

INSTRUCTION MANUAL

Orion® ED66-CF 66mm Carbon Fiber Refractor Telescope

Optical Tube Assembly

#40905

Congratulations on your purchase of the Orion ED66-CF Carbon Fiber refractor. Your telescope has been designed with high quality precision optics and top-notch mechanical construction. These instructions will help you set up and use your optical tube.

Please keep the original shipping box. In the unlikely event you need to ship the telescope back to Orion for warranty repair service, you should use the original packaging. The box also makes a very good container for storing the telescope when it is not in use.

Included Items

- 1 ED66-CF optical tube assembly
- 1 14mm wide-angle eyepiece
- 1 45-degree correct-image prism diagonal, 1.25"
- 1 Objective dust cover
- 1 Aluminum-clad carrying case

Refer to **Figure 1** to familiarize yourself with the parts and features of the ED66-CF refractor.

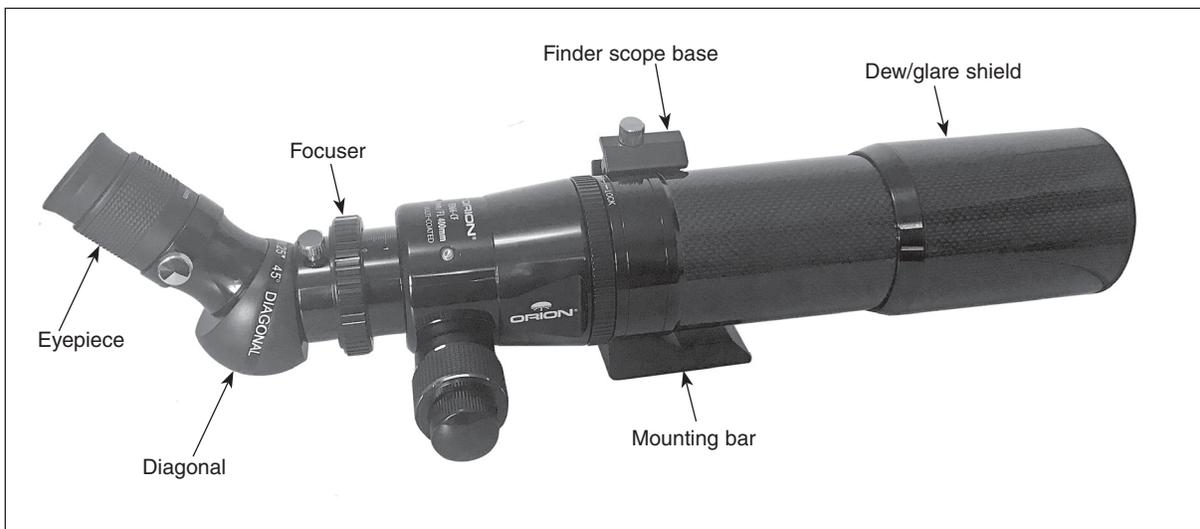


Figure 1. The ED66-CF 66mm Carbon Fiber Refractor

 **ORION**
TELESCOPES & BINOCULARS
AN EMPLOYEE-OWNED COMPANY

Corporate Offices: 89 Hangar Way, Watsonville CA 95076 - USA
Toll Free USA & Canada: (800) 447-1001
International: +1(831) 763-7000
Customer Support: support@telescope.com

Copyright © 2020 Orion Telescopes & Binoculars. All Rights Reserved. No part of this product instruction or any of its contents may be reproduced, copied, modified or adapted, without the prior written consent of Orion Telescopes & Binoculars.

The ED66-CF features a two-element 66mm-diameter objective lens, with one element made from FLP-51 “extra-low dispersion” (ED) optical glass. Inclusion of this glass element greatly minimizes chromatic aberration, or color fringing, which is an inherent aberration in achromatic refractors. The objective lens is “fully multi-coated,” which means that all air-to-glass optical surfaces are multi-layer coated with anti-reflection material, to provide the highest possible light transmission to the eyepiece.

About the Dual-Speed Crayford Focuser

The ED66-CF comes equipped with a 1.25" dual-speed Crayford focuser (**Figure 2A**). The Crayford design allows for smooth, precise focusing without the image shift that rack-and-pinion designs experience. Ten turns of the fine focus wheel on the right side equals one turn of the coarse (rubber-grip) adjustment wheel. Once you have achieved the best possible focus on an object using the coarse adjustment wheel, you can fine-tune your focus using the fine focus wheel to make micro adjustments, to zero in on the precise focus point.

You can make adjustments to the focuser drawtube tension by using the drawtube tension thumbscrew located on the bottom of the focuser (**Figure 2B**). Turn this thumbscrew until the focuser motion feels smooth and the drawtube does not slip once you have obtained focus. If the thumbscrew is too tight the drawtube will not move when the focus wheels are turned. It may be necessary to make adjustments when the weight of your accessories changes significantly. The focuser has 61mm of drawtube travel. A convenient millimeter scale engraved on top of the drawtube lets you note the focus position and return to it quickly with a given eyepiece and diagonal combination.

The focuser is fully rotatable. Just turn the knurled focuser rotation collar (**Figure 2A**) counterclockwise to loosen the focuser for rotation, then turn the collar clockwise again to secure the focuser in the new orientation.

The telescope is equipped with a dovetail finder scope base, which accepts any Orion finder scope as well as some other brands. Using a finder scope, which offers low power and a wide field of view, makes it easier to pinpoint observing subjects and center them in the main telescope's eyepiece.

The focuser drawtube has an accessory collar (**Figure 2A**) that accepts 1.25" accessories. For visual use you just slide the barrel of the included 1.25" diagonal into the collar and then secure it with the thumbscrew on the collar. The thumbscrew presses against a compression ring inside the collar, which provides a tight grip on the diagonal and prevents marring of the diagonal's barrel.

WARNING: Never look directly at the Sun through your telescope—even for an instant—without a professionally made solar filter that completely covers the front of the instrument, or permanent eye damage could result. Young children should use this telescope only with adult supervision.

Attaching the Telescope to a Tripod or Mount

The ED66-CF is equipped with a dovetail mounting bar (**Figure 2B**) that can be attached to a tripod or telescope mount. For attachment to a telescope mount, make sure the mount has a Vixen-style dovetail saddle. Simply insert the dovetail bar into the saddle on the mount and tighten the saddle's locking knob. For attachment of the telescope to a photographic tripod, note that on the underside of the telescope's mounting bar are two ¼"-20 threaded holes. Either of these holes will accept the standard ¼"-20 threaded post found on most photographic tripods.

Included Accessories

The ED66-CF comes with a 1.25" correct-image 45-degree prism diagonal and a 14mm wide-field eyepiece. The “correct-image” diagonal has a barrel diameter of 1.25" and renders a normal upright image. The 14mm eyepiece offers a wide 65-degree apparent field of view and 28.6x magnification (see below for more on magnification).

Please note that the telescope will not come to focus without the use of the diagonal or, if you prefer straight-through viewing, an optional extension tube. To install the diagonal, unthread the thumbscrew on the accessory collar until it is flush with the interior of the adapter. Insert the diagonal and secure it with the thumbscrew. Then insert the eyepiece into the diagonal and secure it with the thumbscrew on the diagonal.

Calculating Magnification (Power)

To calculate the magnification, or power, of a telescope, simply divide the focal length of the telescope by the focal length of the eyepiece.

$$\text{Telescope F.L.} \div \text{Eyepiece F.L.} = \text{Magnification}$$

The ED66-CF has a focal length of 400mm. The eyepiece that comes with it has a 14mm focal length. So the magnification is 28.6x:

$$400 \div 14 = 28.6x$$

It is desirable to have a range of eyepieces of different focal lengths, to allow viewing over a range of magnifications. So you may eventually want to purchase additional 1.25" telescope eyepieces for more magnification options. For example, a 6mm eyepiece would yield a magnification of 67x.

Every telescope has a useful limit of power of about 50x per inch of aperture. So for the ED66-CF, which has an aperture of 66mm, or 2.6", that's 130x. Keep in mind that at higher powers, an image will always be dimmer and less sharp (this is a fundamental law of optics). The steadiness of the air (the “seeing”) will limit how much magnification an image can tolerate.

Always start viewing with your lowest-power (longest focal length) eyepiece in the telescope. After you have located and looked at the object with it, you can try switching to a higher-power eyepiece to ferret out more detail, if atmospheric conditions permit. If the image you see is not crisp and steady, reduce the magnification by switching to a longer focal length eyepiece. As a general rule, a small but well-resolved image will show more detail and provide a more enjoyable view than a dim and fuzzy, over-magnified image.

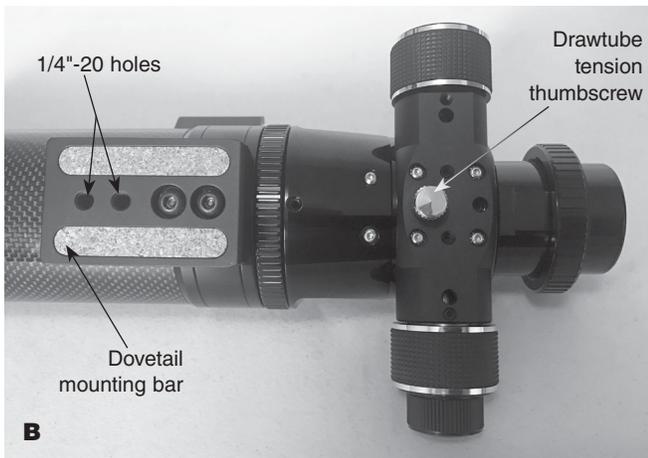
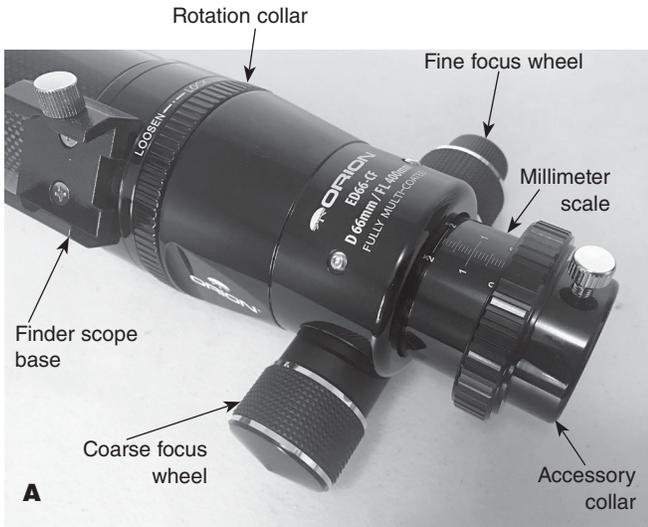


Figure 2. A) The 1.25" Dual Speed Crayford focuser in detail. **B)** Underside of the focuser.

Extendable Dew/Glare Shield

Your telescope features an extendable dew/glare shield (**Figure 1**). Extend it prior to observing by pulling it forward until it clicks to a stop. Extending the shield will inhibit dew formation on the objective lens in moist conditions and will improve image contrast by blocking light from entering from the periphery to cause unwanted glare.

Care & Maintenance

Give your telescope reasonable care and it will last a lifetime. When not in use, keep its dust cover on as well as the dust cap on the eyepiece opening. Store it in the foam-lined telescope case (**Figure 3**) indoors or in a dry garage. Do not leave the telescope outside when not using it. The optical tube is carbon fiber material underneath a protective "clear coat" surface. It is best to clean the surface with a soft cotton towel and window cleaner. A

paper towel may scratch the clear coat finish. If a scratch does appear on the tube, it will not harm the telescope.

To clean the telescope's objective lens as well as the lens of the eyepiece, any quality optical lens tissue and cleaning fluid specifically designed for multi-coated optics can be used. Never use regular glass cleaner or cleaning fluid designed for eyeglasses. Before cleaning with fluid and tissue, however, blow any loose particles off the lens with a photographer's blower bulb or compressed air, or lightly brush the lens with a soft camel hair brush. Apply some cleaning fluid to a tissue, never directly on the optics. Wipe the lens gently in a circular motion, then remove any excess fluid with a fresh lens tissue. Oily fingerprints and smudges may be removed using this method. Use caution; rubbing too hard may scratch the lens! Clean only a small area at a time, using a fresh lens tissue on each area. Never reuse tissues.



Figure 3. The ED66-CF and accessories in their aluminum-clad carrying case.

Specifications

Objective lens:	Doublet, ED glass optics (S-FPL-51)
Objective lens diameter:	66mm
Focal length:	400mm
Focal ratio:	f/6
Anti-reflection coatings:	Fully multi-coated (all air-to-glass surfaces multi-layer coated)
Tube material:	Carbon fiber and machined aluminum
Dew/glare shield:	Carbon fiber and machined aluminum, retractable
Focuser	1.25" dual-speed (10:1) Crayford, rotatable
Tube dimensions:	12" L x 5.75" W (with dew shield retracted)
Eyepiece:	5-element, 65-degree, fully anti-reflection coated
Diagonal:	45-degree correct-image prism, 1.25"
Mounting:	Vixen-style dovetail with two ¼"-20 holes in bottom
Finder scope:	Dovetail base only (finder scope not included)
Weight:	4 lbs. 5 oz. (1.95kg)

One-Year Limited Warranty

This Orion product is warranted against defects in materials or workmanship for a period of one year from the date of purchase. This warranty is for the benefit of the original retail purchaser only. During this warranty period Orion Telescopes & Binoculars will repair or replace, at Orion's option, any warranted instrument that proves to be defective, provided it is returned postage paid. Proof of purchase (such as a copy of the original receipt) is required. This warranty is only valid in the country of purchase.

This warranty does not apply if, in Orion's judgment, the instrument has been abused, mishandled, or modified, nor does it apply to normal wear and tear. This warranty gives you specific legal rights. It is not intended to remove or restrict your other legal rights under applicable local consumer law; your state or national statutory consumer rights governing the sale of consumer goods remain fully applicable.

For further warranty information, please visit www.OrionTelescopes.com/warranty.



Corporate Offices: 89 Hangar Way, Watsonville CA 95076 - USA
Toll Free USA & Canada: (800) 447-1001
International: +1(831) 763-7000
Customer Support: support@telescope.com

Copyright © 2020 Orion Telescopes & Binoculars. All Rights Reserved. No part of this product instruction or any of its contents may be reproduced, copied, modified or adapted, without the prior written consent of Orion Telescopes & Binoculars.