BRESSER®

Spica AE 130/1000 EQ

Reflector telescope

Art. No. 9430110

Instruction manual

Fig. 1

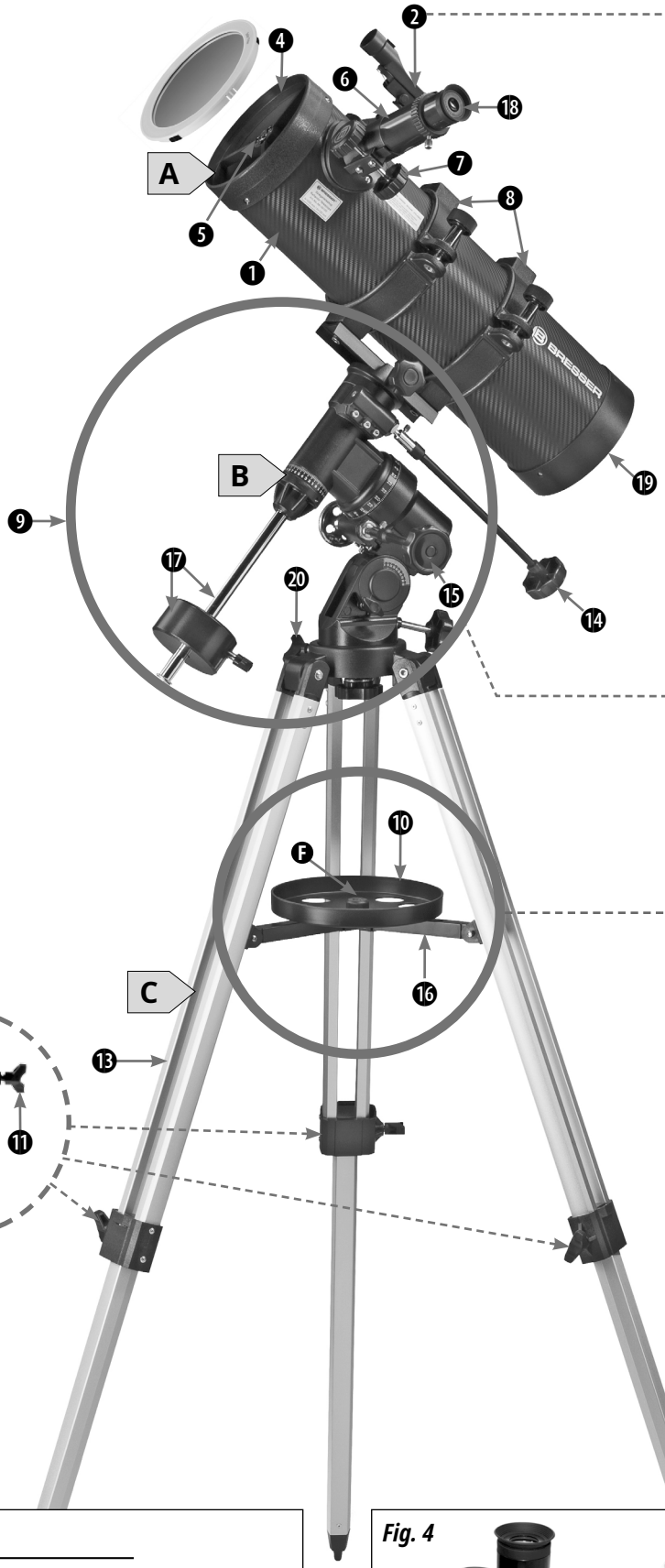


Fig. 1a

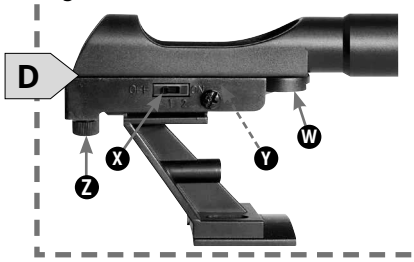
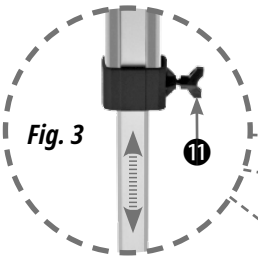


Fig. 2

Fig. 3



Downloads:

- **Astronomy software**
- **Moon map**
- **Instruction manual**

http://www.bresser.de/download/9430110

Fig. 4

Fig. 5

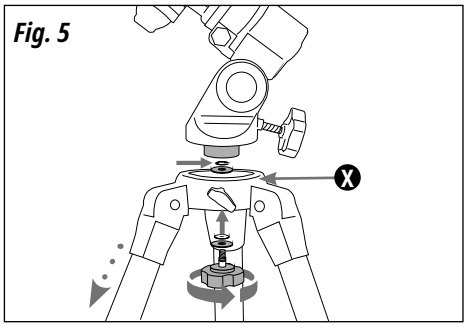


Fig. 6

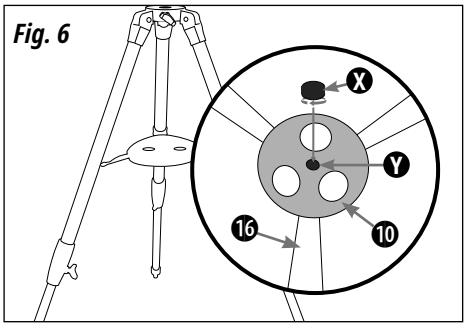


Fig. 7

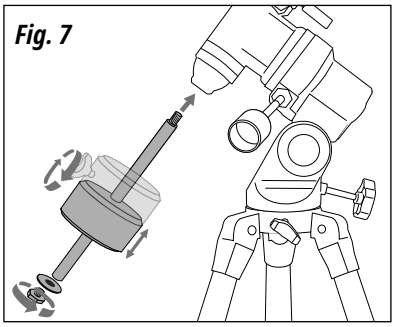
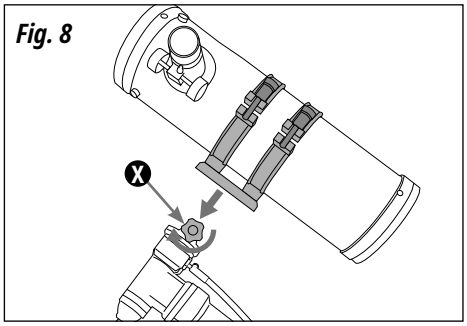


Fig. 8



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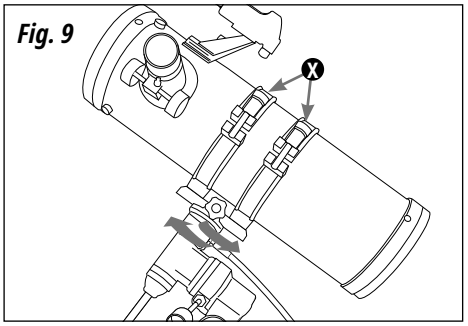


Fig. 10

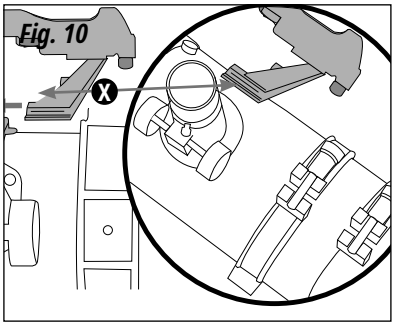
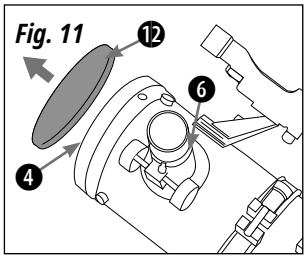


Fig. 11



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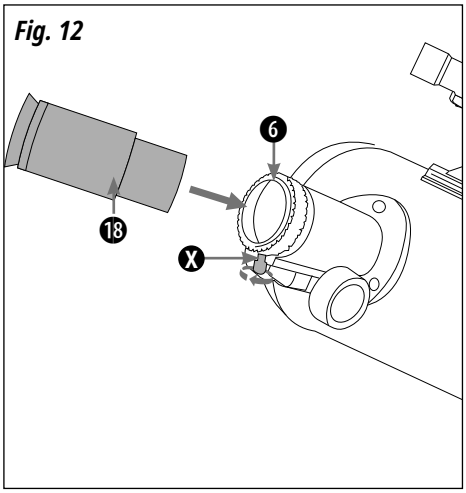


Fig. 13

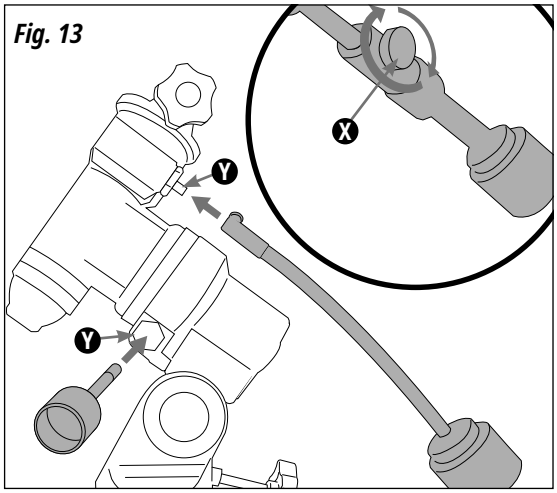


Fig. 14

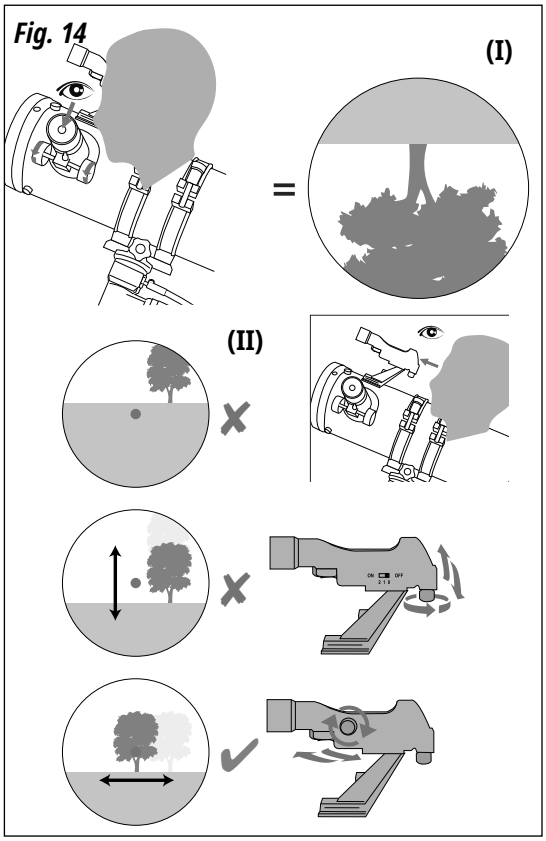
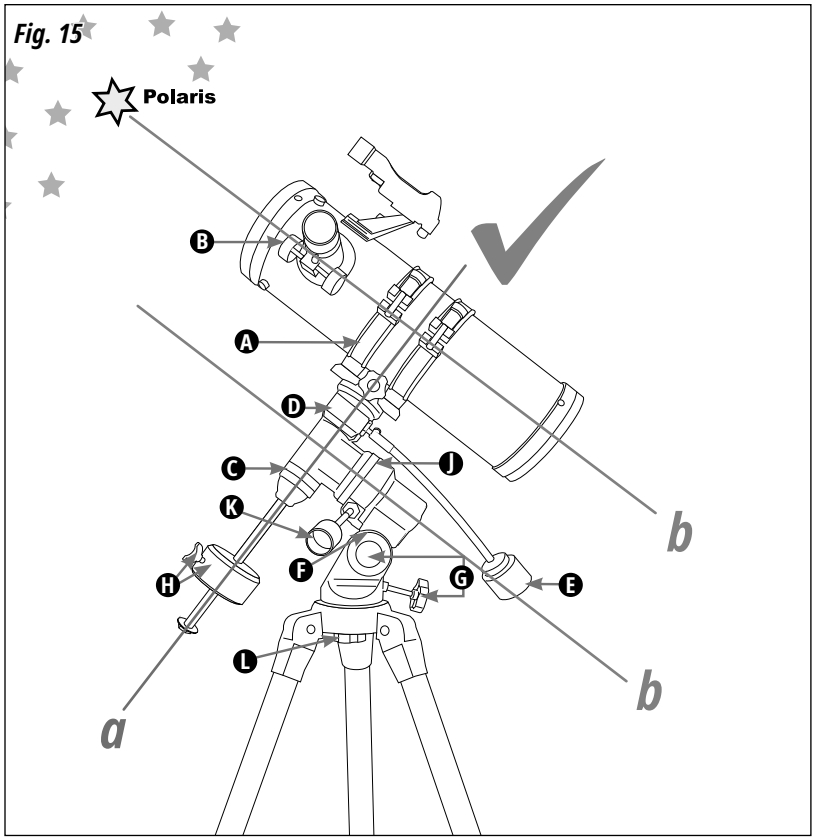


Fig. 15



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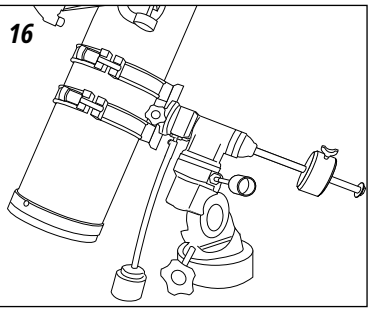


Fig. 17

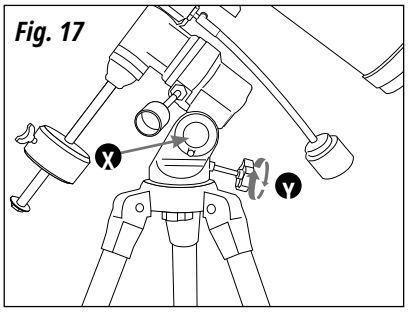


Fig. 18

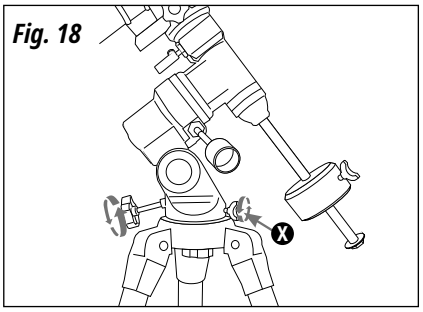


Fig. 19

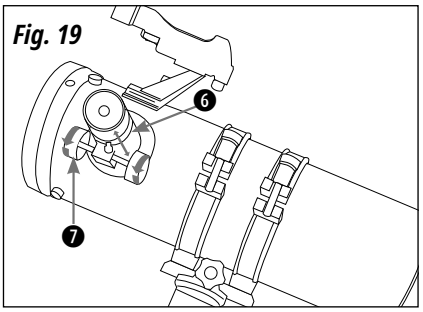


Fig. 20

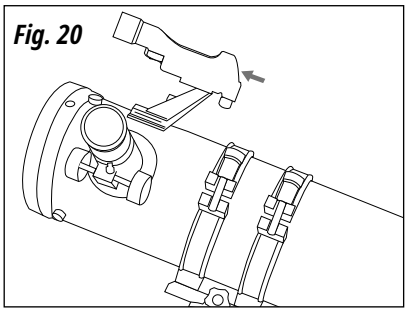


Fig. 21

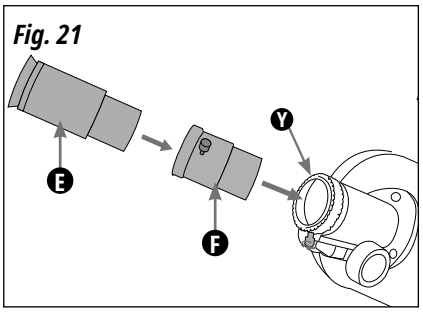


Fig. 22

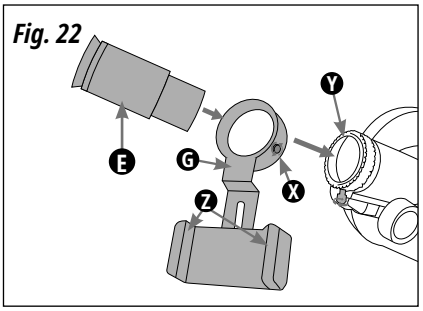


Fig. 24

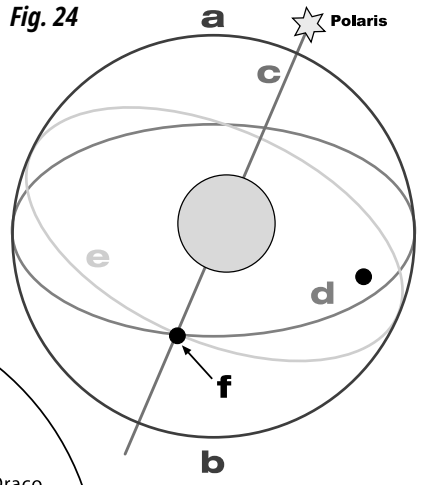


Fig. 25

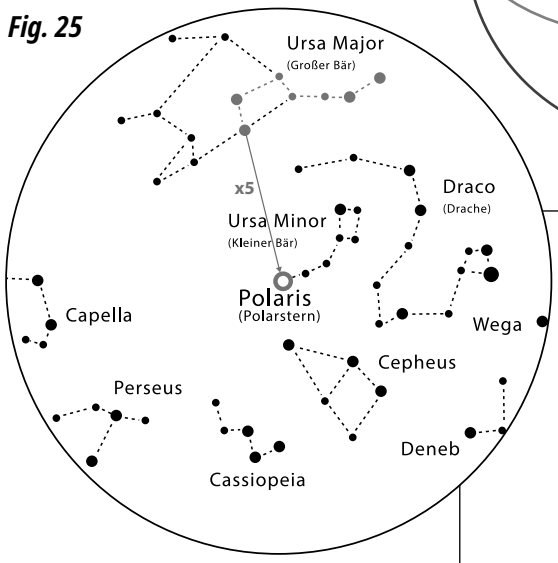


Fig. 23

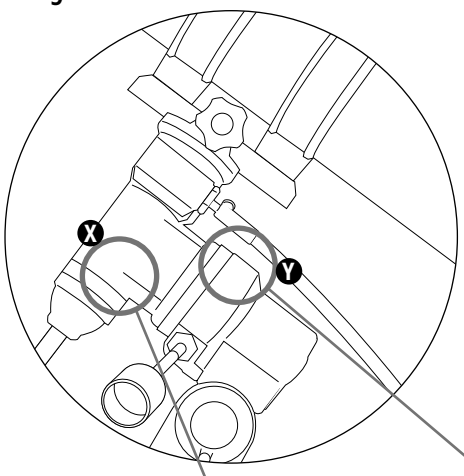
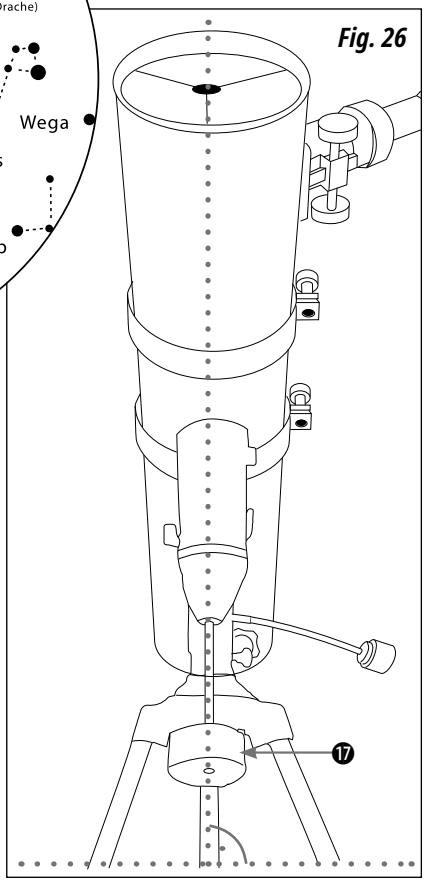


Fig. 26



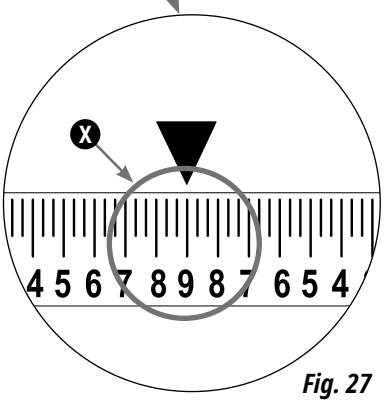


Fig. 27

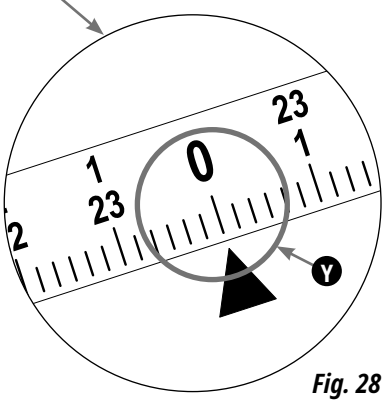
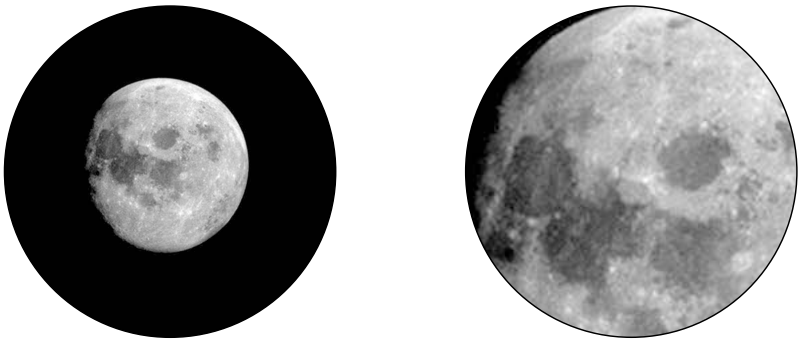


Fig. 28

Possible observation objects

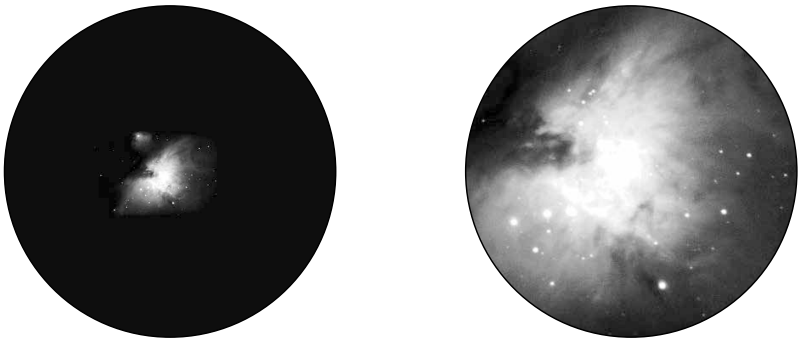
f/20 mm **f/4 mm**

Fig. 29



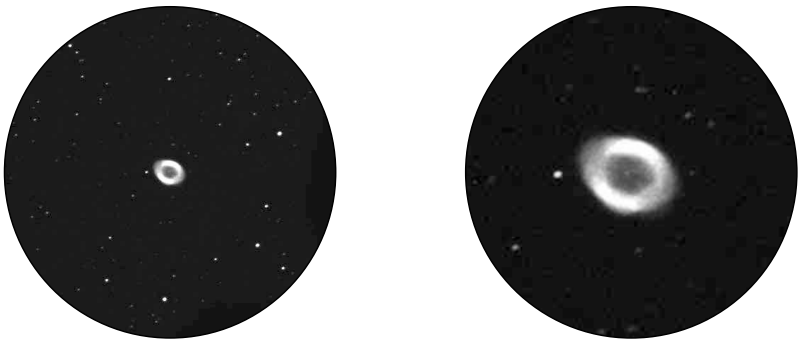
The moon

Fig. 30



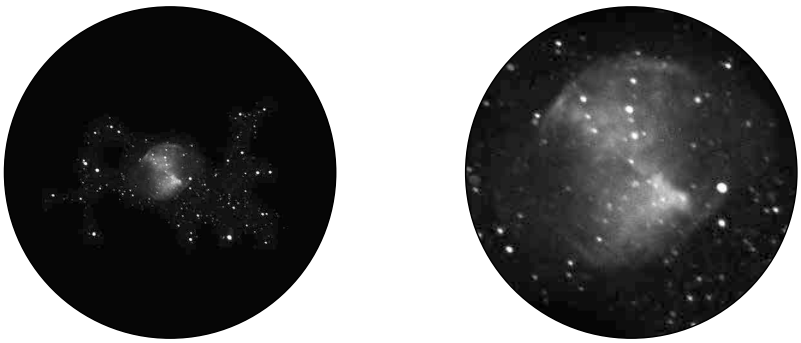
Orion Nebula (M 42)

Fig. 31



Ring Nebula in the constellation "Lyra" (M 57)

Fig. 32



Dumbbell Nebula in the constellation "Little Vixen" (lat. Vulpecula) (M 27)

General Information

About this instruction manual

Read the safety and operating instructions in this user manual carefully. Use this product only as described in the manual to avoid damage to the device or injury. Keep the user manual so that you can find out more about all set-up steps and operating functions at any time.

DANGER!
You will find this symbol before every section of text that deals with the risk of minor to severe injuries resulting from improper use.

ATTENTION!
You will find this symbol in front of every section of text which deals with the risk of damage to property or the environment.

Designated use
This device is for personal use only.
It was developed for a magnified representation of observations of nature.

General warnings

RISK OF BLINDNESS!
Never look directly at, or near to the sun with this device. There is a RISK OF BLINDNESS!

DANGER OF SUFFOCATION!
• Children must only use the device under adult supervision. Keep packaging materials (plastic bags, rubber bands, etc.) away from children! There is a DANGER OF CHOKING!

FIRE HAZARD!
Do not expose this device - especially the lenses - to direct sunlight! Focusing of sunlight could cause fires.

ATTENTION!
Do not disassemble the device! In the event of a defect, please contact your dealer. They will contact the Service Centre and can arrange the return of this device for repair if necessary.

Do not expose the device to high temperatures.

Protect privacy!
The binoculars are only intended for private use. Respect the privacy of your fellow human beings - do not look into private flats with this device, for example!

Scope of delivery (Fig. 1/1a + 4)

Telescope tube (A), mount unit (B), stand (C), LED viewfinder (D), eyepieces (20/4 mm) (E), 2x Barlow lens (F), smartphone adapter (G), solar filter (H), red light flashlight (I), moon/planet filter set (J)

Parts overview (Fig. 1/1a - 3)

❶ Telescope tube
❷ LED viewfinder
❸ Adjustment screws
❹ Tube opening
❺ Secondary mirror
❻ Eyepieceholder
❼ Focus wheel (focus adjustment)
❽ Tube clamp
❾ Mounting
❿ accessory tray with head screw
⓫ Locking screws (tripod)
⓬ dust cap
⓭ Tripod Leg
⓮ Flexible shaft for declination adjustment
⓯ Flexible shaft for right ascension adjustment
⓰ Tripod spider
⓱ Counterweight + rod
⓲ Eyepiece
⓳ Main mirror (internal)
⓴ Azimuth adjustment screws

Mount view (Fig.15)

A Tube clamp
B Focusing the focus wheel
C Scale of the declination axis
D Declination axis fixing screw
E Fine adjustment of the declination axis
F Latitude setting scale
G Fixing and adjusting screw of the latitude setting
H Counterweight with locking screw
I Fixing screw of the right ascension axis
J Right ascension axis scale
K Fine-adjustment of the right ascension axis
L Fixing screw for horizontal alignment
M Bracket for optional tracking motor
N Clutch for disengaging the engine
O Transmission gear for tracking motor

TIP!
The right ascension axis (Fig. 15 green line) is also called the hour axis.
The declination axis (Fig. 15 blue line) is also called the elevation axis.

Part I - The Structure

1. General information about the structure and the choice of location

Before you start setting up, choose a suitable location for your telescope. It helps, if you set up this instrument in a location where a clear view of the skies, a stable footing and sufficient space around you are given.

First, remove all the parts from the packaging. Using the diagram, check whether all the parts are included.

ATTENTION!
Only tighten the screws with care "hand-tight" to avoid "over-tightening" the screws. This can cause damage to the screws and threads

2. Set up the tripod

The tripod legs are pre-assembled and come with the tripod head (Fig. 5, X) and the tripod spider (Fig. 1, 16) connected.
Remove the tripod from its packaging and place it vertically with the tripod feet facing down. Now take two of the tripod legs and carefully pull these tripod legs apart to the fully open position. The entire weight of the tripod rests on one leg. Then set up the tripod straight.

Now pull each tripod leg out one by one to the desired length (Fig. 3) and now tighten one clamping screw each (Fig. 3, 11) (in total. 3 pcs.) hand-tight. Do not overtighten the screws! The clamping screws are used to lock the inner tripod leg segments at the desired height.

TIP!
A small spirit level on the accessory tray can help you set up your tripod level.

3. Mount and install tube pipe clamps

Next, the mount (1, 9) is fixed to the tripod head (Fig. 5, X). To do this, insert the mounting base (grey) from above into the round opening of the tripod head and manually tighten the star grip screw from below.

The mount (Fig. 1, 9) is completed as shown in Fig. 7 by first screwing the counterweight rod into the threaded hole on the declination axis. Then loosen and remove the lock screw and lock washer for now and push the counterweight onto the counterweight rod, clamp it firmly to the rod with the side wing screw and reinstall the lock and counter screw.

Finally, insert the tube clamps (Fig. 1, 8) with the connected so-called mounting rail centrally between the clamping jaws of the mounting head and clamp the rail firmly with the star-head screw (Fig. 8, X).

4. Mount shelf

The accessory tray (Fig. 6, 10) is placed in the centre of the thread (Fig. 6, X) in the middle of the stand spider (Fig. 6, 16) with the bevelled sides facing upwards and fixed from above with the cap screw (Fig. 6, X).

5. Mounting the tube

To mount the telescopic tube (Fig. 1, 1), first loosen the screws of the tube clamps (Fig. 9, X) on the holder and open the clamps.

Place the tube in the middle of the holder and close the clamps.
Hand-tighten the clamp screws again so that the tube is securely fastened to the holder.

6. Insert eyepiece

DANGER OF BLINDNESS!
Never look directly at, or near to the sun with this device. There is a RISK OF BLINDNESS!

Two eyepieces (Fig. 4, E) are supplied with this telescope as basic equipment. The eyepieces determine the respective magnification of the telescope. (For more information, see Part II - 10.1. Eyepieces)

Before inserting the eyepiece, remove the dust cap from the eyepiece socket (Fig. 12, 6).

Loosen the clamping screw (Fig. 12, X) on the eyepiece tube and insert the eyepiece (Fig. 12, 18) into the eyepiece tube.

Retighten the clamping screw (Fig. 12, X) on the eyepiece socket to securely fix the eyepiece in the socket.

7. Mount and adjust the LED viewfinder

Fully insert the base of the LED viewfinder (Fig. 1a, bottom) into the corresponding base on the optics tube (Fig. 10, X).

Important:
The mirrored surface of the LED viewfinder must point in the direction of the tube opening (Fig. 1, 4).

7.1. Battery replacement

Note:
The battery of the LED viewfinder is protected against discharge by a plastic foil when delivered. This must be removed before switching on for the first time!

Remove the button cell held with a contact clip (Fig. 1a, W) from the holder. If the battery is empty, insert a new battery (button cell type CR2032, 3V) into the holder.

8. Adjusting the LED viewfinder

ATTENTION! RISK OF PHYSICAL INJURY!
Observations of the sun must NOT be carried out with the LED viewfinder! Sunlight unfiltered through the LED viewfinder can cause severe eye damage or even blindness!

The LED viewfinder must be adjusted before use. This means that the "viewing direction" of the LED viewfinder and the optical tube must be matched:

Insert the eyepiece with the longest focal length into the eyepiece tube (Fig. 12). Aim the telescope at a prominent object at a distance of approx. 300 m (e.g. house gable, church spire, etc.) until it appears in the centre of the field of view (Fig14, A).

Switch on the LED viewfinder (Fig. 1, 2). To do this, move the slider (Fig. 1a, X) to position '1' (weak red dot) or '2' (brighter red dot).

Tip:
It is best to carry out this procedure at dusk. This makes the red light spot more visible.

Look through the LED viewfinder and adjust it by turning the horizontal (Fig. 1a, Y) and vertical (Fig. 1a, Z) adjustment screws so that you see the red dot in the centre of the image (Fig.14, II below) and this LED dot aligns with the centre of the distant object (here the tree). The LED viewfinder and telescope are now matched. If you have carried out all the steps correctly, you can now see what you see in the centre of the viewfinder field in the centre of the eyepiece.

Important note:
Newton reflector telescopes always position objects in the eyepiece inverted and upside down. However, this does not matter for astronomical observation. We therefore do not recommend close to the horizon or landscape observations with reflecting telescopes.

Occasionally, the viewfinder needs to be readjusted. This is not a defect, but a use-related phenomenon!

9. Use protective caps

To protect the inside of your telescope from dust and dirt, the tube opening (Fig. 11, 4) is protected by a dust cap (Fig. 11, 12). There is also a dust cap on the eyepiece tube (Fig 1, 6). 11, 6

10. Use flexible shafts

The flexible shafts facilitate the exact fine adjustment of the declination and right ascension axis. They are pushed onto the holders provided for the two axles (Fig13, Y) and fixed with the small clamping screws (Fig 13, X). 13, X) fixed.

Note: The long flexible shaft (Fig. 1, 14) is mounted parallel to the telescope tube. It is attached with a clamping screw to the intended notch of the fixing pin on the declination axis. The short flexible shaft (Fig. 1, 15) is mounted laterally on the fixing pin of the right ascension axis (= hour axis). The fastening is done with a clamping screw at the provided notch of the axle.

Your telescope is now ready for use.

PART II - The handling

1. Function and use of the mount

The following information is extremely important for the positioning and tracking accuracy of your telescope during a night observing.

Your telescope has a so-called "parallactic mount" (equatorial mount). This is characterized by two axes that can be rotated perpendicular to each other (Fig15, a+b)

The so-called right ascension axis (also RA or hour axis) (Fig.15, b) must be aligned parallel to the Earth's polar axis (Fig.24, c). For the correct setting of the pole height, see Part II - 4. Handling – Adjusting the telescope).

The declination axis (also DEC or elevation axis) (Fig15, a) is used to set the altitude of a celestial object in relation to the celestial equator (Fig 15, d). 24, e) To do this, take the declination coordinates of a celestial object from a star chart or discover the objects yourself.

By manually operating the right ascension axis via the flexible shaft (Fig. 1, 15) you continuously compensate for the earth's rotation in the opposite direction. This way, your selected (= positioned) object always remains in the field of view of the eyepiece.

2. Choosing the right site

A dark location is very important for many observations, since disturbing lights (lamps, lanterns) can considerably impair the sharpness of detail of the telescope image.

When you go outdoors at night from a bright room, your eyes have to get used to the darkness. After about 20 minutes you can start your astro observation.

Do not observe from closed rooms and place your telescope with the accessories in its location approx. 30 min. before starting observation to ensure temperature equalization in the tube.

Furthermore, you should make sure that this telescope is placed on a level, stable surface.

3. Balancing the telescope

Your telescope must be balanced before observing. This means that the declination axis and the right ascension axis are adjusted for smooth and accurate operation.

The right ascension axis is balanced by loosening the clamping lever opposite the flexible shaft for the RA axis (Fig. 1, 15) and tilting the weight bar to a horizontal position. Now move the counterweight (Fig15, H) on the rod until the tube and the counterweight remain in this horizontal position. Re-tighten the clamping lever opposite the flexible shaft for the RA axis (Fig. 1, 15). The declination axis is balanced by loosening the clamping lever opposite the rotary shaft for the declination axis (Fig. 1, 15). Then turn the tube (Fig. 1, 1) so that it remains as balanced as possible in the horizontal position. If the tube tilts to one side, then carefully loosen the screws of the tube clamp bracket (Fig. 9, X) so that the tube in it can just be pushed easily in one direction or the other and can be balanced in the declination axis. Do not forget to re-tighten the screws of the tube holder and the fixing screw of the declination axis.

4. Polar alignment of the telescope

Adjust the latitude axis (Fig.15, F) (pole height) by loosening the fixing screw (Fig. 17, X) and adjusting the Pohl height accordingly with the adjusting screw (Fig. 17, Y) using the lateral pole height scale according to the latitude of your location.

The number on which you set the axis depends on the latitude of your location (e.g. Munich 48°, Hamburg 53°).

Do not forget to tighten the fixing screw again. Then adjust the declination axis (Fig15, C) to 15° by loosening and tightening the fixing screw (Fig15, D). This ensures that the optical tube is oriented parallel to the rectal ascension axis (hour axis). Then make sure that the North Star appears in the middle of the field of view in the standard eyepiece at low magnification. To do this, the star head screw at the bottom of the connection between the mount base and the tripod head (Fig. 15, L) may need to be loosened slightly, as well as the azimuth adjustment screw (Fig. 1, 20) and the mount and telescope carefully moved horizontally to the left or right until Polaris appears in the centrea of the eyepiece field of view. For this procedure (polar orientation), you are also welcome to use the previously adjusted LED viewfinder (Fig. 1, 2). Then clamp the azimuth adjustment screw and the connecting screw Fig. 15, L).
The telescope tube is now aligned parallel to the Earth's axis. This is called polar orientation.

TIP!
You will always find the latitude of your exact observation location on the right or left edge of a map in an atlas. You can also obtain information from your local council, land registry office or on the Internet: e.g. at www.heavens-above.com. There you can select your country under "Anonymous user > Select"; the data will then be displayed.

5. Polar orientation of the telescope using a compass

With the tube aperture facing forward, point the telescope toward the north. To do this, loosen the locking screw (Fig. 18, X). You can now carefully rotate the mount and tube and point it exactly north. If necessary, use a compass to help you. Afterwards, the locking screw is fixed again.

Check whether your telescope is set up as shown in Fig. 26 The counterweight (Fig. 26, 17) points toward the ground and thus forms a vertical axis together with the tube.

In this position you can see the polar region with the polar star through the viewfinder. Polaris can easily be found with the naked eye by extending the most prominent stars of the Big Dipper (also called the Big Dipper) and the distance of the so-called box stars in Fig. 25 upwards by a factor of 5.

This should then also be visible in the centre of the field of view of the eyepiece (f=20 mm). Polar alignment has been achieved. This setup requires some patience, but allows you to search for celestial objects for celestial coordinates using the so-called startime method or the difference coordinate method.

Note:
A detailed description of these search methods can be found on the Internet or in appropriate technical literature.

However, the correct polar positioning (see above) allows you to easily track objects in the firmament even without using these methods using ONLY one axis of rotation, the hour axis (right ascending axis), which you have already oriented parallel to the Earth's axis with the help of the pole star.

If you want to use one of the two methods described above to find objects with known sky coordinates, then please note the following:
In this polar alignment, the graduated circles (scales) of the declination axis (Fig. 27) should be at "9" (= 90°) and the right ascension axis (Fig. 28) at "0" (= 0 hours). If necessary, carefully rotate both scales to the appropriate values (aligned with the arrows in each case).

Thus set, you can use the finding of celestial objects with the help of the graduated circles (scales) (see also Part III - 1. Possible objects of observation).

6. Fine alignment by means of LED viewfinder

Your telescope is now roughly aligned and adjusted.

To achieve a comfortable viewing position, carefully unscrew the tube mount screws (Fig. 9, X) so that you can rotate the telescope tube. Move the eyepiece and LED viewfinder to a position from which you can observe comfortably.

Note:
The correct position of the tube in the tube holder requires a bit of patience and practice, as every observer finds an “optimal” viewing position suitable for the entire swivel range of the tube from east to south to west.

The fine alignment is done by using the viewfinder. Look through the viewfinder and try to align the polar star (Fig. 25) with the illuminated point of the adjusted LED viewfinder (as in Fig. 14, II below). The shaft (Fig15, K) of the hour axis (Fig15, b), as well as the shaft (Fig15, E) of the declination axis (Fig15, a) will help you with the exact setting.

7. First observations

ATTENTION! RISK OF PHYSICAL INJURY!
Observations of the sun may only be carried out with the enclosed solar filter (Fig. 4, H) intended for this telescope!
Solar observations without the appropriate filter attachment can lead to severe eye damage or even blindness!

Please also read the separate instructions for the solar filter!

Remove the caps from the openings for observation.

After you have adjusted the polar star in the LED viewfinder, you will be able to see the polar star in the telescope when you now look through the eyepiece.

If necessary, you can now use the flexible waves to position the star more precisely in the center of the eyepiece's field of view and adjust the image sharpness using the focus wheel (Fig.1, 7).

Note:
Only operate the rotational shafts gently with fractions of revolutions so that you do not lose the objects from the eyepiece's field of view. This gives you time to enjoy watching.

Furthermore, you can now set a higher magnification by changing the eyepiece (smaller focal length). Please note that the magnification of stars is imperceptible due to their very long distances!

TIP!
Eyepieces are lens systems facing the eye and work in principle like a magnifying glass, as you know them from the household. With the eyepiece, the image formed at the focal point of the telescope lens is recorded, i.e. made visible, and magnified again. You need eyepieces with different focal lengths to achieve different magnifications. Start each observation with a low magnification eyepiece (= higher focal length of 20-25mm).

8. Star search

At first, you will certainly find it difficult to orientate yourself in the starry sky, as stars and constellations are always in motion and change their position in the sky depending on the season, date and time.

The exception is the polar star. Through it runs the extended imaginary polar axis of the earth. It is a fixed star and the starting point of all star charts. On the drawing you can see some well-known constellations and star arrangements that are visible all year round. However, the arrangement of the stars depends on the date and time.

If you point your telescope at one of these stars, you will notice that it disappears from the field of view of your eyepiece after a short time. To compensate for this effect, operate the flexible shaft (Fig15, K) of the right ascension axis and your telescope will follow the apparent trajectory of this star.

9. Setting circles

Stars and other heavenly bodies are positioned in the heavens by coordinates. A star's place in the universe is determined by its right ascension and declination. Declination is the shortest distance between a star and the celestial equator (Fig. 24, e), measured in degrees of angle. For stars north of the celestial equator, the degree becomes positive. If the star is south of the equator, the degree is marked with a minus sign.

Right ascension is a distance of a star from the vernal equinox measured on the celestial equator. The vernal equinox (Fig. 24, f) is the intersection point of the celestial equator with the apparent path of the sun, the so-called ecliptic (Fig. 24, d). This happens in spring at the equinox (end of March). The value is counted in time from 0 to 24 o'clock, contrary to the daily celestial revolution.

You can find more detailed information in star charts or the relevant specialist literature.

10. Accessories

The basic equipment of your telescope includes several accessories (Fig. 4)

Important: When installing accessories, make sure that the small clamping screws (Fig. 12, X) must always be tightened by hand for fixing.

10.1. Eyepieces
By changing the eyepieces, you can determine the respective magnification of your telescope.

Note:
Depending on the eyepiece and the magnification selected, the ideal focus point must be set using the focus wheel (Fig. 19, 7). This may require a bit of patience!

Calculation of the magnification:
Focal length (telescope) ÷ Focal length (eyepiece) = Magnification

Examples:

Telescope Focal length	Eyepiece Focal length	Magnification	Magnification with 3x Barlow lens
900 mm	20 mm	45X	135X
900 mm	12 mm	75X	225X
900 mm	4 mm	225X	675X

10.2. Barlow Lenses
With a 3x Barlow lens, you can achieve an additional increase in magnification of 3x.

If necessary, the Barlow lens (Fig. 21, F) is inserted into the eyepiece socket (Fig. 21, Y) in front of the eyepiece (Fig. 21, E).

Note: Not every mathematically possible enlargement (sh. Table to 10.1) is also absolutely sensible. Some objects - especially in the night sky - can only be seen blurred at higher magnifications. This is not a defect, but a technical or physical one.

10.3. Smartphone adaptor
With this adaptor, a smartphone can be mounted to the telescope to capture bright, flat objects (e.g. the moon) or - depending on the sensor sensitivity of the smartphone - also planets. However, to take pictures of the sun, you must first install the solar filter! (sh. Part II - 10.4. solar filter and separate user manual)

ATTENTION! DANGER OF PROPERTY DAMAGE!
Images of the sun may only be taken with the enclosed solar filter (Fig. 4, H) intended for this telescope!
Photographs of the sun without the appropriate filter attachment can cause irreparable damage to the electronics of the smartphone!

Please also read the separate instructions for the solar filter!

To mount, insert the eyepiece (Fig. 22, E) through the retaining ring (Fig. 22, W) of the smartphone adapter (Fig. 22, G) and fix it with the tommy screw (Fig. 22, X). Insert the eyepiece with the attached Smartphone adapter into the eyepiece socket (Fig. 22, Y).

Place the Smartphone between the two retaining jaws (Y, Fig. 22, Z) of the smartphone adapter so that the camera lens is located directly and centrally above the eyepiece lens.

10.4. Solar filter

ATTENTION! RISK OF PROPERTY AND PHYSICAL DAMAGE!
Photographs and observations of the sun may only be made with the enclosed solar filter (Fig. 4, H) intended for this telescope!

Please also read the separate instructions for the solar filter!

The solar filter is mounted in front of the telescope's tube opening, filters and reflects energy-rich solar radiation, which is harmful to the eye. This is the only way to observe the sun safely and without danger.

11. Dismantling

After a hopefully interesting and successful observation it is recommended to store the entire telescope in a dry and well ventilated room. Some telescope models allow you to separate the mount and tripod by simply unscrewing them. In this case, your settings on the mount are retained. Do not forget to put the dust-protection-caps on to the OTA opening and on to the eyepiece connection. Also, you should stow all the eyepieces and optical accessories into their corresponding containers.

12. Cleaning & Storage

If necessary, remove loose dust without contact (e.g. with dry compressed air).

Clean the lenses (eyepieces and/or objective lenses) only with a soft and lint-free cloth (e.g. microfibre cloth). To avoid scratching the lenses, use only gentle pressure with the cleaning cloth.

To remove more stubborn dirt, moisten the cleaning cloth with an eyeglass-cleaning solution and wipe the lenses gently.

Protect the device from dust and moisture! After use, particularly in high humidity, let the device acclimatize at room temperature for a short period of time, so that the residual moisture can dissipate.

PART III - Annex

1. Possible observation objects

Below we have selected and explained some very interesting celestial bodies and star clusters. In the accompanying illustrations at the end of the manual you can see how you will see the objects through your telescope with the supplied eyepieces - in good viewing conditions:

Moon (Fig 30) 29)
The moon is the only natural satellite of the earth
Orbit: approx. 384,400 km from the earth
Diametre: 3,476 km
Distance: 384,401 km

The moon has been known since prehistoric times. It is the second brightest object in the sky after the sun. As the moon orbits the earth once a month, the angle between the earth, the moon and the sun is constantly changing; you can see this in the cycles of the moon's phases. The time between two consecutive new moon phases is about 29.5 days (709 hours).

Constellation ORION / M42 (Fig 31) 30)
Right Ascension (R.A): 05:32.9 (hours : minutes)
Declination (DEC): 05:25 (degrees : minutes)
Distance: 1.500 million light years

At a distance of about 1600 light-years, the Orion Nebula (M42) is the brightest diffuse nebula in the sky - visible to the naked eye, and a rewarding object for telescopes of all sizes, from the smallest binoculars to the largest Earth-based observatories and the Hubble Space Telescope.

It is the main part of a much larger cloud of hydrogen gas and dust, extending at more than 10 degrees over well over half of the constellation of Orion. The extent of this enormous cloud is several hundred light years.

Constellation LEIER / M57 (Fig. 31)
Right ascension: 18:51.7 (hours : minutes)
Declination (DEC): 32:58 (degrees : minutes)
Distance: 4.100 million light years

The famous Ring Nebula M57 in the constellation Lyra is often considered to be the prototype of a planetary nebula; it is one of the splendours of the northern hemisphere summer sky. Recent studies have shown that it is most likely a ring (torus) of brightly glowing matter surrounding the central star (visible only with larger telescopes), rather than a spherical or ellipsoidal gas structure. If the Ring Nebula were viewed from the side plane, it would resemble the Dumbell Nebula M27. We are looking right at the pole of the nebula for this object.

Constellation Vixen / M27 (Fig. 32)
Right Ascension (R.A): 19:59.6 (hours : minutes)
Declination (DEC): 22:43 (degrees : minutes)
Distance: 1.250 million light years

The Dumbbell Nebula M27 or Dumbbell Nebula in the Vixen was the first planetary nebula ever discovered. On July 12, 1764, Charles Messier discovered this new and fascinating class of objects. We see this object almost exactly from its equatorial plane. If the Dumbell Nebula were seen from one of the poles, it would probably have the shape of a ring and resemble the sight we know from the Ring Nebula M57. This object can already be seen well in reasonably good weather conditions at low magnifications.

2. Accompanying reading
This instruction manual provides only the most important information on using the telescope. In order to make full use of the manifold possibilities of the instrument, you should definitely delve deeper into the subject of "astronomy".
For this purpose, we have compiled some helpful information in an accompanying booklet, which you can download free of charge via the following weblink:
http://www.bresser.de/download/astrowissen

3. Troubleshooting

Mistakes:	**Solution:**
No image	Remove dust cap from tube opening Select eyepiece with lower magnification (= higher focal length)
Blurred picture	Focusing with the focus wheel
No focusing possible	Wait for temperature equalisation (approx. 30 minutes)

Bad picture	Never watch through a pane of glass
Observation object in the viewfinder, but not visible through the eyepiece	Adjust the viewfinder (see part I, 7. and 8.)
Difficult tracking of the axes via shafts	Balance telescope and counterweight (see. Part II - 3.)

Disposal


Dispose of the packaging materials by type. Contact your local waste-disposal service or environmental authority for information about the proper disposal.

Observe the current legal regulations when disposing of the device! Information on proper disposal can be obtained from municipal waste disposal service providers or the Environmental Agency.


Do not dispose of electronic devices in the household waste!
According to the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its transposition into national law, used electrical equipment must be collected separately and recycled in an environmentally sound manner.


Batteries and rechargeable batteries must not be disposed of with household waste. You are legally obliged to return used batteries and accumulators and can return the batteries after use either at our sales outlet or in the immediate vicinity (e.g. in the trade or in municipal collection points) free of charge.

Batteries and accumulators are marked with a crossed-out dustbin and the chemical symbol of the pollutant, "Cd" stands for cadmium, "Hg" stands for mercury and "Pb" stands for lead.

Warranty & Service

IMPORTANT!
Do not send in devices - even in the event of damage - without first consulting the service department. Unfortunately, unsolicited devices cannot be accepted and processed.

The regular warranty period is 5 years and begins on the day of purchase. For complete warranty terms and services, please visit www.bresser.de/warranty_terms.

In the event of a warranty claim, please first contact the service team responsible for your country, preferably by e-mail or using the contact form on the website. Here you can be helped quickly in most cases. The corresponding contact information can be found under "Service" in this manual.

Service

DE AT CH BE

Bei Fragen zum Produkt und eventuellen Reklamationen nehmen Sie bitte zunächst mit dem Service-Center Kontakt auf, vorzugsweise per E-Mail.

E-Mail: service@bresser.de
Telefon*: +49 28 72 80 74 210

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