

Motorized attenuators



Attachable motorized attenuator AT



Q-SPARK with AT motorized attenuator attached

FEATURES

- Drop-in attachable to the laser body attenuators for **1st, 2nd, 3rd, 4th or 5th** harmonics of Nd:YAG or Nd:YLF lasers
- Up to **98 %** maximum transmission
- Precise transmission control by stepper motor in microstepping mode (25600 steps/rotation)
- Transmission adjustment resolution < 0.15 %
- Remote control via common with laser **Ethernet** interface

OPTIONAL EXTENSIONS

- Stand-alone version for mounting on optical table
- Side port transforms attenuator to variable beam splitter

Pulse energy of our Q-switched lasers can be conveniently lowered from maximum value by reducing current of pump-diode. When less pump light is stored in lasing media, laser emits pulses with lower energy.

Above described method of pulse energy attenuation has its pros and cons. It is cost-effective, simple to implement, however, pulse energy change affects also other important laser beam parameters like pulse-to-pulse stability, beam divergence, pulse duration. For example, pulse-to-pulse energy stability of harmonics wavelengths might be more than 2 times worse at lower than nominal fundamental pulse energy. AT series attenuators allows to attenuate laser pulse energy without changes in beam parameters.

Attenuator consist of polarizer and waveplate. By changing of input beam polarization, transmission of beam can be changed for maximum to minimum value.

Minimum transmission value depends on input beam polarization state and polarizer extinction ratio and typically is approx. 1 %.

Maximum possible transmission is determined by reflection and absorption losses of optical components.

Several attenuators can be used in series if larger dynamic range is required. Attenuator transmission can be controlled through common with laser Ethernet interface. API is provided for integration into user software.

SPECIFICATIONS ¹⁾

Single wavelength

Model	Attenuators				
	AT1	AT2	AT3	AT4	AT5
Design wavelength	1064 nm	532 nm	355 nm	266 nm	213 nm
Typical max transmission ²⁾	98 %	95 %	90 %	75 %	65 %
Typical min transmission ³⁾	1 %			0.5 %	
Input polarization	linear				
Output polarization ⁴⁾	linear, vertical			linear, rotating	
Resolution	< 0.15 %				
Accuracy	± 0.5 %				
Clear aperture	6 mm				
Stepper motor	25600 steps / 360 deg, 4-phase, 1 A				
Dimensions (W×L×H)	54 × 43 × 77 mm ³				
Weight	< 0.4 kg				

Broadband versions

Model	Attenuators			
	AT/UV	AT/VIS	AT/NIR	AT/IR
Design wavelength	250 – 410 nm	410 – 710 nm	700 – 1100 nm	1200 – 1800 nm
Typical max transmission ²⁾	75 %	90 %	90 %	85 %
Typical min transmission ³⁾	1 %			
Input polarization	linear			
Output polarization ⁴⁾	linear, vertical			
Resolution	< 0.15 %			
Accuracy	± 0.5 %			
Clear aperture	8 mm			
Stepper motor	25600 steps / 360 deg, 4-phase, 1 A			
Dimensions (W×L×H)	54 × 43 × 77 mm ³			
Weight	< 0.4 kg			

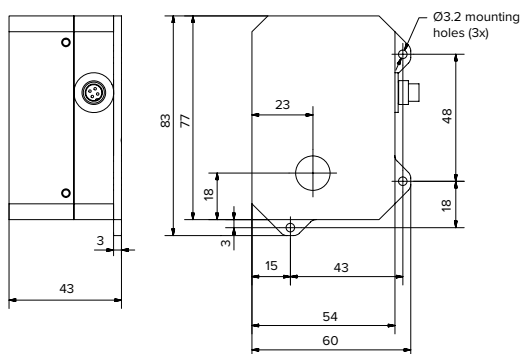
1. Due to continuous improvements all specifications are subject to change. The parameters marked typical are not specifications. They are indications of typical performance and will vary with each unit we manufacture.

2. At peak wavelength. Might be affected by polarization state of laser.

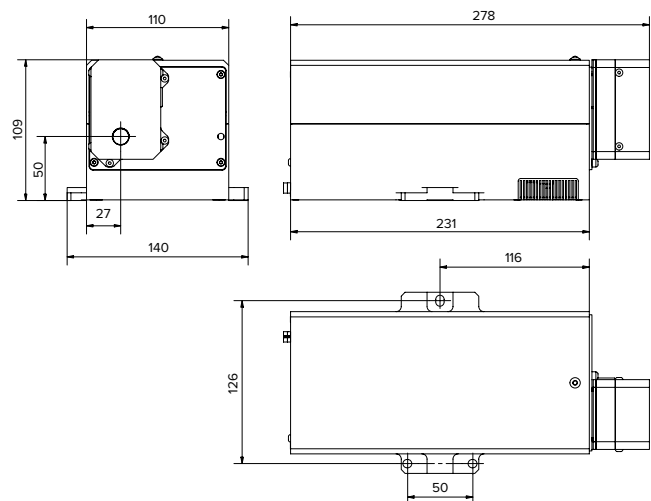
3. Might be affected by polarization state of laser.

4. For some models polarization plane depends on angular position of polarizer.

DRAWINGS



Outline drawings of AT attachable motorized attenuator (dimensions in mm)



Outline drawings of Q1 laser head with attached AT attenuator (dimension in mm)