

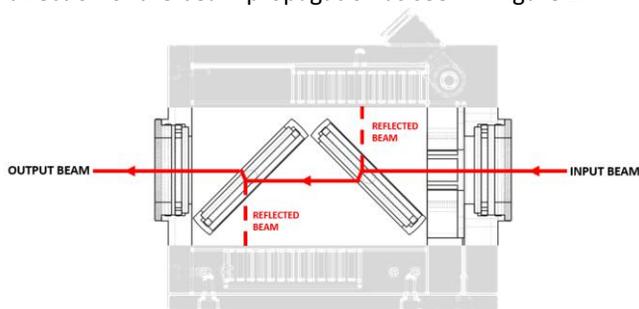
Laser Attenuator — Controlling the Output Power

Introduction

A laser attenuator is an optical device capable of reducing the optical power or intensity of the incoming laser beam. This is especially useful for laser sources with fixed output powers. There are both fixed and variable laser attenuators depending on the intended attenuation required. Variable attenuators are readily available with either manual adjustment or motorised adjustment. The laser attenuator in no way affects the direction of the beam propagation after attenuation.

Operation Principle

The laser attenuator optics works on the principle of reflection where a percentage of light is reflected off the surface of the optics, which is dielectric coated and the remainder is transmitted through. The angular rotation of the optics, changes the angle of the incident light on the optics which in turn causes a change in the transmission ratio which ultimately changes the attenuation level. Due to the angular rotation of the optics, the laser beam passing through the optics undergoes refraction which changes the path of the outgoing laser beam. In order to correct this issue, a second optics is used in sequence and the two optics are moved in tandem to not alter the direction of the beam propagation as seen in Figure 1.



The key specifications of the Bessel Lens are listed below. Compared with similar products in the market, we offer a larger aperture for larger beam diameters and an efficient operation at high power.

Item No.	ATTN-10600-WC-V1
Wavelength	10.6 μ m
Clear Aperture	Up to 19mm (Customizable)
Transmission Range	10 – 90%
Damage Threshold	1MW/cm ²
Resolution	5%

Table 1. Key specifications of ATTN-10600-WC-V1

*The attenuator is available for operation at 9.4 μ m.

The architecture of the laser attenuator allows for larger beam input without the worry of beam clipping during transmission and the water cooling channel allows for constant cooling throughout operation to prevent any damage or beam manipulation at any point in time. The design of the laser attenuator can be seen in Figure 2.

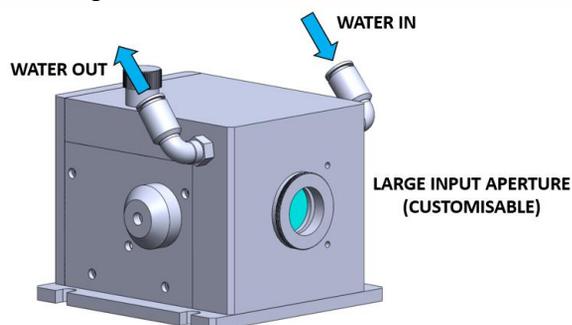


Figure 2. Design features of ATTN-10600-WC-V1

Applications

The internal design of the laser attenuator allows for efficient absorption of reflected light. It is designed for attenuation of collimated beam outputs and not focusing beams. The laser attenuator can be implemented into any laser systems with the purpose of precise control or reduction of the output beam power.

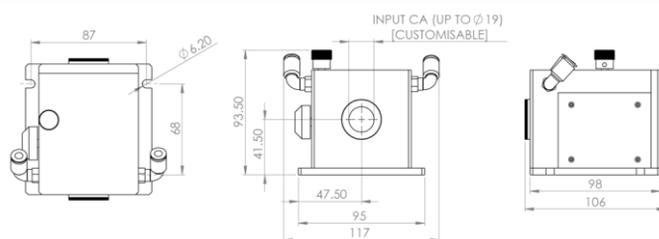


Figure 3. ATTN-10600-WC-V1 Outline

The compact design, as seen in Figure 3, allows for ease of integration into laser systems and the base plate allows for easy manufacturing of holders or adapters for mounting of the laser attenuator. A motorized version is also available upon request.

Conclusion

As a global enterprise, leading photonics innovation since 2002, WOE has built up customization engineering capability for thermal imaging, inspection and measurement systems.

