

Instruction Manual

omegon



Omegon 130/920 EQ-3

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The Omegon® 130/920 EQ-3

Congratulations on the purchase of the new Omegon® 130/920 EQ-2. This small telescope will give you hours of fun, with its all optical glass lens and super compactness, and it is the ideal companion to start in the world of amateur astronomy. With this telescope you will be able to see the craters on the Moon, star clusters, some nebulae a glimpse of the Jupiter disc features and its Galilean moons and the rings of Saturn. We have included many accessories so it will be easy to use this telescope.

1. Included parts

We have included several accessories that will make the use of the telescope easier and fun, please take a look at the list of the parts so you can identify them in the future.

1. & 2. Two eyepieces 1.25" (31.75mm); a Kellner 25mm and a Kellner 10mm eyepiece;
3. 2x magnification Barlow Lens;
4. Red-dot finderscope;



Figure 1. Parts list.

2. Getting Started. It is very simple to get started. Here is how the telescope works. The telescope should point to the object being observed. The mirror at the bottom of the telescope's tube gathers the object's light and reflects it to the secondary mirror that brings it to the eyepiece. Next to the telescope's aperture there is the focuser. The focuser tube moves to get a precise focused image. At the focuser one can use the supplied accessories. Different combinations of accessories give different results, such as different image magnifications or correct image. All this will be explained in more detail on the next pages.

3. Assembly. Start by setting up the tripod. Open the tripod legs as shown (figure 2). Place the tripod tray and thread it (figure 3). You can use the tray to put your eyepieces or other observing accessories. Place the equatorial head on top of the tripod (figure 4). Next place the tube rings on the mount (figure 5), tighten it securely, and insert the counterweight shaft by threading it to the Right Ascension (R.A.) axis. Insert the counterweight (figure 7), don't forget to thread the foot-saver (the screw and washer at the end of the shaft). Place the optical tube by opening the tube rings. Slide it so that the tube stays centred with the rings (figure 8). Install the fine movement handles as shown in the protruding shafts. Remove the two thumbscrews (figure 10) and install the red-dot finder (figure 11) as shown, the finder should point to the same direction as the telescope. Congratulations! You are almost ready to use the telescope!



Figure 2. Tripod assembly.

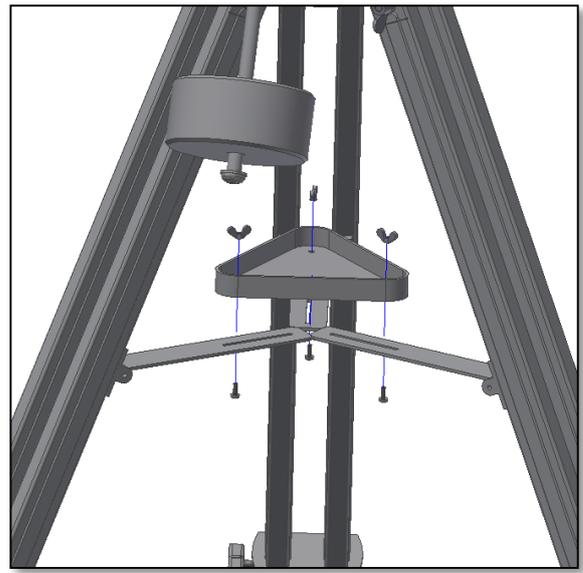


Figure 3. Tray placement.



Figure 4. Place equatorial head on top of tripod.

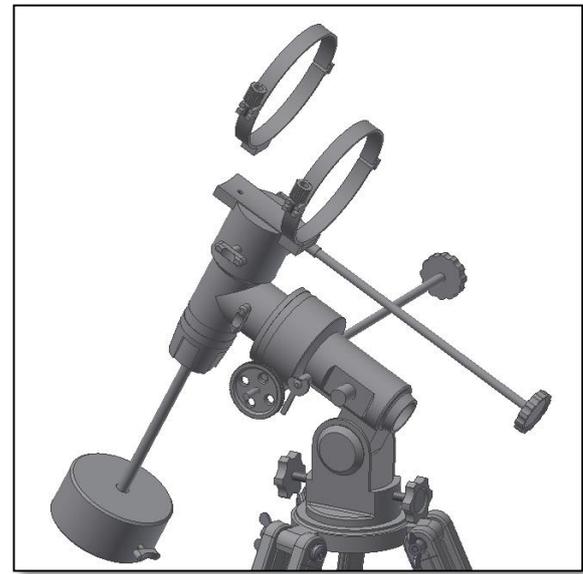


Figure 5. Place the tube rings.



Figure 6. Insert fine shaft.

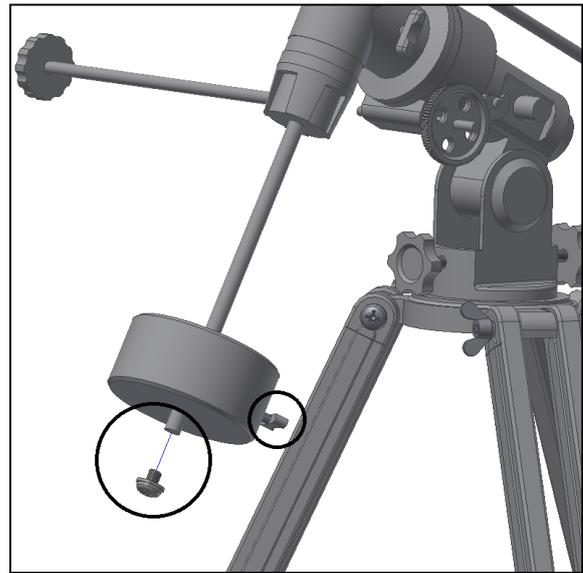


Figure 7. Place the counterweight.



Figure 8. Tube placement.



Figure 9. Fine movement handles.

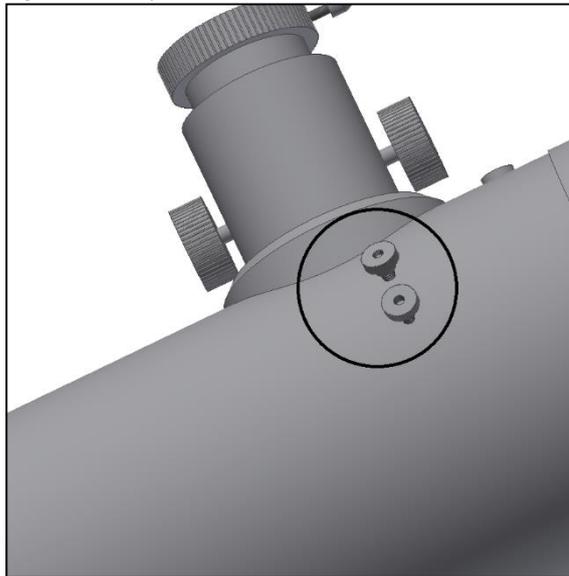


Figure 10. Finderscope placement.



Figure 11. Finderscope placement.

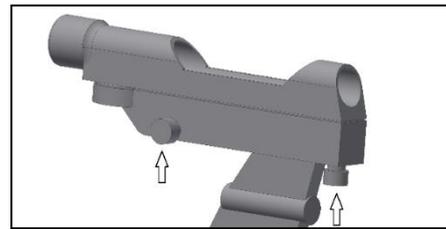
4. Start using your Omegon® 130/920 EQ-3 telescope. Point the telescope to a distant object during the day. It is important to do this during daylight, so that you get familiarized with the telescope operation. A good target is a church tower, a chimney or a distant mountain peak. Rotate the focuser knob, so that the focuser tube moves in and out. Do this slowly. We suggest that you start by racking the focuser all the way in and slowly move it out. With the K25mm eyepiece you should be able to get a focused image easily. **4.1. The Finderscope.** Before we mentioned the finderscope as a valuable tool to point the telescope at an object. To operate properly, the telescope and the finderscope should be aligned. The image obtained through the finderscope has a much broader field of view than that of the telescope. **4.2. How to align the finderscope?** You have the house chimney (example mentioned before) centered at the telescope eyepiece field of view. Now look through the finderscope. The small red-dot at the center of the finderscope field of view should match the center of the telescope field of view. Adjust the two finderscope screws to get the cross pointing to the same object as the telescope (as shown in Figure 4.2.1.).



4.2.1. A distant object is centered at the telescope's field of view. In this example we have a house with a chimney. The chimney is the reference point to place at the center of the field of view. We first look through the telescope with the lowest magnification possible (PL25mm should be preferable), so we have the widest field of view.



4.2.2. Looking through the finderscope (it should be powered on) we see the same building, but in this case the red dot and chimney are not centered. We adjust the finderscope using the two thumbscrews (figure below) so that the finderscope red point moves slightly until it matches the chimney. This is enough to correct the objects position in the finderscope. Trial and error is required to get a satisfactory result.



4.2.3. After playing with the two finderscope thumbscrews and some trial and error, we get the finderscope red dot close to the center (in this case the chimney). The finderscope is now ready to use!

5. Using the accessories, a bit of math to understand how all it works.

Using the accessories is easy and fun. To change magnification simply swap eyepieces. To get more magnification simply use the barlow lens. But how does all of this work?

5.1. Power (magnification)

Your telescope has a focal length of 920mm. This is approximately the distance between the telescope lens and its focal point (very similar to the distance between the focus point of a loupe and the loupe lens). This is a very important feature, that allows to determine several interesting facts such as magnification.

The magnification is determined by the telescope's focal length and the used eyepiece. You probably noticed that the two supplied eyepieces are PL25mm and PL10mm. This means that the PL25mm is a 25mm focal length eyepiece while the PL10mm is a 10mm focal length eyepiece.

To determine the magnification just divide the telescope's focal length by the eyepiece's focal length. Let's give an example for our telescope and the supplied eyepieces:

Telescope's focal length is 920mm.
PL25 eyepiece's focal length is 25mm.

$$\frac{920mm}{25mm} = 36 \text{ power}$$

Some possible accessory combinations

	Terrestrial View	Moon	Deep Sky	Jupiter and Saturn
Barlow Lens 2x				Yes
PL25mm Eyepiece			Yes	Yes
PL10mm Eyepiece		Yes		
Power	<i>Does not apply</i>	<i>92x</i>	<i>36x</i>	<i>74x</i>

This means that the PL25 eyepiece provides a 36x power (magnification). This seems low, but when you try it, you will see a bright image with some (very good) details.

5.2. Barlow Lens

The barlow lens is a very interesting device. It is a negative lens, that multiplies the telescope's focal length. So a 2x Barlow multiplies the original focal length by 2x, in this case $920mm \times 2 = 1840mm$.

A 3x Barlow lens multiplies by 3x.

Your telescope is supplied with a 2x Barlow lens. When used with the PL25mm eyepiece you get 2x the power obtained before
 $36 \text{ power} \times 2x \text{ Barlow} = 72 \text{ power}$

5.3. Erecting lens (not included)

The erecting lens gets you an upright image view with the telescope. It also adds some power like the barlow lens. The supplied Erecting Lens provides an extra 1.5x power.

5.4. Diagonal Mirror (does not apply to this model)

This diverts the light coming from the telescope to an angle of 45 or 90 degrees. It is useful because it provides a more comfortable position when observing.

Here are some examples on how to use the accessories.

6. What can be seen with this telescope?

Below you will find some examples of what you can expect to see when using this telescope.



6.1. The Moon is one of the most spectacular objects to be seen through a telescope. Even a small telescope will reveal high detail of the Moon's surface. You will be able to see the craters on the Moon's surface and other features like the Mare. The moon is a very bright object. It is better to observe it when the Moon is not full. Try the crescent Moon and look for features along the terminator (between illuminated and dark surfaces).



6.2. Jupiter is the biggest planet of our solar system. It is also one of the favorite targets for beginners. Galileo was able to discover that the four tiny dots that turn around the planet were in fact part of Jupiter's system of moons. With this telescope you will not only be able to see Jupiter's planet disc with its two major discernible bands, but also its biggest moons, Io, Europa, Ganymedes and Callisto.



6.3. The "lord of the rings" of the night skies, Saturn is by far the most popular target for small telescopes. Saturn's rings are discernible even at 60x magnification. In a very good night you will be able to see the Cassini's division (the darker band on the Saturn's rings).

7. Troubleshooting and frequently asked questions

Q: I get a mirrored view of the objects. Like if they were reversed, and R shows up like Я

A: This is caused by the telescope's mirrors. To get a corrected image it is necessary to use the correcting lens and the eyepiece as shown below. Please notice this telescope is not designed for terrestrial viewing.

Q: I use the finderscope to point to objects but I always miss the target.

A: You probably need to realign the finderscope. Please proceed as described in 4.2.

Q: When I use the barlow lens and the PL10mm eyepiece the image is so dark I can hardly see anything.

A: Power should be used with moderation. It depends on how stable the atmosphere is, too much turbulence causes image distortion. Usually the limit is 2x for each millimeter of the telescope aperture. In this case the telescope has an aperture of 130mm, so in a very good night you should be able to reach 260x. The more magnified the image is, the darker it gets.

Q: Is my telescope compatible with other eyepieces ?

A: Omegon telescopes are compatible with all telescope eyepieces from different manufacturers as long as the eyepiece is a 1.25" (or 31.75mm) size eyepiece. If you would like to test an eyepiece from a fellow astronomer go ahead. Different eyepieces provide different visual experiences.

Q: I want to use my telescope to take pictures.

A: This telescope is designed for visual use. It doesn't mean it can't be used for photography, however it will be hard to get high quality pictures with this telescope. If you have a smartphone you can shoot the Moon or some terrestrial objects. Search online for digiscoping and afocal photography.

Q: The stars only appear as points in the telescope.

A: Stars will always only appear as points, even in the largest telescopes in the world. It is more interesting for beginners to observe two-dimensional objects, such as the Moon or planets. Once you find these, you will be able to start learning about the astronomical calendar.

Q: I would like to observe the Sun.

A: An appropriate solar filter, placed over the objective, is essential for observing the sun. These are available as plastic foil or glass filters. They only allow a tiny and harmless fraction of sunlight into the telescope, when securely positioned over the objective, allowing you to observe the sun in complete safety. Eyepiece solar filters (not available from us) should be avoided at all costs as they are considered unsafe.

Note: Never look directly at the sun through a telescope without an objective solar filter!

Q: I can't see anything when I look through my telescope.

A: The telescope is only suitable for astronomical observing and when used outside at night.

Observing from inside the house or during the day usually is not possible.

The dust caps must first be removed and an eyepiece inserted before you can start observing. Are you sure you have removed all the dust caps, not just the small ones? If you have not, then no light will enter the telescope and everything will appear black.