

# ASTRO-TECH AT102ED from Astronomy Technologies

Thank you for choosing this **Astro-Tech AT102ED** high-performance ED refractor.

The images from its 709mm focal length f/6.95 ED (Extra-low Dispersion glass element) air-spaced doublet optics are virtually color-free, even at high magnifications.

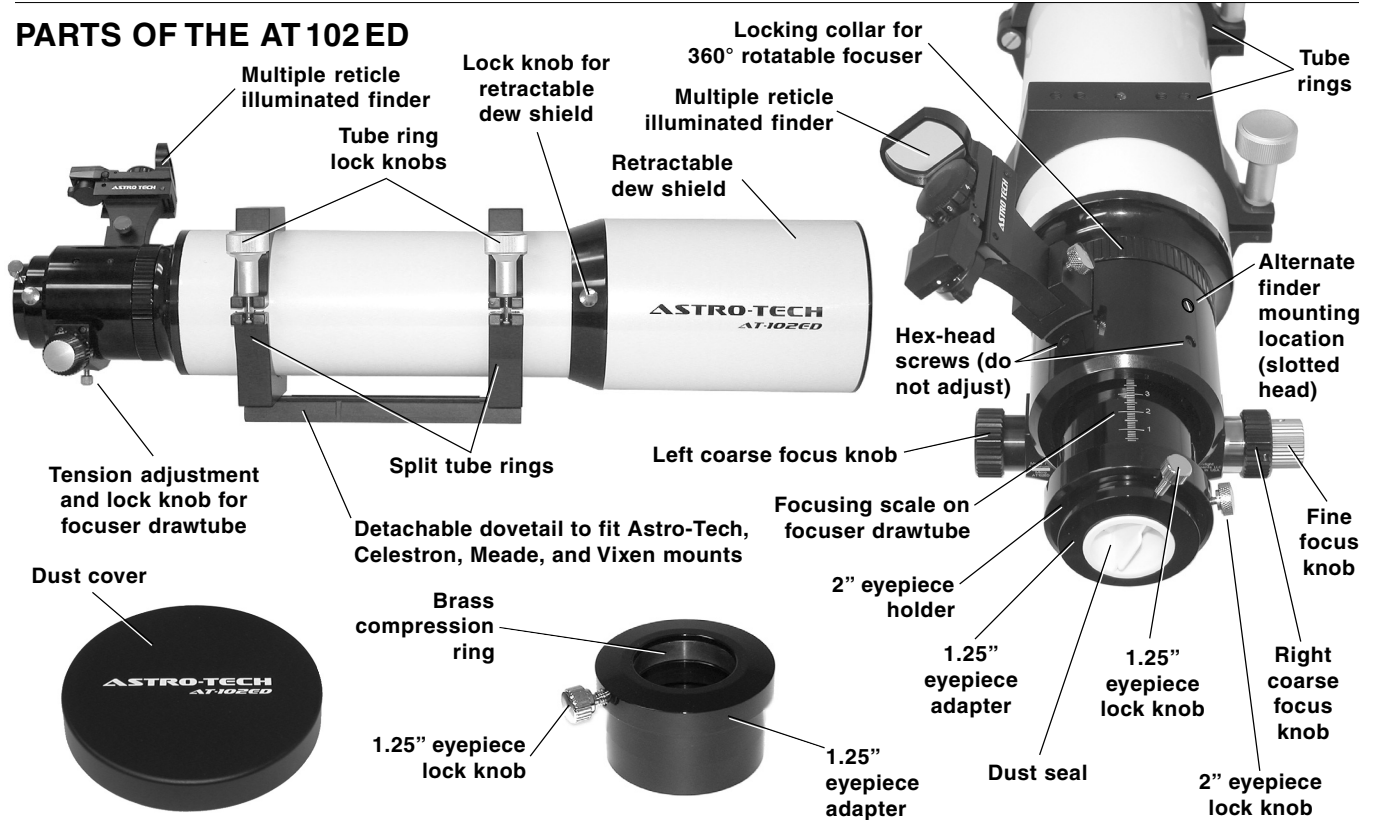
Its package of standard features – a dual-speed Crayford-style focuser, an illuminated multiple reticle finder, tube rings with a separate Vixen-style dovetail, hard case, and more –

is unsurpassed at its sensible price. We believe you will agree that the performance and features of your AT102ED make it an exceptional value.

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

Please familiarize yourself with the parts and functions of your AT102ED before operating it for the first time.

## PARTS OF THE AT102ED



## Astro-Tech AT102ED Apochromatic Refractor Specifications

**Aperture** ..... 102mm (4")  
**Focal Length** ..... 709mm  
**Focal Ratio** ..... f/6.95  
**Objective Type** .... air-spaced doublet with ED element  
**Optical Coatings** ..... fully multicoated  
**Resolving Power (Dawes' Limit)** ..... 1.14 arc seconds  
**Visual Limiting Magnitude** ..... 12.5 maximum  
**Light Grasp (versus the eye)** ..... 212x  
**Field Stops** ..... 3 knife-edge baffles in optical tube  
**Focuser** ..... dual-speed Crayford  
     with 10:1 reduction ratio fine focus;  
     2" and 1.25" compression ring eyepiece holders;  
     360° rotating camera angle/observing angle adjuster  
**Focuser Travel** ..... 3.35" (85mm)  
     with millimeter scale on drawtube for repeatable focus  
**Finder** ..... non-magnifying illuminated multiple reticle

**Lens Shade** ..... retractable, with lock knob  
**Objective Lens Cover** ..... slip-on metal  
**Tripod Mount** ..... hinged split rings with dovetail  
     for Astro-Tech, Celestron, Meade, and Vixen mounts  
**Tube Diameter** ..... 105mm o. d.  
**Tube Length (lens shade retracted)** ..... 23" (584mm)  
**Tube Length (lens shade extended)** ..... 27.5" (699mm)  
**Optical Tube Weight** ..... 7.3 lbs. (3.32 kg)  
**Weight (w/dovetail, rings, finder)** ..... 10.1 lbs. (4.59 kg)  
**Case** ..... lockable aluminum-frame foam-fitted  
     hard case, with carrying handle  
**Case External Dimensions** ..... 28.75" x 9.75" x 8.5"  
**Lowest Usable Power** ..... 17.5x (40mm eyepiece)  
**Highest Terrestrial Power** ..... 101x (7mm eyepiece)  
**Highest Practical Power** ..... 177x (4mm eyepiece)  
**Theoretical Maximum Power** .. 203x (3.5mm eyepiece)

Your Astro-Tech AT102ED refractor is capable of a wide range of astronomical viewing, simply by adding a star diagonal and eyepieces. A 2" compression ring eyepiece holder on the focuser drawtube and a separate 1.25" compression ring eyepiece adapter let you use either 1.25" or 2" star diagonals and eyepieces with no other adapter needed.

**Astronomical Observing:** The theoretical maximum usable power available from your AT102ED is 203x (using a 3.5mm eyepiece), although higher powers are occasionally possible under exceptional (and therefore exceptionally rare) seeing conditions. Keep in mind that the seeing conditions play an important role in just how high a magnification you can use on any given night. Only very good seeing (clear skies and calm air) will support viewing at 200x and above. Under less than ideal conditions, lower powers in the 120x to 140x range provide more consistently usable and pleasing images.

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 10mm eyepiece in your AT102ED gives you a magnification of about 71x ( $709\text{mm}/10\text{mm} = 70.9$ ).

The widest possible field of view with a 1.25" eyepiece is 2.4°, which can be achieved with a 17.5x (40mm) Plössl eyepiece.

While your AT102ED has not been specifically designed for astrophotography, it makes a very good wide-field astrograph for 35mm and CCD imaging. A chrome tension/lock knob under the focuser body lets you lock the tube in place for a sharp focus during photography. You can also use the knob to increase the tension on the focuser to hold very heavy 2" diagonal/eyepiece combinations without slipping when aiming at the zenith.

The focuser can be rotated a full 360° for the best photographic composition, or to put your diagonal in the most comfortable observing position. To rotate the focuser, loosen the ribbed rotation locking collar that encircles the barrel. Adjust the focuser to the desired angle, then retighten the collar to secure the focuser at the new angle.

**Terrestrial Observing:** Your AT102ED works well for daytime birding, nature studies, etc. A good altazimuth mount or a very sturdy photo tripod is essential, however, due to its 12 to 14 pound weight when using a diagonal and eyepiece. Your scope is also a very good 709mm (14x) f/6.95 telephoto lens for terrestrial photography.

Generally speaking, the maximum usable daytime power with any terrestrial scope is about 1x per mm of aperture (101x with a 7mm eyepiece on your scope). 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 28x (25mm) to 79x (9mm) eyepiece is usually more satisfying for everyday high power terrestrial use than a 101x eyepiece.

**Mounting the AT102ED:** A stable tripod, altazimuth mount, or German equatorial astronomical mount is essential for best viewing. The removable 8" long dovetail that is attached to your scope's split mounting rings has a 1/4"-20 thread hole for mounting on a suitably very sturdy photo tripod. This Vixen-style dovetail is also sized and shaped to mount directly in the dovetail slot on the top of an Astro-Tech Voyager altazimuth mount; on a Celestron Advanced Series or Meade LX-D-75 go-to mount; or on a Vixen Porta altazimuth, Sphinx go-to, or Great Polaris German equatorial mount.

**Installing the Multiple Reticle Finder:** There are two holes for mounting the finder, at the 10 o'clock and 2 o'clock positions on the top of the focuser, 3/4" behind the focuser rotation locking collar. The holes have screwdriver-slotted inserts to keep dust out of the scope. Please carefully note the position of the finder mounting holes in the illustration on the front page. There are also two hex-head inserts immediately behind the finder mounting holes. Do not loosen these hex-head inserts, as they are for factory adjustments of the focuser mechanism only. Undoing them will void your warranty.

Choose on which side of the scope you want to mount your finder, remove the appropriate slotted-head insert, and install your finder bracket in the exposed hole per the separate finder instruction sheet.

**Optional Astro-Tech Accessories:** Astro-Tech makes 1/10th wave 1.25" and 2" star diagonals with 46-layer 99% reflectivity dielectric coatings to complement the performance of your AT102ED. These are available from your Astro-Tech dealer to provide the highest

possible reflectivity and planetary contrast. An Astro-Tech 45° viewing angle 1.25" image-erecting diagonal is also available for terrestrial observing. The very stable Astro-Tech Voyager altazimuth mount with slow motion controls is ideal for grab-and-go astronomy.

**Caring for Your Scope Optics:** Never store your AT102ED 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 your scope to absorb excess moisture. If not properly stored in a humid environment, the telescope may develop mildew which can damage the optics.

If dew forms on your AT102ED after an observing session, allow the scope optics to air dry at room temperature before putting the lens cover on your scope and storing it away.

If the front lens surface becomes dusty, smeared, or shows fingerprints or any other surface build-up, clean it 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 its propellant may spit out and leave difficult-to-remove deposits on your lens. Also, the expanding compressed air drops in temperature as it leaves the can. The cold air coming out of the tiny tube used to direct the can's air flow has been known to chill a lens to the point of spalling chips of glass off the lens if pointed at the same spot on the lens 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 both make suitable fluids. Do not drip the cleaning fluid directly onto 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 AT102ED. 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 your lens surface. A few specks of dust on the lens will not be visible in your images. 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:** Your AT102ED is finished in a durable baked-on automotive-grade white paint with black anodized components. The very durable finish can become smudged with fingerprints during use, but this will not harm the finish. 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 remove fingerprints. 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 your telescope in the rain or in conditions where it may get wet. Your telescope is not waterproof. If your scope accidentally gets caught in the rain, immediately wipe off all water using a clean and dry soft cloth. If your telescope gets totally soaked by water, or submerged, immediately contact your dealer for service instructions. Do not disassemble or attempt to repair your telescope yourself, as this violates the terms of the limited product warranty and negates any guarantee.

**Caution! Never directly view the Sun with your telescope!** Never aim your AT102ED 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)  
from Astronomy Technologies, 680 24th Avenue SW, Norman, OK 73069

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