

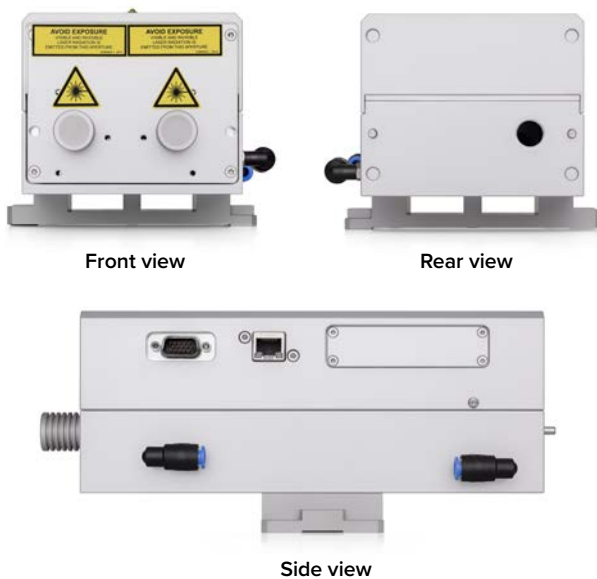
Stand-alone harmonics generator



Harmonics generator H1

H1 is **stand-alone harmonic generator** module is designed to be used with our Q1 series lasers. Module is intended to be mounted side-by-side with Q1 laser on common optical table or breadboard.

Most of high performance birefringent **crystals are hygroscopic**, which might limit their lifetime in humid environment. However, if they are continuously kept at higher than ambient temperatures, the lifetime of crystals can be significantly extended and can be even longer than laser system itself. **To keep crystals dry, H1 module needs to be always connected to the power source.** If power is not available, the module should be stored in dry environment.



Front view

Rear view

Side view

H1

FEATURES

- Stand-alone **2nd, 3rd, 4th or 5th** harmonic generator compatible with Q1 series lasers
- Factory-configurable **two exit ports**
- Microprocessor controlled temperature tuned nonlinear crystals
- Remote monitoring and control via common with laser or separate **Ethernet** interface

OPTIONAL EQUIPMENT

- Motorized attenuator for up to 5th harmonic beam
- Pulse energy monitor with analog and/or digital output
- Fiber coupled output

PART NUMBERS

H1-FH-1P-AT4

Model

Optional items

Output wavelength configuration

- SH → second harmonic
- TH → third harmonic
- TH/SH → third and second harmonics
- FH → fourth harmonic
- FH/SH → fourth and second harmonic
- FiH → fifth harmonic
- FiH/SH → fifth and second harmonics

See datasheet for all available options

- AT1/AT2/AT3/AT4/AT5 → motorized attenuator
- EM1/EM2/EM3/EM4/EM5 → pulse energy monitor
- BSP1 → baseplate for mounting with H1
- FC/UV → fiber coupler for UV range
- FC/VIS → fiber coupler for VIS range
- APU2 → air-purging unit

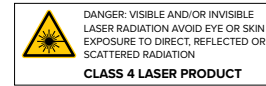
Number of exit ports (optional)

- 1P → single exit port
- 2P → two exit ports
- 3P → three exit ports

SPECIFICATIONS ¹⁾

Model	H1
Conversion efficiency ²⁾	
Fundamental to second harmonic	> 50 %
Fundamental to third harmonic	> 30 %
Fundamental to fourth harmonic	> 15 %
Fundamental to fifth harmonic	> 6 %
Pulse to pulse energy stability ³⁾	
526.5/532 nm	< 2.5 % RMS
351/355 nm	< 3.5 % RMS
263/266 nm	< 4 % RMS
211/213 nm	< 5 % RMS
Spectral purity for Port #1 ⁴⁾	
Typical pulse duration	10 – 20 % shorter in each conversion stage
Typical beam diameter	10 – 30 % smaller than pump beam
Beam pointing stability	same as the pump beam

1. Due to continuous improvements all specifications are subject to change. The parameters marked typical are not specifications. They are indications of typical performance and will vary with each unit we manufacture.
2. Conversion efficiency presented here is for Port #1. Conversion efficiency at Port #2 depends on unit configuration and typically are lower than presented here. Please inquire for details.
3. When unit is pumped by our Q1 series laser. Measured during 30 seconds operation after warm-up.
4. Spectral purity at Port #2 could not be specified for two-wavelength output configuration.
5. When supplied with Q1 laser, H1 is powered from laser controller.



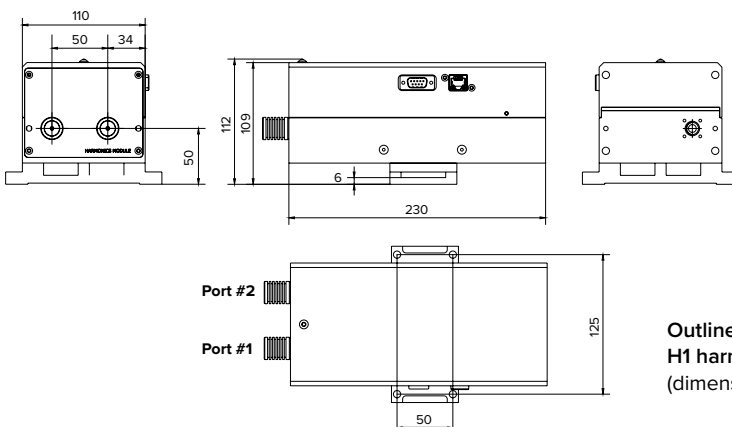
Laser head Q1 with H1 harmonic generator and base plate

Dimensions	
Harmonic generator (W×L×H)	110 × 230 × 109 mm ³
Operating requirements	
Ambient temperature	15 – 30 °C
Relative humidity	10 – 80 % (non-condensing)
Powering	12 VDC ⁵⁾
Average power consumption	< 10 W

CONFIGURATION OPTIONS ¹⁾

H1	Port #1			Port #2
	Wavelength ²⁾	Attenuator (optional) ³⁾	Energy monitor (optional) ⁴⁾	Wavelength
SH	532 nm	-AT2	-EM2	1064 nm ⁵⁾
TH	355 nm	-AT3	-EM3	532+1064 nm ⁶⁾
TH/SH	355 nm	-AT3	-EM3	532 nm ⁵⁾
FH	266 nm	-AT4	-EM4	532+1064 nm ⁶⁾
FH/PB	266 nm ⁷⁾	-AT4	-EM4	N/A
FH/SH	266 nm ⁷⁾	-AT4	-EM4	532 nm
FiH	213 nm ⁷⁾	-AT5	-EM5	N/A
FiH/SH	213 nm ⁷⁾	-AT5	-EM5	532 nm

1. See Figure 1 for port number assignment. Inquire for custom configurations.
2. Wavelength is shown for 1064 nm pump wavelength. For 1053 nm pump wavelength recalculate wavelengths accordingly.
3. Shows compatible attenuator model. This option is available only when H1 is supplied together with Q1 series laser.
4. Shows compatible pulse energy monitor model. This option is available only when H1 is supplied together with Q1 series laser.
5. Spectral purity is >98 %.
6. Both wavelengths exit Port #2, for separation external dichroic mirror is required.
7. Spectral purity for this model is >99.9 %.



Outline drawings of H1 harmonic generator (dimension in mm)