# HARMONIC GENERATORS & ATTENUATORS

## For NL300 Series Lasers

Nanosecond Q-switched lasers enable simple and cost effective laser wavelength conversion to shorter wavelengths through harmonic generation. EKSPLA offers a broad selection of wavelength conversion accessories for NL300 series lasers. The purpose of this guide is to help configure available harmonic generator and attenuator modules for NL300 series lasers for optimal performance.

The harmonic module uses a modular design that allows reconfiguration of laser output for the appropriate experiment wavelength. A typical module houses a non-linear crystal together with a set of dichroic mirrors for separating the harmonic beam from the fundamental wavelength. Nonlinear crystals used for the purpose of wavelength conversion are kept at an elevated temperature in a thermo-stabilized oven.

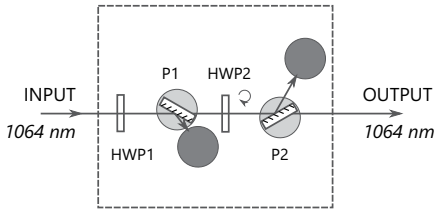
Two or more modules can be joined together for higher harmonic generation: attaching one extra module to a second harmonic generator allows for the generation of 3rd or 4th harmonic wavelengths. It should be noted that only modules with a single output port can be joined together: it is possible to attach a H300S module to a H300SH unit for 532 nm beam separation, or a H300FHC module for 4th harmonic generation (see detailed description below). Modules with two output ports (e.g., H300SHC) cannot be attached to extra units.

### FEATURES

- *Compact harmonic modules*
- *Thermo stabilized crystals for long lifetime*
- *Dichroic mirrors*
- *AR coatings on crystals*
- *Phase matching by mechanical adjustment*
- *High conversion efficiency*
- *Wide selection of different configurations*
- *Smooth adjustment of output pulse energy with attenuator*

### H300A attenuator

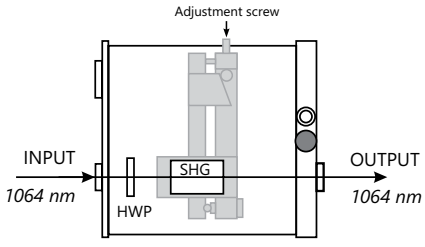
The H300A1 module is integrated into the laser head and designed to attenuate a **1064 nm**. Beam (the length of the laser head extends to 619 mm). Optical layout includes half-wave plates HWP1, HWP2 and polarizers P1, P2. Rotation of the HWP2 half-wave plate changes the polarization of the laser beam and its transmission factor via the P2 polarizer.



H300A

### H300SH harmonic generators

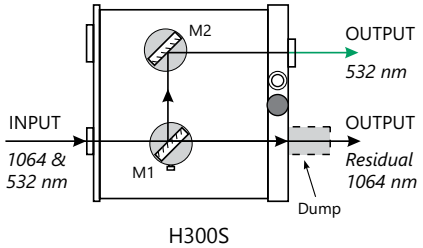
H300SH module contains a SH crystal with a half-wave plate for input polarization adjustment. The output of the H300SH module has both **532 nm** and **1064 nm** wavelengths.



H300SH

### H300S harmonic separator

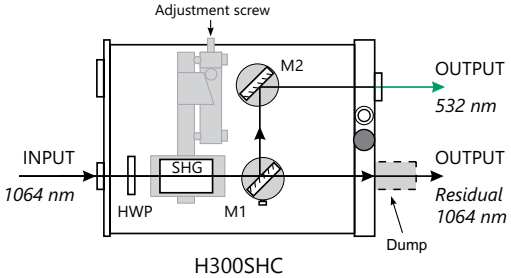
The H300S module has two output ports for the separation of **1064 nm** and **532 nm** wavelengths.



H300S

## H300SHC harmonic generator

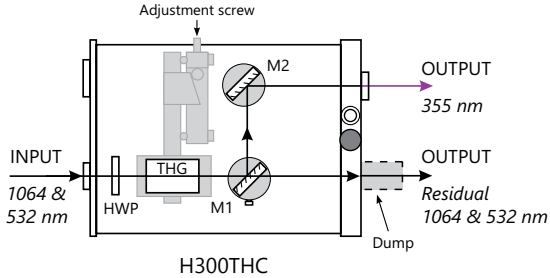
The most cost-effective solution for customers who need a **532 nm** wavelength only, the H300 SHC module combines a SHG crystal and beam separators and has two output ports for **532 nm** and **1064 nm** beams.




H300SHC

## H300THC harmonic generator

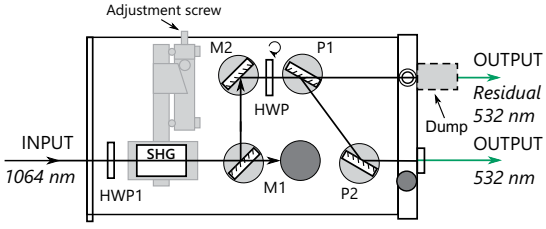
The H300THC module is a third harmonic generator and beam separator with two output ports for a 355 nm beam, and for a residual **532 nm + 1064 nm** beam. This module should be used with the H300SH module.




H300THC

## H300SHA harmonic generator & attenuator

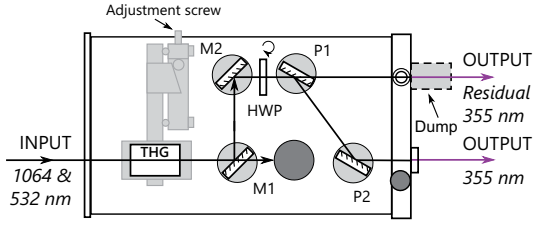
The cost-effective solution for customers who need an attenuated **532 nm** wavelength, the H300SHA module combines a SHG generator with attenuator.




H300SHA

## H300THA harmonic generator & attenuator

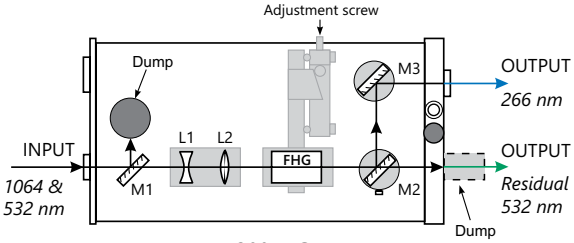
The cost-effective solution for customers who need an attenuated **355 nm** wavelength, the H300THA module combines a THG generator with attenuator.




H300THA

## H300FHC harmonic generator

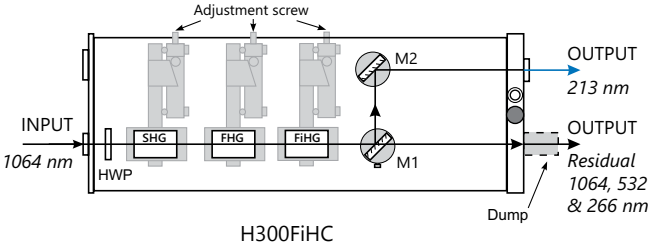
The H300FHC module is a fourth harmonic generator and beam separator for a 266 nm wavelength, with two output ports for a **266 nm** beam, and for a residual **532 nm** beam. This module should be used with the H300SH module.




H300FHC

## H300FiHC harmonic generator

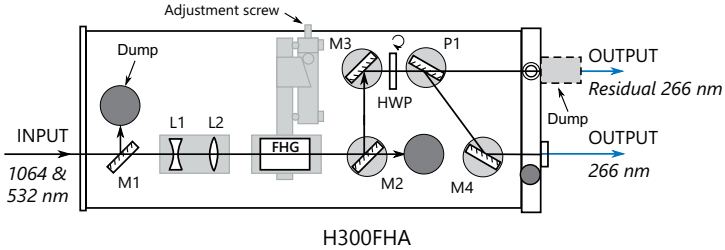
The H300FiHC module is designed to produce a 5th harmonic output. As it requires only a 1064 nm input, the unit contains SH, FH and FiH crystals together with a beam separator for a **213 nm** beam.




H300FiHC

## H300FHA harmonic generator & attenuator

The cost-effective solution for customers who need an attenuated **266 nm** wavelength, the H300FHA module combines a FHG generator with attenuator.




H300FHA