

# ASTRO-TECH AT66ED

from Astronomy Technologies

Thank you for choosing this **Astro-Tech AT66ED** high-quality compact apochromatic refractor.

While some observers might doubt that apochromatic performance can be had in a 66mm scope that costs as little as the AT66ED, we can say only that seeing is believing.

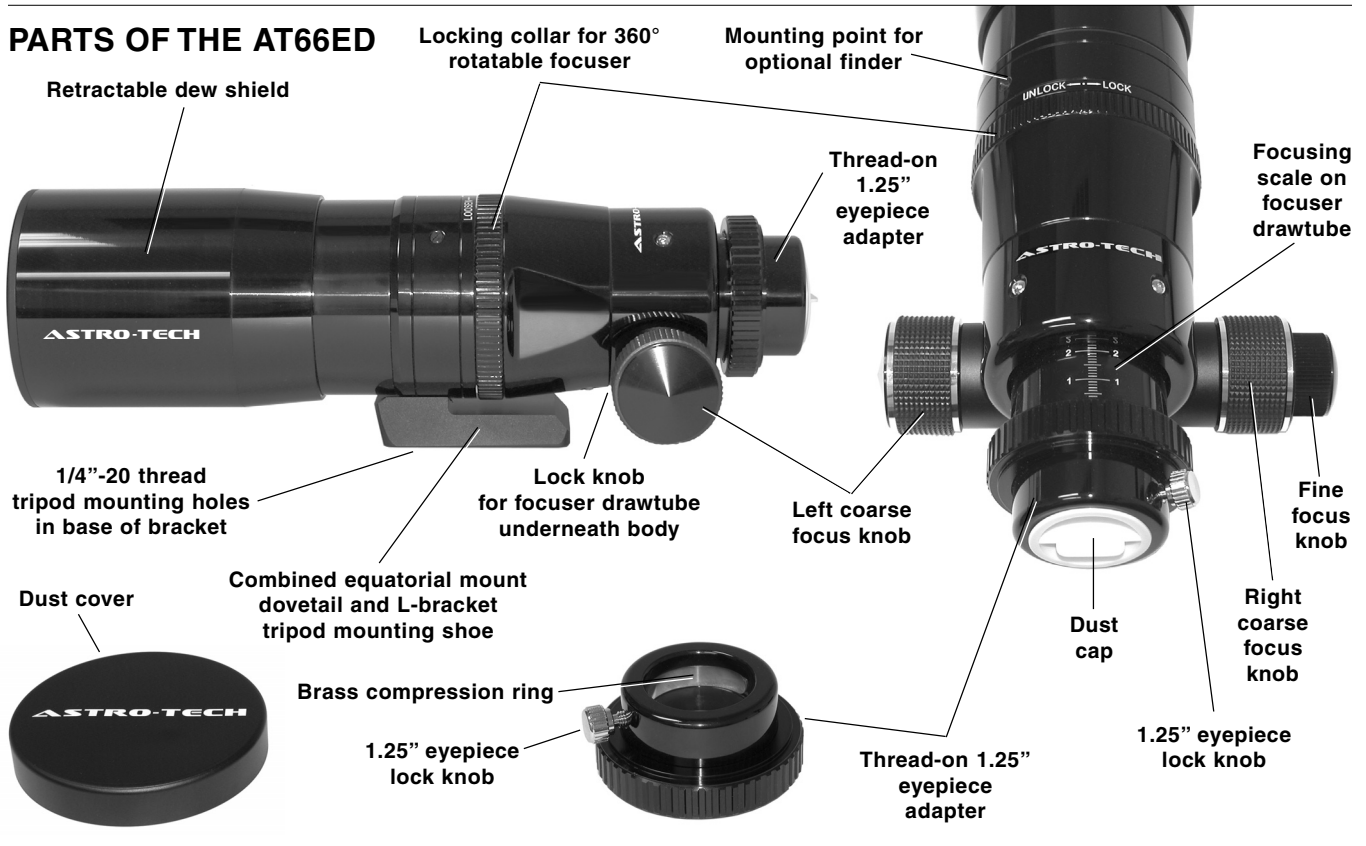
The images from its 400mm f/6 ED (Extra-low Dispersion glass element) air-spaced doublet optics are virtually color-free, even at high magnifications. At its low price, we believe

you'll find that the optical performance of your AT66ED is little short of astonishing.

This instruction manual will provide you with information on how to get the most out of your new telescope, and how to properly maintain your telescope so it can give you a lifetime of observing enjoyment.

Please familiarize yourself with your telescope's parts and functions before operating it for the first time.

## PARTS OF THE AT66ED



### Astro-Tech AT66ED Apochromatic Refractor Specifications

**Aperture** ..... 66mm (2.6")  
**Focal Length** ..... 400mm  
**Focal Ratio** ..... f/6  
**Objective Type** .... air-spaced doublet with ED element  
**Optical Coatings** ..... fully multicoated  
**Resolving Power (Dawes' Limit)** ..... 1.75 arc seconds  
**Visual Limiting Magnitude** ..... 11.6 maximum  
**Light Grasp (versus the eye)** ..... 89x  
**Field Stops** .... 10 glare-reducing baffles in optical tube  
**Focuser** ..... dual-speed Crayford-type  
with 11:1 reduction ratio fine focus;  
360° rotating camera angle/observing angle adjuster;  
and thread-on 1.25" compression ring eyepiece holder  
**Focuser Travel** ..... 2.4" (60mm)  
with millimeter scale on drawtube for repeatable focus  
**Lens Shade** ..... retractable

**Objective Lens Cover** ..... slip-on metal  
**Tripod Mount** ... removable combination L-bracket and  
dovetail with 1/4"-20 thread mounting holes for photo  
tripod use as well as direct mounting on Celestron,  
Meade, and Vixen German equatorial mounts  
**Tube Diameter** ..... 75mm o. d.  
**Tube Length (lens shade retracted)** ..... 11.5" (292mm)  
**Tube Length (lens shade extended)** ..... 14.4" (366mm)  
**Optical Tube Weight** ..... 3.9 lbs. (1.8 kg)  
**Case** ..... aluminum-frame foam-fitted  
lockable hard case, with carrying handle  
**Case Dimensions** ..... 15" x 9.5" x 6.25"  
**Lowest Usable Power** ..... 10x (with 40mm eyepiece)  
**Highest Terrestrial Power** ... 67x (with 6mm eyepiece)  
**Highest Practical Power** .... 100x (with 4mm eyepiece)  
**Theoretical Maximum** ..... 133x (with 3mm eyepiece)

Your **Astro-Tech AT66ED** refractor is usable for day and night viewing, simply by adding a 1.25" star diagonal and eyepiece. Any brand of 1.25" eyepiece can be used, from a 40mm for the lowest possible magnification (10x), down to a 3mm (133x) for high power use. Removing the Astro-Tech's 1.25" eyepiece holder reveals a Schmidt-Cassegrain rear cell thread on the focuser drawtube, allowing you to add a thread-on SCT-type 2" diagonal for 2" eyepiece use.

The focal length of the AT66ED is ideal for low to medium power wide-angle views of nebulas, open star clusters, large galaxies, and comets. Crisp views of the Moon and planets are also routine at magnifications of 100x to 133x when seeing conditions permit.

To calculate the magnification of your telescope and eyepiece combination, divide the telescope focal length in mm by the eyepiece focal length in mm. For example, a 4mm eyepiece in the AT66ED will give you a magnification of 100x ( $400\text{mm}/4\text{mm} = 100$ ).

**Astronomical Observing:** The theoretical maximum usable power available from this telescope is 133x, although this requires a 3mm eyepiece that provides a narrow and dim 0.5mm exit pupil. A more practical maximum magnification for astronomical viewing with the AT66ED would be 100x, using a 4mm eyepiece. Keep in mind that seeing conditions play an important role in how high a magnification you can use on any given night. Only very good seeing conditions (clear skies and calm air) will support viewing at 133x. Under less than ideal conditions, lower powers in the 65x to 100x range provide more consistently usable and pleasing images.

The widest possible field of view with a 1.25" eyepiece is about 4.2°, which can be achieved with a 10x (40mm) Plössl eyepiece.

While the AT66ED has not been specifically designed for astrophotography, it does an outstanding job as a wide-field astrograph for casual 35mm and CCD imaging. A chrome thumbscrew under the focuser lets you lock in a sharp focus for photography.

The focuser can be rotated a full 360° for the best photographic composition, or to put the star diagonal in the most comfortable observing position. Loosening the knurled lock ring on the scope barrel by turning it counterclockwise lets you rotate the focuser. Turning the ring back clockwise locks the focuser at the chosen angle.

**Terrestrial Observing:** The AT66ED works well for daytime birding, nature studies, sweeping the landscape from the home with a view, etc. It is also a very good 400mm (8x) f/6 telephoto lens for terrestrial photography. Generally speaking, the maximum usable daytime power with any terrestrial scope is about 1x per mm of aperture (67x for the AT66ED with a 6mm eyepiece). Attempts to push the daytime power beyond this point often magnify the heat waves, dust, and "mirage" in our atmosphere to the point where the images become blurry and unusable. A 40x (10mm) to 50x (8mm) eyepiece is usually more satisfying for everyday high power terrestrial use than a 67x eyepiece.

**Mounting the AT66ED:** A stable tripod or astronomical mount is essential for best viewing. The AT66ED is light enough to be used on any good quality camera tripod with a 7 to 8 pound payload capacity. The scope's L-shaped mounting foot has two 1/4"-20 thread holes for direct connection to a standard photo tripod head. The front mounting hole provides a better balance when the scope is used with a 1.25" star diagonal and eyepiece. The rear mounting hole provides a better balance when the scope is used with a heavier 2" diagonal and eyepiece, or a camera.

The mounting foot is shaped like the dovetail used to connect optical tubes to the Astro-Tech Voyager altazimuth, Celestron CG-5 Advanced Series, Meade LXD-75, and Vixen Sphinx and Great Polaris German equatorial mounts. This allows you to install the AT66ED directly on any of these mounts with no other adapter required.

**Optional Astro-Tech Accessories:** The adjustable-height Astro-Tech Voyager altazimuth mount has automatic-clutch worm gear manual slow motion controls in both altitude and azimuth to make tracking terrestrial and astronomical objects smooth and easy. The Astro-Tech 1.25" star diagonal has state-of-the-art 99% reflectivity dielectric coatings to provide the maximum brightness and planetary detail contrast possible from your AT66ED. The Astro-Tech 45° image-erecting 1.25" diagonal is available to provide correctly-oriented terrestrial images. An inexpensive Astro-Tech non-magnifying

multireticle illuminated finder is also available for your AT66ED.

**Caring for Your Scope Optics:** Never store the telescope in a damp or humid environment. Avoid leaving it in a hot environment (exposed to direct sunlight on a window sill, in a car trunk, etc.) If you must store it in high humidity conditions, put a few packets of desiccant (silica gel or the equivalent, available from most camera stores) in with the telescope to absorb excess moisture. If not properly stored in a humid environment, the telescope may develop mildew which can damage the optics.

If dew has formed on the scope after a night's observing, allow the scope optics to air dry at room temperature before putting the lens cover on the scope and storing it away.

If the front lens surface becomes dusty, smeared, or shows fingerprints or any other surface build-up, clean the lens as follows. First, gently blow away any surface dust or particles with a clean air blower (a child's ear syringe or a photographer's camel's hair brush with attached blower bulb, for example). Using canned or compressed air is not recommended, as the propellant in the can may spit out and leave difficult-to-remove deposits on the lens. Also, the expanding compressed air drops in temperature as it leaves the can. The cold air coming out of the tiny tube that most compressed air cans use to direct the air flow has been known to chill a lens to the point of cracking the glass if pointed at the same spot on the glass for too long.

Second, moisten a cloth with a few drops of a photographic-quality optical cleaning solution designed for multicoated camera and binocular lenses. A well-worn cotton handkerchief works well and Zeiss and Kodak make suitable lens cleaning fluids. Do not drip the cleaning fluid directly on the lens. Use the barely damp (not wet) cloth to gently wipe the lens surface clean, turning the cloth frequently to always keep a clean portion of the cloth in contact with the lens. Blot the lens dry with a dry portion of the cleaning cloth or a separate cloth. Start with a clean cloth each time cleaning is needed.

Avoid overcleaning your scope. The multicoatings on the lens are quite hard and durable. However, frequent overzealous cleaning can scratch the coatings if all the dust particles (which are often tiny flecks of windborne rock) are not removed before you start pushing a damp cloth around the lens surface. A few specks of debris on the lens will not be visible in your images, as they are not in the focal plane and don't block enough light to measure, let alone be seen. Clean your optics only when absolutely necessary. If you take proper care of your scope, cleaning should rarely be needed.

**Caring for Your Scope Finish:** Depending on the tube color, the AT66ED is either fully anodized or finished in a combination of durable paint and a liquid-anodize high gloss finish. The painted surfaces will rarely show dirt or fingerprints. If they do, a clean soft cloth slightly dampened with plain water should be enough to clean them.

The very durable anodized surfaces can be easily smudged with fingerprints, but these will not harm the anodized finish. As with the painted areas, a clean soft cloth slightly dampened with plain water (or a little moisture from your breath and a quick wipe with a clean handkerchief) is generally enough to clean the surface. Avoid harsh chemical cleaners or organic solvents like benzene, alcohol, etc., as these may ruin the finish. They can certainly affect the optical coatings if they accidentally drip or splash on the objective lens.

Never use the telescope in the rain or in conditions where it may get wet. The telescope is not waterproof. If the telescope accidentally gets caught in the rain, immediately wipe off all water using a clean and dry soft cloth. If the telescope gets totally soaked in water, or submerged, immediately contact your dealer for service instructions. Do not disassemble or attempt to repair your telescope yourself, as this violates the warranty terms under the limited product warranty, and negates any guarantee.

**Caution! Never directly view the Sun with your telescope!** Never aim your AT66ED at the Sun without having a professionally-manufactured solar filter mounted over the objective lens. Viewing the Sun through the scope without the proper protection for even a moment may result in permanent severe damage to your eyes, and can even cause blindness. Contact your Astro-Tech dealer if you are interested in purchasing a compatible professional solar filter.

 **ASTRO-TECH** [www.astronomytechnologies.com](http://www.astronomytechnologies.com)  
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