Scientific Ultrafast Laser Amplifiers

# Monaco 1300

## One-Box Three-Photon Imaging Laser

Monaco 1300 is a dedicated ultrafast 1300 nm light source for three-photon (3P) imaging, specifically developed to offer a simplified and reliable, all-in-one 3P excitation source. Delivering 2.5 W, sub-50 fs pulses at 1300 nm in the MHz regime, Monaco 1300 is optimized for excitation of imaging and functional probes like the GFP and GCaMP families. The Total Power Control (TPC) and dispersion precompensation options combined in a single box afford ease of integration, eliminating the need for complex set-ups. Access to the 1035 nm Monaco output also enables advanced two-photon photostimulation and imaging applications all from a single excitation source.


## FEATURES

- 2.5 W average power
- <50 fs pulse width
- 1, 2, or 4 MHz repetition rate versions
- Optional built-in fast Total Power Control (TPC) for on-the-fly power attenuation and optical gating
- Optional Compact Pulse Compressor (CPC) allowing dispersion precompensation for optimum pulse width at the sample
- Switchable Monaco 1035 nm output access for two-photon photostimulation and imaging
- Integrated one-box design for ease of use and simplified application integration
- Water-cooled for long-term stability
- HALT-designed and HASS-verified for the highest quality and reliability

## APPLICATIONS

- Three-Photon Imaging
- Multiphoton Imaging
- Two-Photon Imaging
- Optogenetics
- Photostimulation
- Multiphoton Microscopy

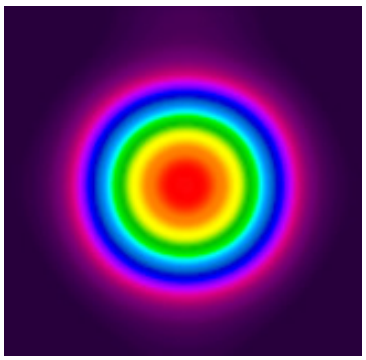
COHERENT

| Optical Output A | Monaco 1300 (base model without TPC or CPC options) | Monaco 1300 TPC |
|---|---|---|
| Wavelength (nm) | 1300 ±10 | |
| Repetition Rate[2] (MHz) | 1, 2, or 4 | |
| Average Power (W) | 2.5 | 2 |
| Pulse Duration (fs) | <50 | |
| Spatial Mode | $M^2$ <1.3 | $M^2$ <1.4 |
| Beam Asymmetry | 0.8 to 1.2 | |
| Beam Diameter (mm) ($1/e^2$) (nominal) | 2.7 | |
| Beam Astigmatism (%) | <25 | |
| Polarization | Linear, Vertical | |
| Power Stability[3] (% rms) | <1.5 | |
| Beam Pointing Stability[3] (µrad) (rms) | <20 | |
| Modulation Rise/Fall Time (ns) | NA | <35 |
| Extinction Ratio | NA | >500:1 |
| **CPC Option Specifications**[1] | | |
| Compressor Efficiency (%) | >80 | |
| Dispersion Precompensation Range[4] ($fs^2$) | -20,000 to +10,000 | |
| Dispersion Precompensation Step Size ($fs^2$) | 200 | |
| **Optical Output B**[5] | | |
| Wavelength (nm) | 1035 ±5 | |
| Repetition Rate (MHz) | Single-shot to 1 MHz, higher rep. rates without AOM pulsepicking: 1 to 50 MHz standard | |
| Average Power (W) (>1 MHz) | 60 | |
| Pulse Duration (fs) | <350 | |
| Spatial Mode | $M^2$ <1.2 | |
| Beam Diameter ($1/e^2$, mm) (nominal) | 2.7 | |
| Polarization | Vertical | |
| Power Stability[3] (% rms) | <1.5 | |
| **Mechanical and Environmental Specifications** | | |
| Laser Head Dimensions[6] (L x W x H) | 1169.7 x 360.4 x 193.0 mm (46.05 x 14.19 x 7.60 in.) | |
| Laser Power Supply Dimensions (L x W x H) | 349.6 x 192.1 x 82.6 mm (13.76 x 7.56 x 3.25 in.) | |
| Laser Head Mass[6] | 77 kg (169.75 lbs) | |
| Operating Temperature Range | 10 to 30°C (50 to 86°F) | |
| Non-Operating Temperature | 5 to 65°C (41 to 149°F) | |
| Relative Humidity (%) | <90% non-condensing | |
| **Electrical and Control Requirements** | | |
| Power Requirements | 100/240 VAC (50/60 Hz) | |
| Cooling | Closed loop water chiller required (sold separately) | |
| Power Consumption (typical) | 48 VDC, <500 W | |

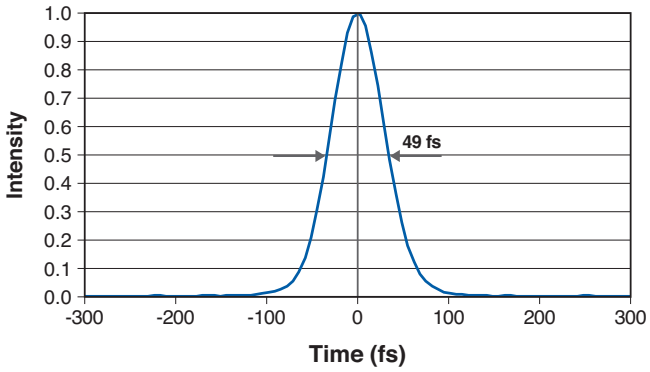
Notes:
1. Specifications subject to change.
2. Factory set, must be specified when ordered and will be optimized prior to shipment.
3. Measured over 24 hrs. after 45 min. warm-up under stable environmental conditions.
4. Extended dispersion precompensation ranges available. Contact the factory for requests.
5. Outputs A and B are not available simultaneously.
6. Specified with optional compressor attached.

**Typical Performance Data**

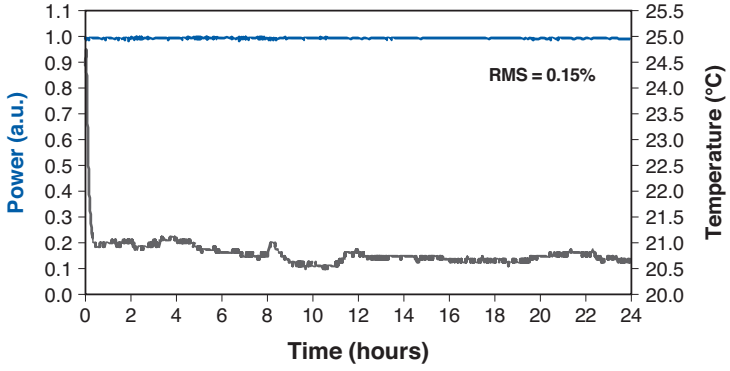
Typical Monaco 1300 Beam Profile at 2 MHz



Typical Monaco 1300 Temporal Profile at 2 MHz (Autocorrelator)

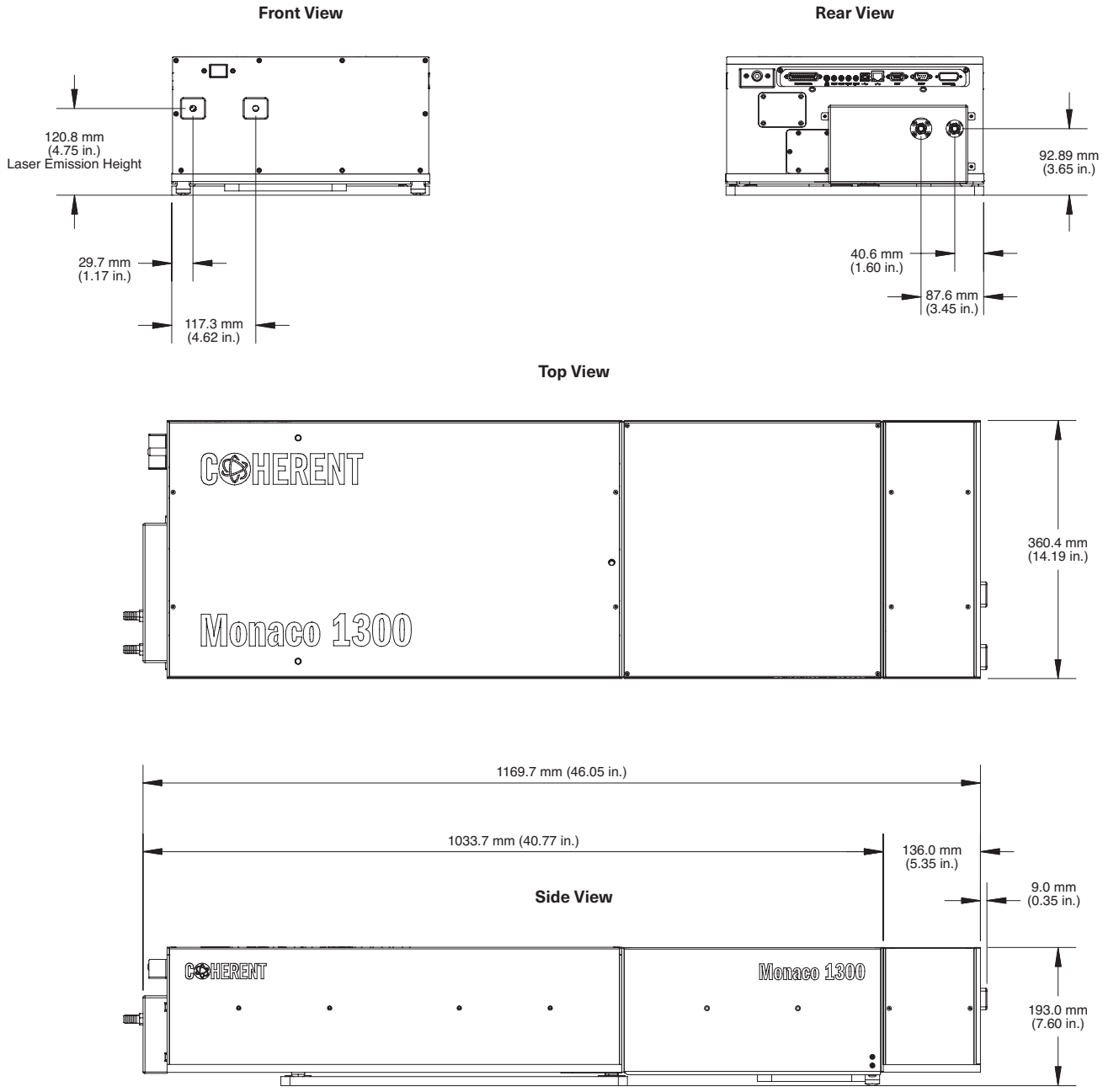



Typical Monaco 1300 Power Stability at 2 MHz over 24 Hrs



## Mechanical Specifications

Monaco 1300

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