

Variable beam expanders VEX and reducers VRE



4Lasers introduces variable manual beam expanders VEX series used to increase or decrease laser beam diameter. Standard or custom-made laser beam expanders for use in the UV, visible, and NIR spectral ranges have a unique mechanical sliding-lens design, ensuring high pointing stability and minimal dimensions.

These variable magnification (zoom) beam expanders are designed for 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 using them with high power lasers. Large input and output apertures allow the optical beam expanders to be used 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	SKU
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	4357
								515-532 nm	6987
								1030-1064 nm	6985
								343-355 + 515-532 nm	6991
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"]	515-532 + 1030-1064 nm	6990
								343-355 nm	6455
								515-532 nm	6725
								1030-1064 nm	6992
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	9279
								515-532 + 1030-1064 nm	9273
								343-355 + 515-532 nm	6456
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)	515-532 + 1030-1064 nm	6994
								343-355 nm	6997
								515-532 nm	6995
								343-355 + 515-532 nm	7000
								515-532 + 1030-1064 nm	6999

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")	9348
X-Y adjustable (3 adjusters) kinematic mount with post holder, SM2 option	76,2 mm (3")	9349
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

Fixed ratio beam expanders FEX



Fixed ratio beam expanders FEX series are used to increase 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 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 materials 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), ϕ 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	SKU
FEX-2	2 x	11,5 mm	ϕ 7 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	ϕ 5,3 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	ϕ 4 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	ϕ 3,2 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	ϕ 2 mm	23 mm	104 mm	343-355 nm	7749
						515-532 nm	7752
						1030-1064 nm	7754
						1030-1064 + 515-532 nm	11173

Mounting accessories for fixed ratio 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