

Fiber Coupler Series 60FC-A19.5

The 60FC-A19.5 fiber couplers are designed for coupling a collimated laser beam into a multimode fiber cable.

This document assists you in installing and aligning the series 60FC-A19.5 fiber couplers. It describes how a fiber is attached, how the focus setting is adjusted and how it is aligned to your laser.

Before You Start

Ensure that the fiber holding screw does not protrude into the inner cylinder of the fiber receptacle.

This would damage the fiber, especially if the fiber connector is forced into the receptacle despite the protruding screw.

Use the screwdriver 9D-12 to carefully retract the pin screw out of harm's way (Fig. 1, left). Take care not to retract it too far, it is small and easily lost.

Ensure that the fiber cable matches the receptacle type:

- Use FC-APC (8°-polish) cables for fiber collimators with an inclined coupling axis (60FC-4)
- Use FC-PC (0°-polish) cables for fiber collimators with a coaxial axis (60FC-0)

Caution:

- Do not touch the optical surface of the lens nor the fiber end face
- If the collimator is not in use install both protection caps
- In order to avoid photo contamination remove the protection caps before you launch radiation to the fiber collimator

Connecting the Fiber Coupler to your System

It is very important for correct coupling that the laser beam reaching the coupler is centered. This can be tested by attaching the 13BL1-13 aperture instead of the fiber coupler (Figure 1: Left).

Especially for HeNe lasers, Schäfter+Kirchhoff offers adapter flanges which can be moved laterally in elongated holes in order to center the adapter flange with the laser beam (Figure 1: Right).

Only a coarse alignment is necessary, and this can be done by hand, as the positioning accuracy must only be a fraction (7 - 10 %) of the beam diameter.

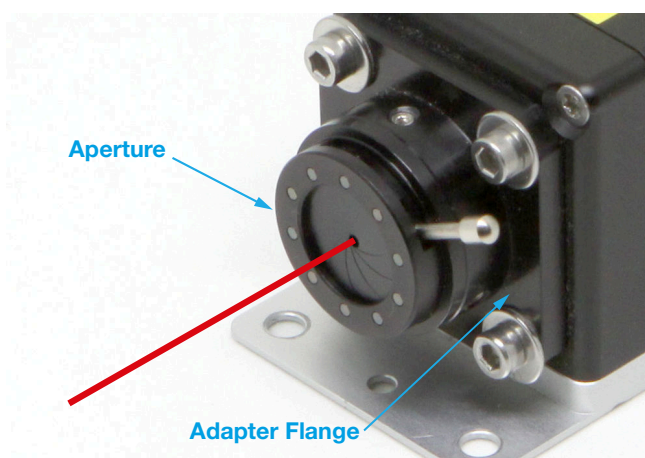


Figure 1 left: The laser beam and the adapter flange are centered using an aperture.

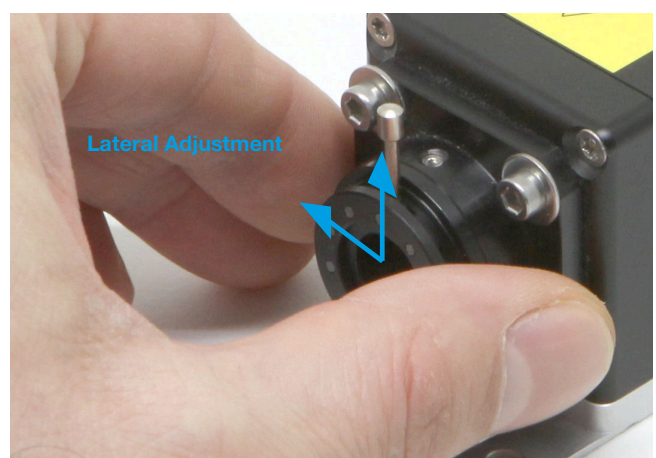


Figure 1 right: Adapter flange with elongated holes for a lateral adjustment.

Locate the three radially arranged tapered pin screws in the adapter flange (Figure 3: Left) and loosen them using the hex screwdriver 50HD-15. For an adapter flange with integrated shutter or attenuator, ensure that the shutter or attenuator is completely open. Gently introduce the fiber coupler into the vacant aperture.

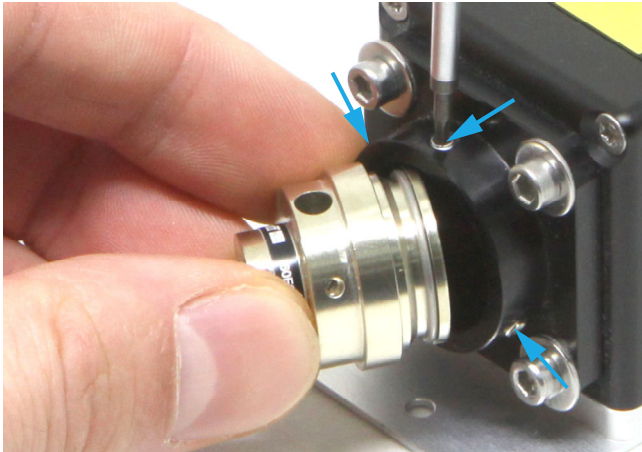


Figure 2 left: Attach the laser beam coupler to the adapter flange with three radially arranged pin screws.

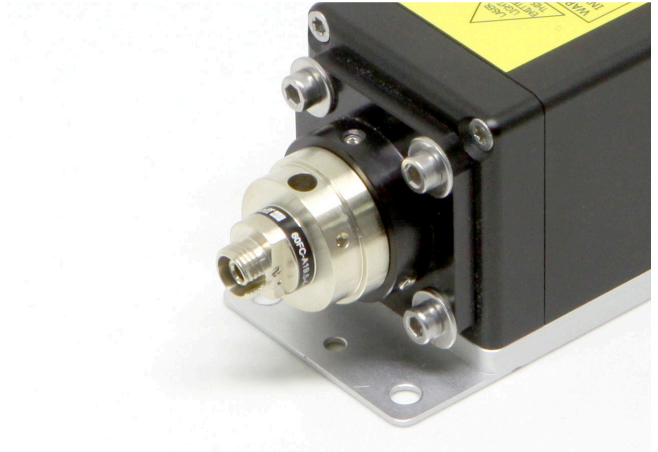


Figure 2 right: Adapter flange with fiber coupler type 60FC-A19.5

Attaching a Fiber Cable to the Fiber Collimator

To prevent damage to the sensitive fiber end face, always insert the fiber connector's ferrule at an angle, with the connector key properly aligned to the receptacle notch, as shown in Fig. 3, left.

When the ferrule tip is safely located in the inner cylinder of the receptacle, align the connector to the receptacle axis and carefully introduce the connector into the collimator. With the connector key pressed gently onto the right-hand side of the receptacle notch, gently screw the fiber cap nut onto the receptacle until it is finger-tight.

Then, with the connector key pressed gently onto the right-hand side of the receptacle notch, gently screw the connector cap nut onto the receptacle until it is finger-tight.

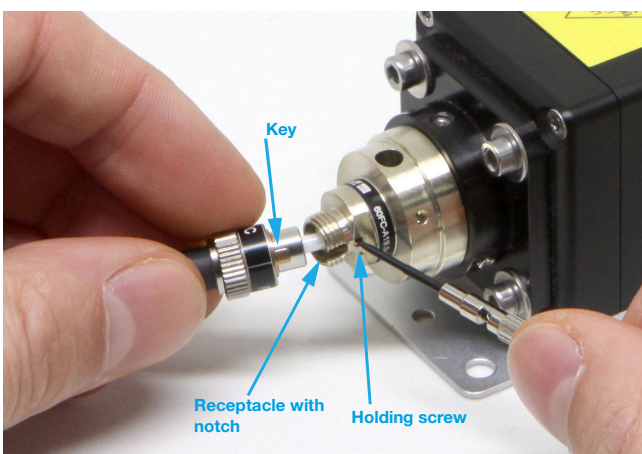


Figure 3 left: Holding pin screw (loosening first)

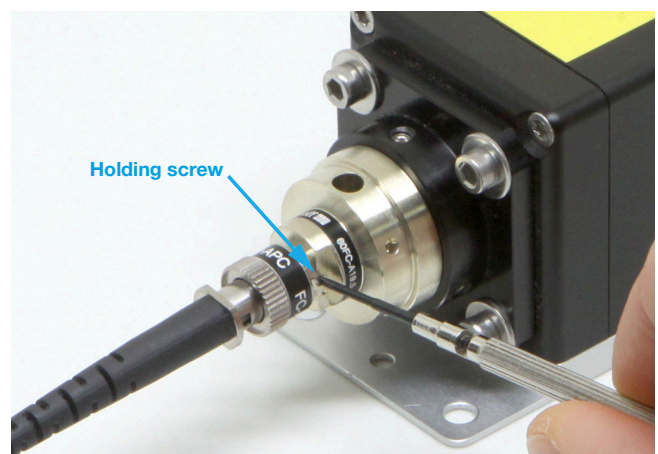


Figure 3 right: Fixing the fiber ferrule

Finally, gently tighten the fiber holding screw to reduce the slackness of the ferrule in the receptacle as shown in Fig. 3, right. The inner cylinder has to be larger than the ferrule, to avoid jamming.

The holding screw together with the right-hand rule for the connector ensure a high reproducibility in mode field position and angle, the latter being important for polarization maintaining fibers.

Collimating the Laser Beam

Focus adjustment (adjustment of the coupling lens in z-direction) is a demanding task and should be preferably performed by use of a collimating telescope.

The collimator is shipped pre-adjusted for the given wavelength and, often, it is not necessary for the customer to readjust the coupling lens position.

To adjust the focus, first loosen the two radially arranged pin screws that lock the coupling lens in place, using screwdriver 9D-12 (Fig. 2, left).

Gently insert the eccentric key 60EX-4 (60EX-5) into the adjustment aperture and, by gently rotating it, adjust the focus until the fiber coupled radiation is maximized (Fig. 2, right).

Do not use a screwdriver or other tools instead of the eccentric key as this will cause irreparable damage to the collimator!

After focus adjustment, relock the coupling lens into position by re-tightening the two radially arranged pin screws.



Figure 2 left: Fasten/unfasten the pin screws



Figure 2 right: Slightly rotate eccentric key