

Beam Expanders

We manufacture a variety of laser beam expanders to suit most laser types, from small waveguide lasers up to multi-kilowatt industrial lasers. There is also a modular range for experimental and laboratory purposes.



The most common type of beam expander is derived from the Galilean telescope which usually has one negative input lens and one positive output lens, as shown in the following figure. The input lens presents a virtual beam focus at the output. For low expansion ratios (1.3-20 \times), the Galilean telescope is most often employed due to its simplicity, small package size, and low cost.

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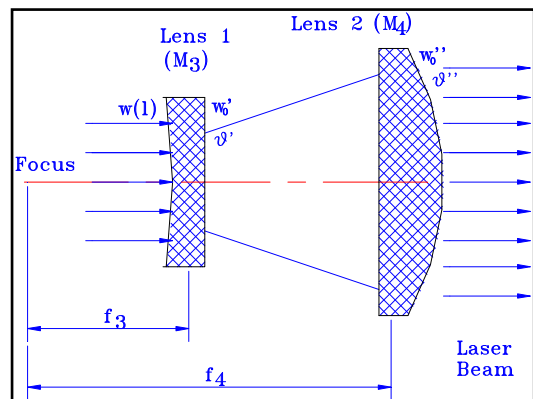
As shown in right figure, the lens M_3 focuses the laser beam onto the front focus plane and the new beam waist ω'_0 and divergence angle θ' can be represented as

$$\omega'_0 = \frac{f_3 \lambda}{\pi \omega(l)} \quad (1)$$

and

$$\theta' = \frac{2\lambda}{\pi \omega'_0} \quad (2)$$

$$\omega(l) = \omega_0 \sqrt{1 + \left(\frac{l\lambda}{\pi \omega_0^2} \right)^2} \quad (3)$$



where $\omega(l)$ is the radius of the beam entering the lens M_3 , l is the distance between the lens M_3 and the beam waist ω_0 from the laser generator, and f_3 is the focal length of the lens M_3 .

Since ω'_0 lies on the back focus plane of the lens M_4 with a longer focal length, f_4 , the Gaussian beam with a beam waist ω'_0 will be collimated by the beam expander. The collimation ratio of the beam expander for a Gaussian beam is as follows

$$T = \frac{\theta}{\theta''} = T_1 \sqrt{1 + \left(\frac{l\lambda}{\pi \omega_0^2} \right)^2} \quad (4)$$

where $T_1 = f_4/f_3$. The beam waist ω''_0 and divergence angle θ'' after the beam expander are

$$\omega_0'' = \frac{\lambda}{\pi\omega_0} f_4 \quad (5)$$

and

$$\theta'' = \frac{\theta}{T} \quad (6)$$

Substituting Equation (1) into Equation (5), the following expression can be obtained

$$\omega_0'' = T_1\omega(l) \quad (7)$$

From Equations (4)-(7), it is concluded that the beam expansion ratio and the collimation ratio for a Gaussian beam depend not only on the specifications of the beam expander, but also on the laser beam parameters as well as the positions of the optical lenses.

The function of a beam expander is to reduce the divergence angle of laser beams and thus make the focused beam diameter smaller.

The specifications of the lenses used in the beam expanders are:

- Material: BK7 fine annealed, fused silica and ZnSe depending on laser wavelength.
- Diameter: -0.1mm
- Thickness: ±0.1mm
- Flatness: $\lambda/4$
- Surface Quality: 60-40 scratch-dig
- Coating: HR dielectric coatings R > 99%

Part number description: BEST-xxx-yy-T-AA

BEST --- BEST series beam expanders, zoom beam expanders.

xxxx----- laser wavelength: 10.6 means 10.6um, 532 means 532nm, 633 means 633nm.

yy ----- expansion ratio (magnification) in times

T ----- type: T means adjustable beam expander; none means fixed beam expander.

AA ----- special purpose.

Example: BEST-10.6-3: 10.6um fixed beam expander, 3x.

BEST-10.6-3.5T: 10.6um adjustable beam expander, max. 3.5x.

We may use the following abbreviations in the tables: WL=wavelength, MAG=magnification, CA=clear aperture, CA1=input clear aperture, CA2=output clear aperture, D1=input diameter, D2=output diameter, L1=total length of beam expander, MT=connection or mounting thread, D=diameter

We offer 3 types of beam expanders: fixed beam expanders, adjustable beam expanders, (motorised) zoom beam expanders at various wavelengths of 213nm, 266nm, 343-355nm, 405nm, 633nm, 515-545nm, 780-980nm, 1030-1090nm, 1550nm, 1850-1980nm, 10.6um. Other wavelengths and custom-designed beam expanders are available upon request. For more information, please feel free to contact us.

CO₂ Laser Beam Expanders (10.6μm & 9.4μm)

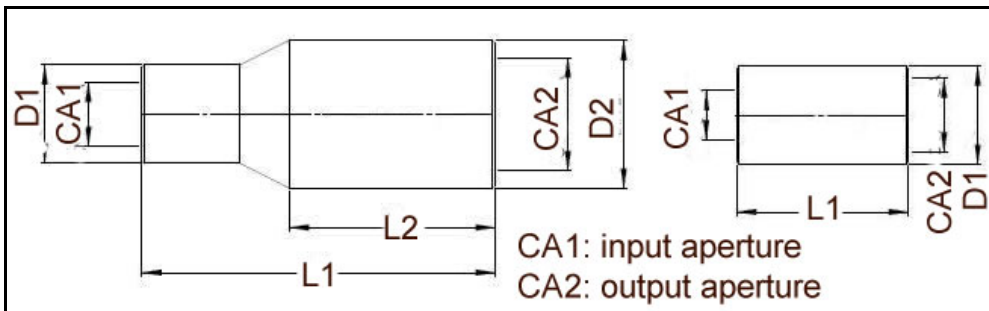
There are 2 types of beam expander: fixed and adjustable beam expanders. For the fixed beam expanders, the spacing between the two lenses inside the beam expander is fixed, but the spacing between the two lenses inside the adjustable beam expanders is adjustable. The lens material is ZnSe, which allows the red light to go through the beam expander.



(1) Fixed Beam Expanders

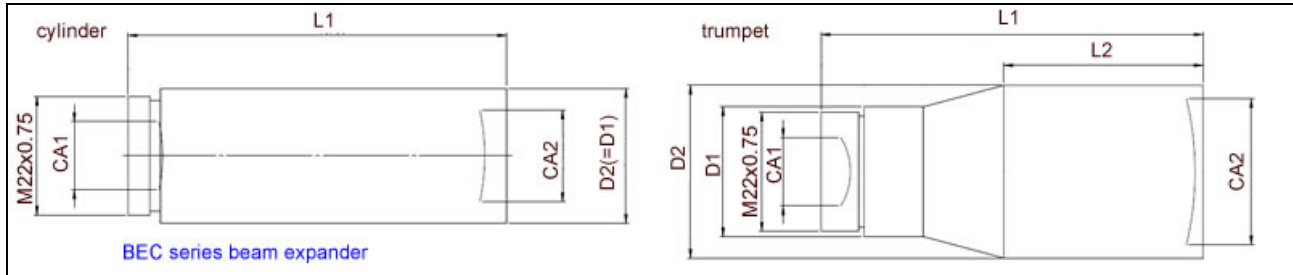
BEST-W Series 10.6μm Fixed Beam Expanders

The material is ZnSe for all the CO₂ laser beam expanders. Their outline is a cylinder or like a trumpet whose input and output diameters are different.



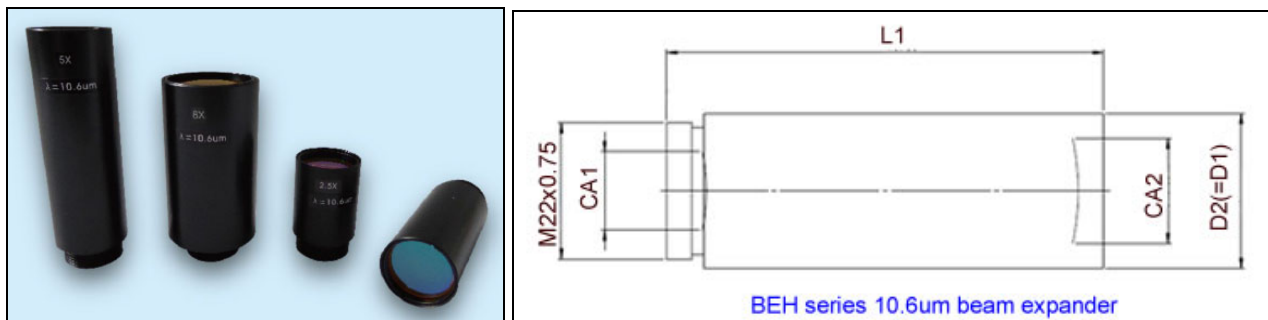
Part No.	MAG	CA1 (mm)	CA2 (mm)	D1 (mm)	D2 (mm)	L1 (mm)	L2 (mm)
BEST-9.4-2-W	2	16.5	23	M22X0.75	28	59	54
BEST-9.4-3-W	3	10	20	28	28	61	51.5
BEST-9.4-5-W	5	13	23	20	30	72	42
BEST-10.6-1.5-W	1.5	13	16	20	-	35	-
BEST-10.6-2-W	2	10	15	22	-	32.5	-
BEST-10.6-2A-W	2	15	17	22	-	35	-
BEST-10.6-2L-W	2	27	53	M44X1	63	72	47
BEST-10.6-2.5-W	2.5	12	20	27	-	54	-
BEST-10.6-3A-W	3	10	15	20	20	61	-
BEST-10.6-3B-W	3	12.5	20	20	28	59	29
BEST-10.6-3C-W	3	13	20	20	28	110	60
BEST-10.6-3-W	3	11	16	20	20	59	-
BEST-10.6-3.3-W	3.3	10	15	21	21	67	-
BEST-10.6-4-W	4	10	20	20	28	67	46
BEST-10.6-4A-W	4	10	25	20	31	67	48
BEST-10.6-4C-W	4	12	23	20	30	135	90
BEST-10.6-5-W	5	12	23	20	30	72	47
BEST-10.6-5A-W	5	12	28	20	36	70	45
BEST-10.6-6A-W	6	10	28	20	36	75	55
BEST-10.6-8-W	8	13	26	20	36	120	75.1
BEST-10.6-8A-W	8	10	30	20	36	73	55.5

BEC Series 10.6um Fixed Beam Expanders



Part No.	MAG	CA1(mm)	CA2(mm)	D1(mm)	D2 (mm)	L1(mm)	L2(mm)	Screw
BEC-10.6-2	2.0	12.7	17	-	25	46.5	-	M22x0.75
BEC-10.6-2.5	2.5	12.7	20	-	25	59.65	-	M22x0.75
BEC-10.6-3	3.0	12.7	17	-	25	64.5	-	M22x0.75
BEC-10.6-4	4.0	12.7	17	-	25	70.5	-	M22x0.75
BEC-10.6-5	5.0	12.7	20	-	25	72	-	M22x0.75
BEC-10.6-6	6.0	12.7	27	-	32	75.75	-	M22x0.75
BEC-10.6-8	8.0	12.7	27	24	27	71	37	M22x0.75

BEH Series 10.6 Fixed Beam Expanders



Part No.	MAG	CA1	CA2	D1=D2	L1	MT
BEH-10.6-1.5	1.5	13	13	25	30	M22x0.75
BEH-10.6-2	2	13	13	25	35	M22x0.75
BEH-10.6-2.5	2.5	11	11	27	49.91	M22x0.75
BEH-10.6-3	3	11	11	27	40.76	M22x0.75
BEH-10.6-4	4	11	11	27	70.62	M22x0.75
BEH-10.6-5	5	11	11	27	87.2	M22x0.75
BEH-10.6-6	6	11	11	37	91.18	M22x0.75
BEH-10.6-8	8	11	11	37	68.94	M22x0.75

(2) Adjustable Beam Expanders

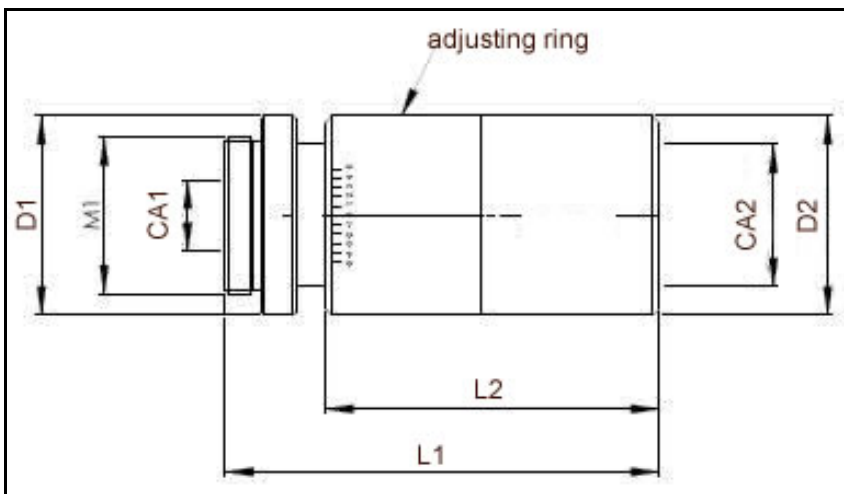
These beam expanders are specially designed for large divergent laser beam. Changing the distance between two lenses inside the beam expander can decrease the beam divergence to obtain better collimation of the laser beam. If they are used for large-divergence laser beam, you may turn the inner body to increase the spacing of two lenses and then to obtain better collimation laser beam. The material is ZnSe and thus the red light can go through the beam expander.

BEST-C Series 10.6um Adjustable Beam Expanders



New part number	Old part number	MAG, x	CA1,mm	CA2,mm	OD(D2),mm	L1,mm	Connection, mm
STY-2X-10.6-C	BEST-10.4-2C	2	8	15	46	52.2	M30x1+M43x0.5
STY-3X-10.6-C	BEST-10.4-3C	3	8	15	46	81.5	M30x1+M43x0.5
STY-4X-10.6-C	BEST-10.4-4C	4	15	28	46	85	M30x1+M43x0.5
STY-4X-10.6-2-C	BEST-10.4-4C2	4	8	15	46	78	M30x1+M43x0.5
STY-8X-10.6-C	BEST-10.4-8C	8	8	32	46	81.5	M30x1+M43x0.5

BEST-W Series Adjustable Beam Expanders



Part No.	MAG	CA1 (mm)	CA2 (mm)	M1	D1 (mm)	D2 (mm)	L2(mm)	L1(mm)
BEST-10.6-2Z-TW	2	10	15	M16x0.75	22	22	37	51
BEST-10.6-2Z1-TW	2	10	23	M22x0.75	32	32	38	48
BEST-10.6-2ZG-TW	2	10	15	M16x0.75	22	22	40	51
BEST-10.6-2Z3-TW	2	15	28	M22x0.75	36	36	33	48
BEST-10.6-2Z4-TW	2	10	15	M16x0.75	20	20	37	50
BEST-10.6-2.5Z-TW	2.5	10	16	M16x0.75	20	20	45	55.2
BEST-10.6-2.5Z1-TW	2.5	10	15	M16x0.75	20	20	25	34
BEST-10.6-2.5Z2-TW	2.5	10	20	M22x0.75	28	28	40.5	56
BEST-10.6-3X3T-TW	3	10	16	M16x0.75	-	20	28	37
BEST-10.6-3Z1-TW	3	10	16	M16x0.75	20	20	45	61
BEST-10.6-3Z2-TW	3	10	20	M22x0.75	28	28	47	61
BEST-10.6-3Z3-TW	3	10	16	M16x0.75	20	20	28	37
BEST-10.6-3Z4/1-TW	3	10	25	M22x0.75	32	32	43	60
BEST-10.6-3Z5-TW	3	15	35	M22x0.75	44	44	60	73
BEST-10.6-3Z6-TW	3	15	28	M22x0.75	36	36	51	60
BEST-10.6-3.75Z-TW	3.75	23	26	M33x0.5	36	36	48	64
BEST-10.6-4X-TW	4	11	17	-	M24x0.5	26	51.5	66
BEST-10.6-4Z-TW	4	10	16	M16x0.75	20	20	47	55
BEST-10.6-4Z1-TW	4	10	20	M22x0.75	28	28	55	71
BEST-10.6-4Z2-TW	4	15	28	M22x0.75	36	36	51	66
BEST-10.6-4Z3-TW	4	10	20	-	26	32	50	70
BEST-10.6-5Z-TW	5	10	16	M16x0.75	20	20	43	58
BEST-10.6-5Z1-TW	5	10	23	M22x0.75	30	30	56	71

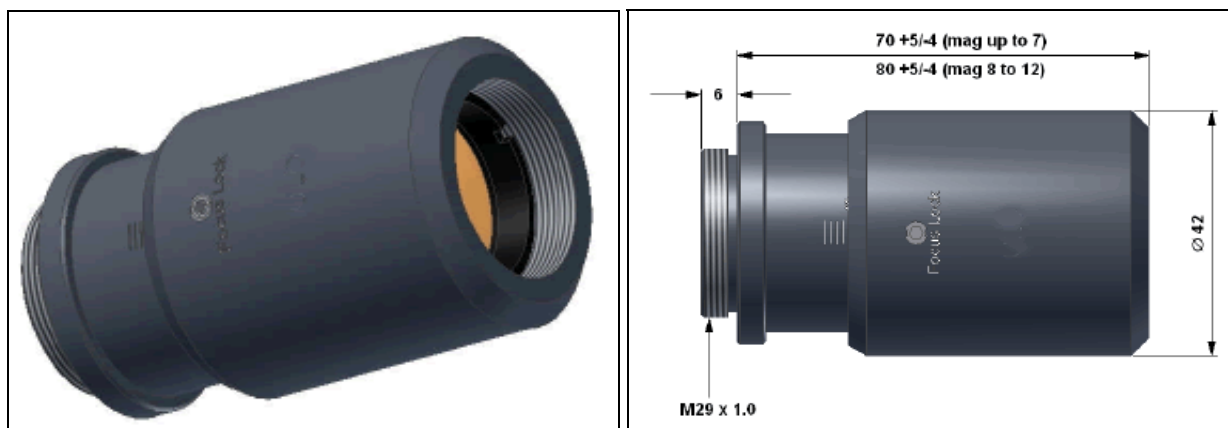
BEST-10.6-6Z-TW	6	11	26	M22x0.75	32	32	62	76
BEST-10.6-6Z1-TW	6	10	35	M22x0.75	44	44	60	75
BEST-10.6-6Z2-TW	6	10	15	M16x0.75	20	20	45	60
BEST-10.6-8Z1-TW	8	10	33	M22x0.75	44	44	98	118
BEST-10.6-10Z1-TW	10	10	36	M22x0.75	44	44	98	118

(3) High-power CO2 Laser Beam Expanders

A: BEST-CBE Series Compact Beam Expanders

The high-power beam expander has a slide and lock focus setting. Normally this is set to infinity during manufacture. However, if a customer needs to adjust this to suit their system, the output should be coupled an adjustable pipe so this too can be adjusted to maintain an overall fixed length. Note that your input beam diameter should not exceed two-thirds of the input aperture. The output clear aperture is the same for all magnifications, 25mm. If your expanded beam diameter is 14.5mm to 22mm, the allowed input laser power can reach up to 500W. The input end has a M29x1.0 male thread and the output has the same female thread to take thread adaptors for coupling to other.

Part No.	MAG	Input clear aperture	Max. input beam diameter
BEST-10.6-1.3ZTM-CBE	1.3	12.5mm	10mm
BEST-10.6-1.6ZTM-CBE	1.6	12.5mm	10mm
BEST-10.6-2ZTM-CBE	2	12.5mm	10mm
BEST-10.6-2.5ZTM-CBE	2.5	12.5mm	8mm
BEST-10.6-3ZTM-CBE	3	12.5mm	6mm
BEST-10.6-3.5ZTM-CBE	3.5	12.5mm	5mm
BEST-10.6-4ZTM-CBE	4	12.5mm	4.5mm
BEST-10.6-5ZTM-CBE	5	12.5mm	3.5mm
BEST-10.6-6ZTM-CBE	6	12.0mm	3.0mm
BEST-10.6-7ZTM-CBE	7	10.0mm	2.5mm
BEST-10.6-8ZTM-CBE	8	10.0mm	2.1mm
BEST-10.6-10ZTM-CBE	10	5.0mm	1.7mm
BEST-10.6-12ZTM-CBE	12	5.0mm	1.4mm



B: BEST-SBE Series Beam Expanders

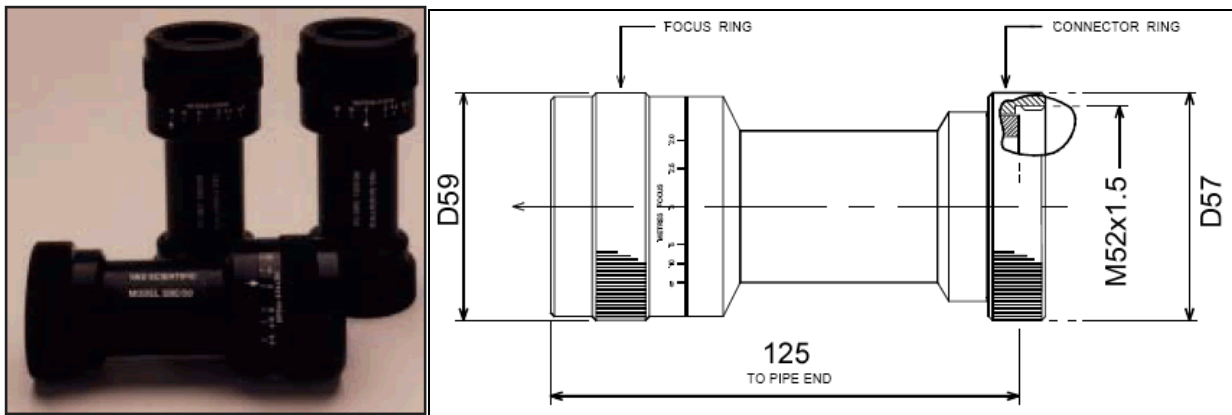
The SBE series of beam expanders are designed for use with CO2 lasers of (relatively) small beam diameter, between the limits of around 2mm up to 12mm, and for power levels of up to 1kW CW. SBE units may be used to increase beam size, and reduce laser divergence accordingly. A wide range of magnifications is available to enable best performance to be obtained from the laser. The SBE series of beam expanders are of Galilean type, with two ZnSe lenses. The lenses are made from laser grade ZnSe and treated with ultra-low absorption anti-reflection coatings for 10.6µm. All models are externally identical.

The focus range is from -10m, through infinity, to +1.6m. It is factory calibrated from infinity to +2m focus range. Please note that the indicated focus is geometrical, and the actual downstream beam waist position will depend upon the parameters of the laser beam. The focus mechanism is of the

actuated-slide type, and actuation of the focusing ring drives the output lens position in a linear, non-rotary sense. This mechanism reduces beam wander usually experienced with rotary focus mechanisms.

Model	Magnification	Input Clear Ap.	Output Clear Ap.
BEST-10.6-2ZTM-SBE	x2.0	12.50mm	25.4mm
BEST-10.6-2.5ZTM-SBE	x2.5	10.20mm	25.4mm
BEST-10.6-3ZTM-SBE	x3.0	8.33mm	25.4mm
BEST-10.6-4ZTM-SBE	x4.0	6.25mm	25.4mm
BEST-10.6-5ZTM-SBE	x5.0	5.00mm	25.4mm
BEST-10.6-6ZTM-SBE	x6.0	4.17mm	25.4mm
BEST-10.6-7ZTM-SBE	x7.0	3.57mm	25.4mm

The SBE series beam expanders can be used to reduce beam divergence and to help achieve very high energy densities from quite low laser power. For example, if used with a 10W Synrad laser, a model SBE/60 plus a TF25 focusing lens, would generate an energy density of around 20kW/mm² at the focus. Typical applications for the SBE series beam expanders with low power lasers include drilling holes in plastics, cutting paper and card, cutting man-made fibre material and rubber, and engraving decorative wooden plaques. In common with other beam expanders, the SBE series can provide a long-path of consistent beam quality. They may be used in conjunction with moderate power (several hundred watts) CO₂ lasers to enable large cutting bed applications, such as the processing of sail-cloth.



C: BEST-BE25 Series Beam Expanders

The BE25 series of beam expanders is designed for use with CO₂ lasers of up to 2kW CW power. The units are water cooled and incorporate an actuated-slide focusing mechanism to reduce beam wander during focusing. By reducing beam divergence and allowing the user control over the ongoing beam characteristics, these industrial laser beam expanders can improve system Performance, especially in large moving-optics systems.

Technical specifications:

Type: Fully corrected Galilean type, with ZnSe lenses.

Construction: Aluminium alloy, black anodised. Lenses mounted using indium wire to aid heat transfer.

Cooling: Water (or air) cooled, via 8/6 size fittings.

Focus range: From infinity down to 2.8m. Calibrated.

Beam wander during focusing: 2 minutes of arc over full range.

Output clear aperture: 35mm diameter.

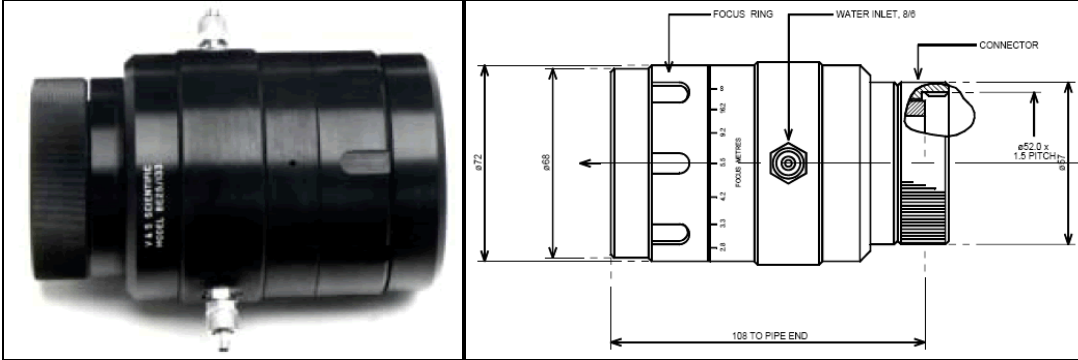
Fitting: Via standard 52.0 dia x 1.5 pitch coupling ring.

Model	Magnification	Input Clear Aperture Dia.
BEST-10.6-1.33ZTM-BE25	x 1.33	25.0mm
BEST-10.6-1.5ZTM-BE25	x 1.50	23.2mm
BEST-10.6-1.66ZTM-BE25	x 1.66	21.1mm
BEST-10.6-1.75ZTM-BE25	x 1.75	20.0mm
BEST-10.6-2ZTM-BE25	x 2.00	17.5mm

The actuated-slide mechanism drives the output lens in a linear motion, reducing beam wander that can

occur in rotary mechanisms. The geometrical focus setting is calibrated from 2.8m to infinity. Please note that the downstream beam waist position will depend upon the laser beam characteristics as well as the focus setting. Geometrical focus is calibrated for a plane wave input.

The specific applications for the BE25 series beam expanders are too numerous to list. In general, they are used by many system integrators in moving-optics cutting systems, long-bed anilox processing and a variety of systems where a controlled beam and increased focused energy density are desirable.



D: BEST-BE38 Series Beam Expanders

The BE38 series of beam expanders is designed for use with high power/large beam diameter CO2 lasers of up to 3kW power CW. These Galilean beam expanders use two ZnSe lens elements made from laser grade ZnSe and treated with ultra-low absorption anti-reflection coatings for maximum power handling capacity. BE38 series beam expanders use an actuated-slide focus mechanism to reduce beam wander during focusing. The units are water cooled. Use of these beam expanders can improve system performance by reduction of the beam far-field divergence and by providing control of the ongoing beam parameters.

Technical specifications:

Type : Fully corrected Galilean type, ZnSe lenses.

Construction : Aluminium alloy, black anodised. The lenses are mounted using indium wire to aid heat transfer.

Cooling : Water cooled via 8/6 size fittings.

Focus range : From infinity down to 2.8m. Calibrated.

Output clear aperture : 57mm diameter.

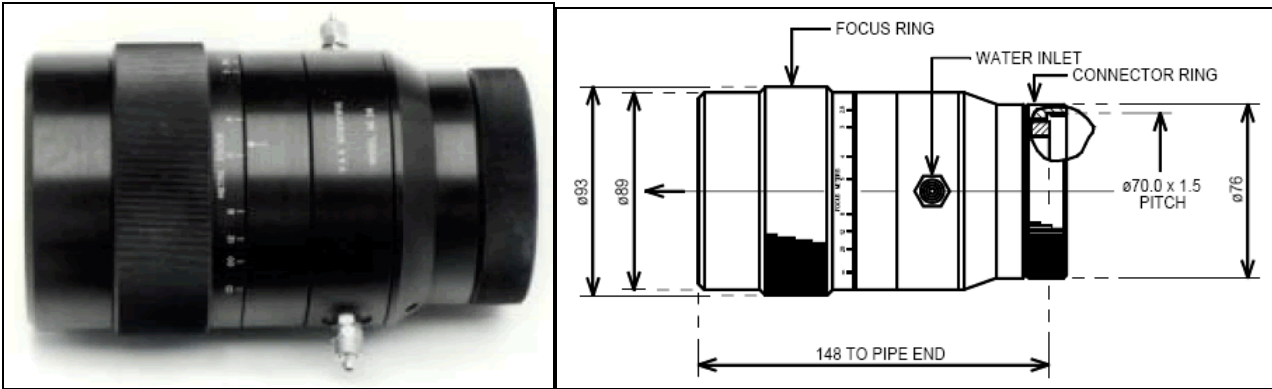
Input clear aperture : 38mm diameter.

Fitting : Via 70.0mm x 1.5 pitch connector ring.

Beam wander during focusing : 2 arc minutes over full range.

Model	Magnification
BEST-10.6-1.15ZTM-BE38	x 1.15
BEST-10.6-1.25ZTM-BE38	x 1.25
BEST-10.6-1.33ZTM-BE38	x 1.33
BEST-10.6-1.5ZTM-BE38	x 1.50

The actuated-slide mechanism causes the output lens to be linearly repositioned when the focus control ring is rotated. This reduces the beam wander that can occur with rotary focus mechanisms. The geometrical focus position is calibrated from 2.8m to infinity. Please note that the downstream beam waist position will, in general, be different from the geometrical focus setting. The geometrical focus is calibrated for a plane wave input.



E. Modular Beam Expanders

The modular series of CO₂ laser beam expanders provide a wide, versatile range of sizes and magnifications for laboratory and general industrial use with lasers of up to 1kW CW laser power. The range consists of a series of output sections, forming the main body of the beam expander, with output diameters from 25mm to 90mm. Input lens units plug into the main body to form the complete beam expander.

Technical specifications (all models):

Lenses: Laser grade ZnSe with ultra-low absorption anti-reflection coatings.

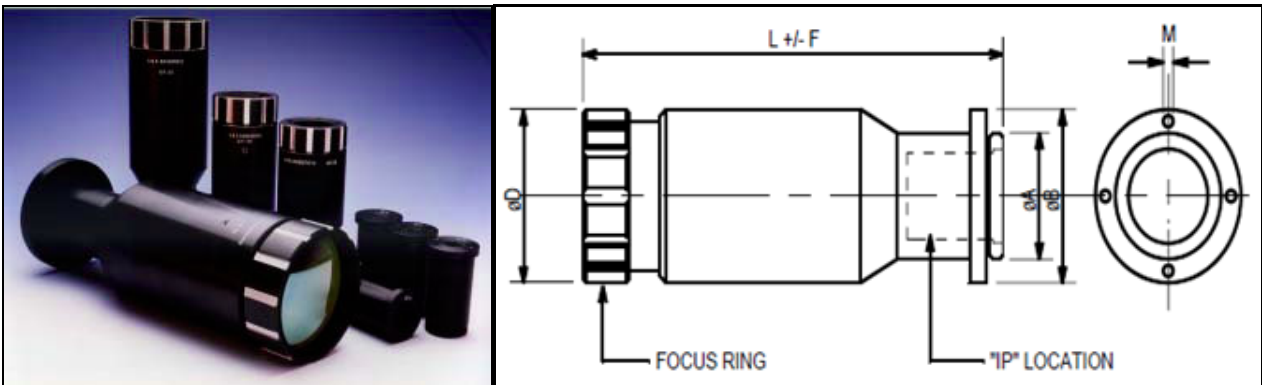
Bodies: Aluminium HE30, black anodised.

Output clear aperture: Defined by designation, eg "OP50" has 50mm clear aperture.

Input clear aperture: Defined by designation, eg "IP14" has 14mm clear aperture.

Magnification: Defined by designation, eg OP50 plus IP10 have, as a combination, a magnification of $50/10 = \times 5$.

Performance: Less than $\lambda/20$ residual spherical aberration.



Model	A	B	D	F	L	M
OP25	40 dia. x 1 ISO	50	50	5	126	3.3 dia. on 45 PCD
OP35	40 dia. x 1 ISO	50	50	8	144	3.3 dia. on 45 PCD
OP50	45 dia. x 1 ISO	62	62	12	200	4.3 dia. on 54 PCD
OP70	45 dia. x 1 ISO	84	84	15	280	6.5 dia. on 70 PCD
OP90	45 dia. x 1 ISO	84	110	20	359	6.5 dia. on 70 PCD

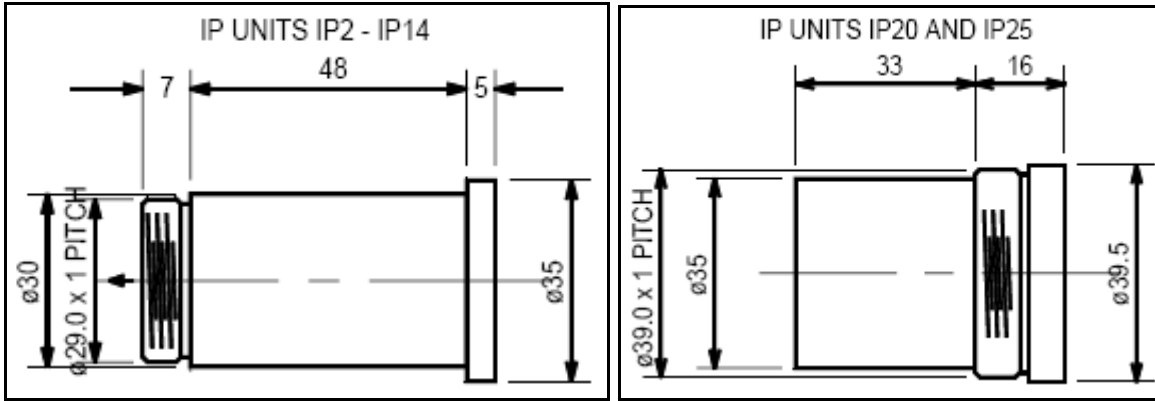
Remark: Lengths "L" stated at infinity focus

Interchangeability

The two larger 'IP' units designated IP20 and IP25 may only be used with OP70 or OP90 bodies. Otherwise, all IP units fit all OP units. In order to fit IP20/IP25 in to the OP70 /OP90 bodies an adaptor sleeve is removed.

Input units

The size and shape of the 'plug-in' input units applies to IP designations from IP3.3 to IP14. The two larger input units IP20 and IP25 are shown in external view in the following figures. These may only be used with OP70 or OP90. Available models are given in the following table.



Model	Input aperture	Use with OP model
IP3.3	3.5mm	Any
IP5	5.0mm	Any
IP7	7.0mm	Any
IP8.75	8.8mm	Any
IP10	10.0mm	Any
IP14	14.0mm	Any
IP20	20.0mm	OP70, OP90 only
IP25	25.0mm	OP70, OP90 only

Nd:YAG Laser Beam Expanders (1064/532/355/266nm)



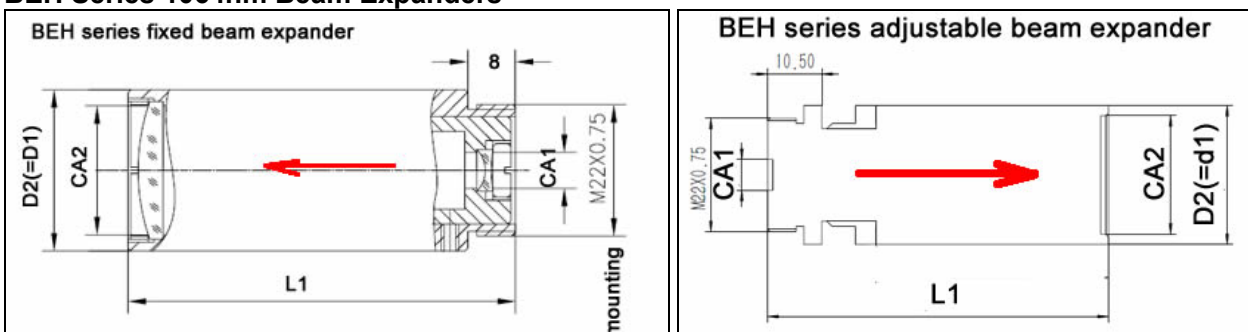
(1) 1064nm Beam Expanders

BEST-C Series 1064nm Adjustable Beam Expanders



New part number	Old art number	MAG,x	CA1,mm	CA2,mm	OD(D2),mm	L1,mm	Connection, mm
STY-1.5X-1064-C	BEST-1064-1.5C	1.5	10	33	46	80.5	M30x1+M43x0.5
STY-2X-1064-C	BEST-1064-2C	2	16	33	46	80.5	M30x1+M43x0.5
STY-2.5X-1064-C	BEST-1064-2.5C	2.5	16	33	46	80.5	M30x1+M43x0.5
STY-3X-1064-C	BEST-1064-3C	3	10	33	46	80.5	M30x1+M43x0.5
STY-4X-1064-C	BEST-1064-4C	4	10	33	46	85	M30x1+M43x0.5
STY-5X-1064-C	BEST-1064-5C	5	10	33	46	80.5	M30x1+M43x0.5
STY-6X-1064-C	BEST-1064-6C	6	10	33	46	85	M30x1+M43x0.5
STY-7X-1064-C	BEST-1064-7C	7	10	33	46	85	M30x1+M43x0.5
STY-8X-1064-C	BEST-1064-8C	8	10	33	46	85	M30x1+M43x0.5
STY-10X-1064-C	BEST-1064-10C	10	10	33	46	85	M30x1+M43x0.5
STY-12X-1064-C	BEST-1064-12C	12	10	33	46	85	M30x1+M43x0.5
STY-14X-1064-C		14	10	33	46	85	M30x1+M43x0.5
STY-15X-1064-C	BEST-1064-15C	15	10	33	46	85	M30x1+M43x0.5
STY-20X-1064-C	BEST-1064-20C	20	8	41	46	92	M30x1/M43x0.5

BEH Series 1064nm Beam Expanders



BEH Series 1064nm Fixed Beam Expanders

Part number	MAG	CA1 (mm)	CA2 (mm)	Connction (mm)	D2xL1 (mm)
BEH-1064-1.5	1.5	10.4	21.6	M22x0.75	Φ27x58.4
BEH-1064-2	2	10.4	21.6	M22x0.75	Φ27x38.2
BEH-1064-3	3	10.4	21.6	M22x0.75	Φ27x67
BEH-1064-4	4	10.4	21.6	M22x0.75	Φ27x74
BEH-1064-5	5	10.4	21.6	M22x0.75	Φ27x72
BEH-1064-6	6	10.4	21.6	M22x0.75	Φ27x71.8
BEH-1064-8	8	6	21.6	M22x0.75	Φ27x66
BEH-1064-10	10	6	21.6	M22x0.75	Φ27x68
BEH-1064-12	12	6	21.6	M22x0.75	Φ27x77.7
BEH-1064-15	15	6	21.6	M22x0.75	Φ27x72
BEH-1064-20	20	6	21.6	M22x0.75	Φ27x81

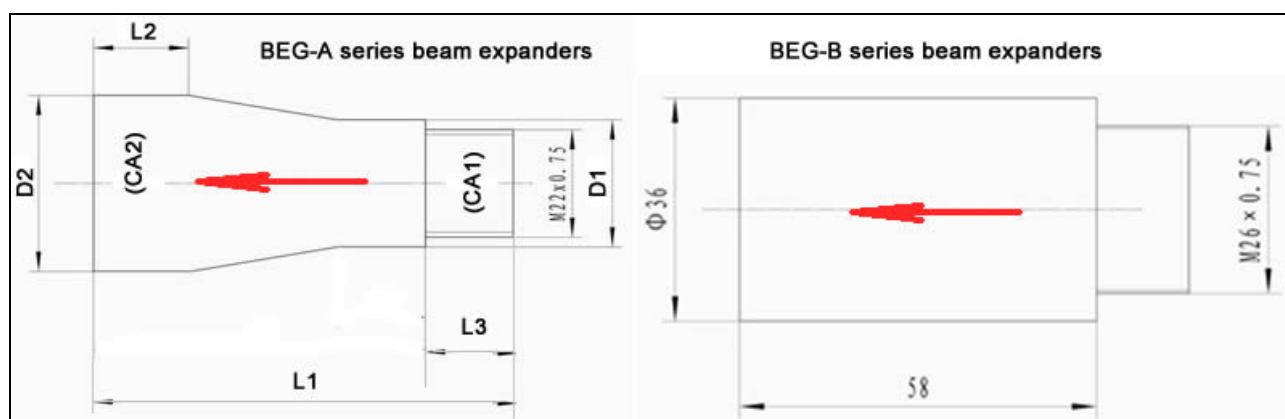
BEH Series 1064nm Adjustable Beam Expanders

Part number	MAG	CA1 (mm)	CA2 (mm)	Connction (mm)	D2xL1 (mm)
BEH-1064-1.5T	1.5	10.4	21.6	M22x0.75	Φ27x58.4
BEH-1064-2T	2	10.4	21.6	M22x0.75	Φ27x38.2
BEH-1064-3T	3	10.4	21.6	M22x0.75	Φ27x67
BEH-1064-4T	4	10.4	21.6	M22x0.75	Φ27x74
BEH-1064-5T	5	10.4	21.6	M22x0.75	Φ27x72
BEH-1064-6T	6	10.4	21.6	M22x0.75	Φ27x71.8
BEH-1064-8T	8	6	21.6	M22x0.75	Φ27x66
BEH-1064-10T	10	6	21.6	M22x0.75	Φ27x68
BEH-1064-12T	12	6	21.6	M22x0.75	Φ27x77.7
BEH-1064-15T	15	6	21.6	M22x0.75	Φ27x72
BEH-1064-20T	20	6	21.6	M22x0.75	Φ27x81

Remark: The input lens is quartz and output lens is optical glass. Optical glass output lens is available upon request.

BEG Series Beam Expanders

There are 2 types outlines: trumpet (A series) and cylinder (B series). For all trumpets, the outside diameters of input and output ends are 26mm and 36mm respectively. The mount screw on the input is M22x0.75mm but the mount screw of the cylinders is M26x0.75.



Part number	MAG	CA1 mm	CA2 mm	D1 mm	D2 mm	L1 mm	L2 mm	L3 mm	MT mm
BEG-1064-1.5A	1.5	10	28	26	36	47	15	2	M22x0.75
BEG-1064-2A	2	10	28	26	36	48	15	3	M22x0.75
BEG-1064-2.5A	2.5	10	28	26	36	57	15	12	M22x0.75
BEG-1064-2.5AQ	2.5	10	28	26	36	57	15	12	M22x0.75
BEG-1064-3A	3	10	28	26	36	74	17	6	M22x0.75
BEG-1064-3AQ	3	10	28	26	36	77	17	9	M22x0.75
BEG-1064-4A	4	10	28	26	36	72	17	4	M22x0.75
BEG-1064-6A	6	10	28	26	36	79	17	11	M22x0.75
BEG-1064-7A	7	10	28	26	36	79	17	11	M22x0.75

BEG-1064-8A	8	10	28	26	36	91	32	11	M22x0.75
BEG-1064-9A	9	10	28	26	36	92	32	12	M22x0.75
BEG-1064-10A	10	10	28	26	36	100	32	20	M22x0.75
BEG-1064-15A	15	10	28	26	36	85	32	5	M22x0.75

Remark: The input lens in BEG-1064-2.5AQ and BEG-1064-3AQ is quartz and others are optical glass.

Part number	MAG	CA1, mm	CA2, mm	Size, mm	MT, mm
BEG-1064-1.5B	1.5	10	28	Φ36x58	M26x0.75
BEG-1064-2B	2	10	28	Φ36x58	M26x0.75
BEG-1064-2.5B	2.5	10	28	Φ36x58	M26x0.75
BEG-1064-2.5BQ	2.5	10	28	Φ36x58	M26x0.75
BEG-1064-3B	3	10	28	Φ36x58	M26x0.75
BEG-1064-3BQ	3	10	28	Φ36x58	M26x0.75
BEG-1064-4B	4	10	28	Φ36x58	M26x0.75
BEG-1064-6B	6	10	28	Φ36x58	M26x0.75
BEG-1064-7B	7	10	28	Φ36x58	M26x0.75
BEG-1064-8B	8	10	28	Φ36x58	M26x0.75
BEG-1064-9B	9	10	28	Φ36x58	M26x0.75
BEG-1064-10B	10	10	28	Φ36x58	M26x0.75
BEG-1064-15B	15	10	28	Φ36x58	M26x0.75

Remark: The input lens in BEG-1064-2.5BQ and BEG-1064-3BQ is quartz and others are optical glass.

BEAL Series Beam Expanders (1064/532/355nm)

Our beam expanders are assembled using one diverging and one converging lenses. As there is no focal point inside the beam expander, it can be used for high powers. Special treatment of lenses and mechanics is performed for UV application to improve lifetime and LIDT of the expander. Standard magnifications are from 1.1x to 10x. Beam expanders for any wavelengths between 266 - 2000 nm are available upon request.

Features

- Custom magnification and design on request
- Extended lifetime and LIDT for UV applications
- Individual reports of beam ellipticity, M2 and pointing stability parameters
- Custom wavelengths are available in the range of 250-3000nm



Standard specifications:

Lens material	UVFS
Transmitted wavefront distortion	λ/4 p-v @ 632 nm
Overall transmission	99%
Laser induced damage threshold	>10 J/cm ² @ 1064 nm, 10 ns, 10 Hz
Housing material	Black anodized aluminium
Diameter	30 mm
Mounting thread	SM1

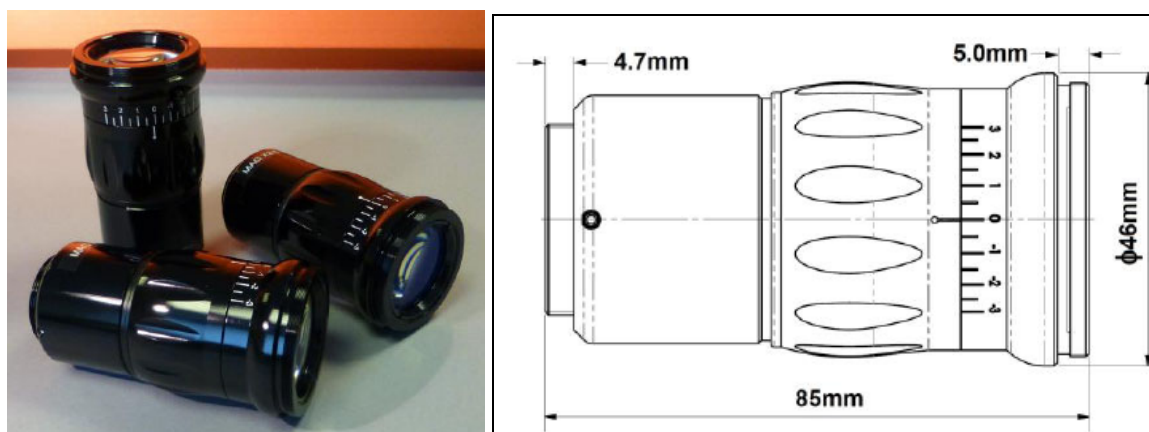
Typical items:

WL, nm	MAG	CA1, mm	CA2, mm	Housing Dim, mm	Product Number
343-355	1.2X	10	12	Ø30 x 56.6	BEAL-1.2X-0355
	1.5X	8.5	12.75	Ø30 x 55.7	BEAL-1.5X-0355
	2X	5	10	Ø30 x 58.1	BEAL-2X-0355
	2.5X	5	12.5	Ø30 x 79.4	BEAL-2.5X-0355
	3X	5	15	Ø30 x 56.6	BEAL-3X-0355
	4X	4	16	Ø30 x 80.1	BEAL-4X-0355
	5X	3	15	Ø30 x 85.1	BEAL-5X-0355
515-532	1.2X	10	12	Ø30 x 58.2	BEAL-1.2X-0532
	1.5X	9	13.5	Ø30 x 57.3	BEAL-1.5X-0532
	2X	6	12	Ø30 x 59.6	BEAL-2X-0532
	2.5X	6	15	Ø30 x 78.8	BEAL-2.5X-0532

	3X	4.5	15	Ø30 x 58.2	BEAL-3X-0532
	4X	4	16	Ø30 x 81.7	BEAL-4X-0532
	5X	3	15	Ø30 x 87.6	BEAL-5X-0532
1020-1070	1.2X	10	12	Ø30 x 59.4	BEAL-1.2X-1064
	1.5X	10	15	Ø30 x 58.4	BEAL-1.5X-1064
	2X	6	12	Ø30 x 60.8	BEAL-2X-1064
	2.5X	6	15	Ø30 x 80.6	BEAL-2.5X-1064
	3X	5	15	Ø30 x 59.4	BEAL-3X-1064
	4X	4.5	18	Ø30 x 82.9	BEAL-4X-1064
	5X	3.5	17.5	Ø30 x 87.5	BEAL-5X-1064

YBE Series Beam Expanders for 1µm Lasers

YBE series beam expanders are intended for low power (500W) lasers such as Nd:YAG and Yb doped fiber lasers operating near the 1µm wavelength. The beam expanders are of Galilean design and use multi-spectral Zinc Sulphide for the optics which has an absorption at 1µm of 0.0005cm⁻¹ (similar to ZnSe at 10.6µm). ZnS also has 20 times the thermal conductivity of Fused Silica and a higher refractive index. The refractive index allows a two element design to be used rather than three elements.



Technical specifications

Dimensions	85mm long, 46mm maximum diameter
Focusing	+/-3mm lens spacing from infinity position corresponding to approximately +/- 1.5m focusing distance respectively. Turning the focusing ring translates the lens without rotating it.
Cooling	Air-cooled.
Output aperture	30mm diameter (all magnifications).
Fittings	M30x1.0 thread on input for 4.7mm length, M43x0.5 thread on output for 5mm length.
Materials	Lenses of Multi-Spectral ZnS, body from black anodised aluminium, brass, Delrin and stainless steel.

Part no.	Mag.	Physical input aperture	Max. input beam dia. (approx.)
BEST-1-YBE1.5	1.5	18mm	12mm
BEST-1-YBE2.0	2.0	15mm	10mm
BEST-1-YBE2.5	2.5	12mm	8mm
BEST-1-YBE3.0	3.0	10mm	7mm
BEST-1-YBE3.5	3.5	8.3mm	5.5mm
BEST-1-YBE4.0	4.0	7.5mm	5.0mm
BEST-1-YBE5.0	5.0	6.0mm	4.0mm
BEST-1-YBE6.0	6.0	5.0mm	3.5mm
BEST-1-YBE7.0	7.0	4.25mm	2.8mm

(2) 1030–1090nm (1064nm) Beam Expanders

STS Series Beam Expanders (Fused Silica)

Model	MAG	CA1(mm)	CA2(mm)	D2(mm)	L1(mm)	Thread	Motorised
STS-ASS0807/328	1.1	25.5	59	77	85.5	M30x1	Not motorised
STS-ASS0812/328	1.2	25.5	50	77	84	M30x1	Not motorised
STS-ASS0884/328	1.8	25.5	50	77	84	M30x1	Not motorised
STS-ASS3116/328	1.5	25.5	50	77	84	M30x1	Not motorised
STS-ASS3121/328	2	24	50	77	120.2	M30x1	Not motorised
STS-ASS3126/328	2.5	25.5	50	77	138.4	M30x1	Not motorised
STS-ASS3132/328	3	25.5	50	77	150.2	M30x1	Not motorised
STS-ASS3140/328	4	24	50	77	249	M30x1	Not motorised
STS-ASS5040/328	4	14	50	77	100.9	M30x1	Not motorised
STS-ASS5065/328	5	10	50	77	104.5	M30x1	Not motorised
STS-ASS5070/328	6	10	50	77	104.5	M30x1	Not motorised
STS-ASS6008/328	0.8	12	20	46	85	M30x1	Not motorised
STS-ASS6012/328	1.2	12	28	46	85	M30x1	Not motorised
STS-EXK0008/328	0.8	12	12	46	44.7	M30x1	Not motorised
STS-EXK0010/328	1	12	14	46	44.7	M30x1	Not motorised
STS-EXK0012/328	1.2	12	26	46	44.7	M30x1	Not motorised
STS-EXK0015/328	1.5	12	26	46	44.7	M30x1	Not motorised
STS-EXK0020/328	2	12	26	46	44.7	M30x1	Not motorised
STS-EXK0025/328	2.5	11	26	46	44.7	M30x1	Not motorised
STS-EXK0030/328	3	8	26	46	44.7	M30x1	Not motorised
STS-EXK0040/328	4	8	20	46	44.7	M30x1	Not motorised
STS-EXM0015/328	1.5	8	31	65	85.1	M30x1	Divergency motorised
STS-EXM0020/328	2	8	31	65	85.1	M30x1	Divergency motorised
STS-EXM0025/328	2.5	8	31	65	85.1	M30x1	Divergency motorised
STS-EXM0030/328	3	8	31	65	85.1	M30x1	Divergency motorised
STS-EXM0040/328	4	8	31	65	85.1	M30x1	Divergency motorised
STS-EXM0050/328	5	8	31	65	85.1	M30x1	Divergency motorised
STS-EXM0060/328	6	8	31	65	85.1	M30x1	Divergency motorised
STS-EXM0070/328	7	8	31	65	85.1	M30x1	Divergency motorised
STS-EXM0080/328	8	8	31	65	85.1	M30x1	Divergency motorised
STS-EXM0090/328	9	8	31	65	85.1	M30x1	Divergency motorised
STS-EXM0100/328	10	6	31	65	85.1	M30x1	Divergency motorised
STS-EXM0120/328	12	8	31	65	85.1	M30x1	Divergency motorised
STS-EXM0150/328	15	6	31	65	85.1	M30x1	Divergency motorised
STS-EXM0200/328	20	5	31	65	86.4	M30x1	Divergency motorised
STS-EXP0015/328	1.5	8	31	46	85	M30x1	Not motorised
STS-EXP0020/328	2	8	31	46	85	M30x1	Not motorised
STS-EXP0025/328	2.5	8	31	46	85	M30x1	Not motorised
STS-EXP0030/328	3	8	31	46	85	M30x1	Not motorised
STS-EXP0040/328	4	8	31	46	85	M30x1	Not motorised
STS-EXP0050/328	5	8	31	46	85	M30x1	Not motorised
STS-EXP0060/328	6	8	31	46	85	M30x1	Not motorised
STS-EXP0070/328	7	8	31	46	85	M30x1	Not motorised
STS-EXP0080/328	8	8	31	46	85	M30x1	Not motorised
STS-EXP0090/328	9	8	31	46	85	M30x1	Not motorised

STS-EXP0100/328	10	6	31	46	85	M30x1	Not motorised
STS-EXP0120/328	12	8	31	46	85	M30x1	Not motorised
STS-EXP0150/328	15	6	31	46	85	M30x1	Not motorised
STS-EXP0200/328	20	5	31	46	85	M30x1	Not motorised

(3) 515-545nm(532nm) Beam Expanders

BEST-C Series 532nm Adjustable Beam Expander

New part number	Old part number	MAG,x	CA1,mm	CA2,mm	OD(D2),mm	L1,mm	Connection, mm
STY-1.5X-532-C	BEST-532-1.5C	1.5	20	33	46	80.5	M30x1+M43x0.5
STY-2X-532-C	BEST-532-2C	2	20	33	46	80.5	M30x1+M43x0.5
STY-3X-532-C	BEST-532-3C	3	10	33	46	80.5	M30x1+M43x0.5
STY-4X-532-C	BEST-532-4C	4	10	33	46	85	M30x1+M43x0.5
STY-5X-532-C	BEST-532-5C	5	10	33	46	80.5	M30x1+M43x0.5
STY-6X-532-C	BEST-532-6C	6	10	33	46	80.5	M30x1+M43x0.5
STY-7X-532-C	BEST-532-7C	7	10	33	46	85	M30x1+M43x0.5
STY-8X-532-C	BEST-532-8C	8	10	33	46	85	M30x1+M43x0.5
STY-10X-532-C	BEST-532-10C	10	10	33	46	85	M30x1+M43x0.5
STY-12X-532-C	BEST-532-12C	12	12	33	46	85	M30x1+M43x0.5
STY-15X-532-C	BEST-532-15C	15	10	33	46	85	M30x1+M43x0.5
STY-20X-532-C	BEST-532-20C	20	10	33	46	85	M30x1+M43x0.5

BEH Series 532nm Fixed Beam Expanders

Part number	MAG	CA1 (mm)	CA2 (mm)	Connction (mm)	D2xL1 (mm)
BEH-532-1.5	1.5	10.4	21.6	M22x0.75	Φ27x58.4
BEH-532-2	2	10.4	21.6	M22x0.75	Φ27x38.2
BEH-532-3	3	10.4	21.6	M22x0.75	Φ27x67
BEH-532-4	4	10.4	21.6	M22x0.75	Φ27x74
BEH-532-5	5	10.4	21.6	M22x0.75	Φ27x72
BEH-532-6	6	10.4	21.6	M22x0.75	Φ27x71.8
BEH-532-8	8	6	21.6	M22x0.75	Φ27x66
BEH-532-10	10	6	21.6	M22x0.75	Φ27x68
BEH-532-12	12	6	21.6	M22x0.75	Φ27x77.7
BEH-532-15	15	6	21.6	M22x0.75	Φ27x72
BEH-532-20	20	6	21.6	M22x0.75	Φ27x81

BEH Series 532nm Adjustable Beam Expanders

Part number	MAG	CA1 (mm)	CA2 (mm)	Connction (mm)	D2xL1 (mm)
BEH-532-1.5T	1.5	10.4	21.6	M22x0.75	Φ27x58.4
BEH-532-2T	2	10.4	21.6	M22x0.75	Φ27x38.2
BEH-532-3T	3	10.4	21.6	M22x0.75	Φ27x67
BEH-532-4T	4	10.4	21.6	M22x0.75	Φ27x74
BEH-532-5T	5	10.4	21.6	M22x0.75	Φ27x72
BEH-532-6T	6	10.4	21.6	M22x0.75	Φ27x71.8
BEH-532-8T	8	6	21.6	M22x0.75	Φ27x66
BEH-532-10T	10	6	21.6	M22x0.75	Φ27x68
BEH-532-12T	12	6	21.6	M22x0.75	Φ27x77.7
BEH-532-15T	15	6	21.6	M22x0.75	Φ27x72
BEH-532-20T	20	6	21.6	M22x0.75	Φ27x81

Remark: The input lens is quartz and output lens is optical glass. Optical glass output lens is available upon request.

STS Series 515-545nm Beam Expanders

Model	MAG	Material	CA1(mm)	CA2(mm)	D2(mm)	L1(mm)	Thread	Motorised
STS-EXK0008/292	0.8	fs	12	12	46	44.7	M30x1	not motorised
STS-EXK0010/292	1	fs	12	14	46	44.7	M30x1	not motorised
STS-EXK0012/292	1.2	fs	12	26	46	44.7	M30x1	not motorised
STS-EXK0015/292	1.5	fs	12	26	46	44.7	M30x1	not motorised
STS-EXK0020/292	2	fs	12	26	46	44.7	M30x1	not motorised
STS-EXK0025/292	2.5	fs	11	26	46	44.7	M30x1	not motorised
STS-EXK0030/292	3	fs	8	26	46	44.7	M30x1	not motorised

STS-EXK0040/292	4	fs	8	20	46	44.7	M30x1	not motorised
STS-EXM0015/292	1.5	fs	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0020/292	2	fs	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0025/292	2.5	fs	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0030/292	3	fs	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0040/292	4	fs	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0050/292	5	fs	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0060/292	6	fs	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0070/292	7	fs	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0080/292	8	fs	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0090/292	9	fs	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0100/292	10	fs	6	31	65	85.1	M30x1	divergency motorised
STS-EXM0120/292	12	fs	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0150/292	15	fs	6	31	65	85.1	M30x1	divergency motorised
STS-EXM0200/292	20	fs	5	31	65	85.1	M30x1	divergency motorised
STS-EXP0015/292	1.5	fs	8	31	46	85	M30x1	not motorised
STS-EXP0020/292	2	fs	8	31	46	85	M30x1	not motorised
STS-EXP0025/292	2.5	fs	8	31	46	85	M30x1	not motorised
STS-EXP0030/292	3	fs	8	31	46	85	M30x1	not motorised
STS-EXP0040/292	4	fs	8	31	46	85	M30x1	not motorised
STS-EXP0050/292	5	fs	8	31	46	85	M30x1	not motorised
STS-EXP0060/292	6	fs	8	31	46	85	M30x1	not motorised
STS-EXP0070/292	7	fs	8	31	46	85	M30x1	not motorised
STS-EXP0080/292	8	fs	8	31	46	85	M30x1	not motorised
STS-EXP0090/292	9	fs	8	31	46	85	M30x1	not motorised
STS-EXP0100/292	10	fs	6	31	46	85	M30x1	not motorised
STS-EXP0120/292	12	fs	8	31	46	85	M30x1	not motorised
STS-EXP0150/292	15	fs	6	31	46	85	M30x1	not motorised
STS-EXP0200/292	20	fs	5	31	46	85	M30x1	not motorised

(4) 343-355nm(355nm) Beam Expanders

BEST-C Series 355nm Adjustable Beam Expander

New part no.	Old part number	MAG, x	CA1,mm	CA2,mm	OD(D2),mm	L1,mm	Connection, mm
STY-1.1X-355-2-M30X1	BEST-355-1.1-0.9C	+1.1x/-0.9x	14	16	41	75.5	M30x1
STY-1.5X-355-2-M30X1	BEST-355-1.5-0.66C	+1.5x/-0.66x	14	16	41	75.5	M30x1
STY-1.5X-355	BEST-355-1.5C	1.5	20	33	46	88	M30x1+M43x0.5
STY-2X-355	BEST-355-2C	2	20	33	46	80.5	M30x1+M43x0.5
STY-2.5X-355	BEST-355-2.5C	2.5	10	33	46	80.5	M30x1+M43x0.5
STY-3X-355	BEST-355-3C	3	10	33	46	80.5	M30x1+M43x0.5
STY-3.5X-355	BEST-355-3.5C	3.5	10	33	46	80.5	M30x1+M43x0.5
STY-4X-355	BEST-355-4C	4	3	33	46	85	M30x1+M43x0.5
STY-5X-355	BEST-355-5C	5	8	33	46	80.5	M30x1+M43x0.5
STY-6X-355	BEST-355-6C	6	8	33	46	80.5	M30x1+M43x0.5
STY-7X-355	BEST-355-7C	7	10	33	46	85	M30x1+M43x0.5
STY-8X-355	BEST-355-8C	8	12	33	46	85	M30x1+M43x0.5
STY-10X-355	BEST-355-10C	10	10	33	46	85	M30x1+M43x0.5
STY-12X-355	BEST-355-12C	12	12	33	46	85	M30x1+M43x0.5
STY-14X-355	BEST-355-14C	14	12	33	46	85	M30x1+M43x0.5
STY-15X-355	BEST-355-15C	15	10	33	46	92.1	M30x1+M43x0.5
STY-20X-355	BEST-355-20C	20	10	33	46	92	M30x1+M43x0.5

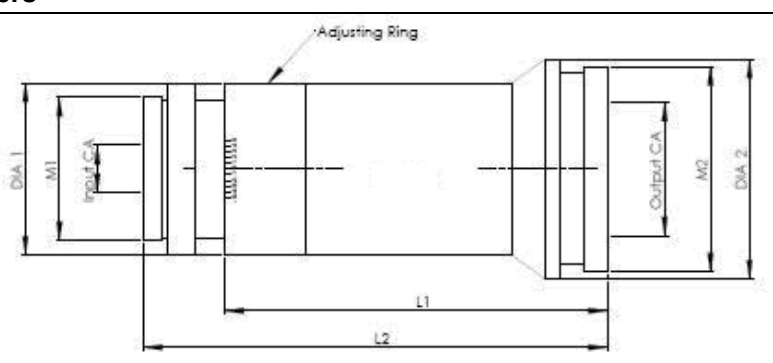
BEH Series 355nm Fixed Beam Expanders

Part number	MAG	CA1 (mm)	CA2 (mm)	Connction (mm)	D2xL1 (mm)
BEH-355-1.5	1.5	6	21.6	M22x0.75	Φ27x37.5
BEH-355-2	2	6	21.6	M22x0.75	Φ27x46.5
BEH-355-3	3	6	21.6	M22x0.75	Φ27x52
BEH-355-4	4	6	21.6	M22x0.75	Φ27x70.7
BEH-355-5	5	6	21.6	M22x0.75	Φ27x76
BEH-355-6	6	6	21.6	M22x0.75	Φ27x62
BEH-355-8	8	6	21.6	M22x0.75	Φ27x64
BEH-355-10	10	6	21.6	M22x0.75	Φ27x66
BEH-355-12	12	6	21.6	M22x0.75	Φ27x84.5
BEH-355-15	15	6	21.6	M22x0.75	Φ27x70.5
BEH-355-20	20	6	21.6	M22x0.75	Φ27x87.1

BEH Series 355nm Adjustable Beam Expanders

Part number	MAG	CA1 (mm)	CA2 (mm)	Connction (mm)	D2xL1 (mm)
BEH-355-1.5T	1.5	6	21.6	M22x0.75	Φ27x37.5
BEH-355-2T	2	6	21.6	M22x0.75	Φ27x46.5
BEH-355-3T	3	6	21.6	M22x0.75	Φ27x52
BEH-355-4T	4	6	21.6	M22x0.75	Φ27x70.7
BEH-355-5T	5	6	21.6	M22x0.75	Φ27x76
BEH-355-6T	6	6	21.6	M22x0.75	Φ27x62
BEH-355-8T	8	6	21.6	M22x0.75	Φ27x64
BEH-355-10T	10	6	21.6	M22x0.75	Φ27x66
BEH-355-12T	12	6	21.6	M22x0.75	Φ27x84.5
BEH-355-15T	15	6	21.6	M22x0.75	Φ27x70.5
BEH-355-20T	20	6	21.6	M22x0.75	Φ27x87.1

Remark: All the lenses are quartz.

BEST-W Series 355nm Beam Expanders


Part No.	MAG	CA1 (mm)	CA2(mm)	M1	M2	L2(mm)	L1(mm)
BEST-355-1.5T-W	1.5	7.0	24.0	M30×1	M43x0.5	48.1	76.5
BEST-355-2T-W	2	7.0	24.0	M30×1	M43x0.5	47.2	75.6
BEST-355-3T-W	3	7.0	24.0	M30×1	M43x0.5	48.9	77.3
BEST-355-4T-W	4	8.0	28.0	M30×1	M43x0.5	48.9	75.0
BEST-355-5T-W	5	6.0	28.0	M30×1	M43x0.5	56.5	73.5
BEST-355-7T-W	7	8.0	28.0	M30×1	M43x0.5	73.13	88.13
BEST-355-10T-W	10	6.0	28.0	M30×1	M43x0.5	80.5	96.0
BEST-355-20T-W	20	6.0	28.0	M30×1	M43x0.5	81.3	97.0

STS Series 343–355nm Beam Expanders (Fused Silica)

Model	WL(nm)	MAG	CA1(mm)	CA2(mm)	D2(mm)	L1(mm)	Thread	Motorised
STS-EXK0008/075	355	0.8	12	12	46	44.7	M30x1	not motorised
STS-EXK0008/574	343 - 355	0.8	12	12	46	44.7	M30x1	not motorised
STS-EXK0010/574	343 - 355	1	12	14	46	44.7	M30x1	not motorised
STS-EXK0012/075	355	1.2	12	26	46	44.7	M30x1	not motorised
STS-EXK0012/574	343 - 355	1.2	12	26	46	44.7	M30x1	not motorised
STS-EXK0015/075	355	1.5	12	26	46	44.7	M30x1	not motorised
STS-EXK0015/574	343 - 355	1.5	12	26	46	44.7	M30x1	not motorised
STS-EXK0020/075	355	2	12	26	46	44.7	M30x1	not motorised
STS-EXK0020/574	343 - 355	2	12	26	46	44.7	M30x1	not motorised
STS-EXK0025/075	355	2.5	11	26	46	44.7	M30x1	not motorised
STS-EXK0025/574	343 - 355	2.5	11	26	46	44.7	M30x1	not motorised
STS-EXK0030/075	355	3	8	26	46	44.7	M30x1	not motorised
STS-EXK0030/574	343 - 355	3	8	26	46	44.7	M30x1	not motorised
STS-EXK0040/075	355	4	8	20	46	44.7	M30x1	not motorised
STS-EXK0040/574	343 - 355	4	8	20	46	44.7	M30x1	not motorised
STS-EXM0015/075	355	1.5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0015/574	343 - 355	1.5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0020/075	355	2	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0020/574	343 - 355	2	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0025/075	355	2.5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0025/574	343 - 355	2.5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0030/075	355	3	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0030/574	343 - 355	3	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0040/075	355	4	8	31	65	85.1	M30x1	divergency motorised

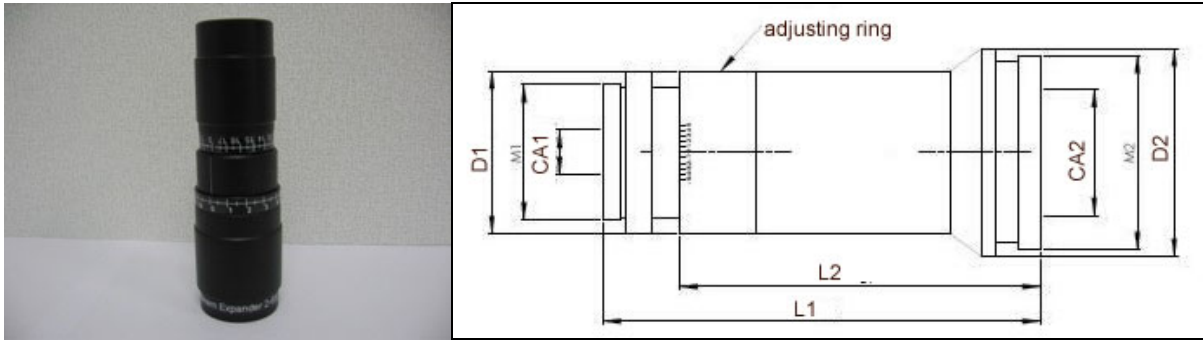
STS-EXM0040/574	343 - 355	4	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0050/075	355	5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0050/574	343 - 355	5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0060/075	355	6	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0060/574	343 - 355	6	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0070/075	355	7	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0070/574	343 - 355	7	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0080/075	355	8	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0080/574	343 - 355	8	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0090/075	355	9	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0090/574	343 - 355	9	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0100/075	355	10	6	31	65	85.1	M30x1	divergency motorised
STS-EXM0100/574	343 - 355	10	6	31	65	85.1	M30x1	divergency motorised
STS-EXM0120/075	355	12	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0120/574	343 - 355	12	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0150/075	355	15	6	31	65	85.1	M30x1	divergency motorised
STS-EXM0150/574	343 - 355	15	6	31	65	85.1	M30x1	divergency motorised
STS-EXM0200/075	355	20	5	31	65	85.1	M30x1	divergency motorised
STS-EXM0200/574	343 - 355	20	5	31	65	85.1	M30x1	divergency motorised
STS-EXP0015/075	355	1.5	8	31	46	85	M30x1	not motorised
STS-EXP0015/574	343 - 355	1.5	8	31	46	85	M30x1	not motorised
STS-EXP0020/075	355	2	8	31	46	85	M30x1	not motorised
STS-EXP0020/574	343 - 355	2	8	31	46	85	M30x1	not motorised
STS-EXP0025/075	355	2.5	8	31	46	85	M30x1	not motorised
STS-EXP0025/574	343 - 355	2.5	8	31	46	85	M30x1	not motorised
STS-EXP0030/075	355	3	8	31	46	85	M30x1	not motorised
STS-EXP0030/574	343 - 355	3	8	31	46	85	M30x1	not motorised
STS-EXP0040/075	355	4	8	31	46	85	M30x1	not motorised
STS-EXP0040/574	343 - 355	4	8	31	46	85	M30x1	not motorised
STS-EXP0050/075	355	5	8	31	46	85	M30x1	not motorised
STS-EXP0050/574	343 - 355	5	8	31	46	85	M30x1	not motorised
STS-EXP0060/075	355	6	8	31	46	85	M30x1	not motorised
STS-EXP0060/574	343 - 355	6	8	31	46	85	M30x1	not motorised
STS-EXP0070/075	355	7	8	31	46	85	M30x1	not motorised
STS-EXP0070/574	343 - 355	7	8	31	46	85	M30x1	not motorised
STS-EXP0080/075	355	8	8	31	46	85	M30x1	not motorised
STS-EXP0080/574	343 - 355	8	8	31	46	85	M30x1	not motorised
STS-EXP0090/075	355	9	8	31	46	85	M30x1	not motorised
STS-EXP0090/574	343 - 355	9	8	31	46	85	M30x1	not motorised
STS-EXP0100/075	355	10	6	31	46	85	M30x1	not motorised
STS-EXP0100/574	343 - 355	10	6	31	46	85	M30x1	not motorised
STS-EXP0120/075	355	12	8	31	46	85	M30x1	not motorised
STS-EXP0120/574	343 - 355	12	8	31	46	85	M30x1	not motorised
STS-EXP0150/075	355	15	6	31	46	85	M30x1	not motorised
STS-EXP0150/574	343 - 355	15	6	31	46	85	M30x1	not motorised
STS-EXP0200/075	355	20	5	31	46	85	M30x1	not motorised
STS-EXP0200/574	343 - 355	20	5	31	46	85	M30x1	not motorised

(5) 266nm Beam Expanders

STS Series 266nm Beam Expanders (Fused Silica)

Model	WL(nm)	MAG	CA1(mm)	CA2(mm)	DA2(mm)	L1(mm)	Thread	Motorised
STS-EXM0015/199	266	1.5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0020/199	266	2	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0030/199	266	3	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0050/199	266	5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0070/199	266	7	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0100/199	266	10	6	31	65	85.1	M30x1	divergency motorised
STS-EXP0015/199	266	1.5	8	31	46	85	M30x1	not motorised
STS-EXP0020/199	266	2	8	31	46	85	M30x1	not motorised
STS-EXP0030/199	266	3	8	31	46	85	M30x1	not motorised
STS-EXP0050/199	266	5	8	31	46	85	M30x1	not motorised
STS-EXP0070/199	266	7	8	31	46	85	M30x1	not motorised
STS-EXP0100/199	266	10	6	31	46	85	M30x1	not motorised

BEST-W Series 266nm Beam Expanders



Part No.	MAG	CA1(mm)	CA2(mm)	D1(mm)	D2(mm)	L2(mm)	L1(mm)
BEST-266-1.5X-W	1.5	8.0	24.0	30.0	30.0	46.2	63.7
BEST-266-2X-W	2	8.0	24.0	30.0	30.0	55.0	73.0
BEST-266-3X-W	3	6.0	30.0	37.6	46.0	71.0	85.0
BEST-266-5X-W	5	6.0	30.0	37.6	46.0	71.0	85.0
BEST-266-10X-W	10	3.0	30.0	37.6	46.0	74.0	88.0
BEST-266-20X-W	20	1.5	30.0	37.6	46.0	75.0	89.5

Beam Expanders at Various Wavelengths (405nm, 633nm, 808-980nm, 1550nm, 1850-1980nm)

(1) 405nm Beam Expanders

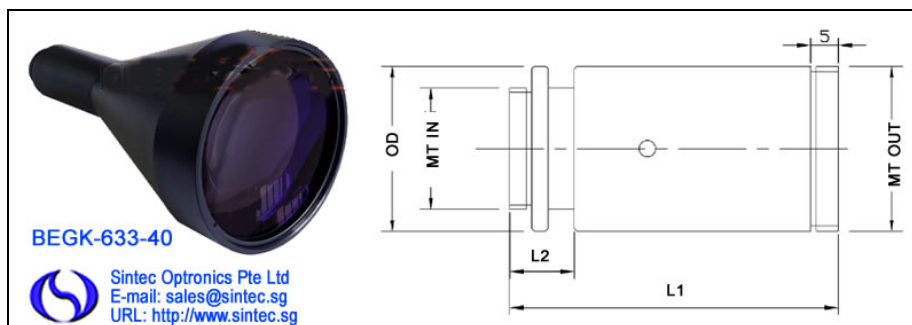
STS Series 405nm Beam Expanders

Model	WL(nm)	MAG	CA1(mm)	CA2(mm)	D2(mm)	L1(mm)	Thread	Motorised
STS-EXM0015/173	405	1.5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0020/173	405	2	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0030/173	405	3	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0050/173	405	5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0070/173	405	7	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0100/173	405	10	6	31	65	85.1	M30x1	divergency motorised
STS-EXM0200/173	405	20	5	31	65	85.1	M30x1	divergency motorised
STS-EXP0015/173	405	1.5	8	31	46	85	M30x1	not motorised
STS-EXP0020/173	405	2	8	31	46	85	M30x1	not motorised
STS-EXP0030/173	405	3	8	31	46	85	M30x1	not motorised
STS-EXP0050/173	405	5	8	31	46	85	M30x1	not motorised
STS-EXP0070/173	405	7	8	31	46	85	M30x1	not motorised
STS-EXP0100/173	405	10	6	31	46	85	M30x1	not motorised
STS-EXP0200/173	405	20	5	31	46	85	M30x1	not motorised

BEST-W Series 405nm Adjustable Beam Expander

Part No.	MAG	CA1(mm)	CA2(mm)	D2 (mm)	L1 (mm)
BEST-405-1.5-TW	1.5	6.0	30.0	46	85
BEST-405-2-TW	2	6.0	30.0	46	85
BEST-405-3-TW	3	6.0	30.0	46	85
BEST-405-5-TW	5	6.0	30.0	46	85
BEST-405-7-TW	7	4.2	30.0	46	85
BEST-405-10-TW	10	3.0	30.0	46	89
BEST-405-20-TW	20	1.5	30.0	46	95

(2) 633nm HeNe Laser Beam Expanders



Part No.	MAG	EP, mm	CA2, mm	L1, mm	L2, mm	OD, mm	MT IN	MT OUT
BEGK-633-2	2	8	18	59.65	11.72	30	M22X0.75	M30X1
BEGK-633-3	3	8	18	60.42	12.48	30	M22X0.75	M30X1
BEGK-633-4	4	8	18	60.06	12.12	30	M22X0.75	M30X1
BEGK-633-5	5	8	18	59.57	11.63	30	M22X0.75	M30X1
BEGK-633-6	6	8	18	59.92	11.99	30	M22X0.75	M30X1
BEGK-633-8	8	6	18	60.43	12.50	30	M22X0.75	M30X1
BEGK-633-10	10	6	18	60.65	12.71	30	M22X0.75	M30X1
BEGK-633-15	15	8	18	99.10	--	30	M22X0.75	--
BEGK-633-20	20	8	30	102.19	--	45	M30X1	M43X0.75
BEGK-633-30	30	8	32	149.81	--	45	M22X0.75	M43X0.75
BEGK-633-40	40	8	100	232.6	--	112	M22X0.75	--

(3) 808-980nm Beam Expanders

STS Series 808-980nm Beam Expanders (Fused Silica)

Model	WL(nm)	MAG	CA1(mm)	CA2(mm)	D2(mm)	L1(mm)	Thread	Motorised
STS-EXM0020/094	808 - 980	2	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0030/094	808 - 980	3	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0050/094	808 - 980	5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0100/094	808 - 980	10	6	31	65	85.1	M30x1	divergency motorised
STS-EXP0020/094	808 - 980	2	8	31	46	85	M30x1	not motorised
STS-EXP0030/094	808 - 980	3	8	31	46	85	M30x1	not motorised
STS-EXP0050/094	808 - 980	5	8	31	46	85	M30x1	not motorised
STS-EXP0100/094	808 - 980	10	6	31	46	85	M30x1	not motorised

(4) 1550nm Beam Expanders

STS Series 1550nm Beam Expanders (Fused Silica)

Model	WL(nm)	MAG	CA1(mm)	CA2(mm)	D2(mm)	L1(mm)	Thread	Motorised
STS-EXM0015/008	1550	1.5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0020/008	1550	2	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0025/008	1550	2.5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0030/008	1550	3	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0040/008	1550	4	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0050/008	1550	5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0060/008	1550	6	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0070/008	1550	7	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0080/008	1550	8	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0090/008	1550	9	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0100/008	1550	10	6	31	65	85.1	M30x1	divergency motorised
STS-EXM0120/008	1550	12	8	31	65	85.1	M30x1	divergency motorised
STS-EXP0015/008	1550	1.5	8	31	46	85	M30x1	not motorised
STS-EXP0020/008	1550	2	8	31	46	85	M30x1	not motorised
STS-EXP0025/008	1550	2.5	8	31	46	85	M30x1	not motorised
STS-EXP0030/008	1550	3	8	31	46	85	M30x1	not motorised
STS-EXP0040/008	1550	4	8	31	46	85	M30x1	not motorised
STS-EXP0050/008	1550	5	8	31	46	85	M30x1	not motorised
STS-EXP0060/008	1550	6	8	31	46	85	M30x1	not motorised
STS-EXP0070/008	1550	7	8	31	46	85	M30x1	not motorised
STS-EXP0080/008	1550	8	8	31	46	85	M30x1	not motorised
STS-EXP0090/008	1550	9	8	31	46	85	M30x1	not motorised
STS-EXP0100/008	1550	10	6	31	46	85	M30x1	not motorised
STS-EXP0120/008	1550	12	8	31	46	85	M30x1	not motorised

(5) 1850-1980nm Beam Expanders

STS Series 1850-1980nm Beam Expanders

Model	MAG	CA1(mm)	CA2(mm)	D2(mm)	L1(mm)	Thread	Motorised
STS-EXM0015/159	1.5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0020/159	2	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0025/159	2.5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0030/159	3	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0040/159	4	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0050/159	5	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0060/159	6	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0070/159	7	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0080/159	8	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0090/159	9	8	31	65	85.1	M30x1	divergency motorised
STS-EXM0100/159	10	6	31	65	85.1	M30x1	divergency motorised
STS-EXM0120/159	12	8	31	65	85.1	M30x1	divergency motorised
STS-EXP0015/159	1.5	8	31	46	85	M30x1	not motorised
STS-EXP0020/159	2	8	31	46	85	M30x1	not motorised
STS-EXP0025/159	2.5	8	31	46	85	M30x1	not motorised
STS-EXP0030/159	3	8	31	46	85	M30x1	not motorised
STS-EXP0040/159	4	8	31	46	85	M30x1	not motorised
STS-EXP0050/159	5	8	31	46	85	M30x1	not motorised
STS-EXP0060/159	6	8	31	46	85	M30x1	not motorised
STS-EXP0070/159	7	8	31	46	85	M30x1	not motorised
STS-EXP0080/159	8	8	31	46	85	M30x1	not motorised
STS-EXP0090/159	9	8	31	46	85	M30x1	not motorised
STS-EXP0100/159	10	6	31	46	85	M30x1	not motorised
STS-EXP0120/159	12	8	31	46	85	M30x1	not motorised

Zoom Beam Expanders

1. 266nm Zoom Beam Expanders

Model	WL(nm)	MAG	CA1(mm)	CA2(mm)	DA2(mm)	L1(mm)	Thread	Motorised
STS-EXZ3976/199	266	1.0 - 8.0	9	30	160x70.5	200.4	---	zoom motorised
STS-EXZ5075/199	266	1.0 - 8.0	10.3	31	58	162	C-mount	not motorised
STS-EZM5075/199	266	1.0 - 8.0	10	30	58	162	C-mount	zoom motorised
BEST-266-1-8X-W	266	1x-8x	10	30		162-200		

2. 343-355nm Zoom Beam Expanders

Model	WL(nm)	MAG	CA1(mm)	CA2(mm)	D2(mm)	L1(mm)	Thread	Motorised
STS-EXZ3976/075	355	1.0 - 8.0	9	30	160x70.5	200.4	---	zoom motorised
STS-EXZ3976/574	343 - 355	1.0 - 8.0	9	30	160x70.5	200.4	---	zoom motorised
STS-EXZ5075/075	355	1.0 - 8.0	10.3	31	58	162	C-mount	not motorised
STS-EXZ5075/574	343 - 355	1.0 - 8.0	10.3	31	58	162	C-mount	not motorised
STS-EXZ5310/075	355	1.0 - 3.0	10.5	20	47	85.2	C-mount	not motorised
STS-EXZ5310/574	343 - 355	1.0 - 3.0	10.5	20	47	85.2	C-mount	not motorised
STS-EXZ5311/075	355	1.0 - 3.0	10.5	20	47	85.2	M30x1	not motorised
STS-EXZ5311/574	343 - 355	1.0 - 3.0	10.5	20	47	85.2	M30x1	not motorised
STS-EZM5075/075	355	1.0 - 8.0	10	30	58	162	C-mount	zoom motorised
STS-EZM5075/574	343 - 355	1.0 - 8.0	10	30	58	162	C-mount	zoom motorised
STS-EZM5310/075	355	1.0 - 3.0	10.5	20	47	105.8	C-mount	zoom motorised
STS-EZM5310/574	343 - 355	1.0 - 3.0	10.5	20	47	105.8	C-mount	zoom motorised
STS-EZM5311/075	355	1.0 - 3.0	10.5	20	47	85.2	M30x1	zoom motorised
STS-EZM5311/574	343 - 355	1.0 - 3.0	10.5	20	47	85.2	M30x1	zoom motorised
BEST-355-1-8X-W	355	1x-8x	10	30		85-200		
BEST-355-1-8X-MOT-W	355	1x-8x	12	32		188		zoom motorised
BEST-355-2-8X-W	355	2x-8x	10	30		142-149		
BEST-355-2-8X-A-W	355	2x-8x	11	60		183-192		

3. 532nm Zoom Beam Expanders

Model	WL(nm)	MAG	CA1(mm)	CA2(mm)	D2 (mm)	L1(mm)	Thread	Motorised
STS-EXZ3976/292	515 - 545	1.0 - 8.0	9	30	160x70.5	200.4	---	zoom motorised
STS-EXZ5076/292	515 - 545	1.0 - 8.0	10.3	31	58	162	C-mount	not motorised
STS-EXZ5310/292	515 - 545	1.0 - 3.0	10.5	20	47	85.2	C-mount	not motorised
STS-EXZ5311/292	515 - 545	1.0 - 3.0	10.5	20	47	85.2	M30x1	not motorised
STS-EXZ5312/292	515 - 545	1.2 - 3.0	18.5	43	80	230.2	M30x1	not motorised
STS-EZM5076/292	515 - 545	1.0 - 8.0	10	30	58	162	C-mount	zoom motorised
STS-EZM5310/292	515 - 545	1.0 - 3.0	10.5	20	47	105.8	C-mount	zoom motorised
STS-EZM5311/292	515 - 545	1.0 - 3.0	10.5	20	47	85.2	M30x1	zoom motorised
BEST-532-1-3X-W	532	1x-3x	10	20		85.0		
BEST-532-2-8X-W	532	2x-8x	10	30		131.1		
BEST-532-2-8X-A-W	532	2x-8x	11	60		190		

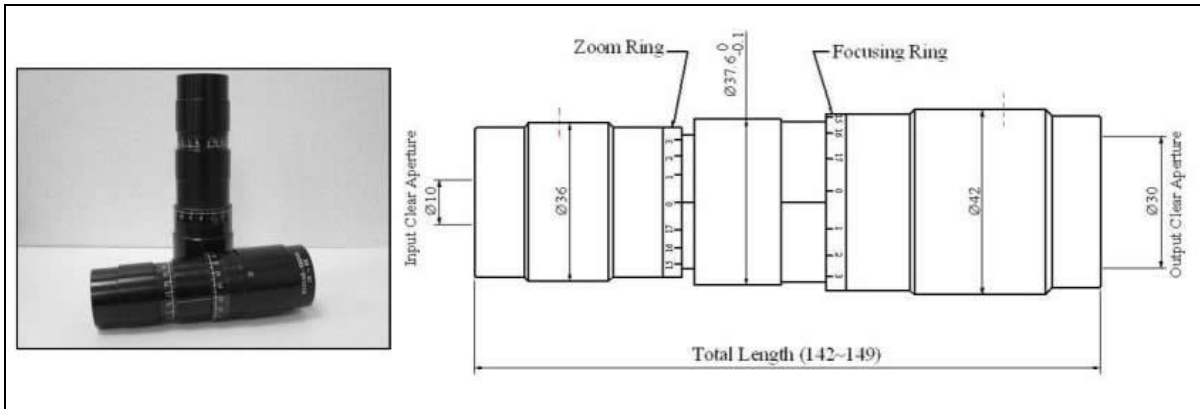
4. 800nm Zoom Beam Expanders

Part No.	WL(nm)	MAG	Input CA (mm)	Output CA (mm)	Length (mm)
BEST-800-2-8X-W	800	2x-8x	10	30	142-149

5. 1064nm Zoom Beam Expanders

Model	WL(nm)	MAG	CA1(mm)	CA2(mm)	D2 (mm)	L1(mm)	Thread	Motorised
STS-EXZ3976/328	1030-1090	1.0 - 8.0	9	30	160x70.5	200.4	---	zoom motorised
STS-EXZ5076/328	1030-1090	1.0 - 8.0	10.3	31	58	162.6	C-mount	not motorised
STS-EXZ5310/328	1030-1090	1.0 - 3.0	10.5	20	47	85.2	C-mount	not motorised
STS-EXZ5311/328	1030-1090	1.0 - 3.0	10.5	20	47	85.2	M30x1	not motorised
STS-EXZ5312/328	1030-1090	1.2 - 3.0	18.5	43	80	230.2	M30x1	not motorised
STS-EZM5076/328	1030-1090	1.0 - 8.0	10	30	58	162	C-mount	zoom motorised
STS-EZM5310/328	1030-1090	1.0 - 3.0	10.5	20	47	105.8	C-mount	zoom motorised
STS-EZM5311/328	1030-1090	1.0 - 3.0	10.5	20	47	85.2	M30x1	zoom motorised

BEST-1064-1-3X-W	1064	1x-3x	10	20		85.0		
BEST-1064-1-3X-AW	1064	1x-3x	20	38		118.0		
BEST-1064-2-8X-W	1064	2x-8x	10	30		142-149		
BEST-1064-2-8X-QW	1064	2x-8x	12	32		195		
BEST-1064-2-8X-AW	1064	2x-8x	13	60.67		162-169		



6. 1550nm Zoom Beam Expanders

Model	MAG	CA1(mm)	CA2 (mm)	D2(mm)	L1(mm)	Thread	Motorised
STS-EXZ5310/008	1.0 - 3.0	10.5	20	47	85.2	C-mount	not motorised
STS-EXZ5311/008	1.0 - 3.0	10.5	20	47	85.2	M30x1	not motorised

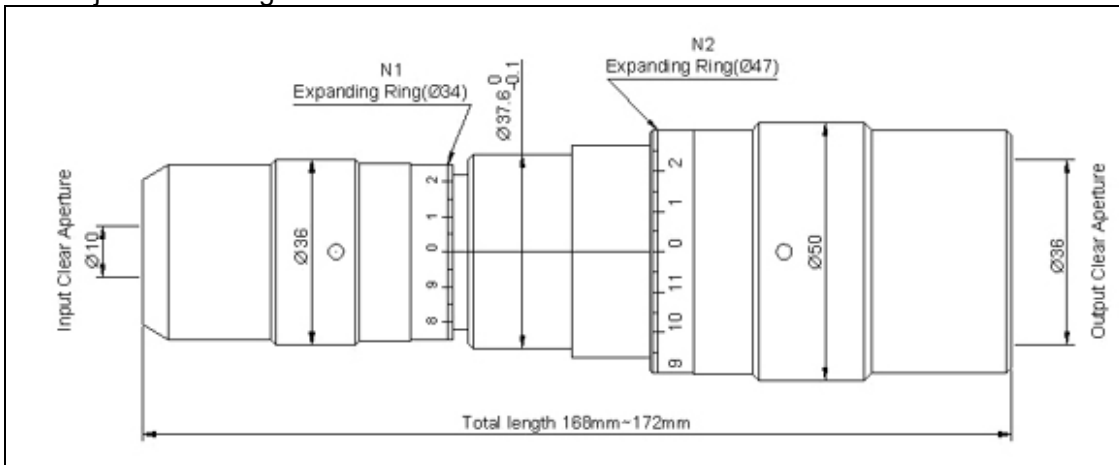
7. 1850-1980nm Zoom Beam Expanders

Model	WL(nm)	MAG	CA1(mm)	CA2(mm)	D2(mm)	L1(mm)	Thread	Motorised
STS-EXZ5310/159	1850 - 1980	1.0 - 3.0	10.5	20	47	85.2	C-mount	not motorised
STS-EXZ5311/159	1850 - 1980	1.0 - 3.0	10.5	20	47	82.5	M30x1	not motorised

8. 9.4um & 10.6um CO2 Laser Zoom Beam Expanders

Specifications

- For collimation of Co₂ laser power < 1.5KW/cm²
- Variable magnifications 2X-8X
- Galilei Design
- Adjustable divergence



Part No.	Magnification	Input CA (mm)	Output CA (mm)	Length (mm)
BEST-10.6-1-4X-W	1X-4X	18	48	135
BEST-10.6-2-6X-W	2X-6X	16	96	205.78-212.37
BEST-9.4-2-8X-W	2X-8X	10	36	168-172
BEST-10.6-2-8X-W	2X-8X	10	36	168-172

9. BEAL Series Motorized Zoom Beam Expanders

BEAL is a zoom beam expander designed for automated applications. It combines multiple lenses to provide variable magnification and automated divergence adjustment from 1x to 6x. Driver and all the motors are integrated in the casing of the beam expander which makes it compact and convenient for usage. High pointing stability (<0.1 mrad) and fast magnification speed (1 sec from 1x to 6x) offers suitable performance for precision and high speed industrial applications.

Features

- Aberration minimized design
- Plug & play solution (controller included)
- Suitable for ultrafast picosecond and femtosecond lasers
- Direct control from microcontrollers and embedded systems
- Laser damage threshold up to 100mJ/cm² @ 1064nm, 10ps, 400kHz
- Custom wavelengths are available in the range of 250-3000nm

Standard specifications:



Wavelength	343-355nm, 515-532nm, 1020-1070nm
Magnification factor	1 - 6 continuous
Pointing stability	<0.1mrad
Magnification speed (1x to 6x)	<1 sec
Diffraction limited maximum input beam diameter	6mm
Total transmission	>98%
Lens material	UVFS
LIDT (coating)	>10J/cm ² @ 1064nm, 10ns, 10Hz
Dimensions (H x W x L)	62 x 62 x 161 mm
Control interface	RS232
Housing material	Black anodized aluminum
Collimator hole	Yes

10. BEAL Series Variable Beam Expanders

Variable beam expanders are ideal for systems in which different magnifications and precise control of laser beam divergence are required. We offer Galilean type variable beam expanders with high LIDT AR coatings that minimize ghost reflections. Our variable beam expanders allows to separately adjust magnification and divergence. Two main standard products change magnification in the range of 1x-4x and 2x-8x.

Features

- High pointing stability (<1 mrad)
- Individual reports of beam ellipticity, M2 and pointing stability parameters
- Mounting adapters at the input, output and middle are available on request
- Extended lifetime and LIDT for UV applications



WL, nm	MAG	Max input beam diameter*, mm		Housing dimensions, mm	Product number
343-355	1x-4x	1X	4.0	Ø41 x 120	BEAL-1X-4X-0343-0355-B
		2X	5.5		
		3X	3.0		
		4X	3.0		

	2x-8x	2X 3X 4X 5X 6X 7X 8X	5.0 5.0 4.0 3.0 2.5 2.25 2.0	Ø41 x 145	BEAL-2X-8X-0343-0355-B
450	1x-4x	1X 2X 3X 4X	4.0 5.5 3.0 3.0	Ø41 x 120	BEAL-1X-4X-0450-B
515-532	1x-4x	1X 2X 3X 4X	4.5 6.5 4.0 3.5	Ø41 x 120	BEAL-1X-4X-0515-0532-B
	2x-8x	2X 3X 4X 5X 6X 7X 8X	5.0 5.0 4.0 3.0 2.5 2.25 2.0	Ø41 x 147.5	BEAL-2X-8X-0515-0532-B
1030-1064	1x-4x	1X 2X 3X 4X	4.5 7.0 5.0 4.0	Ø41 x 120	BEAL-1X-4X-1030-1064-B
	2x-8x	2X 3X 4X 5X 6X 7X 8X	5.0 5.0 5.0 4.0 3.0 2.5 2.5	Ø41 x 147.5	BEAL-2X-8X-1030-1064-B

* Max input beam diameter ensuring diffraction limited performance.

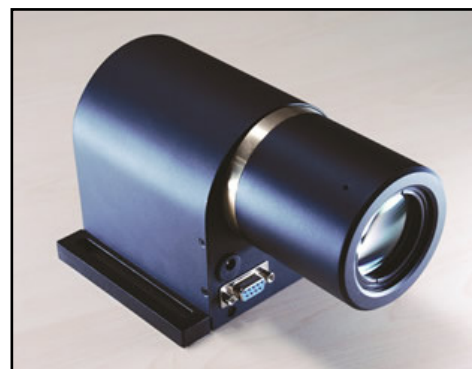
11. BED Series Motorized Zoom Beam Expanders

For automated applications, we developed motorized zoom beam expanders BED-GCD-14 series. They use the 4 lens element optical designs and the build-in adjustment motors for controlling lens groups. With the motorized systems, both magnification and focus can be controlled independently.

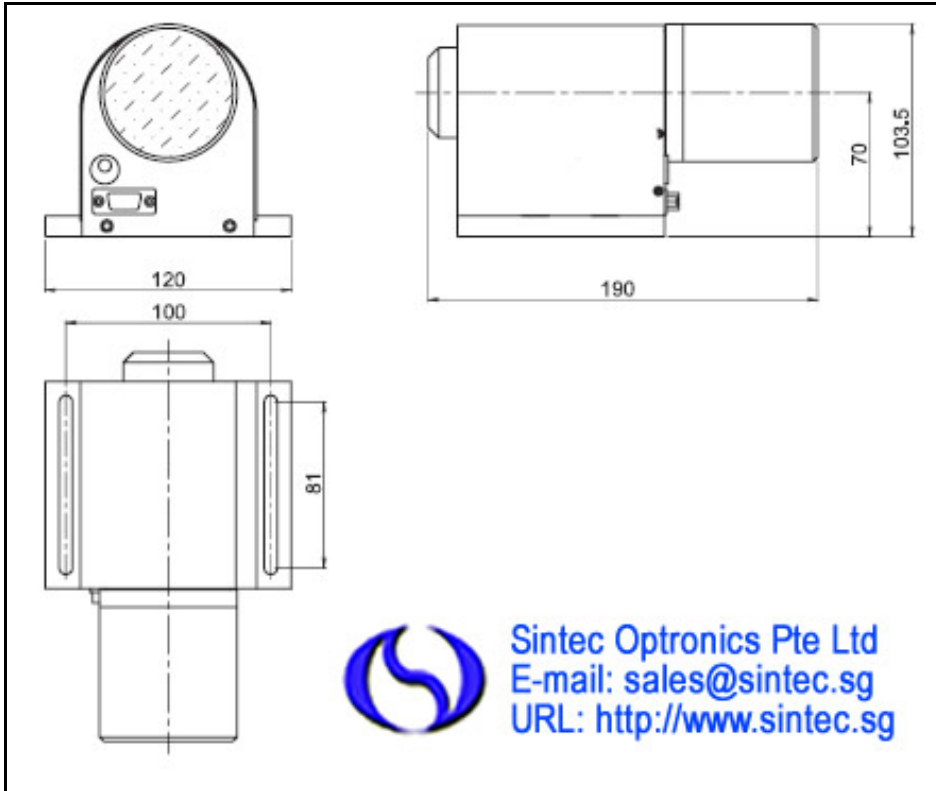
With our optics motorized zoom beam expanders, variable expansion ratio can automatically be set from 1.5X to 6X. This variability helps to reduce machine set up times and provides flexibility to equipment for a wide range of jobs.

Features

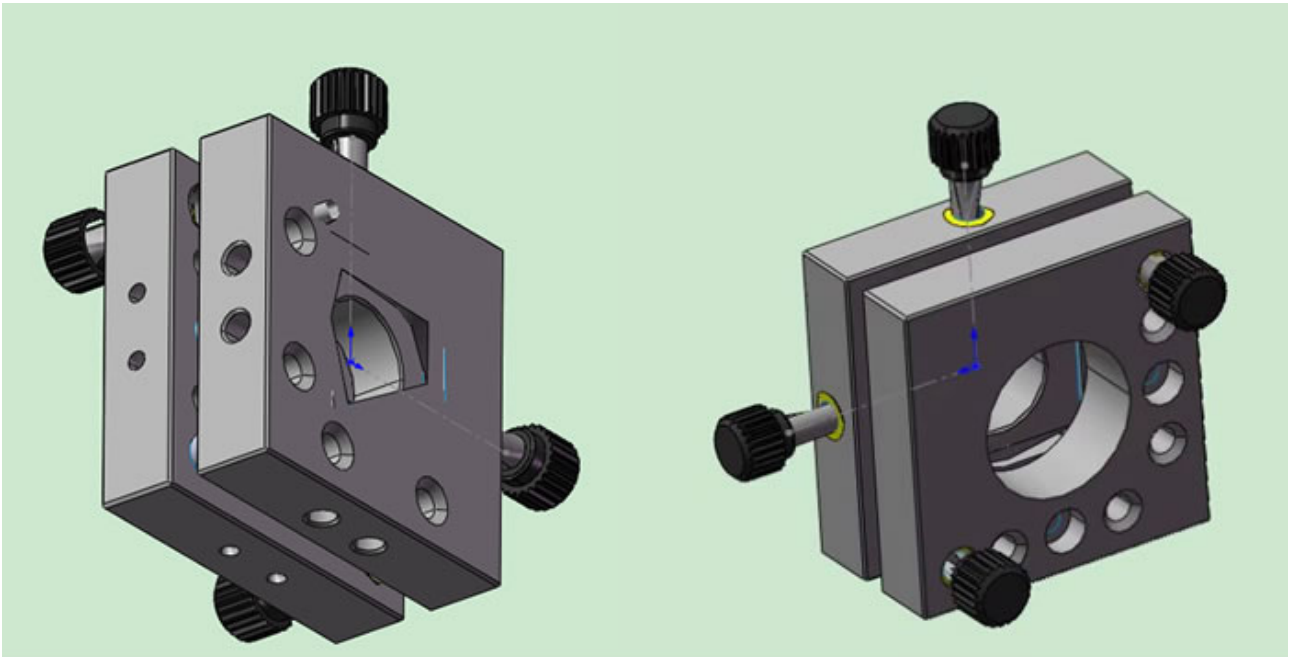
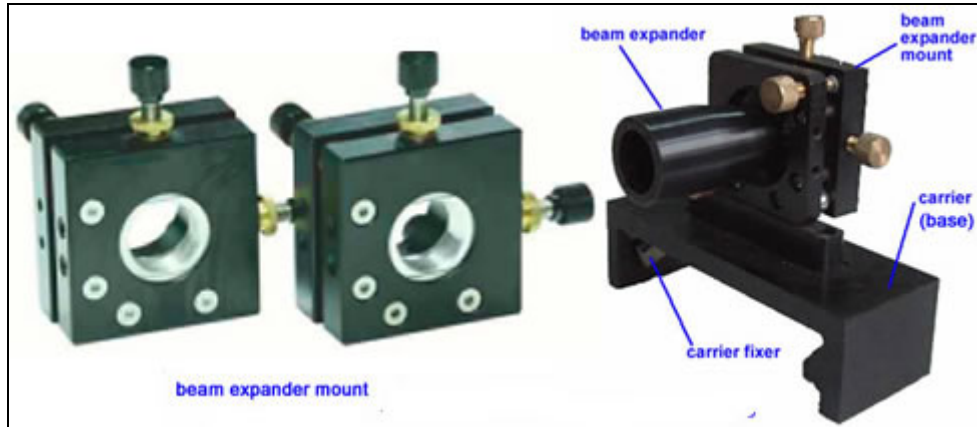
- Continuous variable expansion ratio
- Wavelength 450-650nm, 780-1080nm or 10.6um
- Default expansion ratio setting pre-programmed
- User-defined magnification settings
- Use-controlled focus adjustment
- Communication with PC or joystick with a DSB
- Compact in size at 190x120x103.5mm



Part No.	Magnification	Wavelength	Max. EP (mm)	Output Aperture	Damage Threshold	Transmission
BED-GCD-1401	1.5x ~ 6x	450nm~650nm	Ø4	Ø40	200MW/cm2	> 96%
BED-GCD-1402	1.5x ~ 6x	780nm~1080nm	Ø4	Ø40	200MW/cm2	> 96%
BED-GCD-1403	1.5x ~ 6x	10.6µm	Ø4	Ø40	200MW/cm2	> 96%



Beam Expander Mount



The beam expander mounts are used to hold a beam expander, red pilot diode, mirrors with the screw M22x0.75mm. They are 4D adjustable for optics alignment at angles, positions.

Model: SMH-13-048

4D adjustable (4-axis adjustable) (X and Y direction travel $\pm 2\text{mm}$, X and Z direction tilting $\pm 4\text{ deg}$)

Suitable for the beam expander with a screw of M22x0.75mm

Dimension: 60x60x45mm