Broadband Ultrafast Variable Attenuators (VA-BB)

Motorized VA-BB Broadband Ultrafast Variable Attenuator. (Post and post holder sold separately)

Manual VA-BB Broadband Ultrafast Variable Attenuator

Features

- Compact, robust design comes in manual or motorized version
- Wavelength ranges of 400 – 700 nm, 690 – 1040 nm or 1000 – 1600 nm
- High contrast attenuation (1000:1)
- Minimal stretching for ultrafast pulses >70 fs
- High optical damage threshold over 10 mm clear aperture
- P-polarized collinear output

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Newport's broadband ultrafast variable attenuators (VA-BB) provide continuous attenuation over a series of broad wavelength ranges. The VA-BB series is designed to provide high extinction ratio attenuation of linearly polarized fundamental and harmonic frequencies of light for most ultrafast oscillators. The VA-BB series is available in manual or motorized versions. The motorized version can be used in open or closed-loop operation.

The VA-BB series is based on zero-order half-waveplates and Glan-laser polarizers. For more detail on the principle of operation of these devices, please refer to Newport's Application Note 26 – Variable Attenuator for Lasers. These attenuators are designed to handle average powers up to 100 Watts (see table on opposite side of this datasheet). Specified optics sets are optimized for wavelength ranges of 400 – 700 nm, 690 – 1040 nm or 1000 – 1600 nm.

The optics and high-precision opto-mechanics are incorporated into a compact housing, flexibly designed for post mounting at varying optical axis heights. P-polarized light is transmitted collinear to the input beam path with minimal loss while S-polarized light is rejected into a beam dump on the side of the housing. M-4 and 8-32 mounting threads are included on the bottom and one side of the housing. This allows for horizontally and vertically polarized output.

The manual versions of the VA-BB series come with a manual rotary stage containing the half-waveplate. The user manually rotates the stage to control attenuation.

The motorized versions of the VA-BB series come with a motorized rotary stage containing the half-waveplate. Software is included which allows the user to calibrate the VA-BB at a single wavelength. When using Newport family power meters and detectors (purchased separately), this calibration is automated. When using third-party power meters and detectors, software prompts will step the user through building up the calibration curve. The calibration curve is created by rotating the half-waveplate incrementally through a full attenuation cycle. The absolute output power at each increment is measured with the power meter and detector, and a calibration curve is fit to the data points.

Once the calibration curve is created, the motorized VA-BB can be used in open-loop mode. The power meter and detector are no longer needed as the desired output power is specified as an absolute or percentage value. The half-waveplate is automatically rotated to the appropriate position matching that value on the calibration curve.

The motorized VA-BB can also be used in closed-loop mode if desired. This option requires a beam sampler assembly (purchased separately) to pick off a portion of the transmitted beam for real-time monitoring by a Newport power meter and detector. The closed-loop control will fine adjust to the position of the half-waveplate to reach the requested absolute power.

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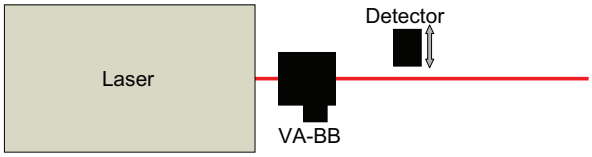
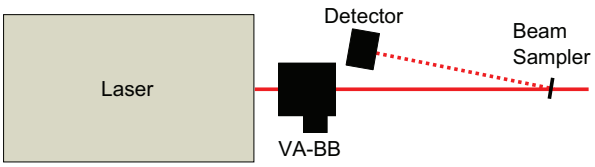
Open Loop Configuration



Closed Loop Configuration

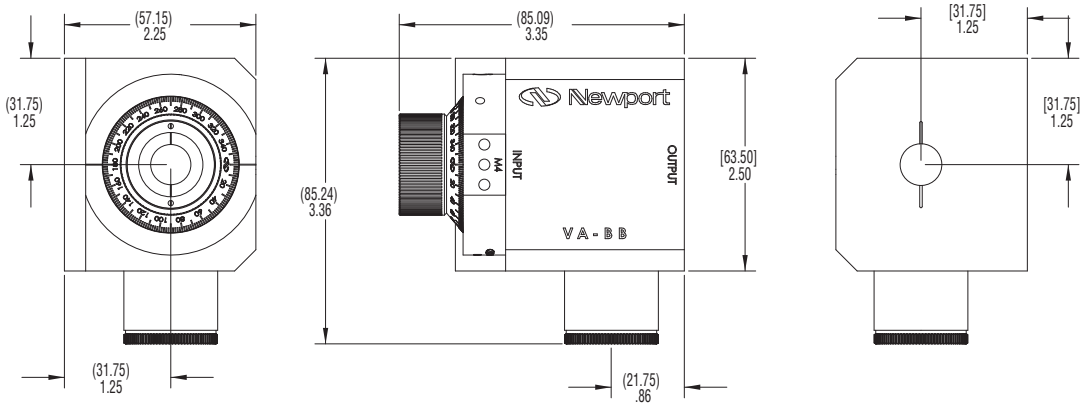


Maximum laser power vs. beam diameter

Beam diameter (mm)	5	4	3	2	1
Laser Power (W)	100	64	36	16	4

Typical Specifications

P-polarization attenuation	1000:1
Clear aperture	10 mm diameter
Damage threshold	500 W/cm2 CW, 2 J/cm2 with 8 nsec pulses at 1064 nm, typical



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