

Cazadero Fiber Laser Based Chirped Pulse Amplification System



Applications

- Medical therapeutic surgery
- Nanoscience
- Materials precision machining
- Biomedical instrumentation
- Terahertz radiation
- Nonlinear optical studies
- Tissue cutting

Features

- Up to 20 μJ pulse energy
- 1030 nm wavelength
- Optimal pulse shape and width adjustment
- Linearly polarized output
- Maintenance free
- Fiber-based architecture
- Single mode output, $M^2 < 1.2$
- Variable repetition rates down to single pulse
- Customizable "burst" mode pulse sequences
- Tunable pulse width
- User selectable pulse energy levels

The fiber laser based chirped pulse amplification system (FLCPA) starts with a passively mode-locked seed fiber laser. The short pulse is time stretched by frequency (chirped) for lower intensity amplification through a high power fiber amplifier stage. Up to 20 μJ of short pulse energy is delivered into free space, with a typical minimum pulse width of 370 fs.

The pulse repetition rate is user selectable up to 1000 kHz. The pulse width is tunable up to 30 ps. Minimum pulse width and its pulse shape can both be optimized for any given pulse repetition rate. Our Arbitrary Pulse Picker feature allows you to select individual pulses to be emitted from the laser. An RF synchronization output is provided as a trigger signal.

The Cazadero Scientific fiber based femtosecond laser is lightweight, compact, and flexible, offering a reliable, cost-effective alternative to solid state laser amplifiers for biomedical, scientific, industrial, and research applications.

Technical Specifications

Model Number	FLCPA-05U
OPTICAL	
Wavelength (nm)	1030 ± 5
Average Power ² (W)	> 2.4 @ 120 kHz
Minimum Pulse Width ¹ (ps)	< 0.5 (0.37 typ)
Tunable Pulse Width (ps)	Up to 30
Selectable Repetition Rate (kHz) and Pulse Energy (μJ)	≥ 20 @ 120 kHz ≥ 14.5 @ 150 kHz ≥ 10 @ 200 kHz ≥ 7 @ 300 kHz ≥ 5 @ 400 kHz ≥ 4 @ 500 kHz ≥ 3 @ 600 kHz ≥ 2.2 @ 1 MHz
Arbitrary Pulse Picker ²	Included. Adjustable repetition rate down to single pulse by customer supplied gating control (LVCMOS3.3)
Beam Diameter _x at Waist (mm)	3.0 ± 10%
Beam Diameter _y at Waist (mm)	3.0 ± 10%
Beam Divergence _x (Full Angle, mrad)	< 0.55
Beam Divergence _y (Full Angle, mrad)	< 0.55
M ² _x	< 1.2 (1.1 typ)
M ² _y	< 1.2 (1.1 typ)
Polarization Extinction Ratio	100:1
Beam Ellipticity (%)	> 90
Beam Output	Free space output, collimated beam
Pulse Energy Stability (%rms, 8 hours)	< 1
Optical Isolation	Protection against back-reflection of up to 1% of laser output
ELECTRICAL	
Supply Voltage (VAC)	85 ~ 264 autoranging
Supply Frequency (Hz)	47 ~ 63 autoranging
Power Consumption (VA)	< 300 (150 typ)
Electrical Synchronization Output	LVCMOS
Communication Interface	RS-232
Data Log	Yes



Technical Specifications

Model Number	FLCPA-05U
MECHANICAL	
Operating Temperature (°C)	15 ~ 32
Storage Temperature (°C)	0 ~ 50
Relative Humidity (% , at 32 °C non-condensing)	Up to 90
Operating Altitude (m)	2000
Laser Head Dimensions (cm)	48 (W) x 76 (D) x 14 (H)
Laser Controller Dimensions (cm)	48 (W) x 50 (D) x 18 (H)
Laser Head Weight (kg)	27.3
Laser Controller Weight (kg)	13.6
Cooling	Air-Cooled
Vibration	Tested to ASTM D4169 Schedule E

¹ A sech^2 pulse shape (convolution factor of 0.65) is used to determine the pulse width for the second harmonic autocorrelation trace.

² Unless otherwise stated, all specified values are measured after the pulse picker, at the output of the laser.

Due to our continuous improvement program, specifications are subject to change without notice

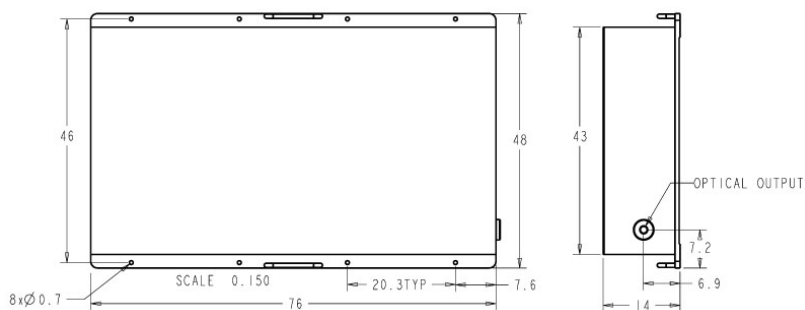


Figure 1 – Dimensions of Cazadero Scientific FLCPA-05U head

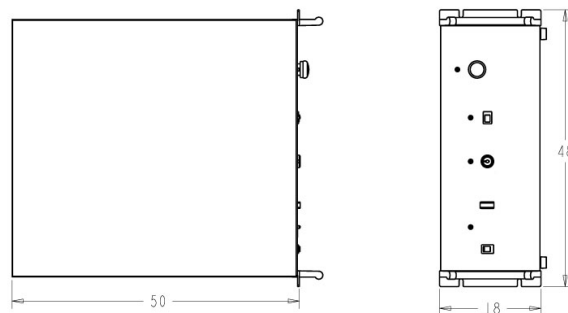


Figure 2 – Dimensions of Cazadero Scientific FLCPA-05U controller

