

# INSTRUCTION MANUAL

## Orion® High-Power 4-Element Barlow Lenses

#8470 High-Power 1.25" 2x 4-Element Barlow

#8707 High-Power 1.25" 3x 4-Element Barlow

#8715 High-Power 1.25" 5x 4-Element Barlow

#8471 High-Power 2" 2x 4-Element Barlow



**Figure 1.** The Orion High-Power Barlow Lens series includes the 2" model and 1.25" 2x, 3x, and 5x models.

Orion 1.25" and 2" High-Power Barlow lenses (**Figure 1**) boost the magnifying power of any telescope eyepiece they are used with. With different models featuring magnification factors of 2x up to 5x, these premium-quality Barlows get you closer to your telescopic target, be it a planet, the Moon, or a deep-sky object. Their exceptional optical quality and mechanical craftsmanship will appeal to the discriminating amateur astronomer who wants only top-notch performance from his or her equipment.



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High-Power Barlows work by reducing the convergence of the light cone heading into the eyepiece. The Barlow effectively increases the focal length of the telescope, thereby increasing the magnifying power of any eyepiece used with the telescope and Barlow:

$$\frac{\text{telescope focal length}}{\text{eyepiece focal length}} \times \text{Barlow magnification} = \text{total magnification}$$

### Features of High-Power Barlow Lenses

High-Power 1.25" Barlows fit standard 1.25" accessory holders and are used with 1.25" eyepieces. The High-Power 2" Barlow fits 2" focusers and accommodates 2" eyepieces. The 2" Barlow includes a separate 2"-to-1.25" adapter that allows use of 1.25" eyepieces and accessories (**Figure 2**). When it's removed the 2" collar is available for use with 2" eyepieces or accessories.

Each High-Power Barlow lens has an enhanced 4-element lens design that minimizes chromatic and spherical aberrations and preserves sharpness and contrast. Images appear flatter, sharper, and better color-corrected than with standard achromatic Barlows. And with a High-Power Barlow you get the full benefit of the longer eye relief typical of longer-focal-length eyepieces, versus using a shorter focal length eyepiece to achieve the same magnification.

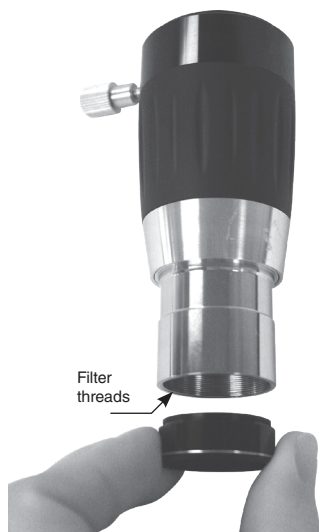


**Figure 2.** The 2" model includes a 2"-to-1.25" adapter to accept 1.25" eyepieces.

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**Figure 3.** Mechanical features of High-Power Barlow Lenses (shown for a 1.25" Barlow)



**Figure 4.** The end of the barrel has female threads that allow use of Orion 1.25" (shown) or 2" filters (depending on the barlow size)

Machined from solid aluminum, High-Power Barlows have a grooved, grip-friendly rubber exterior on the housing (**Figure 3**). A brass compression ring secures any inserted telescope eyepiece in place without marring or scratching the barrel, keeping your eyepieces like-new. The 2" Barlow has two thumbscrews for securing an eyepiece while the 1.25" Barlows have one thumbscrew.

High-Power Barlows' lens elements are fully multilayer coated with anti-reflection coatings, and edge-blackened to provide maximum light throughput and optimal image contrast. The 1.25" and 2" barrels (depending on model) are internally blackened and glare threaded to help prevent internal reflections from reducing image contrast. The barrels have a recessed safety slot to prevent the Barlow from falling out should the locking thumbscrew become loose during use. The barrels are threaded at the end for use with Orion 1.25" or 2" filters, depending on the model (**Figure 4**).

### Use of Orion High-Power Barlows

For refractors and Schmidt-Cassegrain telescopes, you can insert the Barlow between the diagonal and the eyepiece or between the focuser (or visual back for SCTs) and the diagonal. For reflectors, place the Barlow into the eyepiece holder of the focuser drawtube, then insert an eyepiece into the Barlow lens.

**CAUTION!** *When inserting a Barlow into the eyepiece holder of a diagonal, be aware that it could "bottom out" on the diagonal's mirror or prism before it is fully inserted! Use extreme caution to avoid marring or cracking the mirror or prism with the barrel of the Barlow. If you feel the Barlow touch the mirror or prism, carefully back the barlow out a bit before securing it with the diagonal's thumbscrew(s).*

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## Power Limitations

While a Barlow lens will increase the magnification of a telescope, there is a limit to how much magnification is useful. It depends on the telescope's aperture, the quality of the optics, and on the outdoor "seeing" conditions, which vary from night to night. Keep in mind that using the 3x or 5x High-Power Barlow may exceed the maximum practical magnifying power of your telescope and eyepieces.

Generally, the maximum practical magnification a telescope can deliver is about 50x per inch of aperture (diameter of the main lens or mirror). Any higher and the images seen will likely just be blurry and dim. Seeing conditions (i.e., steadiness of the atmosphere) often limit the useful magnification to much less than 50x per inch of aperture. If you are using a High-Power Barlow for planetary imaging with a webcam or special planetary camera, you can benefit from "oversampling" by increasing the magnification higher than you typically would for a sharp image. Digital processing will allow you to sharpen the image and reveal extraordinary detail.

## Care of Your Barlow Lens

Care should be exercised when using all optical and mechanical telescope accessories. Keep your Barlow in a protected environment when you're not using it. Avoid touching the lenses and coatings. If the outside of the lens should become dirty, you may want to clean it. Blow off all loose dirt with a blower bulb. Use only optical lens tissue and good-quality lens fluid. Wet a folded tissue and gently wipe the surface of the lens. Immediately use a second piece of lens tissue to gently dry the lens off. Do not rub or apply pressure, as this may scratch the lens if dust or grit is present.

It is recommended to keep the plastic plug in the top of the Barlow and the cap on the end of the barrel when the Barlow is not in use.

## 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](http://www.OrionTelescopes.com/warranty).



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