

# INSTRUCTION MANUAL

## Orion® 2" Dual-Speed Crayford Focuser for Orion Refractors #13032



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**Congratulations on your purchase of a quality Orion 2" dual-speed Crayford focuser.** This focuser is intended for use with the Orion ED-80, ED-100, Astroview 100, 120ST and the SkyView Pro 120mm. If you do not have one of these refractors, the focuser may not be appropriate for your telescope.

Crayford focusers generally perform better than rack-and pinion models because the design eliminates "focus shift". Focus shift is when an image moves position in the eyepiece when it is being focused. This is very hard to eliminate in rack-and-pinion focusers due to slight gear and tolerance imperfections which cause the drawtube to move slightly left or right when focusing. For the Crayford design, the drawtube is constantly tensioned (by the focusing shaft and four "roller bearings") so the drawtube cannot move perpendicular to the desired motion.

The strong machined aluminum construction supports heavy 2" eyepieces as well as heavy camera bodies. The smooth focus motion and fine-focus wheel allow precision adjustments for critical focusing of eyepieces and cameras.

## Installation

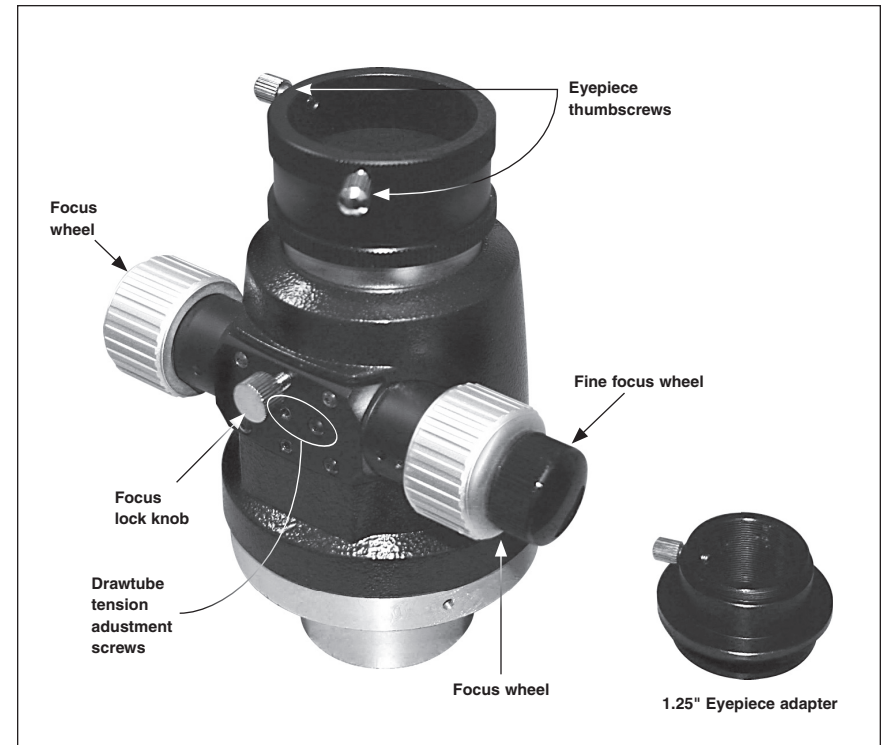
This focuser was designed to be a "drop-in" replacement for the refractors listed above. If you have one of these telescopes, installing the 2" Crayford will be easy. You will only need a Phillips head screwdriver. Use the following procedure:

1. Locate the three screws holding the existing focuser onto the tube wall. In the case of the larger 120mm refractors, locate the screws that hold the focuser to the optical tube adapter collar.
2. Remove these three screws, making sure to hold onto the focuser itself so it does not fall when the last screw is removed. Do not lose the screws as they will be required to install the new focuser.
3. Remove the 2" focuser from the tube.
4. Place the 2" dual-speed Crayford focuser where the other focuser was previously.
5. Install the three screws, and tighten the screws firmly.

## Usage

Using the 2" dual-speed low-profile Crayford focuser is very straightforward. Place your 2" eyepiece in the focuser drawtube, and secure it in place with the thumbscrew. Imaging cameras should generally utilize a 2" camera adapter when used with the focuser. Insert the camera adapter the same way as a 2" eyepiece. To focus, simply rotate one of the focus wheels.

The large focus lock thumbscrew near the focusing shaft (see Figure 1) locks the drawtube into position once focus has been achieved. This is especially useful when using a camera or heavy eyepiece in the focuser. Be sure this thumbscrew is loosened when focusing. The socket head set screws above the focus lock thumbscrew (see Figure 1) adjusts drawtube focusing tension. If a heavy eyepiece



**Figure 1.** The Orion 2" dual-speed Crayford focuser for Orion Refractors.

causes the drawtube to move inward by itself (drawtube tension too loose), or the focus wheels are difficult to turn (drawtube tension too tight), then you will want to adjust these set screws. This requires the included hex keys. Slightly loosen the center screw, then slightly tighten the outer screws equally. Test for tension and repeat if necessary (or reverse the procedure if the tension is too tight).

## Fine Focus

The focuser features dual speed adjustment with the fine focus wheel. This small black wheel located on the side of the right hand focus wheel allows precise focus adjustment at a ratio of 11:1, meaning one turn of the focus wheel equals eleven turns of the fine focus wheel. Use the focus wheels to achieve rough focus on your target object, then use the fine focus wheel to coax out even more detail. You'll be amazed at the amount of detail fine focus adjustments allow you to view on targets such as the lunar surface, planets, double stars, as well as other celestial objects.

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## **The 1.25" Eyepiece Adapter**

In order to use a 1.25" eyepiece in the focuser, you must first install the 1.25" eyepiece adapter. Place this adapter into the drawtube like a 2" eyepiece, and loosely secure it with the thumbscrew. Insert a 1.25" eyepiece into the adapter, and secure the eyepiece by further tightening the thumbscrew.

### **Specifications**

Focuser design: Crayford, accepts 2" eyepieces and 1.25" eyepieces with included adapter.

Focus travel: 75mm

Other features: Focus lock, drawtube focusing tension adjustments, fine focus wheel (11:1).

## **One-Year Limited Warranty**

This Orion 2" Dual-Speed Crayford Focuser for Refractors 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 to: Orion Warranty Repair, 89 Hangar Way, Watsonville, CA 95076.

If the product is not registered, proof of purchase (such as a copy of the original invoice) is required. 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, and you may also have other rights, which vary from state to state. For further warranty service information, contact: Customer Service Department, Orion Telescopes & Binoculars, 89 Hangar Way, Watsonville, CA 95076; (800) 676-1343.

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