

Variable beam expanders VEX and reducers VRE



4Lasers introduces variable manual beam expanders VEX series used to increase or decrease the laser beam diameter. Standard or custom-made laser beam expanders for the UV, visible, and NIR spectral ranges feature a unique mechanical sliding-lens design, ensuring a high pointing stability and minimal dimensions. These variable magnification (zoom) beam expanders are designed for the required wavelength and each type of our beam

expanders have divergence adjustability. All optical elements of beam expanders are made of fused silica with high LIDT coatings and provide stable and reliable performance even when using them with high power lasers. Large input and output apertures allow the optical beam expanders to produce diffraction limited expanded (or reduced) beams for a wide range of input beams.

Main features

- Highest beam pointing stability (< 0.5 mrad)
- Fused silica optical elements
- Grease free mechanical design
- Sliding lens design
- Diffraction limited performance for all magnifications

Application examples

- Laser micromachining
- Research

Standard specifications

VARIABLE BEAM EXPANDERS AND REDUCERS SPECIFICATIONS	
Adjustment	Manual
Divergence	Adjustable
Pointing stability	< 0,5 mrad, < 1 mrad (VEX15-HP)
Lens material	UVFS
Transmission	>97%, >95% (VEX15-HP)
LIDT	3 J/cm ² (10 ns @ 355nm) 5 J/cm ² (10 ns @ 532 nm) 10 J/cm ² (10 ns @ 1064 nm)

Standard products

ITEM MODEL	EXPANSION	CLEAR INPUT APERTURE	CLEAR OUTPUT APERTURE	RECOMMENDED MAX. INPUT BEAM SIZE, 1/E ²	DESIGN	DIMENSIONS	MOUNTING OPTIONS	WAVELENGTH
VEX13	1,0x - 3,0x continuous	11 mm	23,5 mm	ø7 mm - 1x ø5 mm - 3x	Standard	ø42 x 110 mm	M30x1 external, SM1 internal, ø38,1 mm [1,5"], T-mount (M42x0,75)	343-355 nm 515-532 nm 1030-1064 nm 343-355 + 515-532 nm 515-532 + 1030-1064 nm
VEX18	1,0x - 8,0x continuous	11 mm	40 mm	ø7 mm - 1x ø5,3 mm - 5x ø3,3 mm - 8x	Standard	ø53 x 203 mm	SM2, ø50,8 mm [2"]	343-355 nm 515-532 nm 1030-1064 nm 343-355 + 515-532 nm 515-532 + 1030-1064 nm
VEX15-HP	1,0x - 5,0x continuous	11 mm	24 mm	ø7 mm - 1x ø3,3 mm - 5x	High power	ø58 x 250 mm	T-mount, SM2, ø50,8 mm [2"]	343-355 + 515-532 nm 515-532 + 1030-1064 nm
VRE13	0,33x - 1,0x continuous	22 mm	11 mm	ø15 mm - 0,33x ø7 mm - 1x	Standard	ø42 x 110 mm	M30x1 external, SM1 internal, ø38,1 mm [1,5"], T-mount (M42x0,75)	343-355 nm 515-532 nm 343-355 + 515-532 nm 515-532 + 1030-1064 nm

Mounting options for variable beam expanders VEX

MOUNTING OPTION	FOR BEAM HEIGHT OF
Fixed post mounting set	100-125 mm (4" - 5")
Fixed post mounting set	76,2 mm (3")
X-Y adjustable (3 adjusters) kinematic mount with post holder, D50,8mm option	76,2 mm (3")
X-Y adjustable (3 adjusters) kinematic mount with post holder, SM2 option	76,2 mm (3")
X-Y adjustable (3 adjusters) kinematic mount with post holder, D50,8mm option	100-125 mm (4" - 5")
X-Y adjustable (3 adjusters) kinematic mount with post holder, SM2 option	100-125 mm (4" - 5")

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Fixed ratio beam expanders FEX



Fixed ratio beam expanders FEX series are used to increase the laser beam diameter. The FEX model diversity cover the UV, visible and NIR spectral ranges. These compact beam expanders are designed for required wavelength and have divergence adjustability.

All optical elements of beam expanders are made of fused silica with high LIDT coatings and provide a stable and reliable performance even using them with high power lasers.

Main features

- Divergence adjustment
- Galilean optical design
- UVFS optical elements
- Grease free mechanical design
- Wide wavelength adoption - 200 nm to 2 μ m

Application examples

- Laser material processing
- Medical
- Research

Standard specifications

FIXED RATIO BEAM EXPANDER SPECIFICATIONS	
Clear output aperture	23 mm
Divergence	Adjustable
Outer Diameter	30 mm
Mounting options	SM1 (male, female), \varnothing 30 mm
Transmission	>98%
LIDT	3 J/cm ² (10 ns @ 355nm)
	5 J/cm ² (10 ns @ 532 nm)
	10 J/cm ² (10 ns @ 1064 nm)

*Custom design available

Standard products

ITEM MODEL	EXPANSION	CLEAR INPUT APERTURE	RECOMMENDED MAX. INPUT BEAM SIZE, 1/E ²	CLEAR OUTPUT APERTURE	MECHANICAL LENGTH	WAVELENGTH
FEX-2	2 x	11,5 mm	\varnothing 7 mm	23 mm	65 mm	343-355 nm
						515-532 nm
						1030-1064 nm
						1030-1064 + 515-532 nm
FEX-3	3 x	11,5 mm	\varnothing 5,3 mm	23 mm	65 mm	343-355 nm
						515-532 nm
						1030-1064 nm
						1030-1064 + 515-532 nm
FEX-4	4 x	11,5 mm	\varnothing 4 mm	23 mm	90 mm	343-355 nm
						515-532 nm
						1030-1064 nm
						1030-1064 + 515-532 nm
FEX-5	5 x	11,5 mm	\varnothing 3,2 mm	23 mm	95 mm	343-355 nm
						515-532 nm
						1030-1064 nm
						1030-1064 + 515-532 nm
FEX-8	8 x	7 mm	\varnothing 2 mm	23 mm	104 mm	343-355 nm
						515-532 nm
						1030-1064 nm
						1030-1064 + 515-532 nm

Mounting accessories for fixed ratio beam expanders FEX

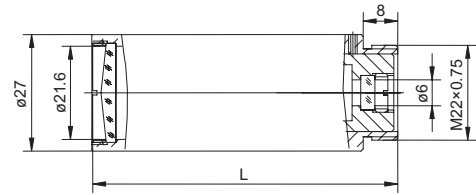
RECOMMENDED ACCESSORY	FOR BEAM HEIGHT OF
Adapter SM1 male to M30 X 1 male	-
Adapter SM1 female to C-mount	-
Adapter SM1 female to M30 X 1 male	-
X-Y adjustable (3 adjusters) kinematic mount with post holder	50,8 mm (2")
X-Y adjustable (3 adjusters) kinematic mount with post holder	76,2 - 100 mm (3" - 4")

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COMPACT BEAM EXPANDER



A laser beam expander is designed to increase the diameter of a collimated input beam to a larger collimated output beam. EKSMA OPTICS offers compact Galilean type beam expanders for 1064 nm, 532 nm and 355 nm wavelengths. Compact beam expander has the possibility to be adjusted for the input beam divergence angle to obtain collimated, divergent or focused beam at the output.



SPECIFICATIONS

Lens material	AR coated Fused Silica Lenses
Screw Size	M22x0.75

Wavelength, nm	Expansion ratio	Beam expander size L, mm	Transmission, %	Catalogue number	Price, EUR
1064	2X	51	>96	160-0021	235
1064	2.5X	51	>96	160-0251	235
1064	3X	68	>96	160-0031	235
1064	4X	75	>96	160-0041	235
1064	5X	73	>96	160-0051	235
1064	6X	75	>96	160-0061	235
1064	8X	77	>96	160-0081	235
1064	10X	70	>96	160-0101	235
532	2X	51	>96	160-0022	235
532	2.5X	51	>96	160-0252	235
532	3X	68	>96	160-0032	235
532	4X	75	>96	160-0042	235
532	5X	73	>96	160-0052	235
532	6X	75	>96	160-0062	235
532	8X	77	>96	160-0082	235
532	10X	70	>96	160-0102	235
355	4X	75	>96	160-0043	250
355	6X	75	>96	160-0063	250
355	8X	68	>96	160-0083	250
355	10X	71	>96	160-0103	250

RELATED PRODUCT

Large Rod Small Mounting Clamp (aluminium) 810-0062A



Compact beam expanders of other expansion ratio are available upon request.

ZOOM BEAM EXPANDER

FEATURES

- › Adjustable 1X – 8X or 2X – 8X expansion ratio
- › Adjustable divergence
- › Galilean design



Compact Galilean type zoom beam expanders are designed for Nd:YAG fundamental and harmonic wavelengths: 1064 nm, 532 nm and 355 nm. Zoom beam expanders provide

1X – 8X or 2X – 8X continuous magnification with adjustable focus to correct for laser beam divergence.

Wavelength, nm	Expansion ratio	Input Clear Aperture, mm	Output Clear Aperture, mm	Length, mm	Catalogue number	Price, EUR
1064	1x-8x	12	33	162	165-1181	860
1064	2x-8x	12	33	143.3	165-1281	860
532	1x-8x	12	33	162	165-1185	860
532	2x-8x	12	33	139.9	165-1285	860
355	1x-8x	12	33	162	165-1183	1120
355	2x-8x	12	33	158.5	165-1283	860

Visit our e-shop www.eksmaoptics.com and find the drawings of all zoom beam expanders.

RELATED PRODUCT

Universal Adjustable Optics Mount 830-0035

