

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 (VEX13-HP)
Lens material	UVFS
Transmission	>97%, >95% (VEX15-HP)
LIDT	3 J/cm <sup>2</sup> (10 ns @ 355nm)
	5 J/cm <sup>2</sup> (10 ns @ 532 nm)
	10 J/cm <sup>2</sup> (10 ns @ 1064 nm)

Standard products

ITEM MODEL	EXPANSION	CLEAR INPUT APERTURE	CLEAR OUTPUT APERTURE	RECOMMENDED MAX. INPUT BEAM SIZE, 1/e <sup>2</sup>	DESIGN	DIMENSIONS	MOUNTING OPTIONS	WAVELENGTH	SKU
VEX13	1.0x - 2.0x continuous	11 mm	23.5 mm	ø7 mm - 1x ø5 mm - 3x	Standard	ø42 x 110 mm	M20x1 external, SM1 internal, ø38.1 mm (1.5"), T-mount (M42x0.75)	343-355 nm	4987
								515-532 nm	4987
								1030-1064 nm	4985
								343-355 + 515-532 nm	4991
								515-532 + 1030-1064 nm	4990
VEX18	1.0x - 8.0x continuous	11 mm	40 mm	ø7 mm - 1x ø5.3 mm - 3x ø3.2 mm - 8x	Standard	ø53 x 203 mm	SM2, ø50.8 mm (2")	343-355 nm	4495
								515-532 nm	4725
								1030-1064 nm	4992
								343-355 + 515-532 nm	4456
								515-532 - 1030-1064 nm	4994
VEX15-HP	1.0x - 5.0x continuous	11 mm	26 mm	ø7 mm - 1x ø5.3 mm - 3x	High power	ø69 x 255 mm	T-mount, SM2, ø50.8 mm (2")	515-532 + 1030-1064 nm	9273
								343-355 nm	4977
								515-532 nm	4995
								343-355 + 515-532 nm	7809
								515-532 + 1030-1064 nm	4999
VRE13	0.33x - 1.0x continuous	22 mm	11 mm	ø15 mm - 0.33x ø7 mm - 1x	Standard	ø42 x 110 mm	M20x1 external, SM1 internal, ø38.1 mm (1.5"), T-mount (M42x0.75)	343-355 nm	4995
								515-532 nm	7809
								1030-1064 nm	4999
								343-355 + 515-532 nm	7809
								515-532 + 1030-1064 nm	4999

Mounting options for variable beam expanders VEX

MOUNTING OPTION	FOR BEAM HEIGHT OF	SKU
Fixed post mounting set	100-125 mm (4" - 5")	9336
Fixed post mounting set	76.2 mm (3")	9337
X-Y adjustable (3 adjusters) kinematic mount with post holder, D50, 8mm option	76.2 mm (3")	9346
X-Y adjustable (3 adjusters) kinematic mount with post holder, SM2 option	76.2 mm (3")	9347
X-Y adjustable (3 adjusters) kinematic mount with post holder, D50, 8mm option	100-125 mm (4" - 5")	9350
X-Y adjustable (3 adjusters) kinematic mount with post holder, SM2 option	100-125 mm (4" - 5")	9351



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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
- UVFS optical elements
- Grease free mechanical design
- Wide wavelength adoption - 200 nm to 2 μm

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), ø30 mm
Transmission	>98%
LIDT	3 J/cm <sup>2</sup> (10 ns @ 355nm)
	5 J/cm <sup>2</sup> (10 ns @ 532 nm)
	10 J/cm <sup>2</sup> (10 ns @ 1064 nm)

\*Custom design available

Standard products

ITEM MODEL	EXPANSION	CLEAR INPUT APERTURE	RECOMMENDED MAX. INPUT BEAM SIZE, 1/e <sup>2</sup>	CLEAR OUTPUT APERTURE	MECHANICAL LENGTH	WAVELENGTH	SKU
FEX-2	2 x	11.5 mm	ø7 mm	23 mm	65 mm	343-355 nm	7723
						515-532 nm	7725
						1030-1064 nm	7727
						343-355 + 515-532 nm	11149
						515-532 nm	7725
FEX-3	3 x	11.5 mm	ø5.3 mm	23 mm	65 mm	343-355 nm	7725
						515-532 nm	7727
						1030-1064 nm	7729
						343-355 + 515-532 nm	11170
						515-532 nm	7726
FEX-4	4 x	11.5 mm	ø4 mm	23 mm	90 mm	343-355 nm	7726
						515-532 nm	7727
						1030-1064 nm	7729
						343-355 + 515-532 nm	11171
						515-532 nm	7726
FEX-5	5 x	11.5 mm	ø3.2 mm	23 mm	95 mm	343-355 nm	7726
						515-532 nm	7727
						1030-1064 nm	7729
						343-355 + 515-532 nm	11172
						515-532 nm	7726
FEX-8	8 x	7 mm	ø2 mm	23 mm	104 mm	343-355 nm	7726
						515-532 nm	7726
						1030-1064 nm	7726
						343-355 + 515-532 nm	11173
						515-532 nm	7726

Mounting accessories for fixed ratio beam expanders FEX

RECOMMENDED ACCESSORY	FOR BEAM HEIGHT OF	SKU
Adapter SM1 male to M20 X 1 male	-	9338
Adapter SM1 female to C-mount	-	9339
Adapter SM1 female to M20 X 1 male	-	9340
X-Y adjustable (3 adjusters) kinematic mount with post holder	50.8 mm (2")	9341
X-Y adjustable (3 adjusters) kinematic mount with post holder	76.2 - 100 mm (3" - 4")	9342



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