

2. Polarization Optics

2.1. Continuously Variable Attenuators

2.1.1. Continuously Variable Attenuator/Beamsplitter



Divides laser beam into two beams of manually adjustable intensity ratio
Convenient 90deg angle between reflected and transmitted beams
Large dynamic range
Broadband transmission
Negligible beam deviation
Low dispersion for femtosecond laser pulses

Continuously Variable Attenuator/Beamsplitter for down to 100 fs laser pulses.

This variable attenuator/beamsplitter consists of 2 high-performance polarizing optics components placed in precision opto-mechanical Holder 5APH79T-1. Variable attenuator/beamsplitter incorporates a high-performance Polarizing Cube Beamsplitter which reflects s-polarized light 90 while transmitting p-polarized light. A rotating quartz Phase L/2 Waveplate is placed in the incident polarized laser beam. The intensity ratio of those two beams may be continuously varied without alteration of other beam parameters by rotating the waveplate. The intensity of either exit beam, and their intensity ratio, can be controlled over a wide dynamic range. Pure p-polarization could be selected for maximum transmission, or pure s-polarization for maximum attenuation of the transmitted beam.

Standard specifications

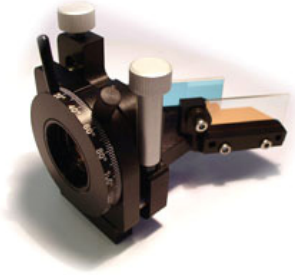
Central wavelengths: 780, 800, 1064 nm or other
Beam deviation: 40×10^{-6} rad, average over range
Aperture diameter: 10, 15, 20 mm
Damage Threshold: 200 mJ/cm ² pulsed at 1064 nm, typical
Antireflection Coating: R < 0.25% all entrance and exit surfaces
Time dispersion: negligible when pulse is down to 150fs
Extinction ratio: Ts/Tp < 1:1000

When Ordering please specify

Wavelength
Clear aperture
Waveplate order: ZO or LO

Code	Name	Type	Order	CA (mm)	Price (1-3pcs)	Price (4-9pcs)	Currency
ATB9	Continuous Variable Attenuator	Beamsplitter	LO	10	141,000	126,000	JPY
ATB3	Continuous Variable Attenuator	Beamsplitter	LO	15	144,000	135,000	JPY
ATB4	Continuous Variable Attenuator	Beamsplitter	LO	20	151,500	141,000	JPY
ATB10	Continuous Variable Attenuator	Beamsplitter	ZO	10	156,000	144,000	JPY
ATB1	Continuous Variable Attenuator	Beamsplitter	ZO	15	162,000	151,500	JPY
ATB2	Continuous Variable Attenuator	Beamsplitter	ZO	20	174,000	156,000	JPY

2.1.2. Continuously Variable Attenuator for Femtosecond laser pulses



Divides laser beam into two beams of manually adjustable intensity ratio
Large dynamic range
High Optical damage threshold
Negligible beam deviation
Low dispersion for femtosecond and high energy laser pulses

Continuously Variable Attenuator with Brewster type polarizers.

This variable attenuator/beamsplitter consists of 2 high-performance polarizing optics components placed in precision opto-mechanical Holder 5APH79T-1. The variable attenuator/beamsplitter incorporates 2 high-performance Brewster type polarizers, which reflect s-polarized light while transmitting p-polarized light. These two Brewster type polarizers are housed in special design opto-mechanical Adapter. This adapter allows to use either round shape either rectangular shape Brewster type polarizers as well. A rotating quartz Phase L/2 Waveplate is placed in the incident polarized laser beam. The intensity ratio of those two beams may be continuously varied without alteration of other beam parameters by rotating the waveplate. The intensity of either exit beam, or their intensity ratio, can be controlled over a wide dynamic range. P-polarization could be selected for maximum transmission, or high-purity s-polarization could be reflected when maximum attenuation of the transmitted beam takes place.

Standard specifications

Central wavelengths: 780, 800, 1064 nm or other
Beam deviation: 40×10^{-6} rad, average over range
Aperture diameter: 10, 15, 20 mm
Damage Threshold: 7 J/cm ² pulsed at 1064 nm, typical
Antireflection Coating: R < 0.25% all entrance and exit surfaces
Time dispersion: t < 4fs for 80fs Ti:Sapphire laser pulses
Polarization Contrast (after 1st polarizer): 1:190
Polarization Contrast (after 2nd polarizer): 1:7000

When Ordering please specify

Wavelength
Clear aperture
Waveplate order: ZO or LO

Code	Name	Type	Order	CA (mm)	Price (1-3pcs)	Price (4-9pcs)	Currency
ATF11	Continuous Variable Attenuator	Femtosecond	LO	10	162,000	147,000	JPY
ATF7	Continuous Variable Attenuator	Femtosecond	LO	15	168,000	154,500	JPY
ATF8	Continuous Variable Attenuator	Femtosecond	LO	20	171,000	160,500	JPY
ATF12	Continuous Variable Attenuator	Femtosecond	ZO	10	177,000	156,000	JPY
ATF5	Continuous Variable Attenuator	Femtosecond	ZO	15	183,000	165,000	JPY
ATF6	Continuous Variable Attenuator	Femtosecond	ZO	20	192,000	171,000	JPY