

## Motorized Beam Expander

### Product Information

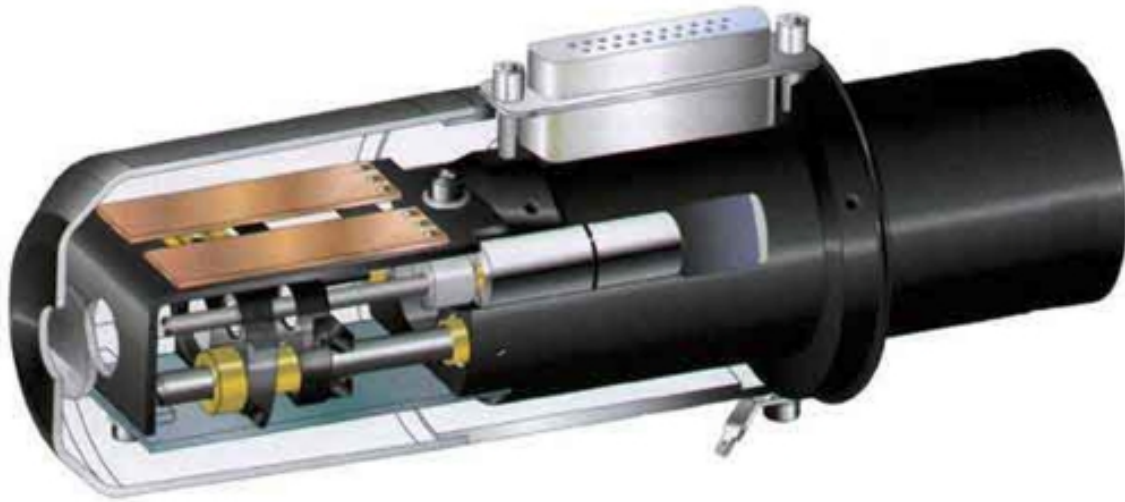


Figure 1: *Section view of the motorized beam expander.*

This motorized beam expander has all optical properties of the manual version while offering fully motorized adjustment.

The motorized beam expander has been designed for an alignment of zoom and focus without the necessity to open the instrument for adjustments on the beam expander (e.g. in a laser engraving system). This means that interruptions of the production process required with manual beam expanders will be decreased.

With the motorized beam expander the alignment of the laser beam expansion and the focus position of your optical system can be remotely adjusted. This is done by two separate lens groups, which are moved by build-in adjustment motors. Separate control electronics and software have been developed for this purpose. The user-friendly software allows the operator to change expansion or back focal length of the optical system. The lens groups will move automatically to their calculated position. Independent movements of the lens groups are also possible to create any desired variation of your laser beam.

#### Optical data

The motorized beam expander offers an expansion range from 2x to 8x. The current version is designed for a wavelength of 1064nm and an entrance beam diameter of 8mm. A motorized beam expander for a wavelength of 532nm and an entrance beam diameter of 8mm is available on request.

The summary of technical data on the motorized beam expander can be found in the appendix.

#### Drive system

The two lens groups are positioned independently by two motors. The position sensing of the two lens groups is realized by the use of conduction plastic resistors.

The combination of the motion pickups and the selected drive concept guarantees reproducibility precision better than 0.05 mm.

The connection of the motorized beam expander to the control electronics is made possible by the use of a 25-pin sub-D connector.



### Controller and Beam Expander Software

The controller forms the interface between the PC and the motorized beam expander. The connection between the controller and the beam expander is made possible by the use of a 5-pin sub-D connector. A 9-pin sub-D connection allows communication between controller and computer using its standard RS232C serial port. A separate world range power supply is part of the delivery.

The serial port of the motorized beam expander controller can be used to control the optics under different operating systems (e.g. DOS, UNIX, etc.). The required control command sequences can be requested separately.

In addition to the controller electronics, Cascade Laser Corporation also supplies a proprietary, Windows™ based user program. This software can be integrated in your software environment and enables communication with the motorized beam expander.

The user control software requires Windows 95™/98™ or Windows NT™ Version 4.0.

This software currently permits the entry of any desired expansion factor between 2x and 8x. The correct position of the

variable lens group is calculated by the software and the position is determined with respect to the factory preset offset value. All essential data, including the offset, is stored inside of the beam expander in a non-volatile memory. System tolerances such as divergent or convergent beam paths and also spherical defects of system components (e.g. lenses and mirrors) can also be partially compensated. In order to do this, the lens groups can be controlled individually by the software.

### Supplied Equipment

The motorized beam expander and the controller System (including software and universal power supply) need to be ordered separately. A manual and CD-ROM for demonstration can be supplied as well.

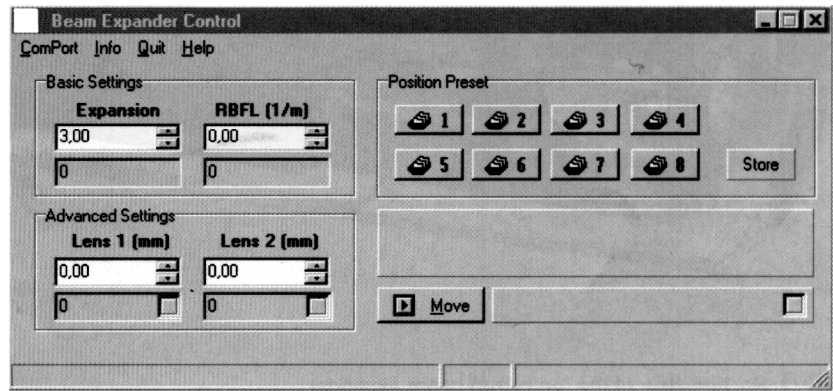


Figure 2: User Software

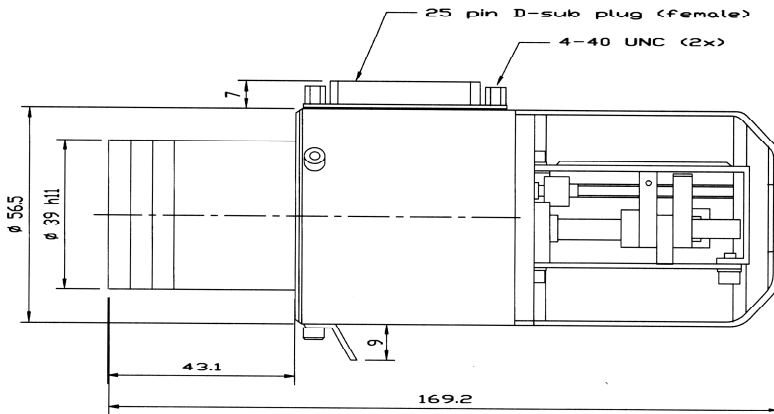


Figure 3: External Dimensions

Contact Cascade Laser Corporation for ordering information or to request a quotation on any of these products.

### Cascade Laser Corp.

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### Appendix

#### Key data for motorized beam expander

Order No.	4401-345-000-21
Entrance laser beam (dia.)	8 mm
Expansion range	2x to 8x
Maximum output (dia.)	32 mm
Wavelength	1064 nm
Length	170 mm
Outside diameter	56.5 mm (+7 mm)
Pick-up diameter	39h11 (0/-160 μm)
Adjustment motor	1016012G
Position pick-up	PTN-025

Order No.	4401-351-000-20
Wavelength	532 nm

Remaining Data See Above

#### Key data for controller system

Order No.	4402-004-000-21
AC supply voltage	100V-240V (+/- 10%)
AC supply frequency	47Hz-63Hz
AC supply current	0.2A max.
External dimensions of controller	Approx. 110x61x35mm <sup>3</sup>
Software platform	Windows™ 9x/NT
PC interface	RS232C
Sub-D-cord (9 pin, 1:1)	Approx. 2000 mm
Power supply cord	Approx. 2000 mm