



Variable beam expanders VEX and reducers VRE

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

Optogama 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.

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	DESIGN	RECOMMENDED MAX INPUT BEAM DIAMETER (1/E2)	MOUNTING OPTIONS	DIMENSIONS	WAVELENGTH	SKU
VEX13	1.0x - 3.0x continuous	11 mm	23.5 mm	Standard	ø7 mm (1x) - ø5 mm (3x)	M30x1 external, SM1 internal, ø38.1 mm [1.5"], T-mount (M42x0.75)	ø42 x 110 mm	1030-1064 nm	6985
								515-532 nm	6987
								343-355 nm	4357
								1030-1064 + 515-532 nm	6990
VRE13	0.33x - 1.0x continuous	22 mm	11 mm	Standard	ø15 mm (0.33x) - ø7 mm (1x)	M30x1 external, SM1 internal, ø38.1 mm [1.5"], T-mount (M42x0.75)	ø42 x 110 mm	515-532 + 343-355 nm	6991
								1030-1064 nm	31295
								515-532 nm	6995
								343-355 nm	6997
VEX18	1.0x - 8.0x continuous	11 mm	40 mm	Standard	ø7 mm (1x) - ø5.3 mm (5x) - ø3.3 mm (8x)	SM2, ø50.8 mm [2"]	ø53 x 203 mm	1030-1064 + 515-532 nm	6999
								515-532 + 343-355 nm	7000
								1030-1064 nm	6992
								515-532 nm	6725
VRE18	0.12x - 1.0x continuous	40 mm	11 mm	Standard	ø26 mm (0.33x) - ø7 mm (1x)	SM2, ø50.8 mm [2"]	ø53 x 203 mm	343-355 nm	6455
								1030-1064 + 515-532 nm	6994
								515-532 + 343-355 nm	6456
								1030-1064 nm	31298
VEX15-HP	1.0x - 5.0x continuous	11 mm	24 mm	High power	ø7 mm (1x) - ø3.3 mm (5x)	T-mount, SM2, ø50.8 mm [2"]	ø58 x 250 mm	515-532 nm	31299
								343-355 nm	31300
								1030-1064 + 515-532 nm	31301
								515-532 + 343-355 nm	31302
								1030-1064 + 515-532 nm	9273
								515-532 + 343-355 nm	9279
								1030-1064 nm	31303
								515-532 nm	31304
								343-355 nm	31305

Mounting options for motorized beam expanders VEX

DESCRIPTION	MOUNTING	WEIGHT	MOUNTING	SKU
VEX13	75 x 28 x 100 mm	500 g	55 mm	29270
VEX18	102 x 28 x 100 mm	500 g	55 mm	29271



Fixed ratio beam expanders FEX

Main features

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

Application examples

- Laser material processing
- Medical
- Research

Fixed ratio beam expanders FEX series are used to increase the laser beam diameter. The FEX model diversity covers 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.

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 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	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
						1030-1064 + 515-532 nm	11169
FEX-3	3 x	11.5 mm	ø5.3 mm	23 mm	65 mm	343-355 nm	7733
						515-532 nm	7731
						1030-1064 nm	7729
						1030-1064 + 515-532 nm	11170
FEX-4	4 x	11.5 mm	ø4 mm	23 mm	90 mm	343-355 nm	7735
						515-532 nm	7737
						1030-1064 nm	7739
						1030-1064 + 515-532 nm	11171
FEX-5	5 x	11.5 mm	ø3.2 mm	23 mm	95 mm	343-355 nm	7741
						515-532 nm	7743
						1030-1064 nm	7746
						1030-1064 + 515-532 nm	11172
FEX-8	8 x	7 mm	ø2 mm	23 mm	104 mm	343-355 nm	7749
						515-532 nm	7752
						1030-1064 nm	7754
						1030-1064 + 515-532 nm	11173

Mounting options for motorized beam expanders FEX

RECOMMENDED ACCESSORY	FOR BEAM HEIGHT OF	SKU
Adapter SM1 male to M30 X 1 male	-	9338
Adapter SM1 female to C-mount	-	9339
Adapter SM1 female to M30 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