ZOOM BEAM EXPANDER

- Adjustable expansion ratio
- Adjustable divergence
- Galilean design

EKSMA OPTICS offers compact Galilean type zoom beam expanders for Nd:YAG lasers fundamental and harmonics wavelength: 1064 nm, 532 nm and 355 nm.

Zoom beam expander provides variable expansion ratio of 2x-8x, 1x-8x, 1x-3x with adjustable focus to correct for laser beam divergence.

Catalogue number	Wavelength, nm	Expantion ratio	Input Clear Aperture, mm	Output Clear Aperture, mm	Length, mm	Price, EUR
165-0281	1064	2x-8x	10	30	142-149	500
165-1181*	1064	1x-8x	12	32	167-202	650
165-0131	1064	1x-3x	14	29	117	650
165-1282*	532	2x-8x	12	32	186.7	650
165-1182*	532	1x-8x	12	32	162-196	850
165-0132	532	1x-3x	10	20	85	650
165-1283*	355	2x-8x	12	32	157-191	800
165-1183*	355	1x-8x	12	32	180.3	1100

** made of quartz; other zoom beam expanders are made of BK7*

Drawings are available upon request.

RELATED PRODUCT

Universal Adjustable Optics Mount 830-0035

See page 8.49

SIMPLE TELESCOPE KIT

Simple lenses are subject to optical aberrations. In many cases these aberrations can be compensated for to a great extent by using a combination of simple lenses with complementary aberrations. A compound lens is a collection of simple lenses of different shapes and made of materials of different refractive indices, arranged one after the other with a common axis.

If two thin lenses are separated in air by some distance d (where d is smaller than the focal length of the first lens), the focal length for the combined system is given by

$$\frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2} - \frac{d}{f_1 \cdot f_2}$$

The distance from the second lens to the focal point of the combined lenses is called the back focal length (BFL).

$$BFL = \frac{f_2 \cdot (d - f_1)}{d - (f_1 + f_2)}$$

If the separation distance is equal to the sum of the focal lengths ($d = f_1 + f_2$), the combined focal length and BFL are infinite. This corresponds to a pair of lenses that transform a parallel (collimated) beam into another collimated beam. This type of system is called an afocal system, since it produces no net convergence or divergence of the beam. Two lenses at this separation form the simplest type of optical telescope. Although the system does not alter the divergence of a collimated beam, it does alter the width of the beam. The magnification of such a telescope is given by

$$M = -\frac{f_2}{f_1} = \frac{D_{out}}{D_{in}} \frac{\text{(exit diameter)}}{\text{(input diameter)}}$$

which is the ratio of the input beam width to the output beam width. Note the sign convention: a telescope with two convex lenses ($f_1 > 0, f_2 > 0$) produces a negative magnification, indicating an inverted image. A concave plus a convex lens ($f_1 < 0 < f_2$) produces a positive magnification and the image is upright.