HELIOS

Femtosecond Solid-state Laser

The HELIOS series femtosecond lasers are designed for high-precision scientific and industrial applications. Offering high stability, broad tunability, and excellent temporal resolution, this series includes compact, high energy, and high power models to meet a wide range of needs. It supports applications like ultrafast optics, laser processing, biomedical imaging, and three-photon microscopy.

The HELIOS series features an efficient water-cooling system and modular design, ensuring stable performance in various environments. With strict quality control and testing, these lasers are built for long-term, continuous use, and the modular design allows for flexible configuration adjustments to suit specific needs.

Product Features:

- **Up to 2mJ single pulse energy**
- **Adjustable pulse width from 190 fs to 10 ps**
- **Maximum output power of 40W**
- **Repetition rate from single pulse to 1 MHz**
- **Laser output in TEM00 mode, $M^2 < 1.2$**
- **Power stability < 0.5% RMS**

HELIOS-40W-HP High-power femtosecond solid-state

Application Areas

- Three-Photon Microscopy
- Neuroscience Research
- Cell Imaging and Activity Monitoring
- Multiphoton Fluorescence Imaging
- Nonlinear Optics Research
- Terahertz Radiation and Imaging
- High-Resolution Three-Dimensional Imaging
- Cell Engineering and Gene Editing

Parameter Specifications

Parameter	HELIOS-40W-HP
Maximum output power	40W
Maximum single pulse energy	400μJ
Pulse duration	<190fs
Pulse width adjustment range	190fs-10ps
Repetition frequency range	100kHz - 1MHz
Pulse selection	Selectable within single shot to ~MHz
Central wavelength	1030 ± 10nm
Polarization	Vertical
Beam quality	M^2 <1.2
Beam diameter	5±1mm
Pulse pointing stability	< 20 μrad/℃
Pre-pulse contrast	<1:1000
Post-pulse contrast	<1:500
Pulse energy stability	<0.5% RMS @24h
Long-term power stability	<0.5% RMS @100h
Dimensions (L×W×H)	831 × 585 × 218mm (L×W×H)
Weight (kg)	100kg
Expansion Options	
Harmonic output	Integrable, 515 nm, 343 nm, 257 nm
Optical parametric amplification output	Integrable, 210 - 16000nm
MPC short pulse output	Integrable, output pulse width <45 fs, energy transmission efficiency >90%
Remaining weight (kg)	24kg (Water-cooled machine) +5kg (frequency doubling)
Power supply requirements	Laser head: AC 220V/10A ; Water-cooled machine: 220V/0.6-7.7A/1.26kW (CWUP-20AI)

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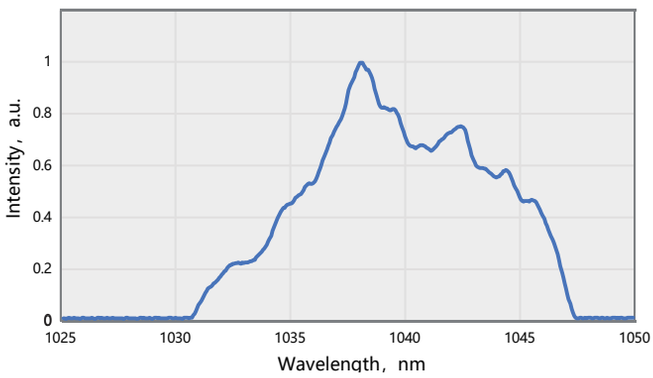
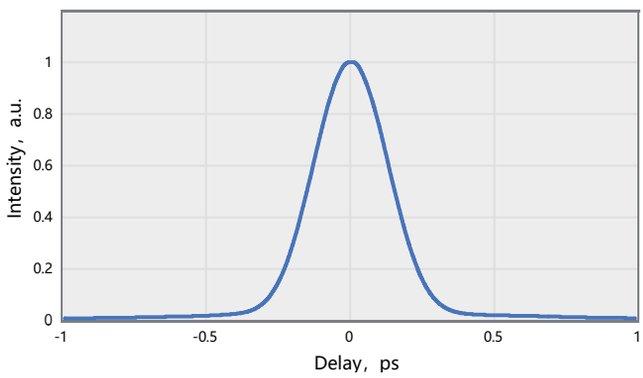
The HELIOS-40W-HP is a laser designed specifically for high-power three-photon microscopy systems, capable of delivering up to 40W of laser output power. It features low noise and high stability, ensuring the demands for deep imaging and high-resolution microscopy are met.

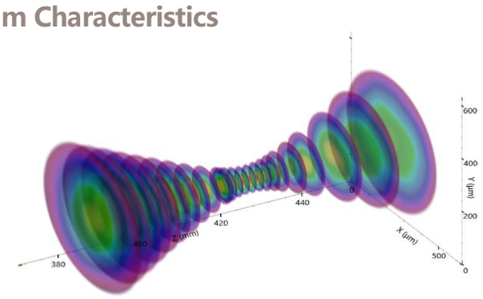


Typical spectrum of the HELIOS-40W-HP

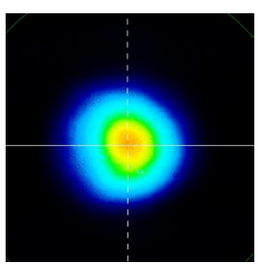


Typical pulse duration of HELIOS-40W-HP (FWHM=217.6fs)

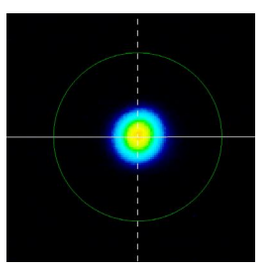
Beam Characteristics



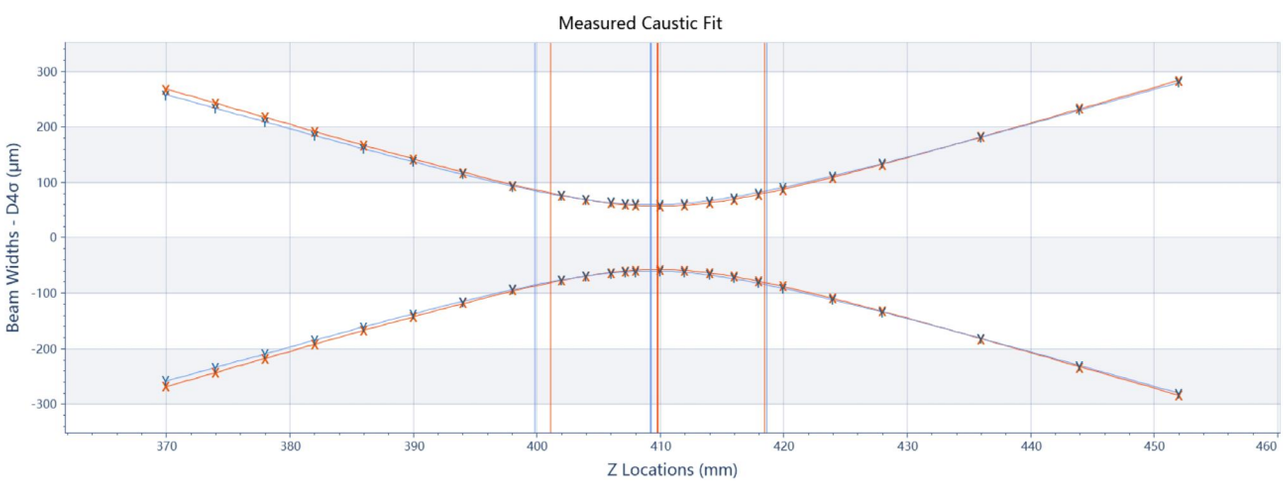
HELIOS-40W-HP M^2 measurement data (M^2<1.2)



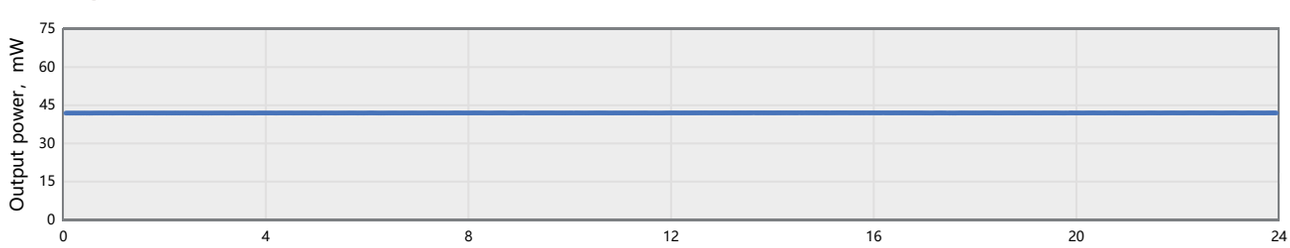
Near-field beam profile



Far-field beam profile



Stability Measurement



Power stability of HELIOS-40W-HP RMS=0.6%

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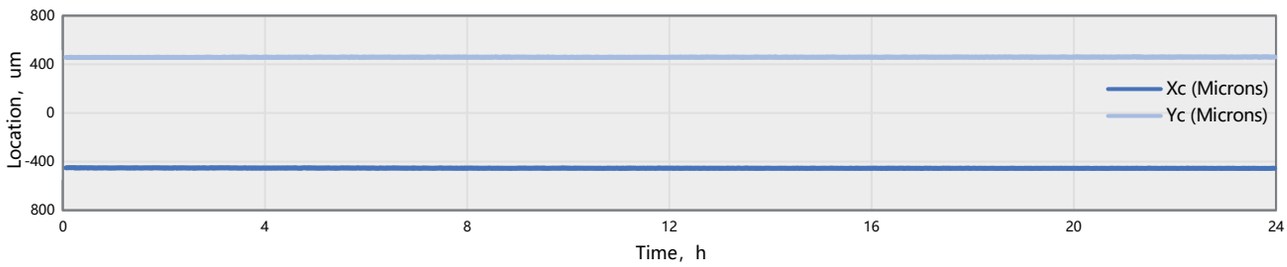
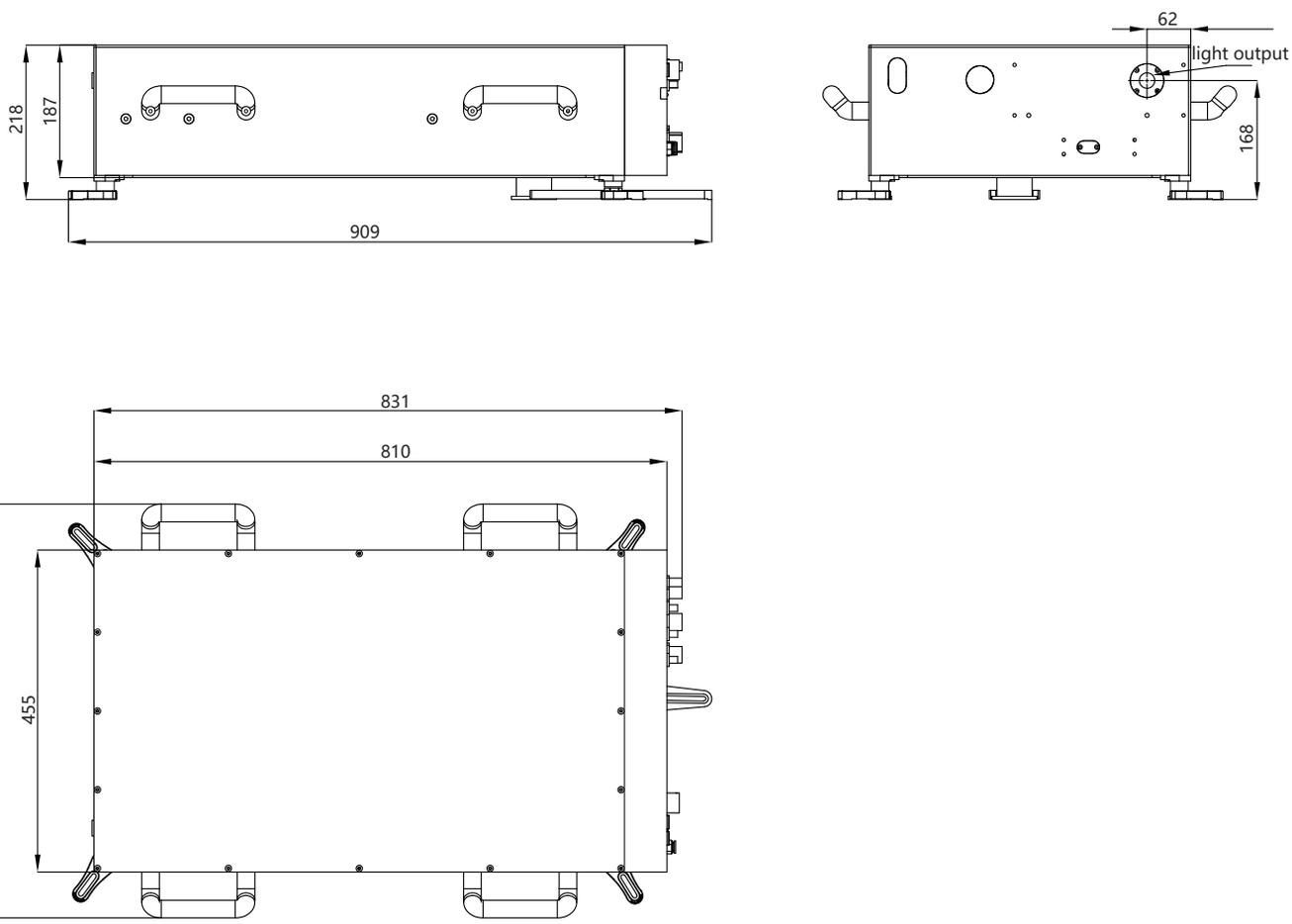


24-hour beam pointing stability of HELIOS-40W-HP

Drawings



HELIOS-40W outline drawing