

Service: Laser Adjustment

Preparation

Upon receipt of the (replacement) laser open its transport box and let them first temper until it has room temperature. Then you can connect laser tube and power supply. For laser model SL 02/1 just connect the free end of the AC/DC adapter to the back side of the laser tube. Plug the adapter to the power socket. New SL 02/1 lasers come with various exchangeable socket adapters.

Laser model SL 04 has a separate controller. Connect the free cable ends from the laser tube to the rear panel of the controller. Connect the controller by power cable to the power socket.

Note: The cable connector of the red high-voltage cable is equipped with a counter nut (see red arrow in picture right). Secure counter nut after cable is plugged to the controller (compare to laser manual page 6). The high-voltage cable can only be disconnected from controller when the counter nut is unscrewed.



Connecting fiber

In case the laser is already equipped with a fiber coupler, coupler is generally adjusted. You just have to connect the fiber end marked with FC-AFC with the coupler. The other end of the fiber marked with FC-APC will be connected to the μ Phase[®]. The laser radiation at the end of the fiber (FC-APC) correlates to the laser class 1.

In case of replacement and refurbished lasers it will be shipped without coupler and holder. Use your existing coupler and screw it onto the laser tube.

After the start of the laser and waiting for the warming-up (when finished, green LED on laser, respectively controller turns on), the free end of fiber should glow red. It may be necessary to open the shutting screw (b, Figure 1-2). If the free end is pointed to a surface a bright red point should be arise.

To re-adjust the laser, follow the instructions below. You should consider the laser safety instruction during the following process.



WARNING

Danger of damage for eyes and skin

Laser radiation

- Do not look directly into the laser beam or his reflection, as well as with optical instruments.
- Due to the necessary remove of the laser safety cover, laser class 1 can't be guaranteed. Please pay attention to the necessary safety instructions: Not looking into the beam and wearing laser protection glasses.

Step-by-step guidance for laser coupler and fiber alignment



CAUTION!

Damage of the Laser

Under no circumstances open the sealed screws (a, Figure 1).

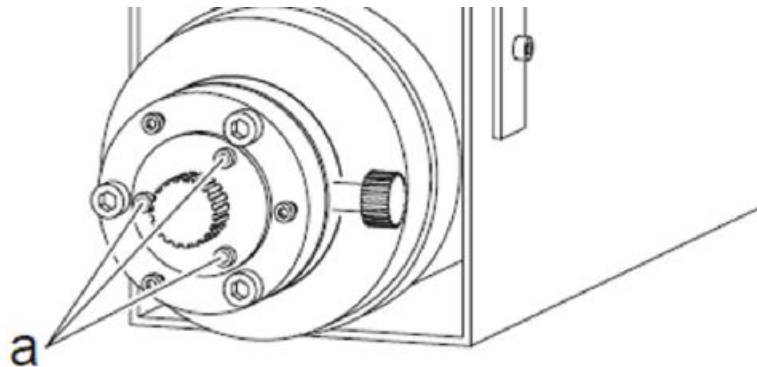


Figure 1: Sealed screws at the coupler.

1. If your laser has a safety case, screw off the fiber to remove it.
Remove the safety case and reconnect the fiber to the coupler. The laser should rest inside the U-profile holder.
2. Turn on the laser and wait for the green LED to switch on.
This LED should be lighted up after approximately 20-30 minutes after the power-on.
If this not happens or the LED is flickering, please contact our support. The laser might be defect.
3. Maximize the intensity of the laser by turning the shutting screw (b, Figure 2).

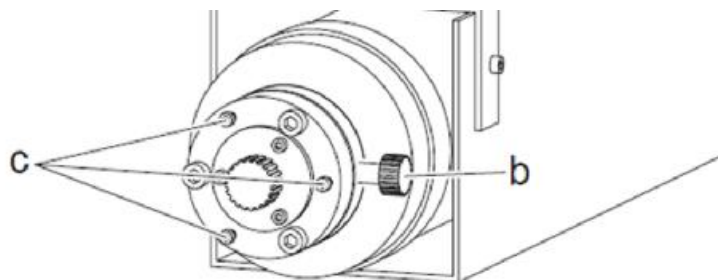


Figure 2: Screw for shutting the laser beam (b), locking screws (c)

4. Test the fiber ending before starting with the adjustment.
Fix the free end of the fiber (FC-APC) and position a white surface (e.g. paper) in front of it (approx. 1-2 cm distance).
If no red laser point is visible continue with the next step.

If a red laser point is visible continue with step 12.

5. Loose the fiber from the coupler.
6. Loose slightly locking screws (c, Figure 2) and set screws (d, Figure 3).

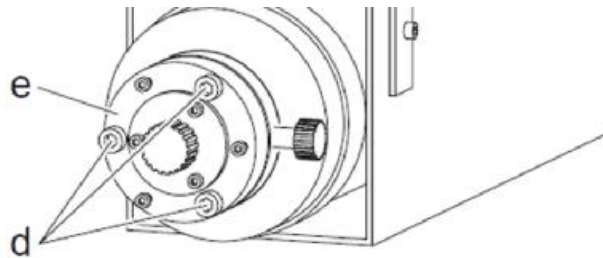


Figure 3: Set screws (d), adjustment plate (e)

7. Position a white surface (e.g. paper) approx. 5cm in front of the coupler output.
8. Move the adjustment plate (e) with thumb and index finger in x/y- direction (vertical to laser beam) until a red light point with maximized intensity is visible on the white surface.
9. Afterwards tighten the set screws slightly so that the position of the coupler could not shift on his own. Observe light spot when tightening screws to avoid losing the spot.
10. Connect the laser fiber with the coupler output.



NOTICE

- Consider the labeling on the laser fiber and coupler plug-in.
- You have to put the end marked „FC-AFC“ in the coupler plug-in.
- Keep the plug-in and the fiber ends dust-free.

11. Position a white surface (e.g. paper) approx. 2-3cm in front of the free fiber end.

If a red laser point is visible continue with the next step.

If no red laser point is visible successively turn slightly all set screws in both directions and pay attention to the appearance of the laser point on the surface. If you can't see a laser point by turning one screw this one should be turned back to the starting position before moving another one.

Notice:

- If no red laser point is visible after turning all screws, you have to repeat step 5-7.

**NOTICE**

- There is a rubber ring positioned between the part of the coupler screwed into the laser tube and the adjustment plate. It is needed for the adjustment of the fiber connections with the set screws.

12. Tilt the adjustment plate with one of the three set screws until the maximized intensity is reached at the end of the fiber (FC-APC). Repeat this procedure with the other set screws. Finally the end of the fiber should glow red.

13. Connect the fiber with the μ Phase[®].

**NOTICE**

- Consider the labeling on the laser fiber and coupler plug-in.
- You have to put the end marked with „FC-APC“ in the μ Phase[®] plug-in.
- Keep the plug-in and the fiber ends dust-free.

14. Start the μ Shape[™].

15. Activate the live video.

Afterwards the laser will be adjusted with the more sensitive live view.

16. Ensure that the camera settings are optimal before starting the adjustment.

**right mouse button into the live view <camera settings>
<measurement camera> <integration time> <40ms>**

17. Regulate the laser intensity with the shutting screw (b, Figure 2) until only some red points are visible in the live view.

18. Tilt the adjustment plate with one of the three set screws until the maximized intensity in the live view is reached. Repeat this procedure with the other set screws.

If necessary you have to reduce the intensity in the live view again with the shutting screw.

19. Fix the locking screws carefully. The adjustment plate is now locked in place.

Pay attention that the intensity of the laser beam is not changed significantly by turning the locking screws. If necessary you can counteract by loosening one of the set screws.

20. Should your laser had a safety cover screw off the fiber from the coupler, mount the cover and screw on the fiber again.