Laser Beam Expanders With diopter correction function

BEDCF/LBEDCF RoHS

**This is an optical system for expanding a small collimated laser beam to a larger one.
Fine adjustment of the collimator is available using the diopter correction function.
You can use a high precision optical system like an interferometer or laser processing with lens designed for wave from aberration.**

- The beam expander optical system is built on air-space and the lenses are not bonded. It can be used for high powered laser applications.
- With the Galilean type lens configuration, it reduces the number of aberration corrections and shortens the length of the beam expander.
- By turning the dioptre ring on the beam expander, you can have a varied collimated beam with beam divergence on the focused beam. A beam waist or an accurate adjustment of the collimation is required.
- There is a wide variety with different magnification and wavelength to choose from.
- With the different types of BE-V and LBEDCF visible lasers, it can be attached to ant He-Ne (05-LHP) lasers with an adapter (included).

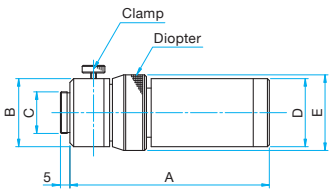
Guide

- Beam expander holders are now available (LBEDCF-H, LBEDCF-YH) and it comes with tilt and fine adjustments. Reference D042
- Holders can be used to fx beam expanders (BEDCF-M34H, BEDCF-M22H). Reference D042
- We can also fabricate achromatic beam expanders with multiple wave lengths other than those found in our catalogue. Call our International Sales Division for more information.
- Fabrication of beam expander is also available for high-energy pulsed laser.

Attention

- By using in the opposite direction, it will not create a reduced in diameter collimated beam. Please use the appropriate optical system by determining the position of the beam waist and the divergence angle of the laser beam.

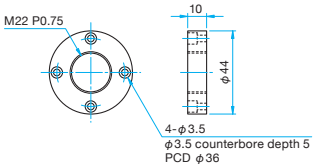
Outline Drawing (in mm)



Accessories for visible light (BEDCF-V/LBEDCF)

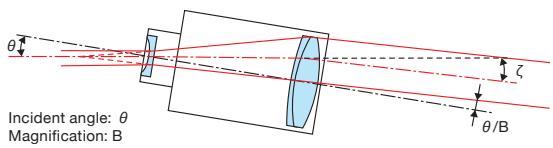
Connection adapters for He-Ne laser

#4-40UNC、L=3/8...4 screws



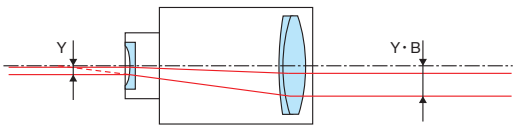
■For adjustment of the laser beam expander

If the incident beam is inclined to the optical axis of the laser beam expander, a larger collimated light is emitted from the direction of the incident beam is inclined.
Therefore, it is necessary to precisely align the optical axis of the beam expander for the incident beam.
We recommend the laser beam expander holder (LBEDCF-H, LBEL-H) to adjust the tilt of the beam expander. Reference D042, D043



Incident angle: θ
Magnification: B
Deviation angle of beam: $\zeta = \theta - \theta/B$

If the center of the incident beam is translated from the optical axis of the laser beam expander, the emission is emitted with enlarged and magnified amounts of deviation of the incident beam. For this reason, if you need the expanded beam with no chipping or deformation, the incident beam must be strictly in accordance with the center of the optical axis.
For adjustment to the center of the optical axis of the beam expander, please see the page of the laser beam expander adapter (LBEL-ADP).
Reference D044



Compatible Optic Mounts

BEDCF-M34H, M22H

Compatible Optic Mounts

LBEDCF-3H, 5H, 10H / LBEDCF-2YH, 3YH, 4YH

Laser Beam Expanders With diopter correction function | BEDCF/LBEDCF

Specifications

Primary material: Aluminum
Finish: Black Anodized

Part Number	Design wavelength [nm]	Expansion ratio	Input aperture (MAX) [mm]	Barrel length A [mm]	φB [mm]	Mounting thread C	φD [mm]	Diameter φE [mm]	Laser Damage Threshold* [J/cm²]	Weight [kg]
BEDCF-2-266	266	2.0	φ15.5	72.0±4	57	M34 P1	48	60	1.4	0.3
BEDCF-3-266	266	3.0	φ10.5	79.5±4	57	M34 P1	48	60	1.4	0.3
BEDCF-4-266	266	4.0	φ9.0	90.5±4	57	M34 P1	48	60	1.4	0.3
BEDCF-5-266	266	5.0	φ7.0	119.5±4	57	M34 P1	48	60	1.4	0.4
BEDCF-7.5-266	266	7.5	φ4.5	129.0±4	57	M34 P1	48	60	1.4	0.4
BEDCF-10-266	266	10.0	φ3.5	173.0±4	57	M34 P1	48	60	1.4	0.4
BEDCF-2-355	355	2.0	φ15.5	75.0±4	57	M34 P1	48	60	4	0.3
BEDCF-3-355	355	3.0	φ10.5	83.0±4	57	M34 P1	48	60	4	0.3
BEDCF-4-355	355	4.0	φ9.0	94.5±4	57	M34 P1	48	60	4	0.3
BEDCF-5-355	355	5.0	φ7.0	125.0±4	57	M34 P1	48	60	4	0.4
BEDCF-7.5-355	355	7.5	φ4.5	134.5±4	57	M34 P1	48	60	4	0.4
BEDCF-10-355	355	10.0	φ3.5	181.0±4	57	M34 P1	48	60	4	0.5
BEDCF-2-V	400 – 700	2.0	φ6.0	42.0^{+3}_{-2}	36	M22 P0.75	26	40	4	0.12
LBEDCF-3	400 – 700	3.0	φ5.4	42.0^{+3}_{-2}	36	M22 P0.75	26	40	4	0.12
BEDCF-4.1-V	400 – 700	4.1	φ4.1	62.0±3	36	M22 P0.75	26	40	4	0.13
LBEDCF-5	400 – 700	5.0	φ3.2	50.5±3	36	M22 P0.75	26	40	4	0.12
BEDCF-6-V	400 – 700	6.0	φ4.3	102.0±3	36	M22 P0.75	36	40	4	0.17
BEDCF-7.6-V	400 – 700	7.6	φ3.4	80.0±3	36	M22 P0.75	36	40	4	0.15
BEDCF-8.4-V	400 – 700	8.4	φ3.1	89.5±3	36	M22 P0.75	36	40	4	0.16
LBEDCF-10	440 – 700	10.0	φ2.6	109.5±3	36	M22 P0.75	36	40	4	0.18
BEDCF-12.6-V	450 – 700	12.6	φ2.1	138.0±3	36	M22 P0.75	36	40	4	0.2
BEDCF-14.3-V	460 – 700	14.3	φ1.8	158.5±3	36	M22 P0.75	36	40	4	0.2
BEDCF-14.3-V-16.8-V	480 – 700	16.8	φ2.1	190.0±3	36	M22 P0.75	46	40	4	0.3
BEDCF-14.3-V-18.5-V	500 – 700	18.5	φ1.9	211.0±3	36	M22 P0.75	46	40	4	0.3
BEDCF-14.3-V-21-V	510 – 700	21.0	φ1.7	241.0±3	36	M22 P0.75	46	40	4	0.3
BEDCF-1.5-LD	780 – 830	1.5	φ16.1	51.0^{+4}_{-2}	57	M34 P1	48	60	7	0.3
BEDCF-2-LD	780 – 830	2.0	φ15.3	53.0±4	57	M34 P1	48	60	7	0.3
BEDCF-3-LD	780 – 830	3.0	φ10.1	64.0±4	57	M34 P1	48	60	7	0.3
BEDCF-4-LD	780 – 830	4.0	φ8.9	95.5±4	57	M34 P1	48	60	7	0.3
BEDCF-5-LD	780 – 830	5.0	φ7.2	125.5±4	57	M34 P1	48	60	7	0.4
BEDCF-7.5-LD	780 – 830	7.5	φ4.7	135.5±4	57	M34 P1	48	60	7	0.4
BEDCF-10-LD	780 – 830	10.0	φ3.6	186.5±4	57	M34 P1	48	60	7	0.5
BEDCF-1.5-1064	1064	1.5	φ16.0	52.0^{+4}_{-3}	57	M34 P1	48	60	7	0.3
LBEDCF-2Y	1064	2.0	φ15.1	49.0^{+4}_{-0}	57	M34 P1	48	60	7	0.3
LBEDCF-3Y	1064	3.0	φ10.2	64.5±4	57	M34 P1	48	60	7	0.3
LBEDCF-4Y	1064	4.0	φ8.6	93.5±4	57	M34 P1	48	60	7	0.3
BEDCF-5.3-1064	1064	5.3	φ6.8	127.5±4	57	M34 P1	48	60	7	0.4
BEDCF-7-1064	1064	7.0	φ5.1	179.5±4	57	M34 P1	48	60	7	0.5
BEDCF-10-1064	1064	10.0	φ3.6	188.5±4	57	M34 P1	48	60	7	0.5

* Laser pulse width 10ns, repetition frequency 20Hz

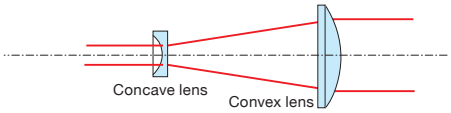
Lens configuration

Beam expander is divided into two main types depending on the configuration of the lens.

Galilean type

Combination of convex and concave type

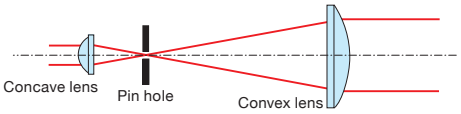
Features.
- Can shorten the overall length of the beam expander.
- High performance with small number of lenses.
- Usable with high powered lasers.



Keplerian type

Uses two convex lenses.

Features.
- You can insert a pin hole in the expander.
- You can obtain a clean Gaussian beam emitted by the effect of the pinhole spatial filter.



Note: Do not use with high energy lasers
It can cause a spark in the focal point of the laser causing the transmitted wave front to collapse.

Diopter and diopter correction function

By using the diopter correction function, it is available to adjust the divergent light beam to the parallel beam.
If it is necessary to use exact optical laser system, recommended to use the beam expander with diopter correction function.
And if the parallel light beam incident into the beam expander, the light would be emitted in expanded beam.
However, since most laser is slightly divergent, the beam will not be emitted by parallel beam.
In addition, parallel light emitted from the beam expander will be shifted in various factors. Such as LD (laser diode) which has a possibility that wavelength will change, and by the changes of the temperature.