wavelengths[1] available, single or multi-wavelength selectable and/or blended output | | 1053 nm, 527 nm, 351 nm, 263 nm | | 1064 nm, 532 nm, 355 nm, 266 nm | |
| Maximum pulse energy[1,2], single-wavelength output | IR | 5 mJ | 20 mJ | 5mJ | 15 mJ |
| | GRN | 4 mJ | 18 mJ | 4 mJ | 12 mJ |
| | UV | 1 mJ | 8 mJ | 2 mJ | 6 mJ |
| Pulse repetition rate | | Single shot to 100 Hz, 1-200 Hz, or 1-300 Hz available on request. | | Single shot to 1 kHz | |
| Pulse width range[3] | | 6-10 ns | | | |
| Multi-wavelength output types | | [IR/GRN], [GRN/DUV], [IR/GRN/UV], or [IR/GRN/DUV] | | | |
| | Blended (-MWB) | All wavelengths come out of a single exit port blended. | | | |
| | Blended/Selectable (-MWB/S) | One, two, or three different wavelengths come out of a single exit port blended. The specific wavelength blend combination is user-selectable via the software GUI. | | | |
| | Selectable (-MWS) | Each individual wavelength is isolated and user-selectable via the software GUI. | | | |
| Output pulse energy[1,2] at different wavelengths[4], efficiency dependent on wavelength output type | | 1 – 4 mJ, 527 nm<br>0.5 – 1 mJ, 351 nm | 4 – 18 mJ, 527 nm<br>2 – 8 mJ, 351 nm | 1 – 4 mJ, 532 nm<br>0.5 – 2 mJ, 355 nm | 3 – 12 mJ, 532 nm<br>1.5 – 6 mJ, 355 nm |
| Pulse energy stability | | < 3% rms, measured at ambient temperature of ± 2°C | | | |
| Long-term stability | | 3% rms, measured over 8 hours ± 1°C | | | |
| Beam spatial mode[5] | | $TEM_{00}$ $M^2$ < 2 | | | |
| Beam pointing stability | | < 25 µrad | | | |
| Beam divergence | | < 4 mrad | | | |
| Beam diameter[6] | | ~2 mm, at exit | | | |
| **Operational and system characteristics** | | | | | |
| Interface | | RS232, Ethernet, Software GUI, External TTL Triggering | | | |
| Electrical requirement | | 100-240 V AC; or 32 V DC, 15 A; Line Frequency 50-60 Hz | | | |
| Power consumption | | ~50 W | | ~80 W | ~240 W |
| Warm-up time | | < 5 minutes from standby, < 10 minutes from cold start | | | |
| Ambient | | 15°C to 30°C (59°F to 86°F) Operating Range, RH 90% Max, non-condensing | | | |
| Cooling system[7] | | Passively cooled, no air-cooling fan required | Air-cooling fan | Air-cooling fans, option for rad-cooling™ | Rad-cooling™ |
| Dimensions[8] (LxWxH) | | 11 x 5 x 3.25 in | 12.50 x 6.75 x 3.88 in | 12.50 x 6.75 x 5.95 in | 12.50 x 6.75 x 3.88 in |

[1] For DUV 263 nm or 266 nm output, please contact us. [2] Constant pulse energy across the entire pulse repetition rate range. Depending on pulse energy needed, air-cooling or rad-cooling™ systems can be used for laser head heat removal. [3] Precise pulse width range dependent on model and configuration chosen. [4] Pulse energy output efficiency for each wavelength dependent on multi-wavelength output option chosen. Pulse energy is constant across the entire pulse repetition rate range. [5] Typical $M^2$ values are lower depending on wavelength output type and model. [6] Specified value in the IR. [7] Rad-cooling™ is a special cooling system for highly effective heat removal while also isolating vibrational noise away from the laser head (low dB). Please contact us for more information. [8] The DP Series Lasers are all-in-one (AIO) and do not require a separate controller. All connections for operation and control of the laser are found on the back panel of the AIO laser. [NB] For further details on the multi-wavelength output options, please contact us.

| **How to order** | | | | | | |
|---|---|---|---|---|---|---|
| Format | DP | xx | - | xxx | | [xx/xx/xx] |
| Designation criteria | DP | 5, 20, or 1k-5, 1k-15 | - | MWB, MWB/S, or MWS | | IR, GRN, UV, or DUV |
| Examples | DP20-MWB/S [GRN/DUV], DP1k-15 [IR], DP5 [GRN], etc. | | | | | |

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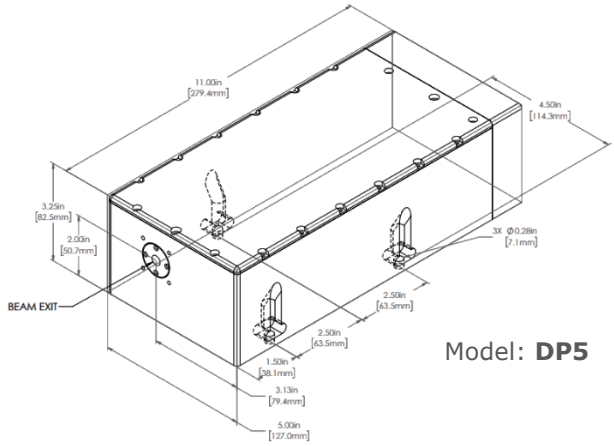
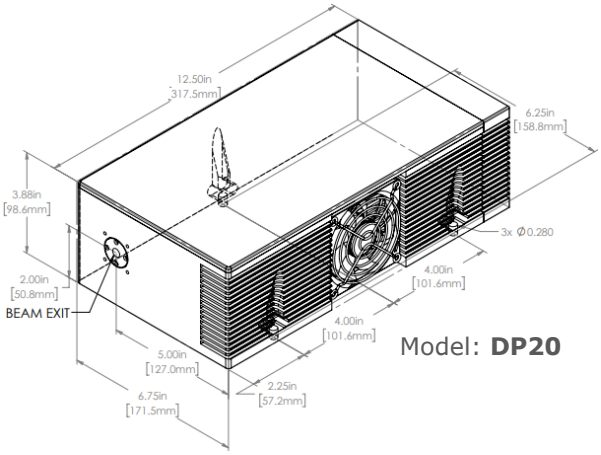
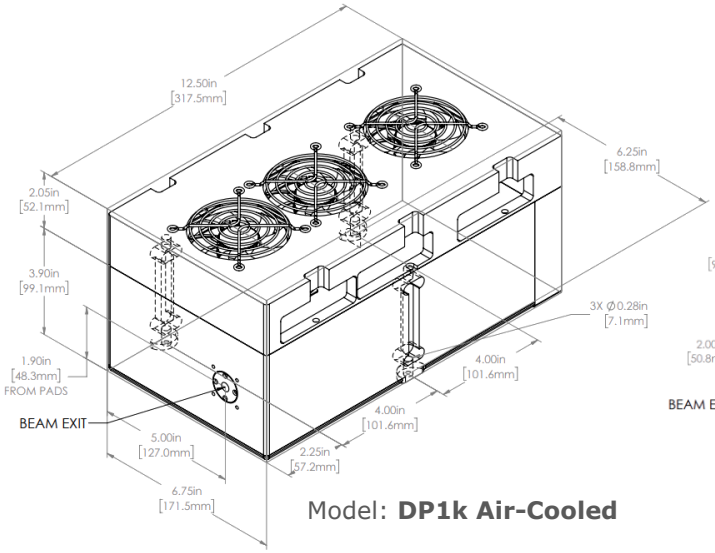
## Dimensional Drawings



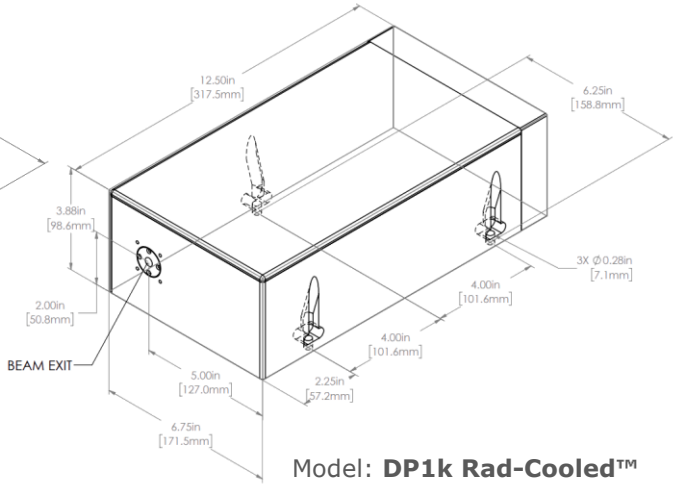

Model: **DP5**




Model: **DP20**




Model: **DP1k Air-Cooled**




Model: **DP1k Rad-Cooled™**



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Photonics Industries International is the pioneer of intracavity harmonic lasers and is at the forefront of developing, manufacturing and marketing a wide range of nanosecond, sub-nanosecond, picosecond and femtosecond lasers for industrial, scientific, defense, and medical industries. Check out our products and see how we can help you apply our lasers to your needs.



LASER RADIATION

Photonics Industries International, Inc.

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# Rayture Systems

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