



# Electro Optical Components, Inc.

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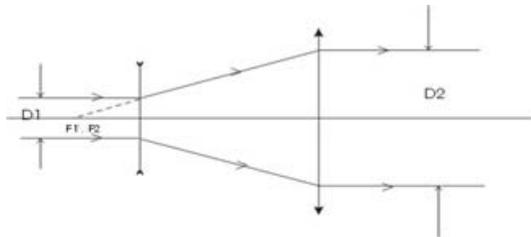


*Optics Leading the Light*

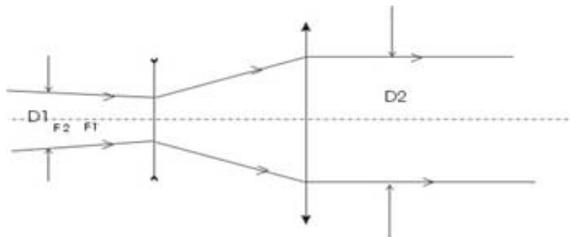
**RONAR-SMITH<sup>®</sup> LASER OPTICS & IR IMAGING**

## BEX Series Adjustable Divergence Beam Expander

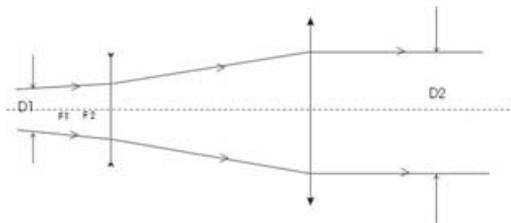
### • Technical Features



1) Parallel beam remains parallel after expanding with the beam expander; the amplification is  $D2/D1$ .



2) If the entrance beam is a converging beam, manual adjustment is required to reduce the distance between two lenses in order to make exit beam parallel.



3) If the entrance beam is a diverging beam, manual adjustment is required to increase the distance between two lenses in order to make exit beam parallel.

**Note: D1, D2 is the size of the beam waist.**

For example RONAR-SMITH® beam expander:

<b>Amplification</b>	<b>Distance change*</b>	<b>+2mm</b>	<b>+1mm</b>	<b>0</b>	<b>-1mm</b>	<b>-2mm</b>
2X	Focal length	+1.4m	+2.9m	$\infty$	-2.3m	-1.2m
3X	Focal length	+3.0m	+5.6m	$\infty$	-6.6m	-3.1m
4X	Focal length	+3.4m	+7.3m	$\infty$	-5.1m	-2.7m
5X	Focal length	+3.7m	+8.9m	$\infty$	-4.6m	-2.5m

\* Refer to the distance between two lenses:

- "+": increase the distance between two lenses;
- "-": reduce the distance between two lenses.

Inducing the appropriate change of focal length:

- "+": inducing beam converging (positive focal length);
- "-": reducing beam diverging (negative focal length).

● **Application notes:**

Why do we develop Adjustable divergence beam expander?

1) When the entrance laser beam is an idealized parallel beam, it will be focused at the ideal focal position after being expanded and focused;

2) However, as the entrance laser beam is usually divergence in nature, it focus at a location deviated from the ideal focal position after being expanded and focused;

3) By adjusting the distance between two lenses, adjustable divergence beam expander focuses the laser beam at the required position such as the focus point or at other position in order to meet the practical working distance requirement of the laser operation such as laser marking.