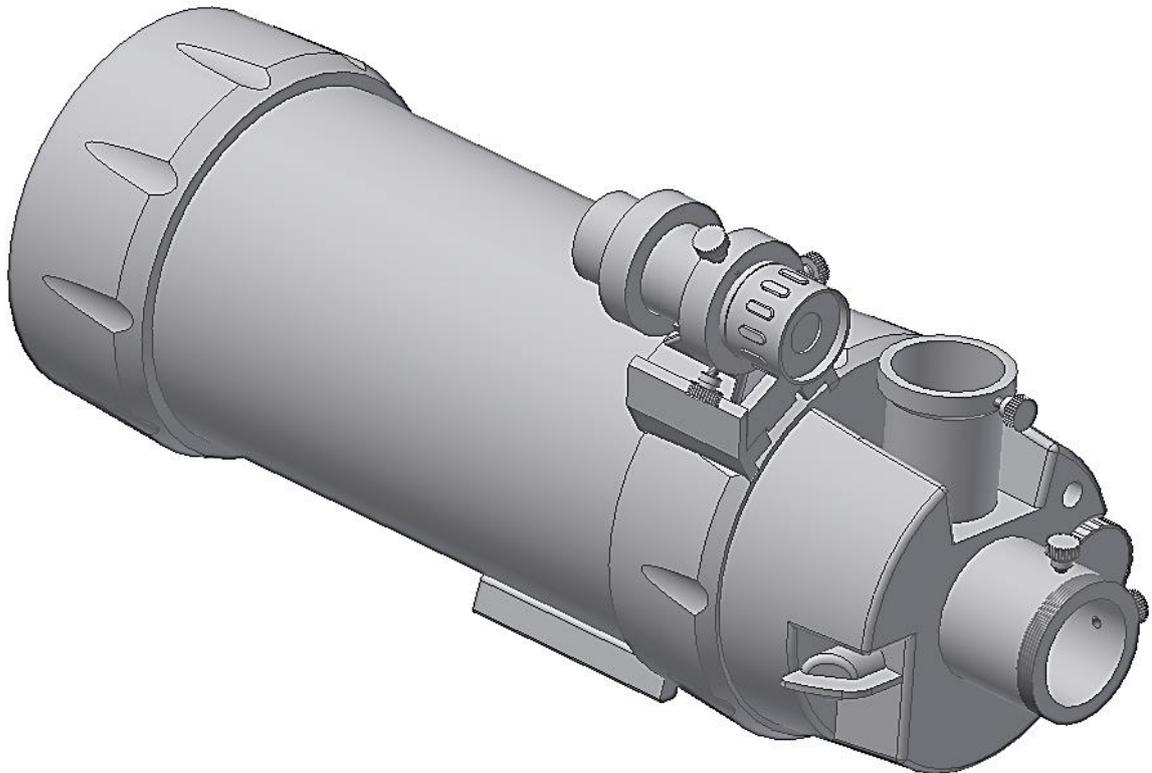


Instruction Manual

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Maksutov Telescope 90/1250 OTA

English version 10.2014 Rev A

The Omegon® Maksutov Telescope 90/1250 OTA

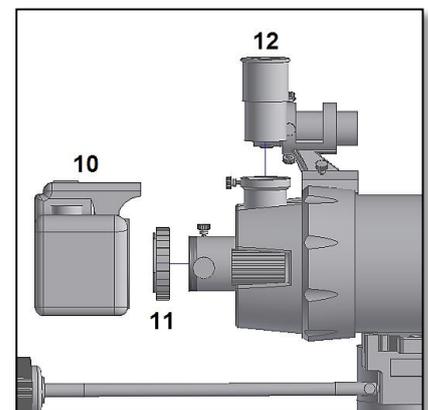
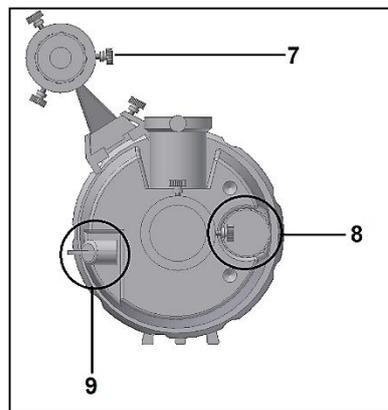
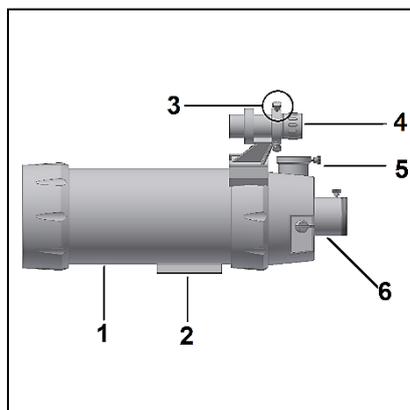
Congratulations on the purchase of the new Omegon® Telescope Maksutov 90/1250 OTA. This telescope tube is suited for both terrestrial and astronomical use. It is compact and easy to carry around; it can also be used as a tele-objective or a high-power telescope. You can even use it to take photos with a DSLR camera (not included).

1. Included parts. Besides the telescope tube we have included a finderscope, a finderscope bracket and a soft carry case.

2. Getting started. It is very simple to get started. Here is how the telescope works. The telescope aperture (lens) should be pointing to the object being observed. The light comes through the aperture lens, to the mirror on the back and is then reflected to the small secondary mirror on the telescope lens. There it is reflected again and so brought to the eyepiece. The eyepiece can be used in two positions – top (#5) or back (#6) – see below. At the focuser one can use accessories. Different accessory combinations give different results, such as different image magnifications. All this will be explained in detail on the next pages.

2.1. Knowing your telescope.

- | | |
|--|------------------------------------|
| 1- Optical Tube; | 7- Finderscope adjustment screw; |
| 2- Dovetail adapter for telescope mount or tripod; | 8- Focusing knob; |
| 3- Finderscope adjustment screw; | 9- Flip-Mirror System; |
| 4- Finderscope; | 10- DSLR Camera (not included); |
| 5- Top eyepiece holder; | 11- T-ring adapter (not included); |
| 6- Back eyepiece holder; | 12- Eyepiece (not included). |



3. Assembly. Remove the telescope from the shipping box. Start by installing the finderscope tube and finderscope bracket as shown in figure 1. Make sure it is pointing to the telescope's aperture, tighten it using the side finderscope thumbscrew (on the finderscope shoe base). You will need to use a photographic tripod or a telescope mount (Vixen/Synta compatible dovetail) to mount the tube (figure 2). Make sure you choose a stable tripod or mount for ease of use. The telescope's aperture should point to the object being observed. Choose a low magnification eyepiece (#12), insert it into the top eyepiece holder (#5), and make sure to securely tighten the eyepiece using the eyepiece holder thumbscrew. You may also use the eyepiece on the back eyepiece holder (#6). Use the focusing knob (#8) to get a sharp (focused) image. The back eyepiece holder (#6) provides a straight view for a DSLR camera. To use a DSLR camera with the telescope start by removing the

camera objective lens and place the T-ring on the camera body (#11), thread the camera to the telescope back eyepiece holder (#6), it should look like figure 3. The telescope includes a spring-loaded flip-mirror system (figure 4). Switch from horizontal to vertical position to get straight-through view, or from vertical to horizontal position to get top view (figure 4).

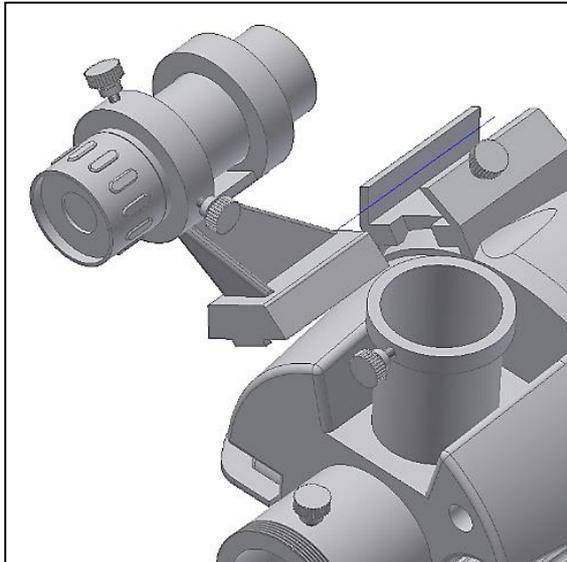


Figure 1. Install the finderscope.



Figure 2. Place the tube on a suitable tripod or mount.

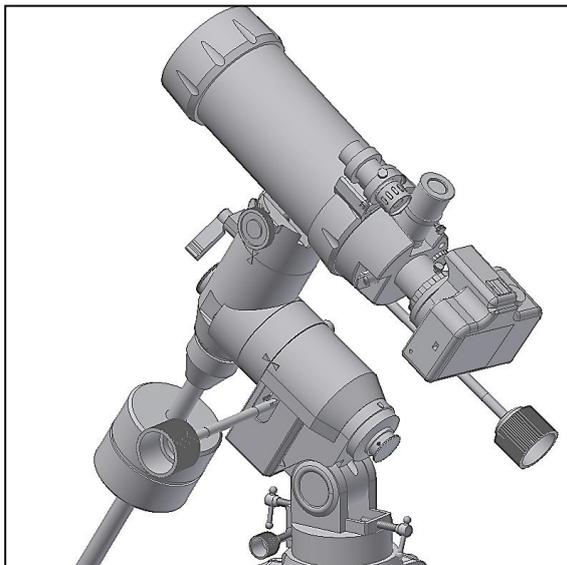


Figure 3. Telescope ready for imaging (camera, mount and eyepiece not included).

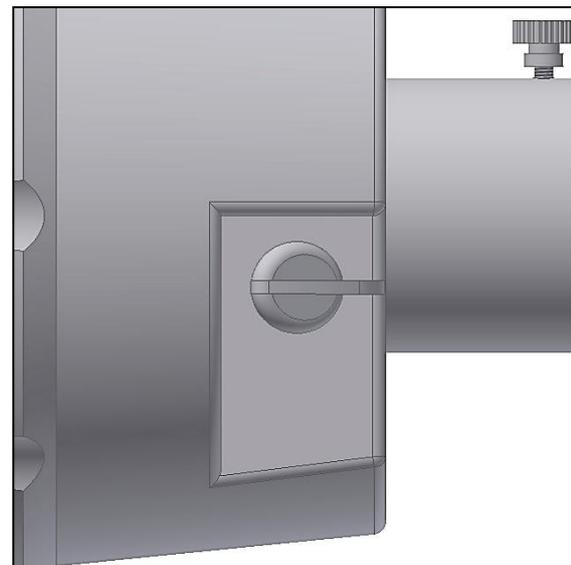
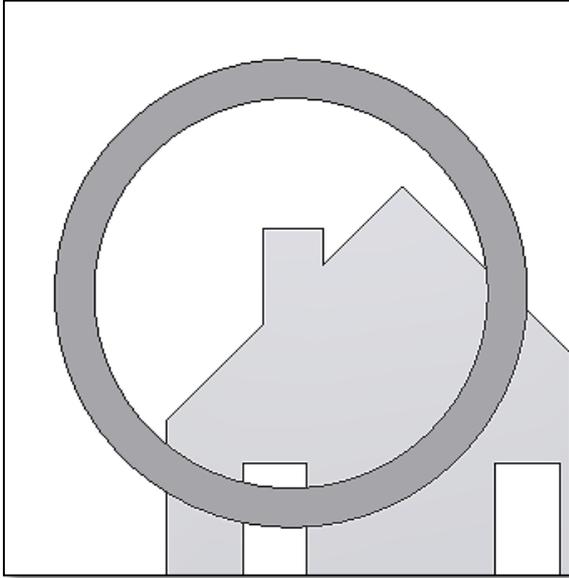


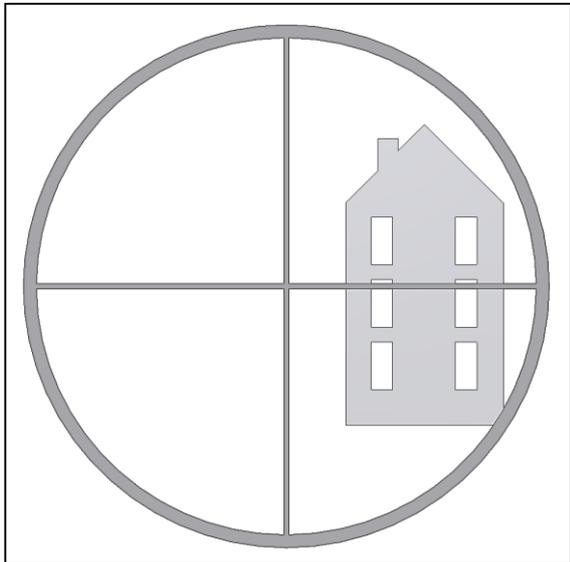
Figure 4. Flip mirror horizontal (light comes through back - #6 suitable for DSLR use).

ATTENTION! Never look at the Sun through a telescope. Concentrated Sun light may cause serious eye injury. Children should use with adult supervision only!

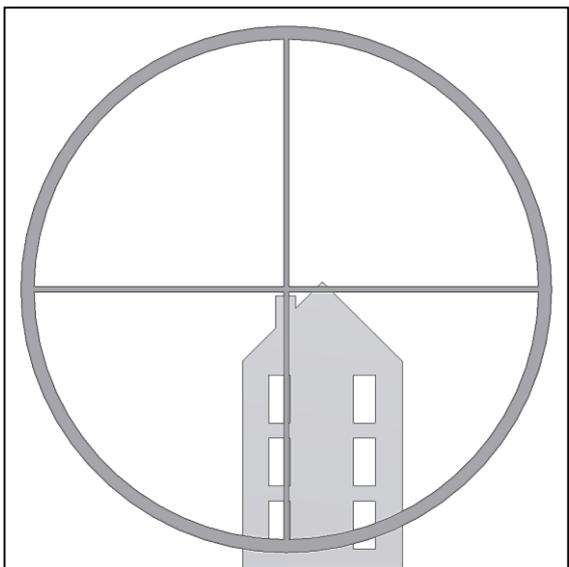
4. How to use and how to align the finderscope?



4.1. A distant object is centered at the telescope's field of view with an eyepiece. 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 to get the widest field of view.



4.2. Looking through the finderscope we see the same building, but in this case the chimney is not centered. We adjust the finderscope using the three thumbscrews, so that the finderscope moves slightly. This is enough to correct the objects position in the finderscope. Trial and error is required to get a satisfactory result. Make sure to tighten the 3 screws after finishing, so that the finderscope tube does not move.



4.3. After playing with the three finderscope thumbscrews and some trial and error we get the finderscope's recticle close to the center (in this case the chimney). The finderscope is now ready to use!

5. What can be seen with this telescope?

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



5.1. The Moon is one of the most spectacular objects to be seen through a telescope. Even a small telescope will reveal a lot of details 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 observed when the Moon is not full. Try the crescent Moon and look for features along the terminator (between illuminated and dark surfaces).



5.2. Jupiter is the biggest planets of our solar system. It is also one of the most favorite targets for beginners. Galileo was able to discover that the four tiny dots that circle 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.



5.3. The "lord of the rings" of the night sky, 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 of Saturn's rings).

6. Using the accessories: a bit of math to understand how it all works.

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

6.1. Power (magnification)

Your telescope has a focal length of 1250mm. 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.

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 some eyepieces:

Telescope's focal length is 1250mm;
Omegon® Plössl 25mm eyepiece's focal length is 25mm;

$$\frac{1250mm}{25mm} = 50 \text{ power}$$

This means that the 25mm eyepiece provides a 50x power (magnification). This seems low, but try it, you will see a bright image with details.

6.2. Barlow Lens (not included)

The barlow lens is a very interesting device (not included). It is a negative lens, that multiplies the telescope's focal length. A 2x Barlow, for example, multiplies the original focal length by 2x, in this case $1250mm \times 2 = 2500mm$.

A 3x Barlow lens multiplies by 3x.

When used with a 25mm eyepiece you get 2x the power obtained before
 $50 \text{ power} \times 2x \text{ Barlow} = 100 \text{ power}$

Here are some examples on how to use the accessories.

Some possible accessory combinations

	Terrestrial View	Moon	Deep Sky	Jupiter and Saturn
Omegon® Plössl 25mm	Yes		Yes	
Omegon® Plössl 9mm		Yes		
Omegon® LE 12.5mm				Yes
Omegon® Moon Filter		Yes		
Omegon® UHC Filter			Yes	
Power	50x	139x	50x	100x

Technical notes

The two top and back eyepiece exit holders are not parfocal. The back eyepiece holder (#6) requires an additional 5mm spacing to be parfocal with the top. We recommend using a 1.25" (31.75mm) parfocalizing ring, if required.

For both DSLR use and eyepiece use we recommend using a 1.25" eyepiece extender at the top eyepiece holder (#5) to push the eyepiece out and make it parfocal with the camera.

7. Troubleshooting and frequently asked questions

Q: I can't focus my telescope, but only get a bright circle.

R: Make sure you have inserted the eyepiece (start by the lowest power eyepiece). Point to a distant object during the day and proceed as described in 3.

Q: When I use the barlow lens and a 6mm 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's aperture. In this case, the telescope has an aperture of 90mm, so in a very good night you should be able to reach 180x. 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: The stars only appear as points in the telescope.

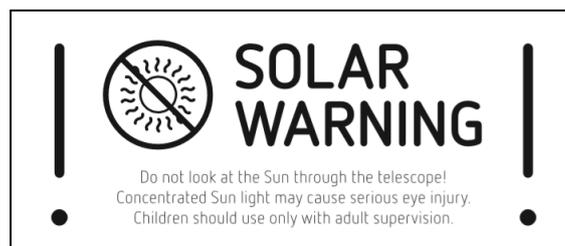
A: Stars will always appear only as points, even in the largest telescopes in the world. It is more interesting for beginners to observe two-dimensional objects, such as the Moon or planets. Once you find these, you will be able to start learning about the astronomical calendar.

Q: I would like to observe the Sun.

A: An appropriate solar filter, placed over the objective, is essential for observing the sun. Those are available as plastic foil or glass filters. They allow only a tiny and harmless fraction of sun light 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 is usually not possible. The dust caps must first be removed and an eyepiece must be inserted, before you can start observing. Are you sure you have removed all the dust caps, not just the small one? If you have not, then no light will enter the telescope and everything will appear black.



Annotations

For any other questions please feel free to drop a line or visit our website at: <http://www.astroshop.de>

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