



Flexible Harmonic Generator

The Flexible Harmonic Generator (FHG) consists of a compact frequency doubler and frequency tripler in one housing. The field proven nonlinear crystals BBO or LBO are used depending on the wavelength range. This enables the wavelength of your mode-locked Titanium-Sapphire Tsunami laser to be converted into the visible and ultraviolet spectral range. The Flexible Harmonic Generator was developed in cooperation with GWU in Germany.

The FHG counts on the convenience of the Millennia pumped Tsunami system and can be operated with pulses in the picosecond or the femtosecond range. The standard wavelength coverage is between 240 nm and 500 nm depending on the wavelength of the pump laser. Using fourth harmonic generation instead of third harmonic generation wavelengths even shorter than 240 nm can be generated.

The wavelength of the FHG is tuned by tuning the wavelength of the Tsunami. To cover the wide FHG wavelength range the wavelength of the Tsunami has to be varied using only its broadband mirror set. The FHG operates at room temperature.

The FHG-advantage:

- Compact design: SHG and THG in one box.
- Easy alignment.
- Wide wavelength range in the visible and ultraviolet spectral range.
- Operation at room temperature.
- Picosecond pulse or femtosecond pulse depending on the pulse duration of your Tsunami.
- Long pulse option available.



Flexible Harmonic Generator specifications¹:

Second harmonic performance GWU-23-	Picosecond pulse duration		Femtosecond pulse duration	
	-PS 395 nm	-PL 450 nm	-FS 395 nm	-FL 450 nm
Output Power ^{2,3}				
Millennia XsJ	200 mW	100 mW	200 mW	100 mW
Millennia VsJ	75 mW	30 mW	75 mW	30 mW
Pulse Width ⁴	< 2 ps	< 2 ps	< 200 fs	< 250 fs
Tuning range	360 – 425 nm	420 – 500 nm	360 – 425 nm	420 – 500 nm

Third harmonic performance	263 nm	300 nm	263 nm	300 nm
Out put power ^{2,3}				
Millennia XsJ	50 mW	40 mW	50 mW	40 mW
Millennia VsJ	10 mW	5 mW	10 mW	5 mW
Pulse Width ⁴	< 2 ps	< 2 ps	< 250 fs	< 300 fs
Tuning range	240 – 283 nm	280 – 333 nm	240 – 283 nm	280 – 333 nm

Housing Dimensions (H x W x L): 19.4 cm x 31.1 cm x 91.4 cm

Options⁵:

Fourth harmonic option for ps or fs

Long pulse operation (up to 15 ps)

Extended wavelength range (up to 540 nm)

Tripler only (to be used in combination with the frequency doubler modell 3980)

Quadrupler only (to be used in combination with the frequency doubler modell 3980)

1. Due to our continuous product improvement program, specifications may change without notice. Specifications only apply when the Tsunami is pumped by a Spectra-Physics Millennia V or X, and the entire environmental package is installed.
2. Specifications apply at the wavelength noted.
3. Laser operation is specified at a nominal repetition rate of 82 MHz.
4. Based upon the pulse width of the fundamental.
5. Fore more information, please contact your local sales engineer.

