

Fiber Collimator Series 60FC-F

This document assists you in installing the series 60FC-F fiber collimators. It describes how a fiber cable is attached and how the focus setting is adjusted.

If you want to use the 60FC fiber collimator as an in-coupler, please also refer to document NN.

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

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. 1, 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.

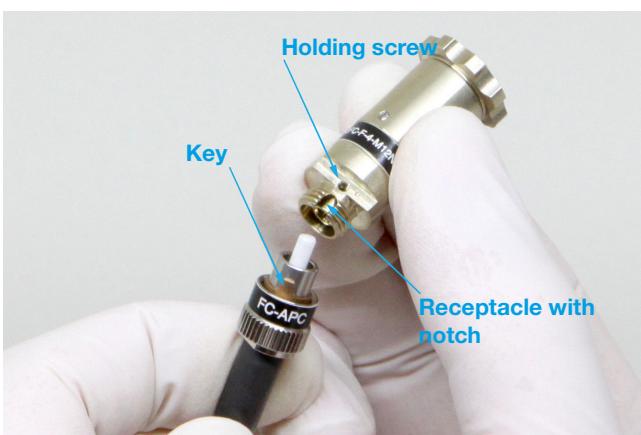


Figure 1 left: Holding pin screw (loosening first)



Figure 1 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. 1, 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 check the focus setting of the fiber collimator, couple a radiation source of appropriate wavelength into the fiber connected to the fiber collimator and direct the beam at a target about half the Rayleigh length z_R away:

$$\frac{z_R}{2} = \frac{\pi \cdot \mathcal{O}_{beam}}{\lambda \cdot 8}$$

Here λ is the optical wavelength and \mathcal{O}_{beam} the collimated beam diameter ($1/e^2$ level).

Follow laser safety precautions!

When correctly focused, the laser spot diameter on a target about $z_R/2$ away must have the same diameter such as the beam directly behind the fiber collimator. Please make sure that the beam at midpoint between the collimator and the target has the same diameter.

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).

The focus is adjusted by gently rotating the knurled ring. Adjust the focus by minimizing the size of the laser spot on the target about half the Rayleigh length z_R away (Fig. 2, right).

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