INSTRUCTION MANUAL

Orion® GoScope 80mm Backpack Refractor

#52596

Francais

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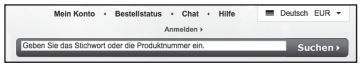

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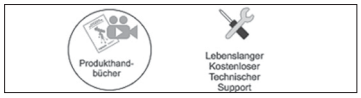

Español

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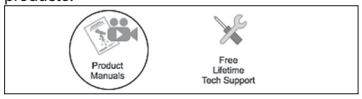

Italiano

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Congratulations on your purchase of a quality Orion product. The GoScope 80mm Backpack Refractor is a versatile and ultra-portable 80mm telescope designed for exploring scenic daytime vistas as well as scanning the night skies for celestial treasures. A complete telescope with an extendable tripod, great accessories, and a padded backpack that holds everything, the "GoScope 80" makes a perfect companion for the explorer on the go.

These instructions will help you set-up, properly use, and care for your instrument. Please read them over carefully before getting started.

Figure 1. *Included items of the GoScope 80mm Backpack Refractor*

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.***

Included Items

Unpack all of the items and lay them out in your workspace. Make sure all the items listed below and shown in **Figure 1** are present. Save the shipping box and packaging material. In the unlikely event that you need to return the mount, you must use the original packaging. Assembly of the telescope is easy and should take only about 10 minutes.

Item List

A Backpack

B Tripod

C Optical tube

C Accessory tray and leg brace

D Red dot finder scope

E 25mm Kellner eyepiece

F 10mm Plossl eyepiece

G 45-degree correct-image diagonal

H Moon filter

I MoonMap 260

J Dust cap

Assembly

1. With all items removed from the backpack (A), find the tripod (B) and spread the legs apart. To do this, twist the leg brace collar counterclockwise to unlock it (if it's not already unlocked), then push the collar downward **(Figure 2A)** until the leg brace is fully extended **(2B)**. Then twist the collar clockwise to tighten.

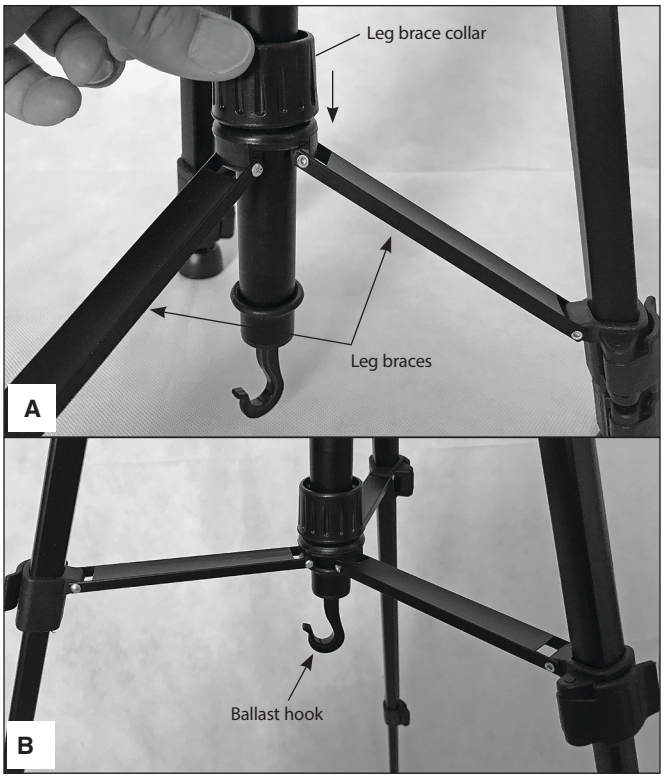

Figure 2. A) *Spread the tripod legs and slide leg brace collar down until it stops.* **B)** *Then twist the collar clockwise to lock the leg.*

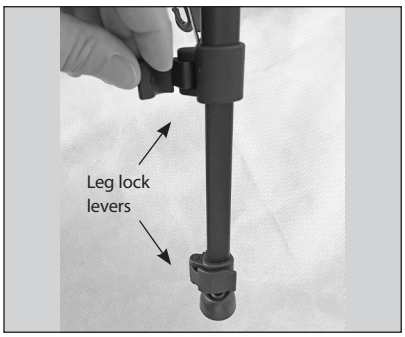

Figure 3. *Open the leg lock flip levers to adjust the tripod leg height.*

2. Extend the tripod legs by flipping the lock levers open **(Figure 3)**, extending the legs all the way, then closing the lock levers.
3. Referring to the pan head in **Figure 4**, remove the quick-release ("QR") plate from the pan head by releasing the lock lever and pulling the plate out of its saddle. Then attach the QR plate to the mounting adapter on the bottom of the telescope optical tube (C) by threading the ¼-20" post of the QR plate into one of the holes in the mounting adapter **(Figure 5)**. Use the "D-ring" under the QR plate to tighten the post.
4. Attach the telescope optical tube to the tripod pan head by inserting the QR plate into its saddle and press the plate down **(Figure 6)**. This will release the open lock lever. Then push the lock lever to the closed position.

Figure 4. *The GoScope 80 tripod's pan head.*

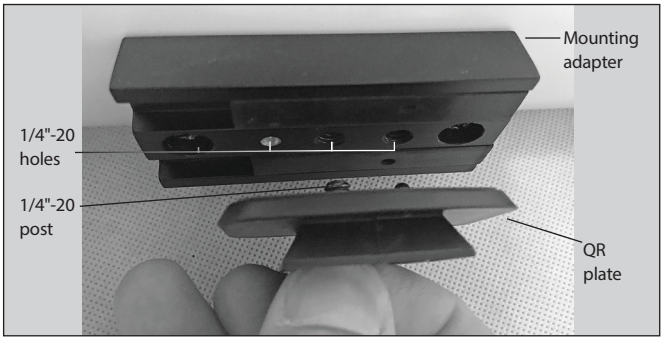

Figure 5. *Attach the quick-release (QR) plate to the mounting adapter on the bottom of the telescope optical tube.*

Now you're ready to install the accessories, starting with the red dot finder scope.

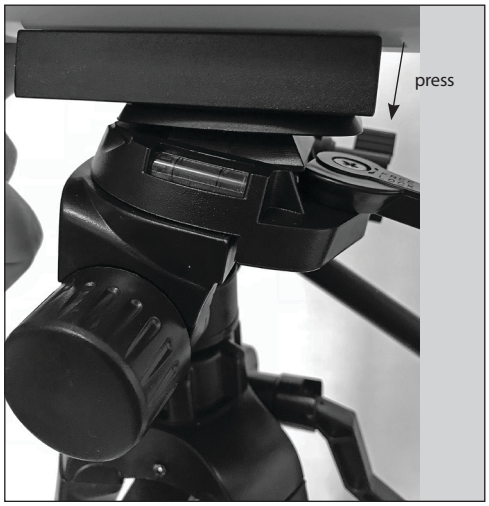

Figure 6. *Press the QR plate into the saddle to release the open lock lever, then push it closed.*

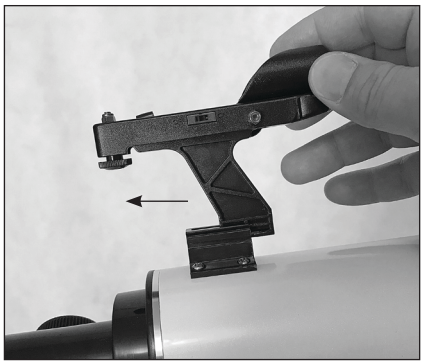

Figure 7. *Slide the red dot finder scope's bracket into its base as shown.*

5. Slide the bracket of the red dot finder scope (D) into its base, as shown in **Figure 7**.
6. Install the 45-degree correct-image diagonal (G) in the focuser and tighten the thumbscrew to secure it in place. Then insert the 25mm eyepiece (E) in the diagonal and secure it with the diagonal's thumbscrew. **(Figure 8)**.
7. The telescope is now fully assembled and should appear as in **Figure 9**.

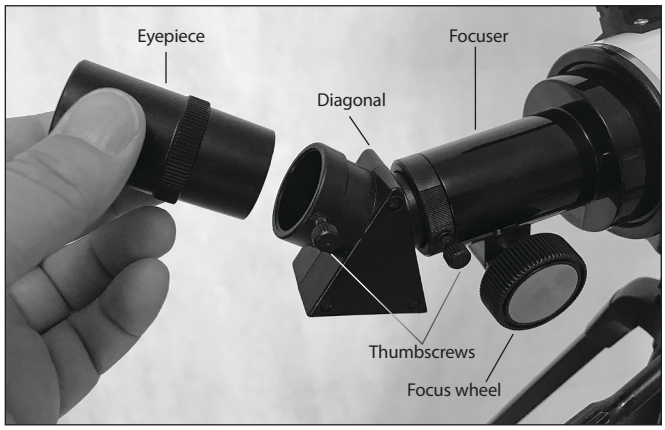

Figure 8. *Install the diagonal and an eyepiece in the focuser as shown.*

Telescope Operation

Aligning and Using the Red Dot Finder Scope

The included red dot finder scope makes pointing your telescope almost as easy as pointing your finger! It's a non-magnifying aiming device that superimposes a tiny LED-illuminated red dot on the sky, showing exactly where the telescope is pointed. It permits easy object targeting prior to observation in the main telescope.

Before you can use the red dot finder scope, you must remove the tab sticking out from the battery compartment **(Figure 10)**. Doing so will allow the pre-installed 3V CR-2032 button cell battery to make contact with the finder scope's electronic circuitry to power the finder's red LED illuminator. The tab can then be discarded.

To use the red dot finder scope properly, it must be aligned with the main telescope. This is easiest to do during daylight hours, before observing at night. Follow this procedure:

1. First, remove the dust cap (J) from the front of the telescope.
2. With the diagonal and 25mm eyepiece already in place, point the telescope at a well-defined land target (e.g., the top of a telephone pole) that's at least a quarter mile away. Center the target in the eyepiece by moving the optical tube by hand, with the altitude and azimuth tension knobs slightly loosened to allow easy movement in both axes), then by turning the slow-motion cables as needed to center the target object.
3. Now that a distant target is centered in the main telescope's eyepiece, turn on the red dot finder scope by sliding the power switch to ON (refer to **Figure 10**). Position your eye at a comfortable distance from the rear of the unit. Look through the round window of the finder scope with both eyes open to see the illuminated red dot. The target object should appear in the field of view somewhere near the red dot.

NOTE: ***This finder has two brightness settings. When the switch is set all the way over to the ON position, the red dot is brightest. But in between the OFF and ON positions is a middle setting in which the red dot is dim. Typically the dim setting is used under dark skies and the brighter setting is used under light-polluted skies or in daylight.***

4. You'll want to center the target object on the red dot. To do so, without moving the telescope, use the finder scope's vertical and horizontal adjustment knobs (shown in **Figure 10**) to position the red dot on the object.
5. When the red dot is centered on the distant object, check to make sure the object is still centered in the telescope's eyepiece. If it isn't, re-center it then adjust the finder scope's alignment again. When the object is centered in the telescope eyepiece and on the finder scope's red dot, the finder scope is properly aligned with the telescope. The red dot finder scope's alignment should be checked before every observing session.

At the end of your observing session, be sure to slide the power switch on the red dot finder scope to OFF to preserve battery life.

Figure 9. *The fully assembled GoScope 80mm Backpack Refractor.*

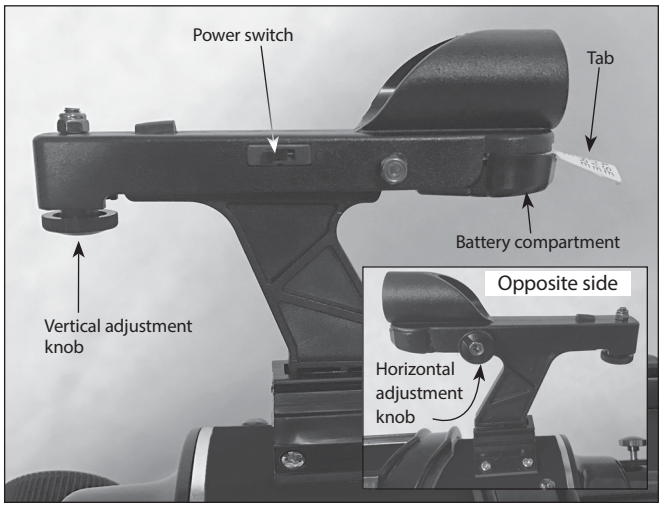

Figure 10. *The red dot finder scope has vertical and (inset) horizontal adjustment knobs for aligning it with the telescope.*

Using the Pan Head

The GoScope 80mm refractor features a standard "altazimuth" pan head mount, which permits motion along two perpendicular axes: altitude (up/down) and azimuth (left/right). This makes pointing the telescope easy and intuitive. To move the telescope in the azimuth direction, loosen the azimuth tension knob a little (refer to **Figure 4**), then take hold of the pan handle and gently move it left or right. To move the telescope in altitude, twist the pan handle counterclockwise to allow easy motion, then move the telescope up or down to the desired position. Then twist the pan handle clockwise to lock that position. You may be able to find a suitable azimuth and altitude axis tension to allow the telescope to be moved freely without having to make any adjustments to the tension every time you move the telescope.

The top plate of the pan head can also be tilted 90° laterally by loosening the tilt lock knob (see **Figure 4**). While this feature may not be particularly useful when viewing with the telescope, it can come in handy if you replaced the telescope on the pan head with a DSLR camera, allowing quick switching between landscape (horizontal) and portrait (vertical) camera orientations.

The tripod also comes equipped with a geared center column, which provides additional height for the scope when needed. (See **Figure 11**.) To extend the column, first loosen the center column lock knob a half turn or so. Then pull the crank handle outward and rotate it clockwise. When you reach the desired height, retighten the lock knob. To lower the center column, loosen the lock knob then rotate the crank handle counterclockwise.

Eyepiece Selection

Magnification, or power, is determined by the focal length of the telescope and the focal length of the eyepiece being used. Therefore, by using eyepieces of different focal lengths, the resultant magnification can be varied. It is quite common for an observer to own five or more eyepieces to access a wide

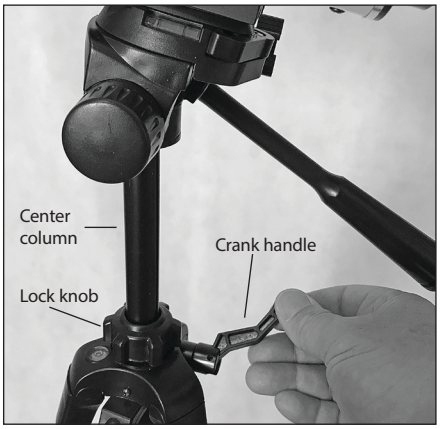

Figure 11. *Use the crank handle to move the geared center column up or down, making sure to first loosen the center column lock knob a bit.*

range of magnifications. This allows the observer to choose the best eyepiece to use depending on the object being viewed and viewing conditions. Your GoScope 80mm refractor comes with 25mm and 10mm eyepieces, which will suffice nicely to begin with. You can purchase additional eyepieces later if you wish to have more magnification options.

Magnification is calculated as follows:

$$\frac{\textbf{Telescope Focal Length (mm)}}{\textbf{Eyepiece Focal Length (mm)}} = \textbf{Magnification}$$

For example, the GoScope 80mm has a focal length of 400mm, which when used with the supplied 25mm eyepiece yields:

$$\frac{\textbf{400 mm}}{\textbf{25 mm}} = \textbf{16x}$$

The magnification provided by the 10mm eyepiece is:

$$\frac{400\text{ mm}}{10\text{ mm}} = 40\text{x}$$

The maximum attainable magnification for a telescope is directly related to how much light it can gather. The larger the aperture, the more magnification is possible. In general, a figure of 50x per inch of aperture is the maximum attainable for most telescopes. Going beyond that will yield simply blurry, unsatisfactory views. Your GoScope 80mm refractor has an aperture of 80mm, or 3.1 inches, so the maximum magnification would be about 155x (3.1 x 50). This level of magnification assumes you have ideal atmospheric conditions for observing (which is seldom the case).

Keep in mind that as you increase magnification, the brightness of the object viewed will decrease; this is an inherent principle of the laws of physics and cannot be avoided. If magnification is doubled, an image appears four times dimmer. If magnification is tripled, image brightness is reduced by a factor of nine!

So start by using the 25mm eyepiece, then try switching to the 10mm eyepiece later if you want to boost the magnification.

Focusing the Telescope

To focus the telescope, turn the focus wheels (**Figure 8**) forward or back until you see your target object in the eyepiece. Then make finer adjustments until the image is sharp. If you're having trouble achieving initial focus, rack the focuser drawtube all the way in using the focus wheels, then while looking into the eyepiece slowly turn the focus wheels so that the drawtube extends outward. Keep going until you see your target object come into focus. Note that when you change eyepieces you may have to adjust the focus a bit to get a sharp image with the newly inserted eyepiece.

Terrestrial and Celestial Viewing with the GoScope 80mm

The Orion GoScope 80mm is equipped with a 45-degree "correct-image" diagonal, which provides an upright, "normal" view. Because of this, the GoScope is an excellent terrestrial telescope for viewing Earth-based scenes during daylight hours. More powerful than binoculars, it can get you visually "up close" to your target for vivid, detailed views. For best results, however, DO NOT VIEW OUT WINDOWS. The glass in a window is approximately 1000 times less accurate than the optics of your GoScope – so it will soften your views, and things will seem to be slightly out of focus. If you must view through a window, use the lowest power available (and open the window!).

The GoScope 80mm also excels for nighttime viewing, enabling you to see hundreds of craters on the Moon, Jupiter and its four major moons, the rings of Saturn, and much more! If you take the GoScope to a location away from city lights (the darker, the better), you will be able to spot most of the famous "M objects," or Messier objects, which include open star clusters, globular star clusters, gaseous nebulas, and even galaxies outside our own Milky Way galaxy. You'll need a star map or a planisphere (the Orion Star Target plansiphere is a great one) and some patience, but the rewards are endless.

The GoScope 80mm includes a rugged backpack for taking the telescope, tripod, and all the included accessories with you wherever you go (**Figure 12**). So get out there and enjoy the views!

For astronomical viewing you may find that having a 90-degree "star" diagonal positions the eyepiece at a more-comfortable angle for viewing objects high overhead. In that case you should consider purchasing a 90-degree star diagonal (1.25"); check the telescope.com website for current options.

Figure 12. *The telescope, tripod and accessories all fit inside the rugged backpack, ready to go wherever you take it!*

Best Targets

Best night sky targets from the city:

- The Moon
- Venus
- Jupiter
- Saturn

Best targets from rural locations (everything above, plus):

- **The Great Nebula in Orion** – a spectacular glowing cloud of gas in Orion's sword; this is a "stellar maternity ward," a place where new stars are forming.
- **The Summer Milky Way** – the GoScope is well suited to scanning the Milky Way to "discover" dozens of star clusters.

- **The Pleiades (M45)** – a bright open star cluster
- **The Andromeda Galaxy (M31)** – the brightest external galaxy
- **The Double Cluster in Perseus**
- **M11, M6 & M7** – three bright, summer star clusters
- **The Beehive Cluster** – A big, open star cluster in the spring sky
- **The Great Cluster in Hercules M13** – a wonderful globular star cluster, spring & summer
- **M22** – another grand globular star cluster in Sagittarius, a summer constellation

"Seeing" and Transparency

Atmospheric conditions vary significantly from night to night. "Seeing" refers to the steadiness of the Earth's atmosphere at a given time. In conditions of poor seeing, atmospheric turbulence causes objects viewed through the telescope to "boil." If you look up at the sky and stars are twinkling noticeably, the seeing is poor and you will be limited to viewing at lower magnifications. At higher magnifications, images will not focus clearly. Fine details on the planets and Moon will likely not be visible.

In conditions of good seeing, star twinkling is minimal and images appear steady in the eyepiece. Seeing is best overhead, worst at the horizon. Also, seeing generally gets better after midnight, when much of the heat absorbed by the Earth during the day has radiated off into space.

Especially important for observing faint objects is good "transparency"—air free of moisture, smoke, and dust. All tend to scatter light, which reduces an object's brightness. Transparency is judged by the magnitude of the faintest stars you can see with the unaided eye (5th or 6th magnitude is desirable).

Cooling the Telescope

All optical instruments need time to reach "thermal equilibrium." The bigger the instrument and the larger the temperature change, the more time is needed. Allow at least 30 minutes for your telescope to acclimate to the temperature outdoors before you start observing with it.

Let Your Eyes Dark-Adapt

Don't expect to go from a lighted house into the darkness of the outdoors at night and immediately see faint nebulas, galaxies, and star clusters—or even very many stars, for that matter. Your eyes take about 30 minutes to reach perhaps 80% of their full dark-adapted sensitivity. As your eyes become dark-adapted, more stars will glimmer into view and you'll be able to see fainter details in objects you view in your telescope.

To see what you're doing in the darkness, use a red-filtered flashlight rather than a white light. Red light does not spoil your eyes' dark adaptation like white light does. A flashlight with a red LED light is ideal. Beware, too, that nearby porch, streetlights, and car headlights will ruin your night vision.

Using the Moon Filter and MoonMap 260

Included with your GoScope 80mm Backpack Refractor telescope are an Orion Moon Filter (H) and Orion's exclusive MoonMap 260 (I). These are excellent accessories for observing the Moon comfortably and identifying the many incredible features on the lunar surface.

When looking at the Moon through a telescope, the bright reflected sunlight from the lunar surface can be overwhelming. This glare can be so bright that it washes out most of the interesting lunar features such as craters, rilles, mountains, and valleys, and reduces contrast. It cuts the brightness of the Moon to bring out considerably more lunar surface details while providing greater viewing comfort. The Moon filter threads directly into the barrel of the telescope eyepiece, as shown in **Figure 13**. Once it is threaded on, just insert the eyepiece into the diagonal and start viewing.

The DeepMap 260 depicts the locations and names of over 260 features on the Moon such as craters, mountains, valleys, "seas" and more. It is a great tool for beginning astronomers.

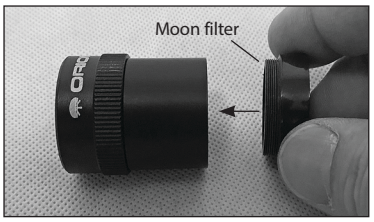

Figure 13. ***Install the Moon filter by threading it into the bottom of the eyepiece.***

This detailed map will even show you where various spacecraft have landed on the Moon's surface!

The great thing about the Moon is that its phase changes every night. Focus your attention on the border between the illuminated and dark portions or the surface, called the "terminator". Shadows cast along the terminator help to reveal the rugged relief of the landscape. Note that the worst time to view the Moon is during the full Moon phase. That's because sunlight shines directly downward on the lunar surface, so no shadows are cast by the moon's topography.

Telescope Care and Maintenance

If you give your telescope reasonable care, it will last a lifetime. Store it in a clean, dry, dust-free place, safe from rapid changes in temperature and humidity. Do not store the telescope outdoors, although storage in a garage or shed is okay. Small components like eyepieces and other accessories should be kept in a protective box or storage case. Keep the dust cover on the front of the telescope when it is not in use.

Your refractor telescope requires very little mechanical maintenance. The optical tube has a smooth painted finish that is fairly scratch-resistant. If a scratch does appear on the tube, it

will not harm the telescope. If you wish, you may apply some auto touch-up paint to the scratch. Smudges on the tube can be wiped off with a soft cloth and household cleaning fluid.

Cleaning Optics

Any quality optical lens cleaning tissue and optical lens cleaning fluid specifically designed for multi-coated optics can be used to clean the lenses of your telescope and eyepieces. Never use regular glass cleaner or cleaning fluid designed for eyeglasses. Before cleaning, remove any loose particles or dust from the lens with a blower bulb or soft brush. Then 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. On larger lenses, clean only a small area at a time, using a fresh lens tissue on each area. Never reuse tissues.

When bringing the telescope inside after an evening's viewing it is normal for moisture to accumulate on the lenses due to the change in temperature. We suggest leaving the telescope and eyepieces uncovered overnight to allow the condensation to evaporate.

Specifications

Objective lens:	80mm (3.15") diameter, achromatic
Effective focal length:	400mm
Focal ratio:	f/5.0
Lens coatings:	Fully antireflection coated
Focuser:	Rack-and-pinion, accepts 1.25" accessories
Eyepieces:	25mm Kellner and 10mm Plossl, 1.25" barrel diameter, threaded for Orion filters
Eyepiece coatings:	Fully antireflection coated
Diagonal:	45-degree correct-image, 1.25"
Eyepiece magnification:	16x (with 25mm eyepiece) and 40x (with 10mm eyepiece)
Finder scope:	Red dot finder scope, two brightness levels
Tripod:	Aluminum and ABS, 3-section legs
Pan head:	3-Way, with removable shoe
Height, legs extended:	53"
Total weight:	5 lbs. 10 oz.

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.

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