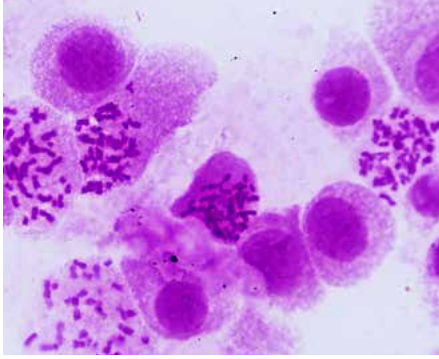
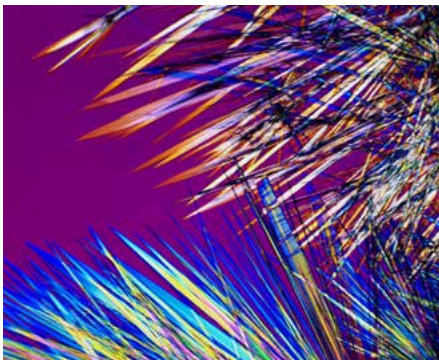
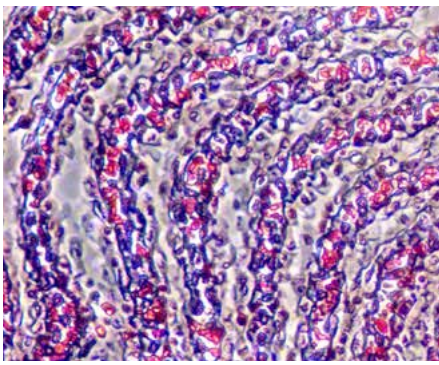
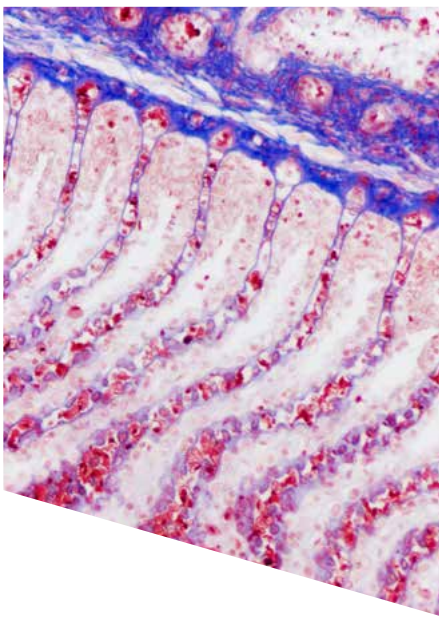
NE620T

UPRIGHT BIOLOGICAL MICROSCOPE
FOR PROFESSIONAL APPLICATIONS









EN INSTRUCTION MANUAL

NE620T
UPRIGHT RESEARCH
MICROSCOPE

Nexcope®
Scientific research microscope

INTRODUCTION

WE CONGRATULATE YOU

on your purchase of the professional research microscope NEXCOPE NE620T. It has been carefully manufactured with materials of lasting value, and careful attention has been paid to function and reliability. This microscope is designed for a wide range of applications. It features a very high contrast, which ensures an outstanding image quality and resolution. This makes it ideal for demanding and professional applications. The eyepieces have a 22 mm field of view. This produces a wide-angle image for a more comprehensive observation content and faster sample observation. The intelligent automatic brightness control and the ergonomic design ensure the user can perform microscope operation in the most comfortable situation. The Nexcope microscopes are very robust, but need a certain amount of attention and care to guarantee their longevity. We therefore recommend that you read this user manual carefully and keep it within reach for your reference while working with the microscope. It contains all relevant information on operation, user safety and care. If you follow the guidelines, your microscope will function reliably and smoothly even after years of intensive use.

We wish you much success in your work with your new microscope!

The operating instructions can be downloaded
from the following web address:
https://www.bresser.de/Mikroskopie/Mikroskope

WARRANTY TERMS

DE Besuchen Sie unsere Website über den folgenden QR Code oder Weblink um weitere Informationen zu diesem Produkt oder die verfügbaren Übersetzungen dieser Anleitung zu finden.

EN Visit our website via the following QR Code or web link to find further information on this product or the available translations of these instructions.

FR Si vous souhaitez obtenir plus d'informations concernant ce produit ou rechercher ce mode d'emploi en d'autres langues, rendez-vous sur notre site Internet en utilisant le code QR ou le lien correspondant.

NL Bezoek onze internetpagina via de volgende QR-code of weblink, voor meer informatie over dit product of de beschikbare vertalingen van deze gebruiksaanwijzing.

ES Desearía recibir unas instrucciones de uso completas sobre este producto en un idioma determinado? Entonces visite nuestra página web utilizando el siguiente enlace (código QR) para ver las versiones disponibles.

IT Desidera ricevere informazioni esaustive su questo prodotto in una lingua specifica? Venga a visitare il nostro sito Web al seguente link (codice QR Code) per conoscere le versioni disponibili.

www.bresser.de/download/nexcope

GARANTIE · WARRANTY · GARANTÍA · GARANZIA

www.bresser.de/warranty_terms

We recommend that you study this manual thoroughly before operating the microscope for the first time. It will help you become fully familiar with the equipment and achieve optimum performance. Keep this manual in an easily accessible place near the work area for future reference.

SERVICE

You can obtain additional information from your customer 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

BRESSER GmbH
Kundenservice
Gutenbergstr. 2
46414 Rhede
Deutschland

*Lokale Rufnummer in Deutschland (Die Höhe der Gebühren je Telefonat ist abhängig vom Tarif Ihres Telefonanbieters); Anrufe aus dem Ausland sind mit höheren Kosten verbunden.

GB IE

Please contact the service centre first for any questions regarding the product or claims, preferably by e-mail.

E-Mail: service@bresseruk.com
Telephone*: +44 1342 837 098

BRESSER UK Ltd.
Customer Support
Suite 3G, Eden House
Enterprise Way
Edenbridge, Kent TN8 6HF
United Kingdom

*Number charged at local rates in the UK (the amount you will be charged per phone call will depend on the tariff of your phone provider); calls from abroad will involve higher costs.

FR BE

Si vous avez des questions concernant ce produit ou en cas de réclamations, veuillez prendre contact avec notre centre de services (de préférence via e-mail).

E-Mail: sav@bresser.fr
Téléphone*: 00 800 6343 7000

BRESSER France SARL
Service après-vente
Pôle d'Activités de Nicopolis
314 Avenue des Chênes Verts
83170 Brignoles
France

*Prix d'un appel local depuis la France ou Belgique

NL BE

Als u met betrekking tot het product vragen of eventuele klachten heeft kunt u contact opnemen met het service centrum (bij voorkeur per e-mail).

E-Mail: info@bresserbenelux.nl
Telefoon*: +31 528 23 24 76

BRESSER Benelux
Klantenservice
Smirnoffstraat 8
7903 AX Hoogeveen
The Netherlands

*Het telefoonnummer wordt in het Nederland tegen lokaal tarief in rekening gebracht. Het bedrag dat u per gesprek in rekening gebracht zal worden, is afhankelijk van het tarief van uw telefoon provider; gesprekken vanuit het buitenland zullen hogere kosten met zich meebrengen.

ES IT PT

Si desea formular alguna pregunta sobre el producto o alguna eventual reclamación, le rogamos que se ponga en contacto con el centro de servicio técnico (de preferencia por e-mail).

E-Mail: servicio.iberia@bresser-iberia.es
Teléfono*: +34 91 67972 69

BRESSER Iberia SLU
Servicio al Cliente
c/Valdemorillo,1 Nave B
P.I. Ventorro del Cano
28925 Alcorcón Madrid
España

*Número local de España (el importe de cada llamada telefónica dependen de las tarifas de los distribuidores); Las llamadas des del extranjero están ligadas a costes suplementarios..

1. IMPORTANT NOTES

This chapter informs the user about the general instructions for the microscope and the important safety symbols.

1.1. Imprint/validity information

Imprint

Bresser GmbH
Gutenbergstraße 2
46414 Rhede Deutschland
http://www.bresser.de

For information regarding liability claims or service requests, please refer to chapters "Warranty" and "Service" in this documentation. Errors reserved - technical specifications subject to change.

Validity information

This documentation is valid for the products with the article numbers listed below:
NX20620

Manual version: v052022a

Manual description: Manual_NE-620T_en_NEXCOPE_v052022a
inquiries, please state these information.

1.2. About this instruction manual/intended use

About this instruction manual

These operating instructions are to be considered a component of the device.

PLEASE READ THE SAFETY INSTRUCTIONS AND THE OPERATING INSTRUCTIONS CAREFULLY BEFORE USE. Keep these instructions available for further reference when using the microscope. When the device is sold or given to someone else, the instruction manual must be provided to the new owner/ user of the product.

Intended use

- This product is intended for private and corporate use.
- It was developed for the magnified display of things in nature.
- The device is intended only for indoor use.

This device is not intended for use by individuals (including children) with limited physical, sensory or mental capabilities or those lacking in experience and/or knowledge, unless they are supervised by an individual responsible for their safety or have received instructions from them regarding the use of the device.

1.3. General safety instructions

Danger of an electric shock!

This device contains electronic components that operate via a power source (power supply and/or batteries). In case of any improper use of this device, there is a risk of an electric shock. An electric shock can cause severe injury or even death. Therefore please read the safety instructions below to avoid an explosion.

- Disconnect the device from the power supply by pulling the power plug when it is not used or in case of longer interruption of operation and before starting any work on maintenance and cleaning.
- Position your device so that it can be disconnected from the power supply at any time. The wall socket you use should be located near the device and easily accessible, since the plug on the power cable serves as a disconnecting device for the power supply.
- Always pull on the plug to seperate the device from the power supply.
- Before operating, check the device, cables and connections for dammage.
- Never use a damaged unit or a unit with damaged power cables. Damaged parts must be exchanged immediately by an authorised service centre.
- Only use the device in complete dry environment and do not touch it with wet or moist parts of your body.
- The microscope is equipped with a plug-in power supply unit which allows the use of mains voltage values in the range of 100 to 240 V, 50 / 60 Hz, without additional voltage adjustment on the device.
- To avoid electric shock, connect the supplied power cord to a properly grounded power outlet on. These power cords have three-pin plugs to ensure proper grounding.

Danger of choking!

In case of any improper use of this device, there is a risk of choking, especially for children. Therefore please read the safety instructions below.

- Keep packaging material, like plastic bags and rubber bans, out of the reach for children, as these materials pose a choking hazard!

Danger of explosion!

In case of any improper use of this device, there is a risk of an explosion. Therefore please read the safety instructions below to avoid and explosion.

- Do not expose the device to high temperatures. Use only the supplied power adapter. Do not short-circuit the device or throw them into a fire. Excessive heat or improper handling could trigger a short-circuit, a fire or an explosion.
- Do not use the microscopes and the accessories supplied with them in potentially explosive atmospheres, in the presence of flammable solvents such as alcohol, petrol or volatile anaesthetics, etc..

CAUTION: Danger of injury!

This device contains components and/or accessories that can cause minor to severe injuries in case of any improper use. Therefore please read the safety instructions below to avoid any bodily injury.

- Tools with sharp edges and points are often used when working with this device. Because there is a risk of injury from such tools, store this device and all the tools and accessories in a location that is out of the reach of children.
- Children must not have access to the included chemicals and liquids. Do not drink the chemicals. Wash hands thoroughly with running water after using the chemicals. In the event that the chemicals come into contact with your eyes or mouth, rinse thoroughly with water. If you are in pain after exposure, contact a doctor immediately and take the substances with which you came into contact with you.

CAUTION: Fire hazard!

In case of any improper use of this device, there is a risk of fire. Therefore please read the safety instructions below to avoid the initiation of burning.

- Never cover the ventilation slots or cooling fins of the device while using it or as long as it has not sufficiently cooled down!

NOTICE: Risk of property damage!

In case of any improper use of this device and/or its accessories, there is a risk of property damage. Therefore only use the device according to the safety instructions below.

- Do not disassemble the device. In the event of a defect, please contact your dealer. The dealer will contact the Service Centre and can send the device in to be repaired, if necessary.
- Do not expose this device to higher temperatures and protect it from water and high humidity.
- Protect the device from severe shocks!
- For this device only use accessories and spare parts that comply with the technical information.
- Always use the power cord supplied by Nexcope. If an unsuitable power cord is used, Nexcope can no longer guarantee the electrical functionality and safety of the microscope.
- Avoid inserting metal objects into the ventilation slots on the underside and the back of the microscope. Otherwise, there is a risk of damage to the instrument, electric shock or injury.
- Use these microscopes and their original accessories only for the applications described in this manual.
- The manufacturer does not accept any liability for any other application, possibly also for individual assemblies or individual parts. This also applies to all repair and service work that is not carried out by authorised service personnel. Therefore all guarantee / warranty claims expire.
- NEXCOPE NE620T is not equipped with any special device to protect against corrosive, toxic, potentially infectious or radioactive samples or other samples that are harmful to health. All legal requirements, in particular national regulations for accident prevention, must be observed when handling such samples.
- This microscope will not cause radiation and the electromagnetic interference to the surrounding environment, totally accordance with the EMC certification standards.

LED fluorescent attachment - CAUTION: LED radiation

LED class 3B, 3W LED, FL-B (blue excitation: 460-495 nm), FL-G (green excitation: 510-550 nm)

- Do not expose to the beam. Avoid irradiation of the skin!

The microscope is equipped with a green and blue LED illumination. Neve look directly into the illumination or directly at the illuminated specimen. Only look through the eyepieces if the correct filter is set, or through the radiation shield.

If you have any complaints or queries please contact your national service centre by telephone. The address is included in these instructions.

1.4. Safety symbols used in the manual

Danger symbols	
	**Warning of a danger point** This symbol indicates information that must be read and observed. Non-observance can lead to: o Risk of injury o Malfunctions or equipment damage
	**Warning of dangerous electrical voltage** This symbol precedes information that must be read and observed. Non-observance can lead to: o Risk of injury o Malfunctions or equipment damage
Warning symbol	
	**Warning symbol indicates a possible source of danger** Failure to follow the warnings may result in injury to the user and/or damage to the microscope (including nearby objects).
Note symbol	
	**Important additional hint** Accompanying instructions serve to simplify operation and maintenance.

1.5. Safety symbols on the microscope

The following symbols are located on the microscope/accessories and should always be observed:

	The device manufacturer is legally obliged to take back defective devices for recycling.
CE	**EC Declaration of Confirmity** Bresser GmbH has issued a "Declaration of Conformity" in accordance with applicable guidelines and corresponding standards. This can be viewed any time upon request. www.bresser.de , info@bresser.de
	**Caution LED Radiation** The LED module of the incident light fluorescence lighting system emits class 3B LED light. Direct exposure to the light and direct incidence of light on the skin must therefore be avoided at all costs. When microscopes are used, the protective devices provided with the microscope must always be used. Never - neither with nor without optical instruments - look into the light beam, not even to simply look at the sample. Failure to observe this warning may result in eye damage!

1.6. Check scope of delivery

- Open the packaging with care. Avoid fingerprints and sweat on the camera lens. Prevent the camera and some accessories from falling and being damaged.
- Remove all components from the packaging and check for completeness according to the delivery note. The microscope could be packaged in more than one carton depending on the model or accessories.
- Handle the microscope with care and always protect it against violent impact and vibrations.
- Keep the original packaging for possible longer storage or return of the device to the supplier in case a repair or revision is needed.

Never lift the microscope by the cross stage, trinocular viewing head or coarse/ fine focusing knobs. This can damage the microscope!

- Always carry the microscope with **both hands**.
- On the upper part of the microscope body there is a carrying handle.
- The microscope back plate is designed with a holing device to effectively store the long power cord, improve the cleanliness of the laboratory, and reduce the tripping accident caused by the long power cord during the carrying process.

1.7. Site location

- Select a suitable location before setting up the microscope.
- Place the microscope on a resistant surface away from strong sunlight, heat sources, high humidity, high dust exposure as well as strong vibration.

Do not expose the device to temperatures below 5°C or higher than +30°C! If the device is exposed to temperatures outside this range, this will cause irreparable damage to optical and/or mechanical parts which are not covered by warranty.

› Working temperature: 0°C ~40°C ;
› Maximum relative humidity: it is 80% for temperature of 31°C , the following is the linear decrease, 70% for 34°C , 60% for 37°C , 50% for 40°C ;
› The highest elevation is 2000m
› Storage and transport environment:
› Range of working temperature: -25°C ~+65°C
› Range of relative humidity: 0%~90%

- Place the microscope on a surface that meets the following criteria:
  › Flat / Level
  › Vibration-free
  › Hard surface and non-flammable
  › Chemical and mechanical resistant

- Place the microscope so that:
  › The ventilation slits on the underside are not blocked
  › There is at least 10 cm clearance around the device or to other devices or the wall.
  › You can disconnect it from the mains at any time

- The mains cable must be freely accessible at all times, as the mains cable is intended as a disconnecting device from the mains.
- Make sure the residual moisture is fully eliminated before use.
- For use in warm and humid climates, all optical components of the microscope are already equipped with protection against fungus infestation.

1.8. Cleaning/maintenance/transport

Disconnect the device from the power supply by pulling the power plug when it is not used or in case of longer interruption of operation and before starting any work on maintenance and cleaning.

Disassemble optical elements (e.g.objective, eyepiece, etc.) before cleaning.

Be sure that the instrument is dry before using.

Do not use organic solvents (e.g. alcohol, ether, acetone, xylol or other dilutions) to clean lacquered parts or plastic parts!

Alcohol is highly flammable.

To avoid damaging the electronics, do not use any cleaning fluid.

When using objects that present a potential risk of infection, all parts that have come into contact with the object must be thoroughly cleaned.

The nosepiece, the coarse/fine focusing mechanism and the condenser are precisely designed and aligned. Please avoid dismantling the components. This affects the performance of the microscope.

Transport: Please remove all loose parts and the object to be observed from the stage. Only use the original packaging for transport.

Cleaning microscope body / optical elements

- Only use a dry cloth to clean the exterior of the device.
- Disassemble optical elements (e.g. objective, eyepiece, etc.) before cleaning.
- Blow away loose dust from the lens surfaces first.
- Use high quality lens cleaning towels or soft cloth and moisten it with a little bit of pure alcohol (available in a drug store). Wipe the lens surface with it.

Cleaning the 100x immersion oil objective

- The immersion oil/ cedar oil should be removed from the lens at the end of each workday.
- Clean the 100x objective by dabbing off the oil with a soft baby paper tissue. When the immersion lens is used regularly, wet clean the lens only once a week, Use a solution of 70% ethanol or isopropanol (use p.a. or pharmacy grade alcohol and double distilled water to make such a solution).

Immersion oil

- When using immersion oil, it is essential to read the relevant safety data sheet.

Immersion oil irritates the skin. Therefore avoid contact with skin, eyes and clothing.

- **In case of skin contact:** wash off with plenty of water and soap.
- **In case of eye contact:** rinse immediately with plenty of water for at least 5 minutes.
- **In case of prolonged irritation:** consult a specialist.

Depending on the type of oil used, it might be harmful to the environment, especially aquatic organisms.

1.9. Protection and storage

- Protect the device against dust and moisture.
- Avoid putting fingerprints and equal contaminations on any optical surfaces.
- Pull a dust protection cover over the microscope. Before covering the microscope, always check that the microscope is also switched off.
- Store it in a closed container at a dry and mould-free place.
- Store the microscope and the accessories in the relevant containers when they are not used for a longer time.
- It is recommended to store also objectives and eyepieces in closed containers with desiccant.

A dust protection cover is included in delivery.

Remember:
A well maintained microscope will keep its optical quality for years and thus maintain its value.

1.10. Disposal

Dispose of the packaging materials properly, according to their type, such as paper or cardboard. Contact your local waste-disposal service or environmental authority for information on the proper disposal.

Do not dispose of electronic devices in the household garbage!
As per Directive 2002/96/EC of the European Parliament on waste electrical and electronic equipment and its adaptation into German law, used electronic devices must be collected separately and recycled in an environmentally friendly manner.

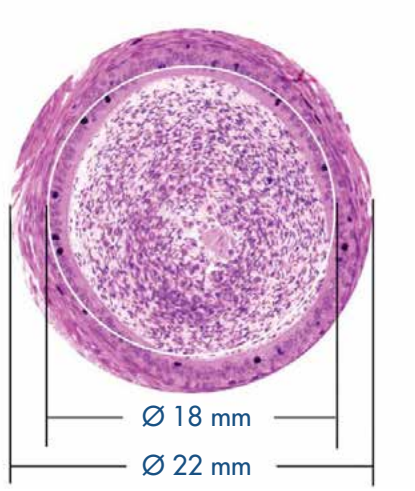
The device manufacturer is legally obliged to take back defective devices.

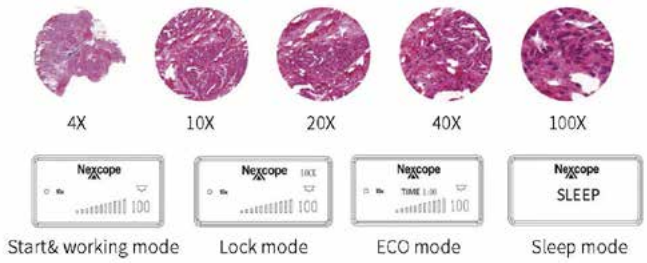
2. INTRODUCTION

2.1. What you can expect...

EXCELLENT OPTICAL DESIGN

NIS INFINITY PLAN OBJECTIVES can provide high contrast and very flat image with sharp, excellent resolution and high signal-to-noise ratio imaging. NE620T achieves the wide field of 22 mm view with 10x eyepieces for a more comprehensive observation content and faster sample observation.





INTELLIGENT OPERATING SYSTEM

CODED NOSEPIECE

NE620T can memorize the illumination brightness for each objective and automatically adjust the light intensity. This improves work efficiency and reduces visual fatigue.

The Liquid Crystal Display (LCD)

The LCD shows the usage status of the microscope, including magnification, light intensity, sleep mode and more.

MULTIFUNCTIONAL UNIVERSAL CONDENSER

Universal condenser for bright field, dark field and phase contrast: The observation methods could be quickly switched by switching the slider. There are two phase contrast sliders universal for 10/20/40/100 objectives also, simple and fast to use.

ERGONOMIC DESIGN / WIDE APPLICATION

NE620T uses an ergonomic design, high eye-point, low-hand focus mechanism, low-hand stage and other ergonomic designs to ensure the user can perform microscope operation in the most comfortable situation.

As a continuously upgradeable microscope, the NE620T can be extended by a variety of observation possibilities.

3. DESIGN OF NE620T

3.1. Product image NE620T – biological microscope

A NE620T front/side view

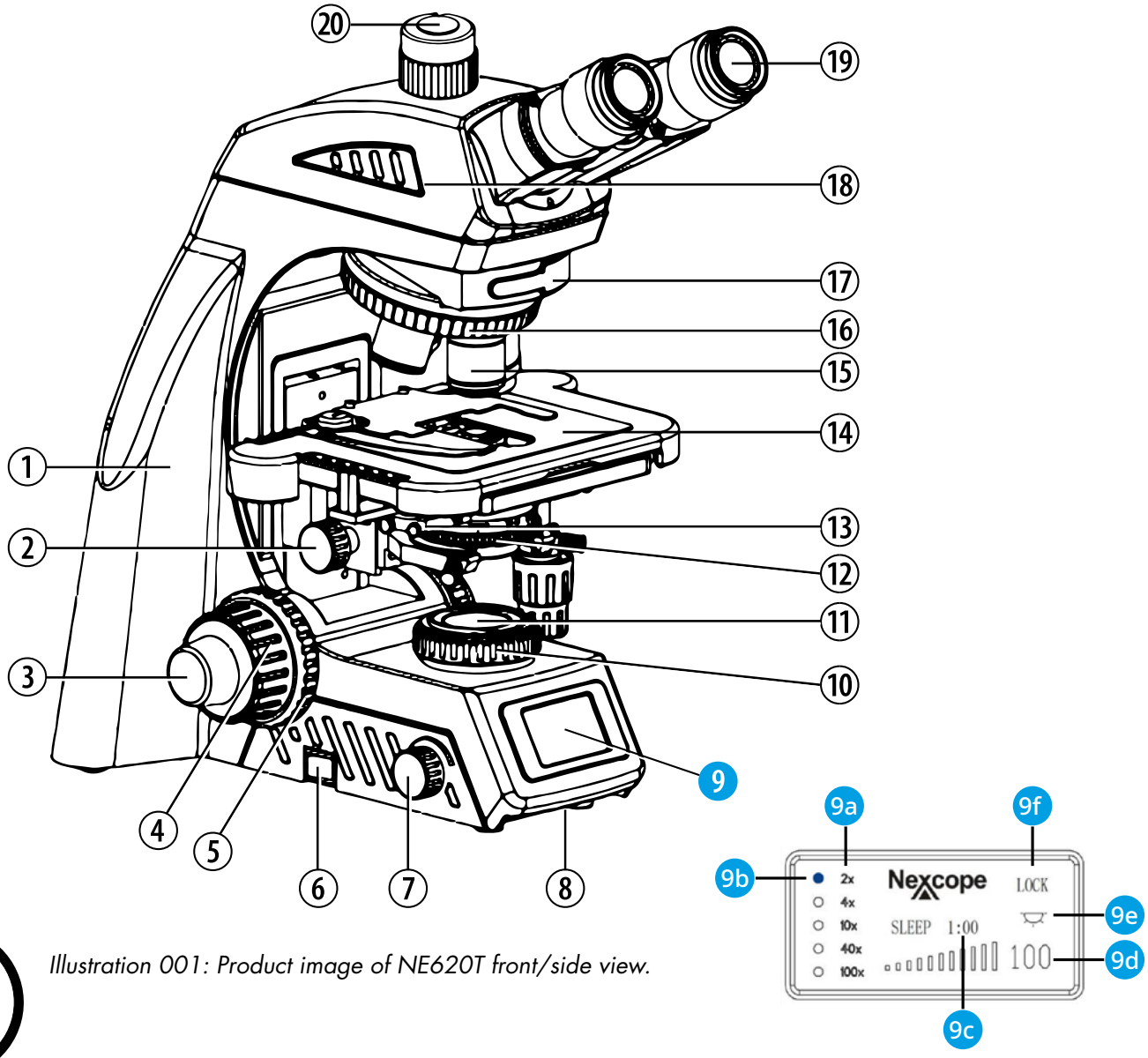


Illustration 001: Product image of NE620T front/side view.

AUTOMATIC DESIGN

9. Liquid Crystal Display (LCD)
9a. Selected objective
9b. Blue dot
9c. Adjustable time for SLEEP mode
9d. Light intensity (%)
9e. Transmitted light ON/OFF
9f. Light blocking or unblocking

BASIC DESIGN

1. Main body
2. Condenser up-down knob
3. Left fine focusing knob
4. Coarse focusing knob
5. Tension adjustment ring
6. On/Off switch
7. Brightness control knob
8. Carrying handle 1
10. Field diaphragm ring
11. Field diaphragm
12. Condenser with aperture diaphragm
13. Slider for different observation methods/placeholder
14. Cross stage with specimen clamp
15. Objective
16. Encoded quintuple nosepiece
17. External filter slider/placeholder
18. Trinocular viewing head
19. Eyepiece
20. Photo adapter

B NE620T back/side view

Power Supply:
AC 100-240 V; 50/60 Hz
Specification of fuse:
250 V

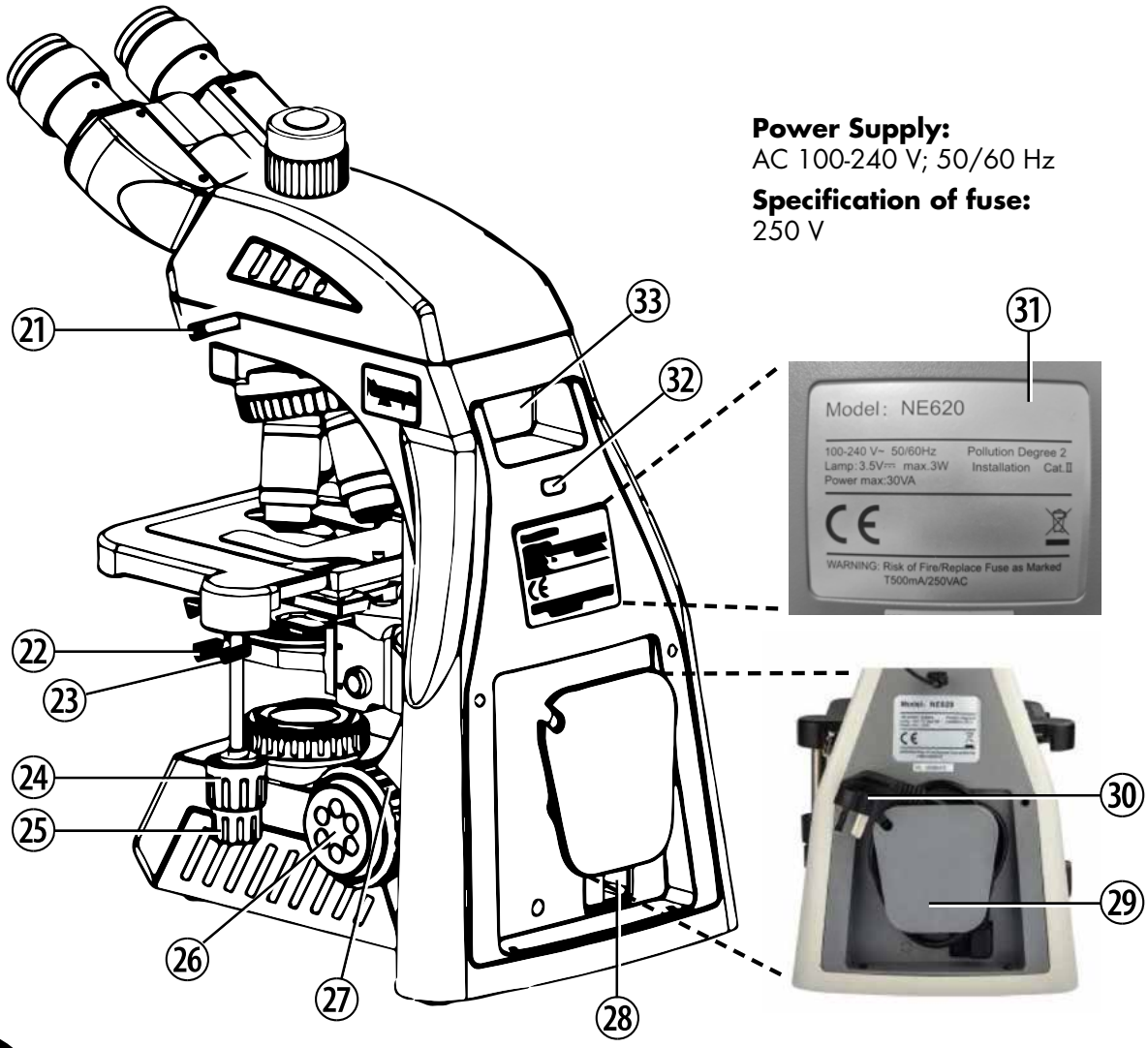


Illustration 002: Product image of NE620T back/side view.

BASIC DESIGN

21. Viewing head holding screw
22. Condenser centering screw (on both sides)
23. Condenser holding screw
24. Y-axis knob
25. X-axis knob
26. Right fine focusing knob
27. Limit knob (up-stop)
28. Mains in
29. Holding device for power cord
30. Power cord
31. Type plate with important information
32. USB interface
33. Carrying handle 2

3.2. Assembly of the NE620T microscope

The diagram below shows the sequence of assembly of the various modules. The numbers indicate the order of assembly.

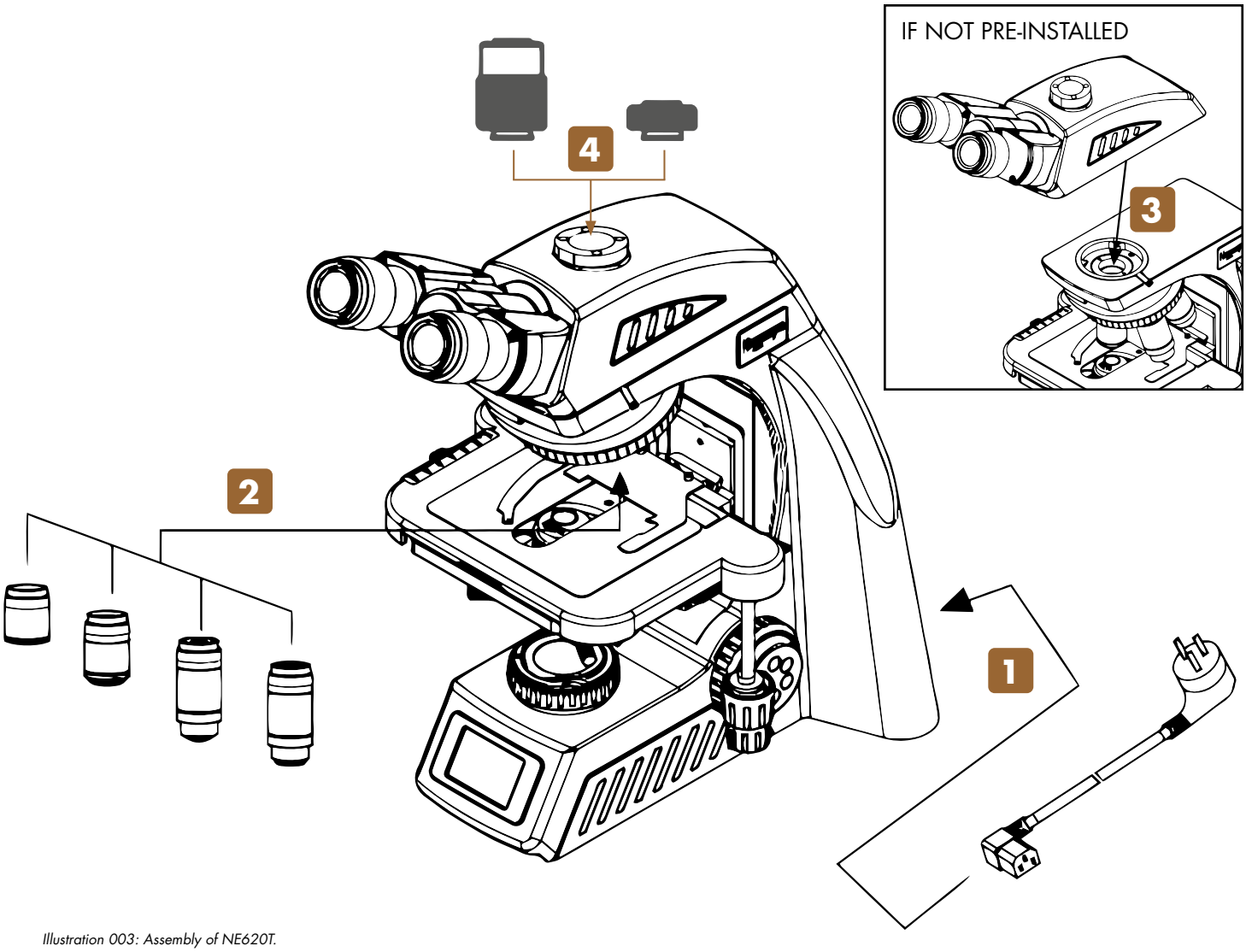


Illustration 003: Assembly of NE620T.

When assembling the microscope, make sure that all parts are free of dust and dirt and avoid scratching any parts or touching glass surfaces.

Check input voltage: The input voltage and supply voltage indicated on the back of the microscope must be consistent, otherwise the microscope will be seriously damaged.

Please use a suitable Allen wrench for assembling and replacing components.

3.2.1. Detailed assembly procedure

1 Attaching the power cord and startup of the device

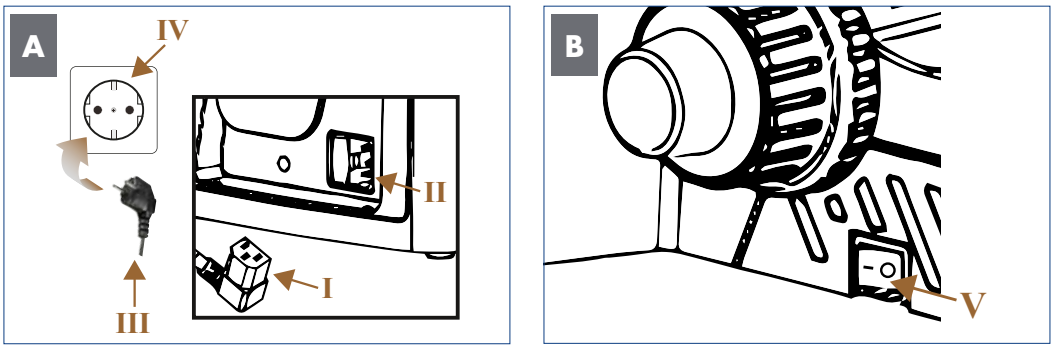


Illustration 004: Connecting the power cord and commissioning.

Connect the cold-device plug (I) to the appropriate mains in (II) on the back of the microscope.

Insert the main power plug (III) into the power socket (IV).

Move On/Off switch (V) to position I to turn on the device on the left side of the microscope.

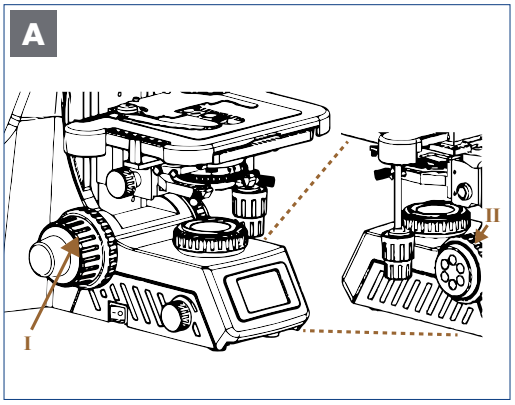
Make sure the supplied voltage matches the instruments specifications: 100-240 V, 50/60 Hz.

Make sure that the main switch is set to O (OFF) before connecting the power cord.

To avoid electric shock, connect the cold-device plug to a properly grounded power socket. These cold-device plug has three-pin plugs to ensure proper grounding.

Cables and cords are vulnerable when bent or twisted. Never subject them to excessive force.

2 Installing objectives



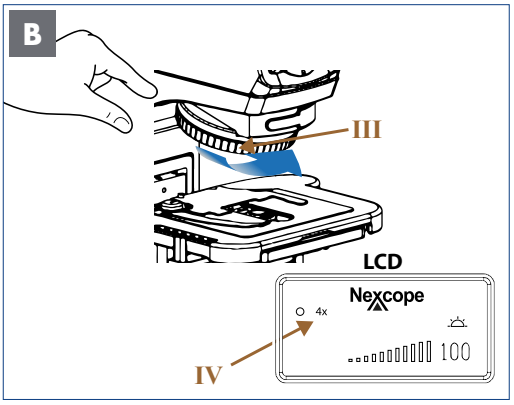
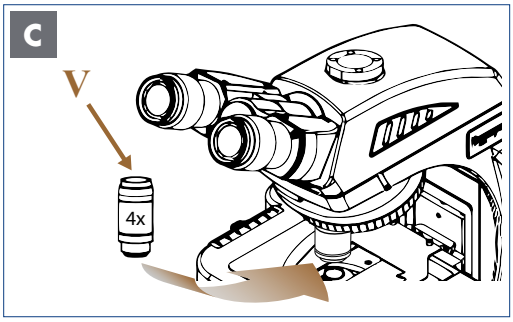


Illustration A/B: Installing objectives: Preparatory measures.

Use the coarse focusing knob (I) to turn the cross stage to the lowest position.

Check that no limit is set for the coarse focus movement by limit knob (up-stop) (II).

Turn the encoded quintuple objective nosepiece (III) by hand until the LCD shows the programmed position for the 4x objective (IV).



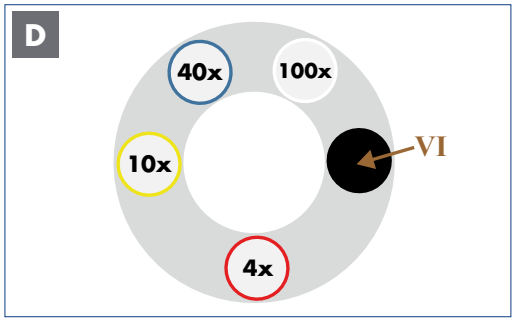


Illustration C/D: Inserting the objectives.

Screw the 4x objective (V) into the assigned free space on the nosepiece.

Before each use, check the front lens of the objective for dirt. The closer a contamination is to the object or a camera sensor, the greater its effect on the visual or recorded image. Therefore clean the objectives regularly.

Start up the device before inserting the objectives on the nosepiece. Only in this way will you be assigned the predefined space for each objective.

The objectives snap into place with an audible "click" when they are positioned in the beam path. Only in this position does the lighting come on.

Repeat procedure B and C for the next higher objectives to occupy the programmed positions on the nosepiece until all objectives are mounted.

The sequence is defined so that the magnification increases continuously when turning counterclockwise.

The following objectives are included in delivery: Plan achromatic objectives (NIS60): 4x, 10x, 40x, 100x oil.

Protect the free opening on the objective nosepiece with the black protective cap (VI).

Always start with the lowest magnification: you then have a large focus range and additionally protect the microscope from damage.

3 Attaching the trinocular viewing head

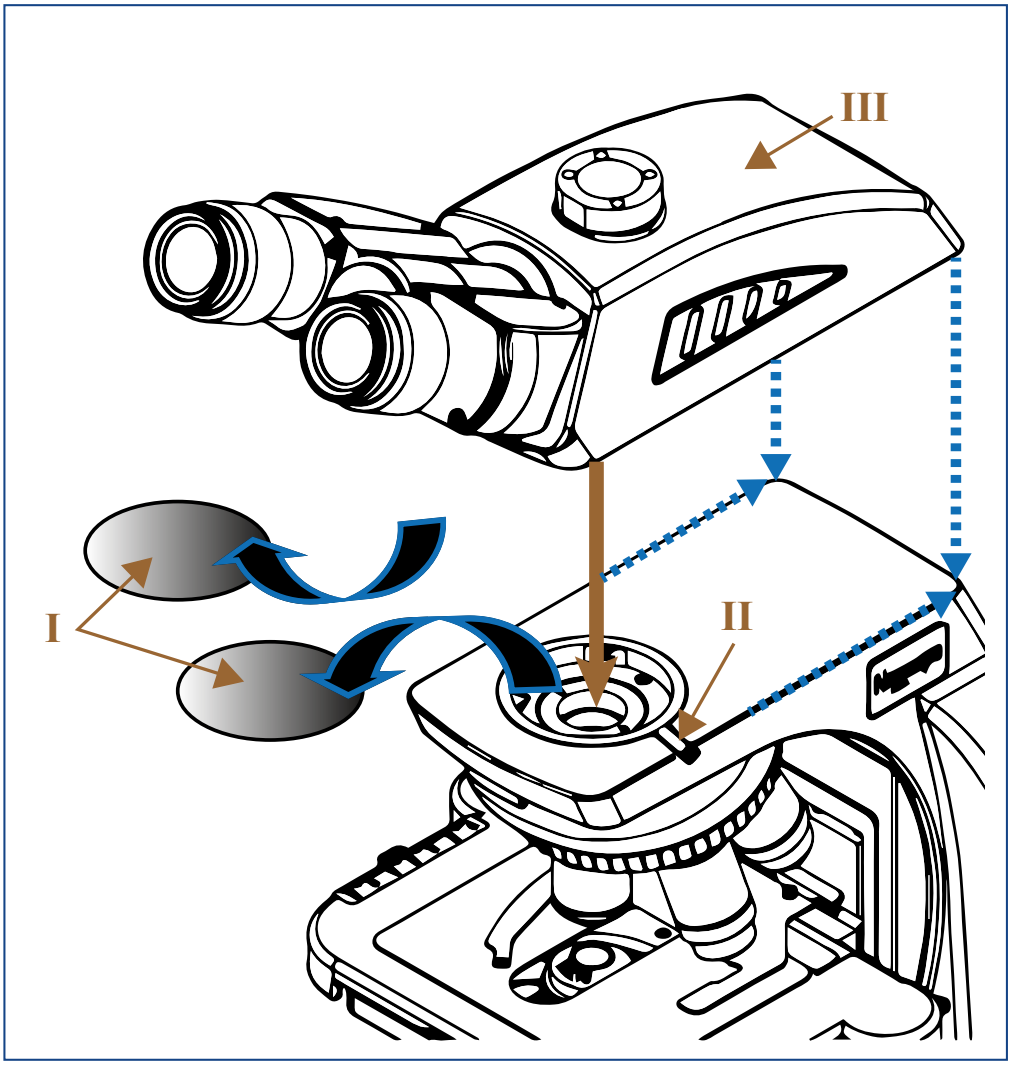


Illustration 005: Attaching the trinocular viewing head.

If present pull off the black protective cap (I) from the tube lens (at the bottom of the trinocular head).

Make sure not to touch any optical lenses.

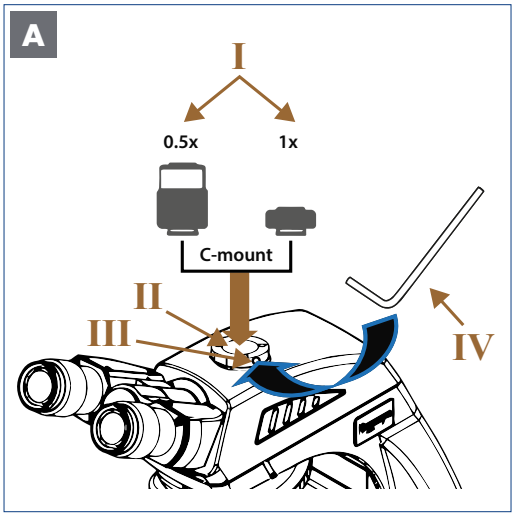
Remove the black protective cap (I) from the microscope body by loosen the viewing head holding screw (II).

Place the trinocular viewing head (III) into the round dovetail of the microscope so that the eyepieces are in front.

Ensure correct alignment along the microscope body (blue lines).

Fasten the viewing head by tightening the viewing head holding screw.

4 Using the C-mount camera adapters



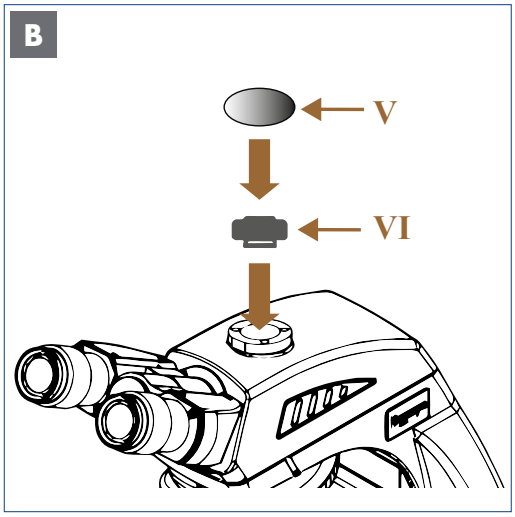


Illustration 006: A/B: Attaching the C-mount camera adapters.

Using a C-mount camera

If not already pre-installed, place the C-mount adapter (0.5x or 1x - depending on the camera type) (I) in the port of the trinocular viewing head (II).

Fix both elements by tightening the set screw (III).

0.5x C-mount adapter for sensor sizes up to 2/3″.
1x C-mount adapter for sensor sizes of 1″.

Use a suitable Allen key (IV) for mounting the camera adapter.

1x C-mount adapter is included in delivery.

0.5x C-mount adapter is not included in delivery but can be ordered as accessories.

If you do not want to use a camera, please use the appropriate protective cap (V) of the camera adapter to protect the interface from dust.

When installing the camera, please always make sure that you hold it firmly in place to protect it from damage due to dropping.

Setting the camera:
Parfocality: Observe the desired object through the eyepiece and focus the image. Then install the camera and adjust the image on the monitor accordingly. With the set screw (III) you can align and tighten the camera in a suitable position.

Setting the camera:
After obtaining a clear image by binocular observation, observe the image on the computer or monitor. If it is not sharp, please turn the focusing ring (VI) on the camera adapter until the image is sharp enough.

4. START-UP AND OPERATION

4.1. Setting up power supply

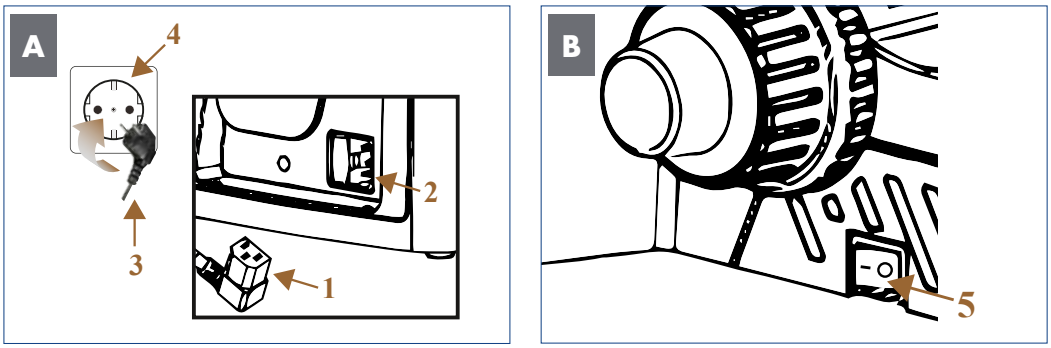
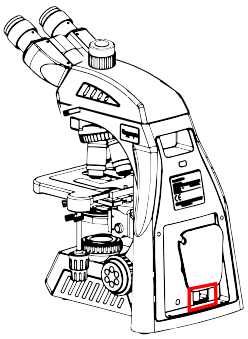


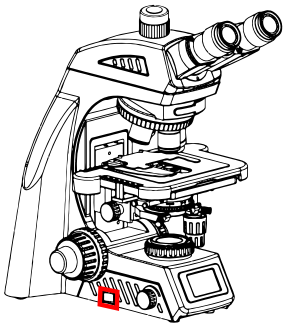
Illustration 007: A/B: Setting up power supply.

Connect the cold-device plug (1) to a suitable mains in (2) on the back of the microscope.

Insert the main power plug (3) into the power socket (4).

Switch on the device by setting the On/Off switch (5) to position I on the left side.





Make sure the supplied voltage matches the instruments specifications: 100-240 V, 50/60 Hz.

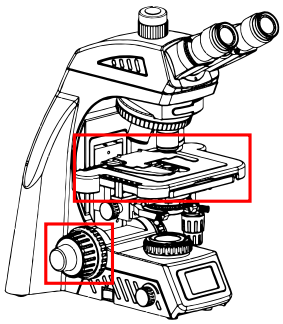
Make sure that the main switch is set to O (OFF) before connecting the power cord.

To avoid electric shock, connect the cold-device plug to a properly grounded power socket. These cold-device plug has three-pin plugs to ensure proper grounding.

Cables and cords are vulnerable when bent or twisted. Never subject them to excessive force.

4.2. Placing the specimen

Cross stage for acquisition, positioning and fixation of the specimens with clamp holder.



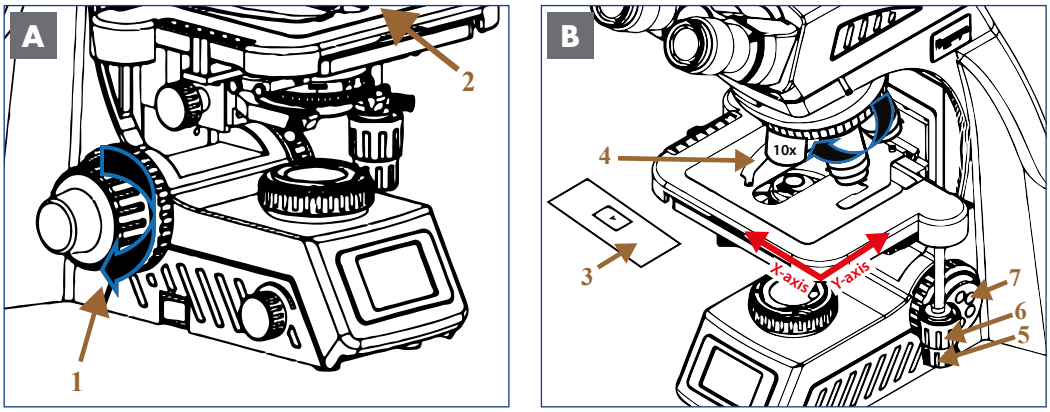


Illustration 008: A/B: Placing the specimen on the cross stage.

Turn the coarse focusing knob (1) in the direction of the blue arrow to lower the cross stage a little (2).

The specimen slide (3) can easily be placed by moving it into the specimen clamp holder (4) from the front.
Manually swing the 10x objective into the light beam.
The focusing knobs (5, 6) are coaxial.
The X-axis knob (5) moves the specimen holder along the X-axis.
The Y-axis knob (6) moves the cross stage along the Y-axis.
Turn the coarse focusing knob again to carefully raise the stage up.
Focus on the specimen.
Fine focusing is performed with the fine focusing knob (7).

Avoid damages to the specimen! Only turn the coarse focusing knob until it stops to avoid damages to the specimen through collision with the objective.

4.3. Observationtubus

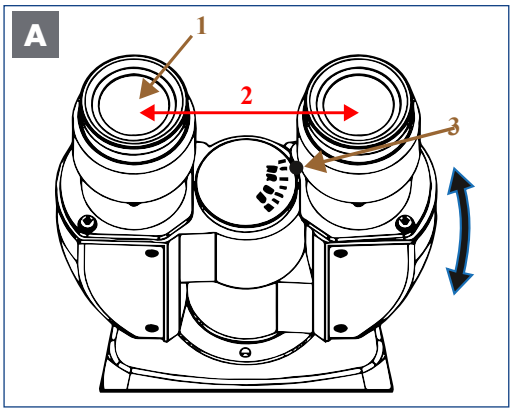
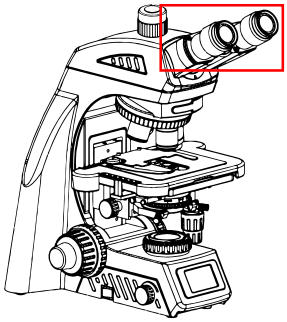


Illustration 009: A: Adjusting the interpupillary distance.

1. Adjusting the interpupillary distance (Distance between the eyepieces)



Look through the eyepieces (1) and adjust the interpupillary distance (2) so that the left and right fields of view are completely aligned.

The device can be adjusted to the interpupillary distance of the respective observer between 47 mm and 78 mm.

The small black dot (3) on the right-hand side indicates the interpupillary distance on the scale.

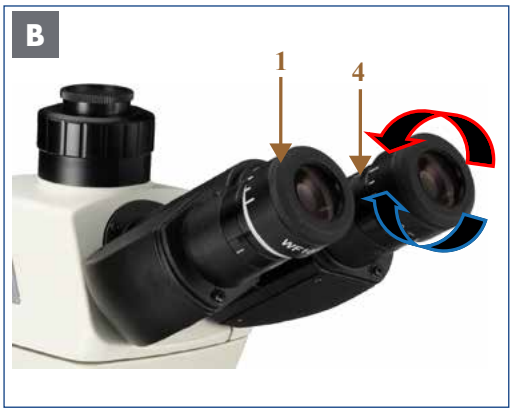


Illustration 010: B: Diopter adjustment.

2. Diopter adjustment

Look through one of the eyepiece (1) and focus the image (eyepiece freely selectable). Then look through the other eyepiece with the other eye and turn only the diopter adjustment ring (4) on this eyepiece to focus the sample.

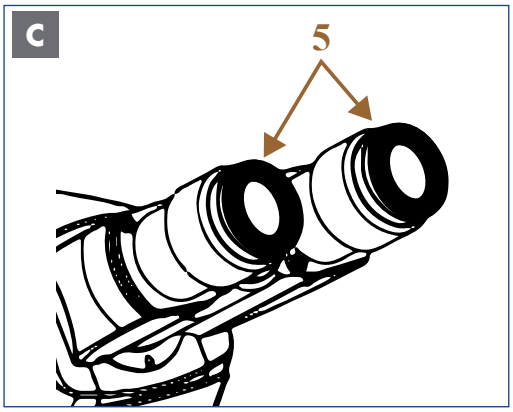


Illustration 011: C: Eyepieces with rubber cups.

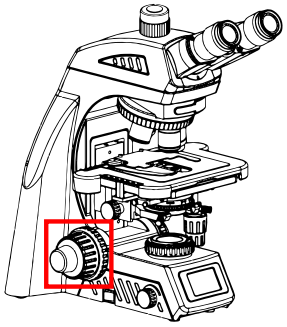
3. Protection through rubber cups

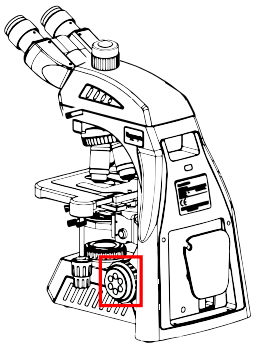
Both eyepieces are suitable for spectacle wearers. They are protected with rubber cups (5) so that the user's eyeglasses are not damaged when accidentally coming in contact with the eyepiece.

Proper interpupillary distance is crucial to the comfort of the user. Note your interpupillary distance so that it can be quickly duplicated.

The diopter compensation is an adjustment possibility on both eyepieces and serves to compensate for near - or farsightedness (max. +/-8 dpt. difference between both eyes can be compensated). If the difference is higher, or if you suffer from astigmatism etc. we recommend observing with your prescribed glasses on.

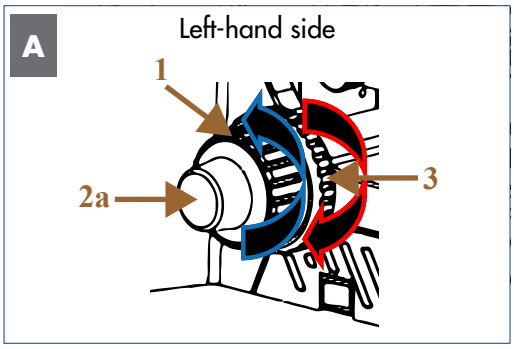
Diopter compensation is possible on both eyepieces but is only performed on one eye if the difference is +/- 4 dpt. or lower.





4.4. Focusing the specimen

4.4.1. Focusing controls



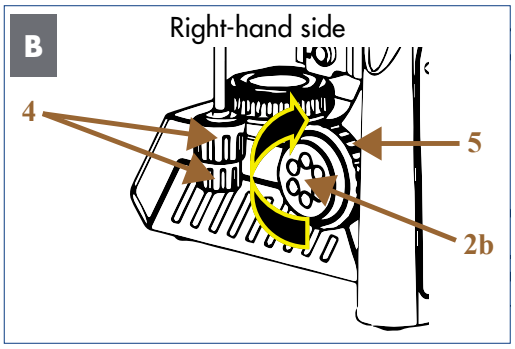


Illustration 012: A/B: Focusing controls.

Turn the coarse focusing knob (1) to raise or lower the stage:

Stage moves up and vice versa

Bring the object into focus and adjust the focus with the left fine focusing knob (2a) with scaling located on the same focusing shaft.

Adjusting the coarse focusing knob tension:

The coarse focusing knob tension is preset for easy use.

If desired, you can change the tension using the tension adjustment ring (3).

Tension increases and vice versa

Fine focusing knobs are located comfortably on each side of the microscope.

The right fine focusing knob (2b) has six small recesses to make fine adjustment even easier.

Fine focusing knob and X-axis/ Y-axis knobs (4) can be operated simultaneously with one hand.

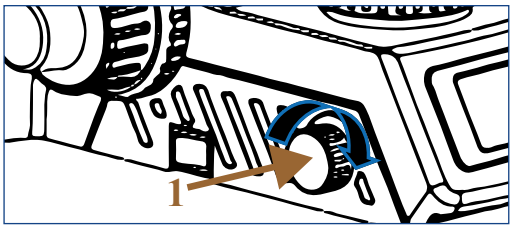
Limit knob (up-stop) (5):

Set an upper limit for the coarse focus movement. Repeal the function in the opposite direction.

After changing specimens or objectives, focusing is easily accomplished by rotating the coarse focusing knob to reach the pre-focused position. Then make fine adjustments with the fine focusing knob.

The stop control ensures that the objective does not come in contact with the specimen.

4.4.2. Adjusting the lighting



Turn the brightness control knob (1) in the direction of the arrow → the light intensity increases and vice versa.

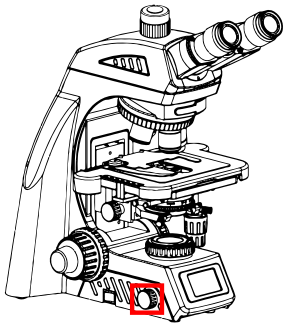


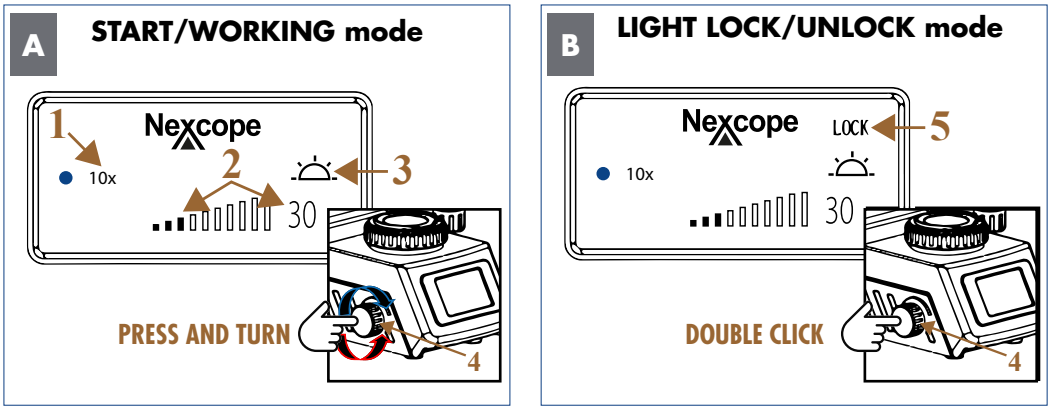
Illustration 013: Adjusting the lighting.

4.4.3. The Liquid Crystal Display (LCD)

The Liquid Crystal Display on the front of the microscope can display the different working modes of the microscope, including magnification, light intensity, SLEEP mode, and so on.

NE620T can store and automatically adjust the light intensity for each objective. This improves work efficiency and reduces visual fatigue.

The following symbols appear in the LCD when you start the microscope and the 10x objective is tilted in:



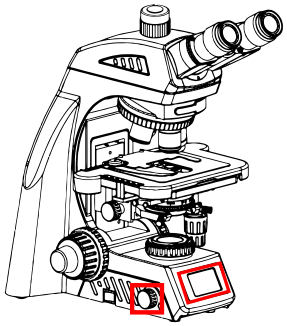


Illustration 014: A/B: LCD of NE620T: START/WORKING mode and LIGHT LOCK/UNLOCK mode.

The selected objective (1) is displayed next to the blue dot.

Last used light intensity (2) is shown as number (percentage unit) and in form of bars.

Display for transmitted light switched ON or OFF (3):

PRESS and TURN the brightness control knob (4):

Transmitted light OFF

Transmitted light ON

LIGHT LOCK mode
Double click on the brightness control knob (4) → the display shows LOCK (5).
LOCK: This function means that you can set and lock a desired light intensity when using an objective with a certain magnification. This prevents any change by another user.
When changing objectives, the system automatically switches to the light intensity of the corresponding magnification, but the brightness control knob (4) can no longer be adjusted manually.

LIGHT UNLOCK mode
Double click again on the brightness control knob (4) → LOCK-display (5) disappears.
The light intensity can be individually adjusted using the brightness control knob.

For the other display elements, refer to the explanation in figure A.

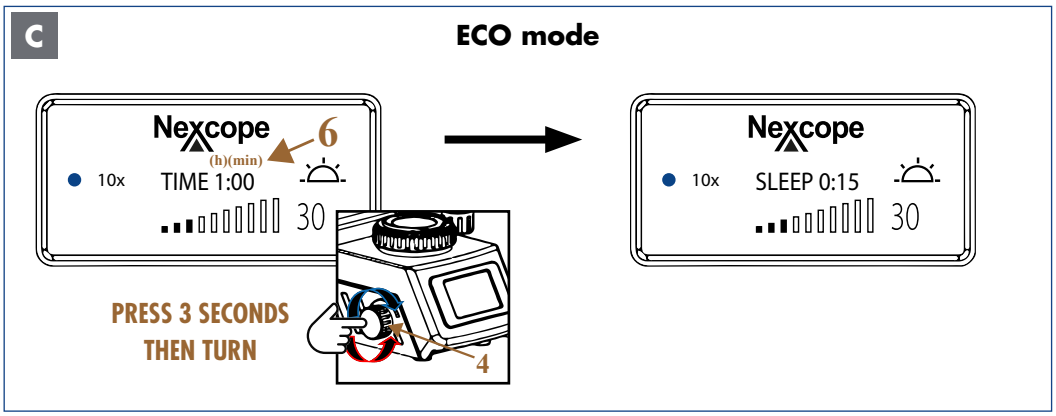


Illustration 015: C: LCD of NE620T: ECO mode.

Set a time after which the light is automatically switched off (switch-off time):

Press the brightness control knob (4) for at least 3 seconds. The TIME-display (6) appears with hours (h) and minutes (min). The TIME-display flashes for setting.

Set the desired switch-off time by turning the brightness control knob (5-minute increments from 0 to 8 hours).

Switch-off time is extended by 5 minutes

Switch-off time is shortened by 5 minutes

After setting the switch-off time, release the brightness control knob. The TIME-display changes to SLEEP-display after flashing three more times. The switch-off time (for example 15 min) is now saved.

The microscope switches the light off after 15 min.

You can leave the ECO mode by pressing the brightness control knob for 3 seconds. Then the display changes to the START/WORKING mode and the TIME/SLEEP-display disappears.

For the other display elements, refer to the explanation in figure A.

The switch-off time should be set otherwise the 0:00 display flashes continuously.

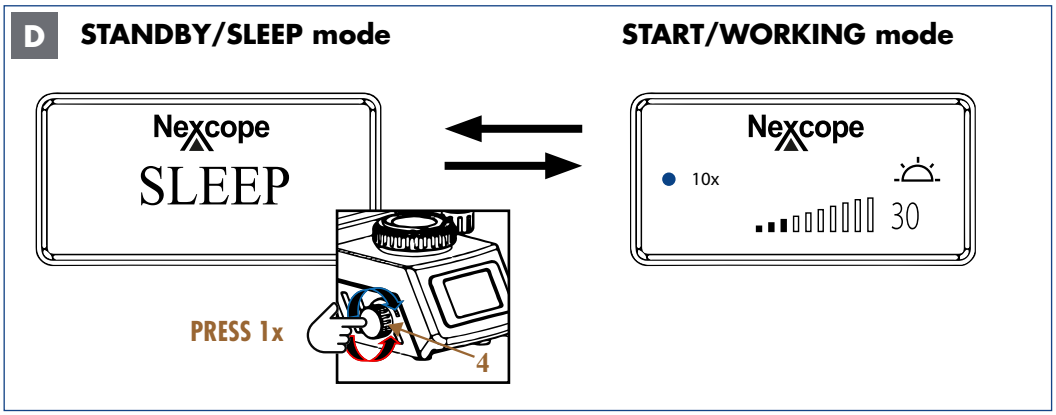


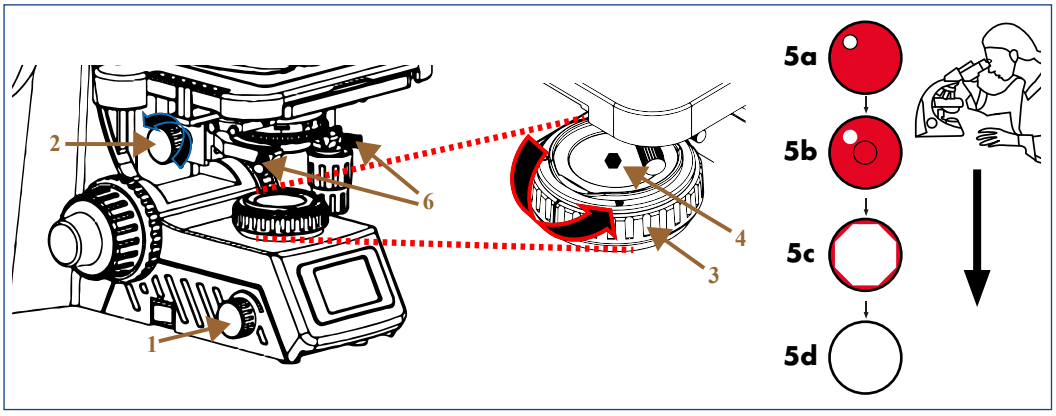
Illustration 016: D: LCD of NE620T: STANDBY/SLEEP mode and START/WORKING mode.

In STANDBY/SLEEP mode, the light is switched off to save energy and lamp life.
Press once or turn the brightness control knob (4) - both directions possible - to change from STANDBY/SLEEP mode to START/WORKING mode.

Press once the brightness control knob to change from START/WORKING mode to STANDBY/SLEEP mode.

4.5. Bright field observation according to Koehler

4.5.1. Centering the condenser



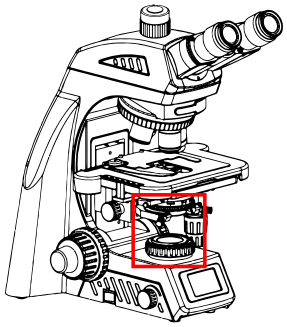


Illustration 017: Centering the condenser.

PRESS and TURN the brightness control knob (1) to turn transmitted light ON .

Turn the condenser up-down knob (2) in the direction of the blue arrow to raise the condenser to its upper limit.

Focus the specimen using the 10x objective.

Rotate the field diaphragm ring (3) in the direction of the red arrow so that the field diaphragm (4) is completely closed. Look through the eyepieces.

Adjust the condenser up-down knob to focus the image of field diaphragm.

If the condenser is out of center, you will see an image of the iris opening similar to (5a).

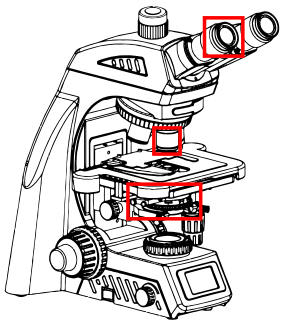
In order to center the iris opening in the field of view, use the two condenser centering screws (6) at each side of the condenser holder.

Once the image is in focus and centered in the field of view (5b), open the field diaphragm until the image is at least as large as field of view (5c-5d).

The field diaphragm restricts the diameter of the light beam entering the objective. This prevents the incidence of disturbing light and increases the image contrast. To support objective performance, the diameter of the field diaphragm must be adjusted so that its image and the field of view are the same size.

- Use of a 4x objective → open the field diaphragm completely
- Use of a 100x objective → close the field diaphragm

4.5.2. Aperture diaphragm (condenser diaphragm)



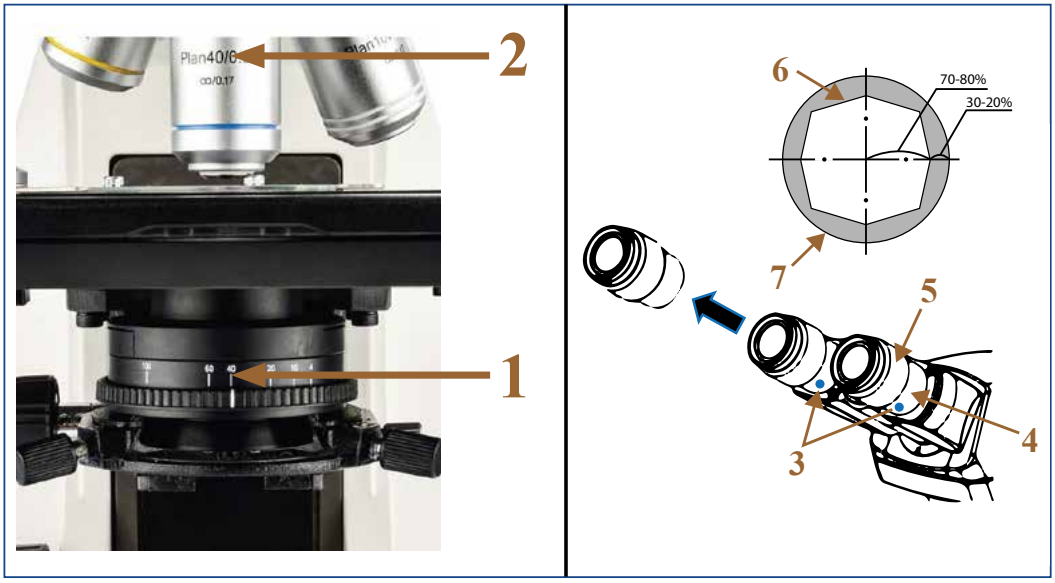


Illustration 018: Adjustment of aperture diaphragm.

Two possible ways to adjust the aperture diaphragm (condenser diaphragm):

First possibility

- Turn the aperture diaphragm ring (1) to the same number as the objective magnification (2).

For example 10x objective: aperture diaphragm ring position 10

Second possibility

- As an alternative, loosen the small screws (3) on the eyepiece sleeves (4) to pull out the eyepieces (5).

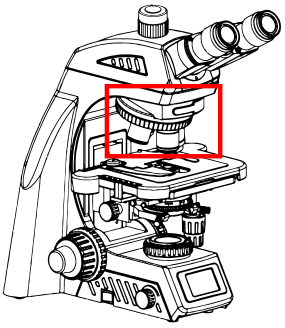
Use a suitable Allen key.

- Look into the eyepiece sleeve.
- Set the aperture diaphragm image (6) to approximately 70-80 % of the diameter of the objective pupil (7) by adjusting the aperture diaphragm ring.

The aperture diaphragm (condenser diaphragm) determines the numerical aperture of the illumination system. It has an effect of adjusting image resolution and contrast. Stopping down the aperture diaphragm increases the depth of focus.

Each time the objective is changed, the object field size and objective aperture and possibly the centering will change slightly, so that for optimal results, the light field and aperture diaphragm settings must be adjusted again.

4.6. Optical design



NIS infinity plan objectives can provide high contrast and very flat image up to wide field 22 mm view. With FN 22 wide field eyepieces, the optical system always brings you sharp, excellent resolution and high signal to noise ratio imaging.

- **Plan objective**

By using infinity plan achromatic objectives (NIS60 – 4x, 10x, 40x, 100x), flat image with higher imaging reduction degree over the entire field of view could be achieved.
NE620T achieves the wide field of 22 mm view with 10x eyepieces for a more comprehensive observation content and faster sample observation. The eyepiece adopts a flat field distortion-free design to prevent the edge of the field from being imaginary and stray light.

- **40x LWD objective**

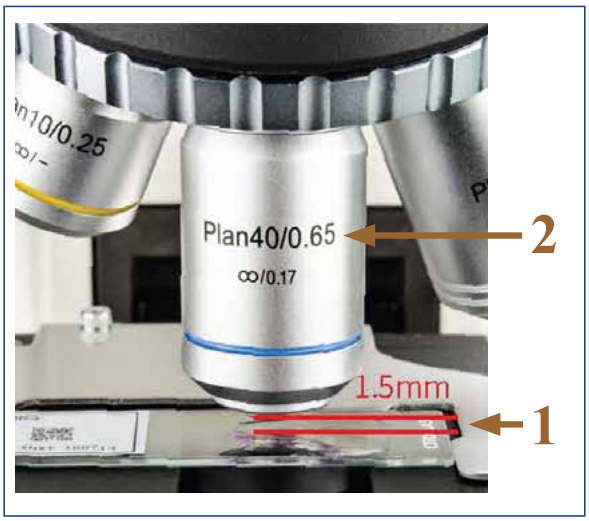


Illustration 019: 40x LWD objective of NE620T.
LWD = long working distance

The working distance (1) of 40x objective (2) can be up to 1.5 mm, avoiding the erosion from residual immersion oil and water when converted from 100x to 40x objective.

40x LWD objective is included in the delivery.

- **Immersion objectives**

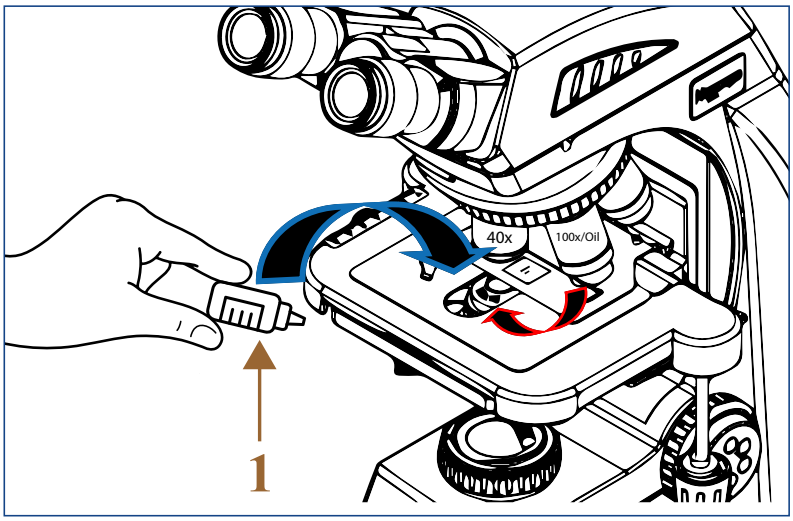


Illustration 020: The 100x oil-immersion objective.

The oil immersion can only be done with a suitable 100x objective! The 100x oil objective is included in the scope of delivery.

Cedar oil is included in the delivery. We recommend oil with a refractive index (RI) nD=1.515 according to ISO 8036.

Focus on the object with the 40x objective.

Turn the 40x objective sideways.

Put a drop of immersion oil (1) onto the cover glass of the specimen slide.

Turn in the 100x objective, the front lens is immersed in the oil.

Slowly refocus the image.

Because air bubbles in the oil will affect the image quality, make sure that the oil drop is free of bubbles. To remove the bubbles, repeatedly defocus and refocus the oil immersion objective or switch to another objective and let visible bubbles burst before immersing the 100x objective again.

Clean the 100x objective by dabbing off the oil with a soft baby paper tissue (lotion-free). When the immersion lens is used regularly, wet clean the lens only once a week, Use a solution of 70% ethanol or Isopropanol (use p.a. or pharmacy grade alcohol and double distilled water to make such a solution).

If immersion oil comes into contact with the skin, rinse thoroughly with soap and water. If immersion oil gets into your eyes, rinse under running water for at least 15 minutes.

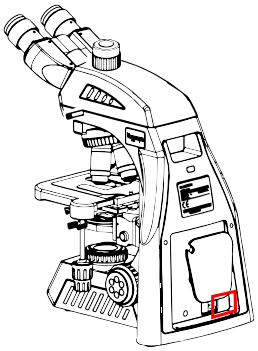
- **Water-immersion objective**

Illustration 021: The 100x water-immersion objective.

Water (1) is used instead of cedar oil or immersion oil for 100x water-immersion objective (2). Excellent image, easy to operate better and easier cleaning and therefore better environmental performance.

Water-immersion 100x objective is not included in the delivery but is available as accessory.

4.7. Exchange of the fuse



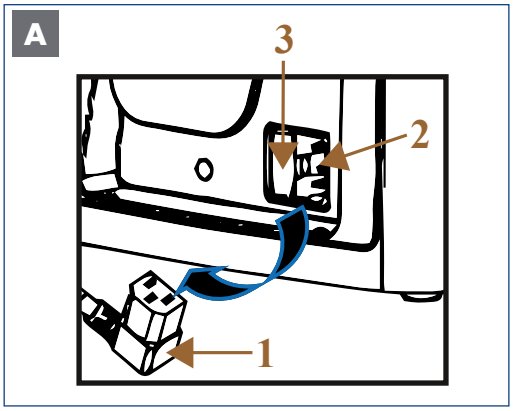


Illustration 022: A: Exchange of the fuse: Precautions.

Unplug the power plug before changing the fuse!

If fuses should fail, the cause must first be determined and any technical faults taken care of.

Pull the cold-device plug (1) from the mains connection (2) at the back of the microscope.

The fuse compartment (3) is combined with the mains connection (2).

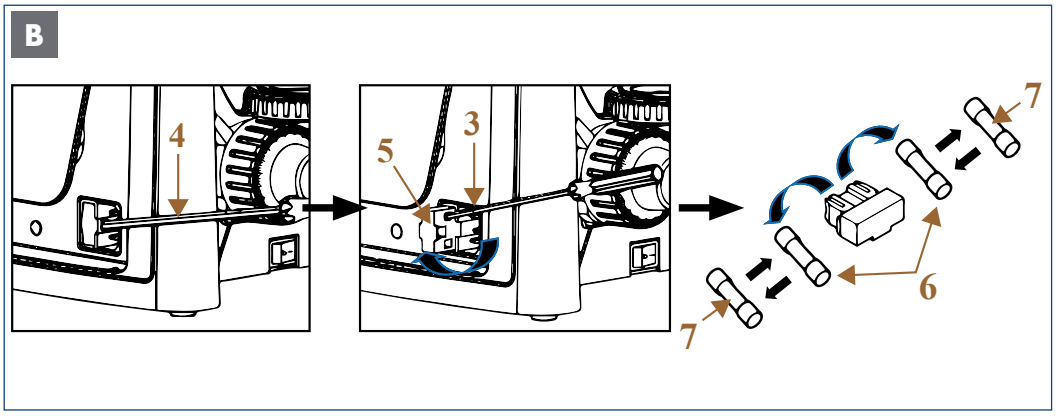


Illustration 023: B: Exchange of the fuse: Installation of the replacement fuses.

The fuse holder sits very firmly in the fuse compartment and can only be released with a little more force.

Use a suitable screwdriver (4) to pull out the fuse holder (5) to the front out of the fuse compartment (3).

The fuse holder contains two fuses (6).

Press the blown fuse sideways out of the holder.

Replace the fuse. An audible "click" symbolises the correct engagement. Two replacement fuses (7) are included in the delivery.

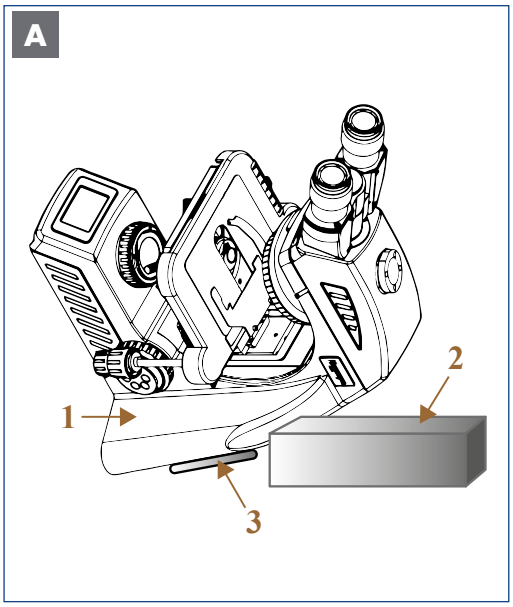
After replacement, push the fuse holder into the fuse compartment as far as it will go.

Insert the power plug in the mains connection and switch the device on again.

Specification of the fuse: 250 V.

REMEMBER: The fuse body is made of glass, please operate carefully when pushing out and changing the fuse.

4.8. LED lamp replacement

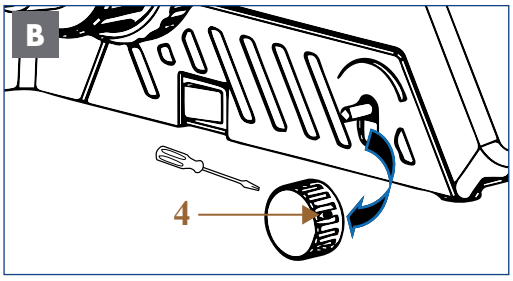


Unplug the power plug before changing the LED lamp!

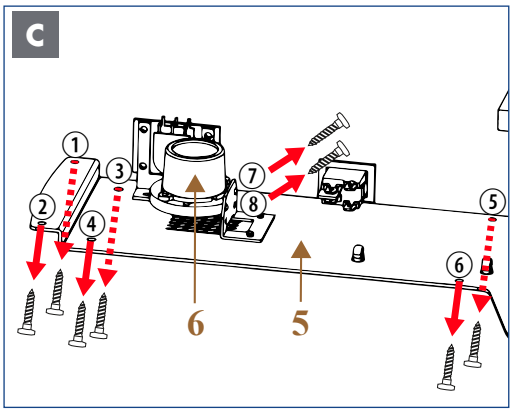
In general, the LED lamp is very durable. If it is damaged, please contact the customer service to get a replacement LED.

Have suitable tools ready for the change!

Place the microscope on the microscope body (1). Support the body with a firm base (2) so that the holding device for power cord (3) is not damaged.



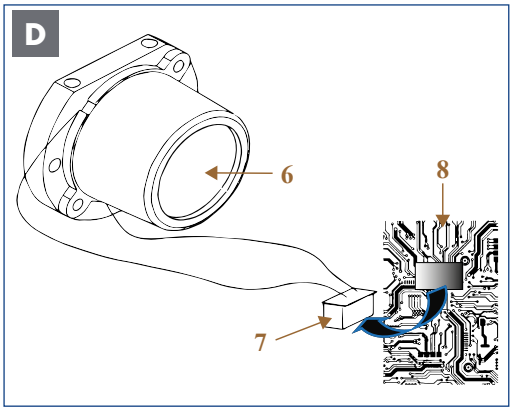
Loosen the locking screw of the brightness control knob (4) to remove the knob from the microscope.



Loosen the six outer screws ① to ⑥ of the base plate (5) and then carefully remove the base plate from the microscope.

The LED lamp (6) is fixed with two additional locking screws ⑦ and ⑧ . Unscrew these screws.

Take care to remove the base plate slowly so that the wiring inside the microscope is not pulled apart.



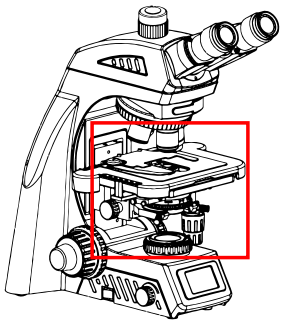
The connector (7) is linked to the LED lamp (6) and to the PCB board (8). Pull the connector carefully out of the PCB board. Mount a new LED lamp plus connector. Then tighten screws ⑦ / ⑧ and insert the connector completely into the PCB board. Carefully place the base plate back on the microscope and tighten all six outer screws ① to ⑥. Put the brightness control knob on and tighten the locking screw. Connect the microscope and put it back into operation.

Illustration 024: A-D:LED lamp replacement.

5. VARIOUS OBSERVATION METHODS

As a continually upgradable microscope, NE620T can be extended on basic model to show a variety of observation capabilities. The accessory sets are not included in the scope of delivery and can be ordered separately.

Before using the various observation methods, it is recommended to set the illumination according to Koehler analogous to the bright field adjustment see chapter 4.5.

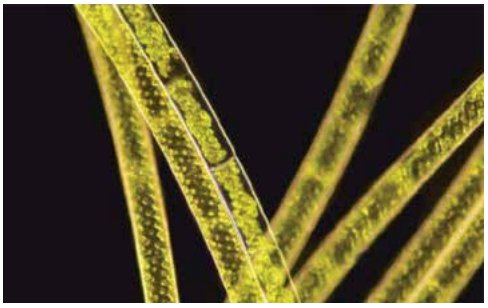


5.1. Dark field observation

5.1.1. Overview

Dark field microscopy leads to a dark image background, in front of which the structures to be observed stand out brightly. As a result, it is possible to produce well-resolved, high-contrast images of transparent objects with only very low contrast without the need for prior staining of the specimen.

Typical examples for dark field microscopy are amoeba or epithelial cells, e.g. of the oral mucosa. Fixing and subsequent coloring is not necessary. Dark field microscopy is also particularly suitable for live cultures of aquatic organisms or algae, which one would like to see in motion, which usually prohibits staining. In addition to the contrast gain achieved, dark field observations are also aesthetically pleasing!



Spirogyra: *source: Nexcope*

The method is primarily suitable for finding: cell outlines, very fine structures like flagella, very small particles, because they light up brightly.

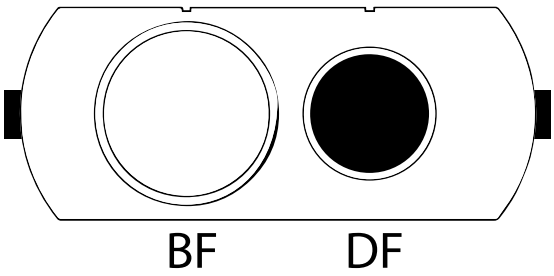
5.1.2. Components for dark field observation

Included in scope of delivery:

- **Infinity-corrected plan objectives (4x, 10x, 40x, 100x)**

Not included in the scope of delivery but available separately:

- **Bright field/dark field slider (BF/DF slider)**



5.1.3. Settings for dark field observation

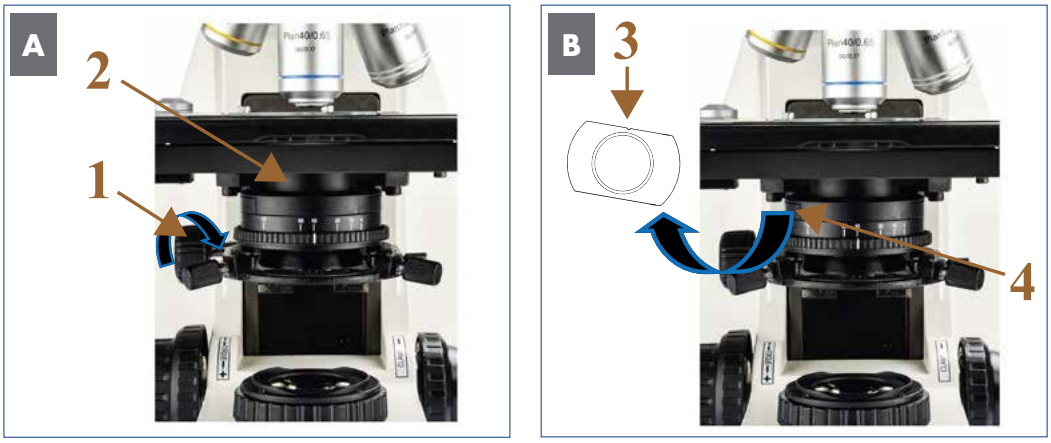


Illustration 025 A/B: Settings for dark field observation: Removing the placeholder on condenser.

All settings, including adjustment of the lighting according to Koehler, were made in bright field.

Turn condenser up-down knob (1) to lower the condenser (2).

Slide the placeholder (3) out of the corresponding holder (4) on the left-hand side of the condenser.

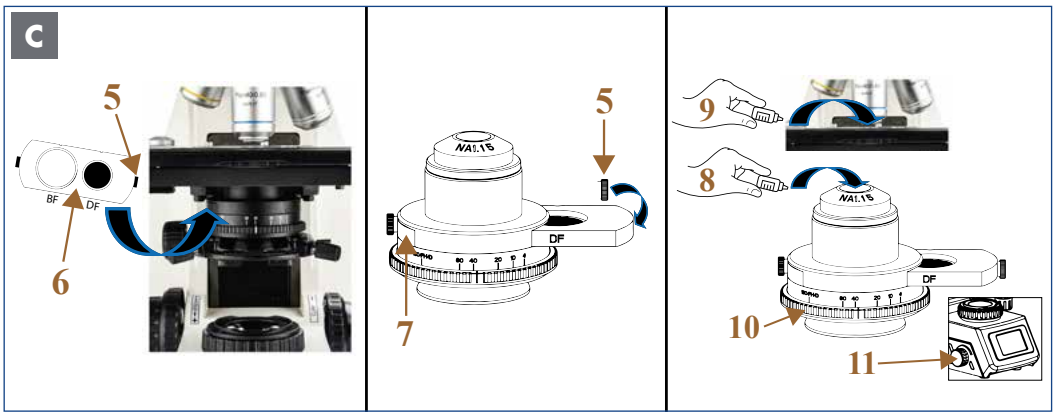


Illustration 026 C: Settings for dark field observation: Inserting the BF/DF slider.

With the BF/DF slider an observation in bright field and dark field is possible:

Loosen the right-hand screw (5) of the BF/DF slider (6).

Insert the BF/DF slider into the corresponding hole of condenser (7).

Attach the right screw (5) of the BF/DF slider and screw it tight.

The screws on the left and right side hold the BF/DF slider in position.

Turn condenser up-down knob to raise the condenser (see picture A reverse process).

The condenser lens should not touch the slide.

By pulling or pushing the right or left screw, you can quickly and easily switch between bright field (BF) and dark field (DF) observation.

When inserting the slider, make sure that the BF/DF label is facing you.

The slider can be inserted from both sides of the condenser. More space is available on the left side.

Make sure that the BF/DF slider is always fully aligned in the light path.

For optimal dark field observation:

Add a drop of cedar oil/immersion oil (8) between the condenser and the specimen so that the light is not completely reflected on the condenser and reaches the object to be examined.

Add an additional drop of cedar oil/immersion oil on the cover glass of the sample when using the 100x objective.

Setting a background for the field of view that is as dark as possible.

Turn the aperture diaphragm ring (10) completely to the left to position 100/PH/D.

Turn the brightness control knob (11) to adjust the lighting.

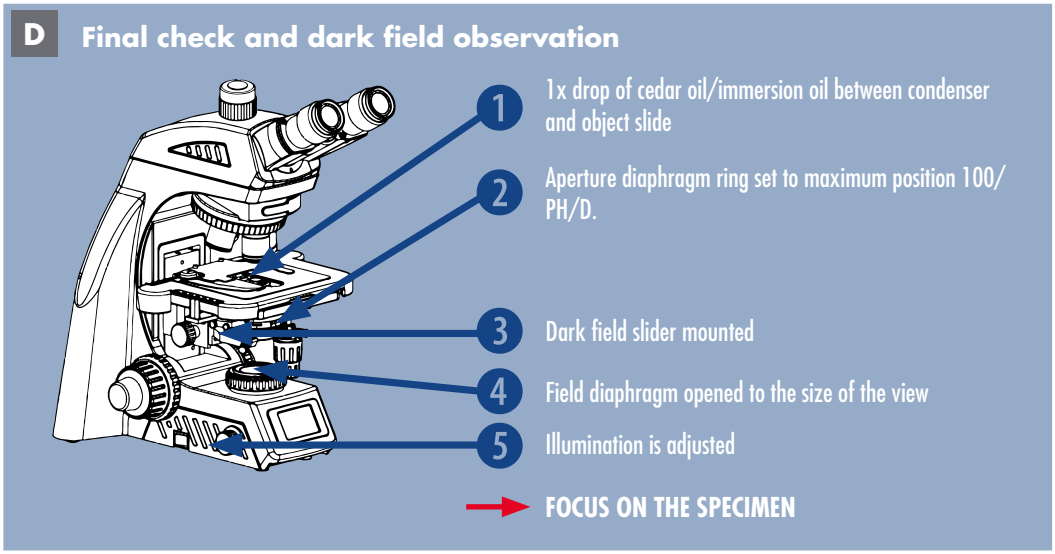
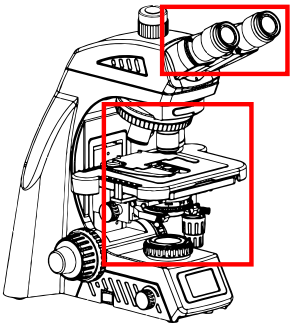


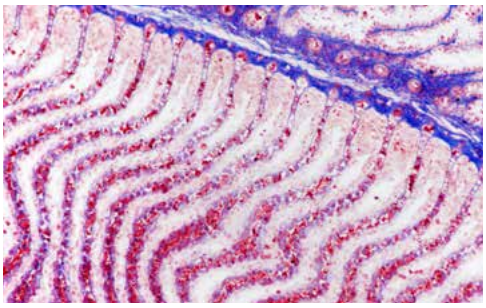
Illustration 027 D: Settings for dark field observation: Final check and observation.

5.2. Phase contrast observation

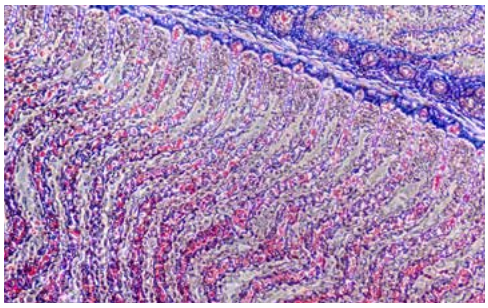


5.2.1. Overview

Phase contrast microscopy is used to convert invisible phase shifts into differences in brightness that are perceptible to our eyes. This effect is achieved by the interference of diffracted light from the object and direct microscopic light. The phase shift through the specimen is thus converted into a change in amplitude. This enables direct imaging of structures that have only a low inherent contrast and would only be visible with artificial coloring in bright field microscopy. These include, for example, plankton organisms or activated sludge. Cell cultures or cells in the urine sediment can also be better visualized with phase contrast and thus be evaluated more quickly and reliably.



Scyliorhinus sp. gill arc: *Bright field: source: Bresser GmbH*



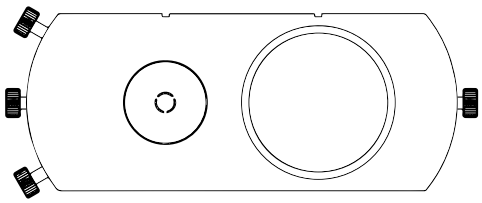
Scyliorhinus sp. gill arc: *Phase contrast: source: Bresser GmbH*

5.2.2. Components for phase contrast observation

Not included in the scope of delivery but available separately:

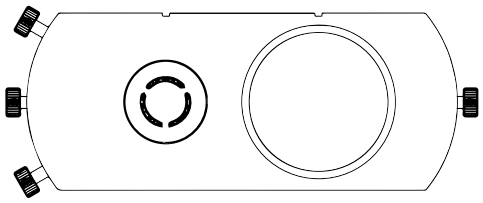
- **4 plan phase contrast objectives: 10x, 20x, 40x, 100x**

- **2 phase contrast slider:**



10/20/40 BF

10/20/40/BF phase contrast slider matches with the 10x/20x/40x phase contrast objectives.

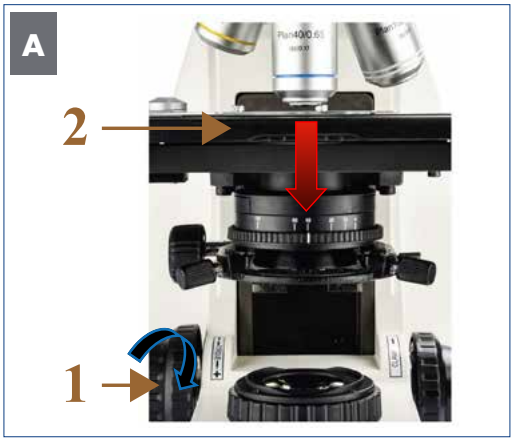


100 BF

100/BF phase contrast slider matches with the 100x phase contrast objective.

- **Centering Telescope (CT): serves for better centering**

5.2.3. Settings for phase contrast observation



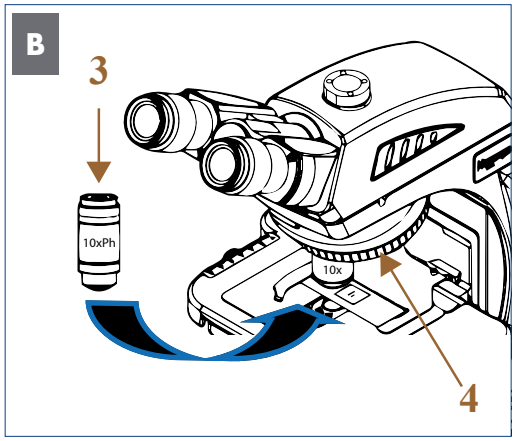


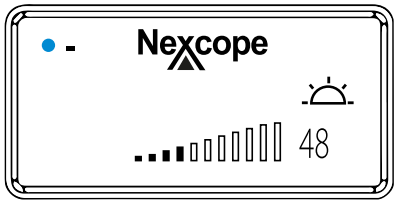
Illustration 028 A/B: Settings for phase contrast: Inserting the appropriate objectives.

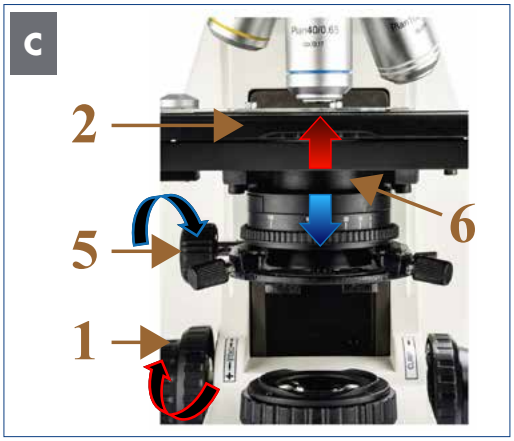
All settings, including adjustment of the lighting according to Koehler, were made in bright field.

Turn the coarse focusing knob (1) to lower the cross stage (2) completely.

Now replace the objectives with the phase contrast objectives (3) on the nosepiece (4).

Place the 20x objective in the free space on the nosepiece that is not assigned to any objective.





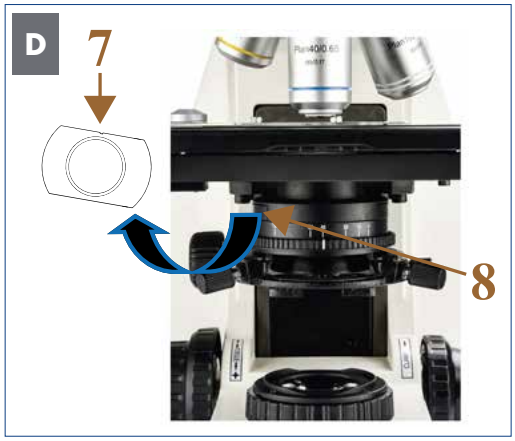


Illustration 029 C/D: Settings for phase contrast: Removing the placeholder on condenser.

Turn the coarse focusing knob (1) to raise the cross stage (2) to its upper limit. Then turn condenser up-down knob (5) to lower the condenser (6).

Slide the placeholder (7) out of the corresponding holder (8) on the left-hand side of the condenser.

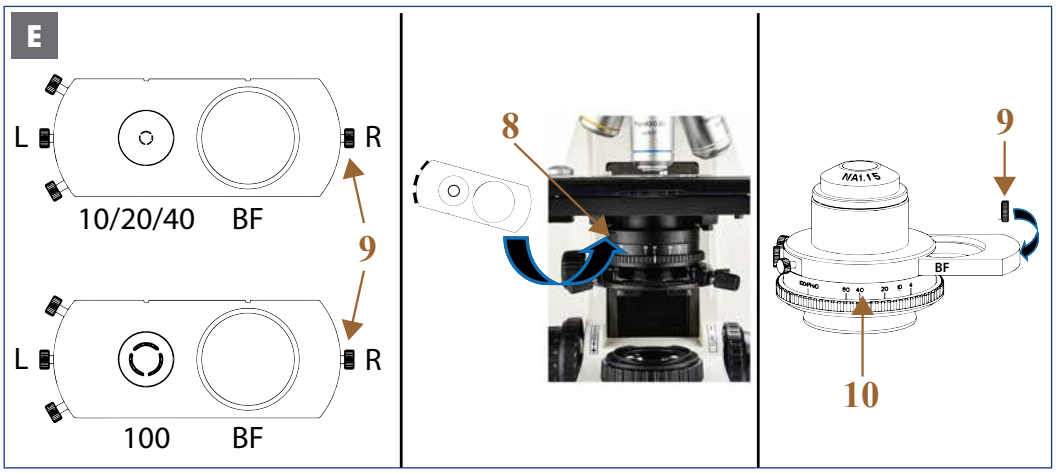


Illustration 030 E: Settings for phase contrast: Mounting corresponding phase contrast slider.

With both sliders, phase contrast and bright field (BF) observation is possible.

- 10/20/40/BF phase contrast slider matches with the 10x/20x/40x phase contrast objectives.
- 100/BF phase contrast slider matches with the 100x phase contrast objective.

Loosen the right-hand screw (9) of the phase contrast slider.

Insert the phase contrast slider into the corresponding hole of condenser (8).
Attach the right screw (9) of the slider and screw it tight.
Then carefully raise the condenser holder to its highest position (see picture C reverse process).

The condenser lens should not touch the slide.

By pulling or pushing the right (R) or left screw (L), you can quickly and easily switch between phase contrast and bright field (BF) observation.
Turn the aperture diaphragm ring (10) of the condenser to maximum position 100/PH/D.

Make sure that the phase contrast slider is always fully aligned in the light path.

The screws on the left and right side hold the phase contrast slider in position.

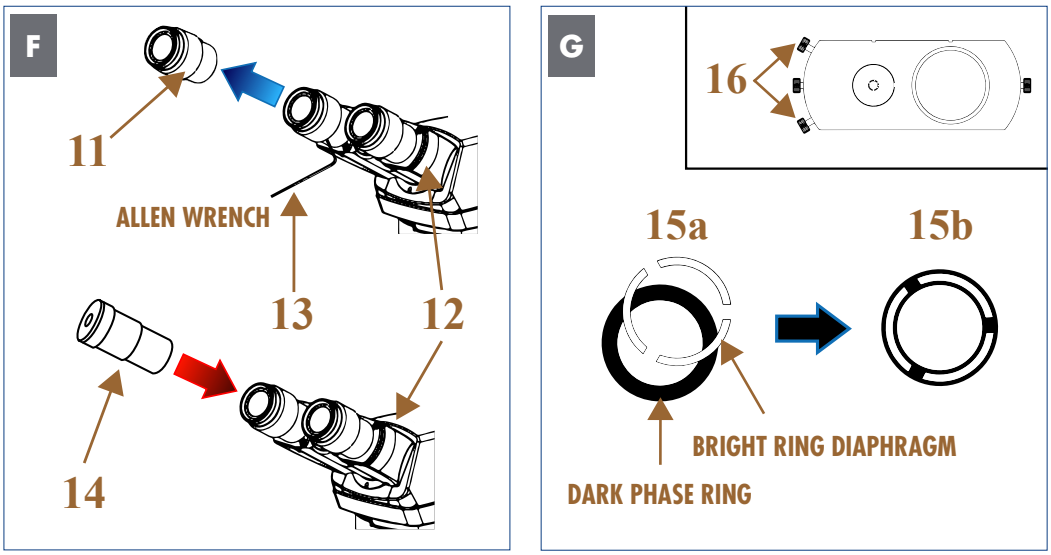


Illustration 031 F/G: Settings for phase contrast: Centering the phase rings.

Centering of the phase rings

The phase rings have been centered by the manufacturer. It is recommended to check the centering before the phase contrast observation.

Swivel the 10x phase contrast objective into the beam path.

Set the phase contrast slider to position 10/20/40 and turn the phase ring diaphragm to the corresponding position 10.

Focus the specimen.

Unscrew an eyepiece (11) from the binocular attachment (12) using a suitable Allen key (13).

If available, then insert the centering telescope (CT) (14) into the socket and turn it up until two sharp phase rings become visible.

The CT enlarges the phase rings and makes centering easier. An approximate centering of the phase rings is also possible without CT.

Check the centering and overlap of the bright ring diaphragm (in the condenser) with the dark phase ring (in the objective).

Center the two phase rings if you do not see any overlay (15a). Adjust the centering screws (16) on the phase contrast slider until the bright ring diaphragm and the dark phase ring completely overlap (15b).

Perfect phase contrast can only be achieved when the bright ring diaphragm and the dark phase ring exactly covers the beam path.

Then switch to the next objective, check the phase rings for all objectives and adjust if necessary.

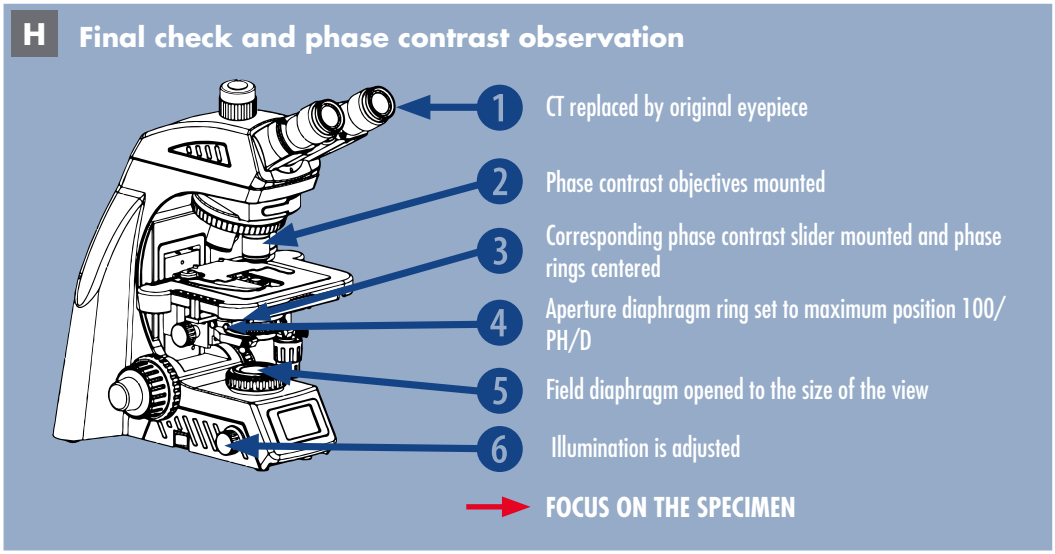
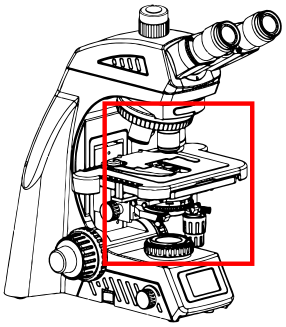


Illustration 032 H: Settings for phase contrast: Final check and observation.

After removing or replacing a thick specimen, the bright ring and the dark ring are likely to deviate each other, which will result in a decline of the image contrast. So if happened, please repeat the steps as above.

If the specimen is not flat, it maybe need to repeat the centering steps for obtaining greater effect. Use the phase contrast objective to center the diaphragm, according to the sequence of low to high magnification.

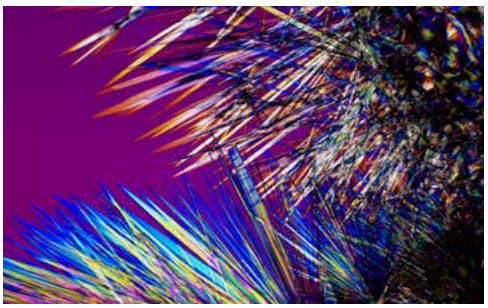


5.3. Polarization observation

5.3.1. Overview

By **polarization microscopy**, optically active or birefringent specimen structures can be highlighted. For this purpose, the object to be examined is microscoped between two polarizing filters. This leads to the formation of different color rings or to the illumination of the structures.

Minerals, but also many plastics or natural materials such as starch etc. show this effect. It is less known that interesting structures can also be highlighted in living organisms, e.g. muscle fibers of daphnia or rotifers. In industry, polarization is mainly used to characterize materials. If the layer thickness of the sample is known, the resulting interference colors can also be used to determine the type of material. In materials research, polarization is also used, for example, to investigate tension in the material by stress birefringence. Especially injection moulded parts or plastic foils or fibres can be examined for manufacturing defects. The classical application is of course geology / mineralogy, in which thin sections of rock are examined in polarized light. Due to the spectral distribution, halogen illumination is more suitable than LED in polarization microscopy.



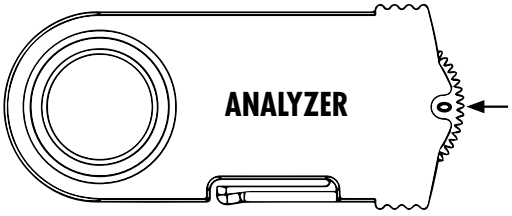
Simvastatin crystals: *source: Bresser GmbH*

5.3.2. Components for polarization observation

Included in scope of delivery:

- **Infinity-corrected plan objectives (4x, 10x, 40x, 100x)**

Not included in the scope of delivery but available separately:



With the help of the analyzer ring you can turn the analyzer from 0° to 90°.

In orthogonal polarization observation, it is necessary to turn the analyzer to make the vibration directions of the polarizer and the analyzer perpendicular to each other and the field of view is darkest.

5.3.3. Settings for polarization observation

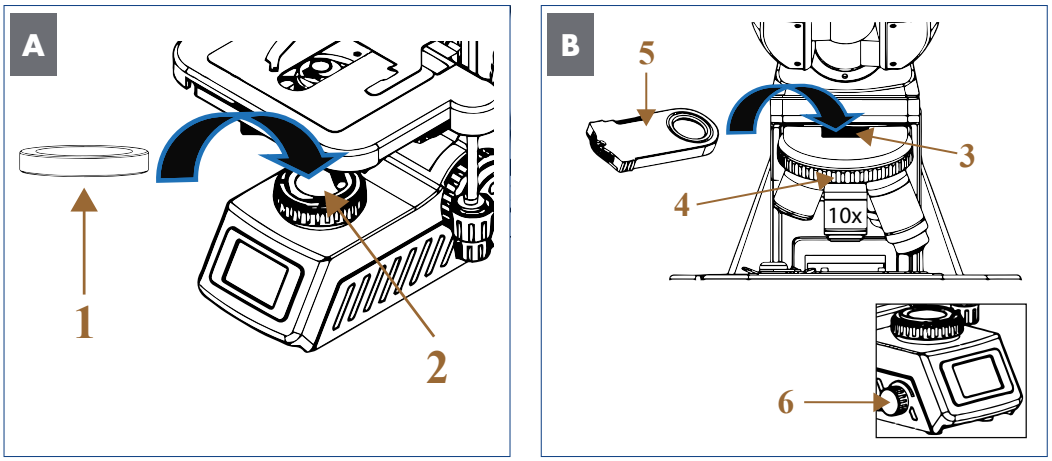


Illustration 033: A/B: Setting for polarization: Assembly of the polarizer and analyzer.

All settings, including adjustment of the lighting according to Koehler, were made in bright field.

Place the polarizer (1) on the field diaphragm (2).

Remove the rubber placeholder (3) on the objective nosepiece (4) and insert the analyzer (5) in the slot.

The analyzer must engage securely.

Turn the 10x objective into working position. Increase the illumination intensity slightly (6). You will notice while looking into the microscope with the polarizer and analyzer in place and no specimen, that the field will look dark.
Place the specimen on the stage and focus it Adjust the field diaphragm until the image is at least as large as the field of view.
Contrast can be increased by reducing the aperture diaphragm.

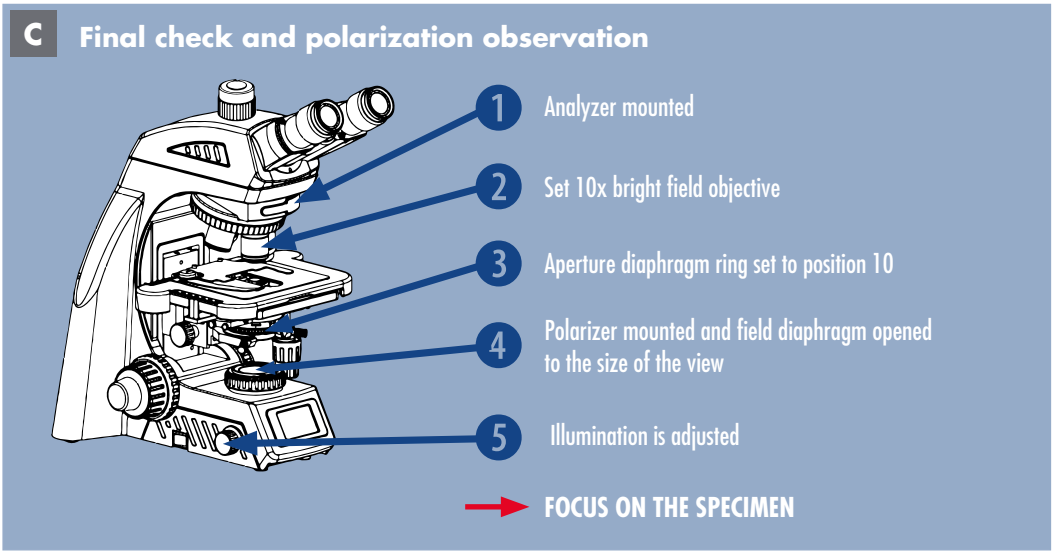
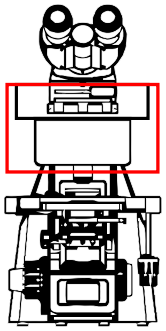


Illustration 034 C: Settings for polarization observation: Final check and observation.

Birefringent structures should now light up brightly on the dark background. The contrast can be increased by setting the aperture diaphragm ring below 10.

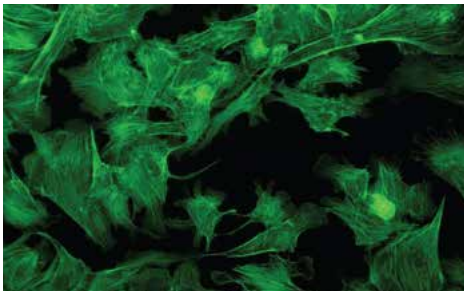
Birefringent structures light up after every 90°rotation and appear dark in between. Meanwhile non-birefringent structures remain dark in every position.

5.4. Fluorescent observation



5.4.1. Overview

In fluorescence microscopy, the sample is illuminated with light of a short wavelength from above. Certain fluorophores that are either present in the sample itself (autofluorescence), or fluorophores that are introduced by staining or recombinant techniques, emit fluorescent light, which can be observed visually or with a camera. As the energy level of the emitted light (fluorescence) is lower, the wavelength is shifted to longer values. Depending on the type of the fluorophore, UV light can excite fluorescence throughout the visible spectrum (violet, blue, green, yellow, red). Other excitation wavelengths can only produce fluorescence in the part of the spectrum with longer wavelengths. So excitation with blue can only produce green, yellow and red; green excitation can only produce yellow and red fluorescence, respectively. Excitation wavelength and filter settings must be chosen according to the fluorophores present in the sample. As the physical background is different than for optical microscopy, fluorescence microscopy can show details that are smaller than the optical resolution limit. Fluorescence in general produces bright signals against a dark background.



Source: Nexcope

Structures are imaged larger than they are in reality by fluorescence microscopy, so it is difficult to determine their size.

5.4.2. Safety instructions BEFORE USE

- **The LED-fluorescent attachment is a precise instrument. Open the box carefully, and avoid dropping the accessories to ground and causing damage to them.**
- **Protect the instrument from direct sunlight, high temperature, humidity, dust and strong vibration.**
- **Always use the supplied power cord and make sure that the main switch is set off before plugging the power cord into the power outlet.**
- **Make sure that all cables are firmly connected before use.**
- **If you want to switch quickly to bright field observation, turn the filter module to position 2.**
- **Use slides, cover glasses and oil immersion without self-fluorescence.**

- **The fluorescence attenuation of the sample:**

However, the fluorescence attenuation will occur when the high power objective lens is used for a long time, resulting in the decrease of fluorescence image contrast. Therefore, if you do not need the microscope, switch off the power at the fluorescent attachment and the microscope. By narrowing the aperture iris diaphragm , the intensity of the excited light is reduced. Commercially available anti-fluorescence quenchers, (such as DAB) can also delay the fluorescence attenuation of the sample. It is particularly recommended that you use an anti-fluorescence quenching agent if you use a high power objective frequently.

Please note that anti-fluorescence quenchers are not available for some samples.

5.4.3. Components for fluorescent observation

Components for fluorescent observation are not included in scope of delivery but available separately:

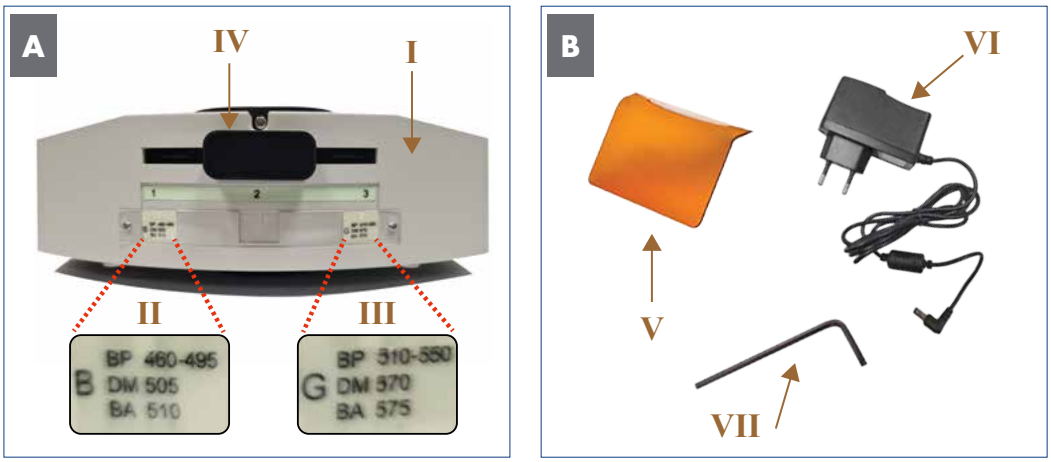


Illustration 034: A/B: Components of the LED fluorescent attachment.

The LED fluorescent attachment (I) uses 3W LED as illuminant and consist of two fluorescent modules (fluorescence filter cubes, each with a built-in dichroic mirror):

- **Position 1:** B band fluorescent module: **FL-B** (blue excitation: 460-495 nm) (II)
- **Position 3:** G band fluorescent module: **FL-G** (green excitation: 510-550 nm) (III)

The two modules can be adjusted via the slider (IV).

Position 2: Control module in bright field mode. This allows a quick change to transmitted light microscopy possible to compare the object in bright field.

As an accessory to the LED fluorescent attachment you will find an orange radiation shield (V), an adapter (VI) and a small Allen key for the assembly (VII).

5.4.4. Installation of the LED fluorescent attachment

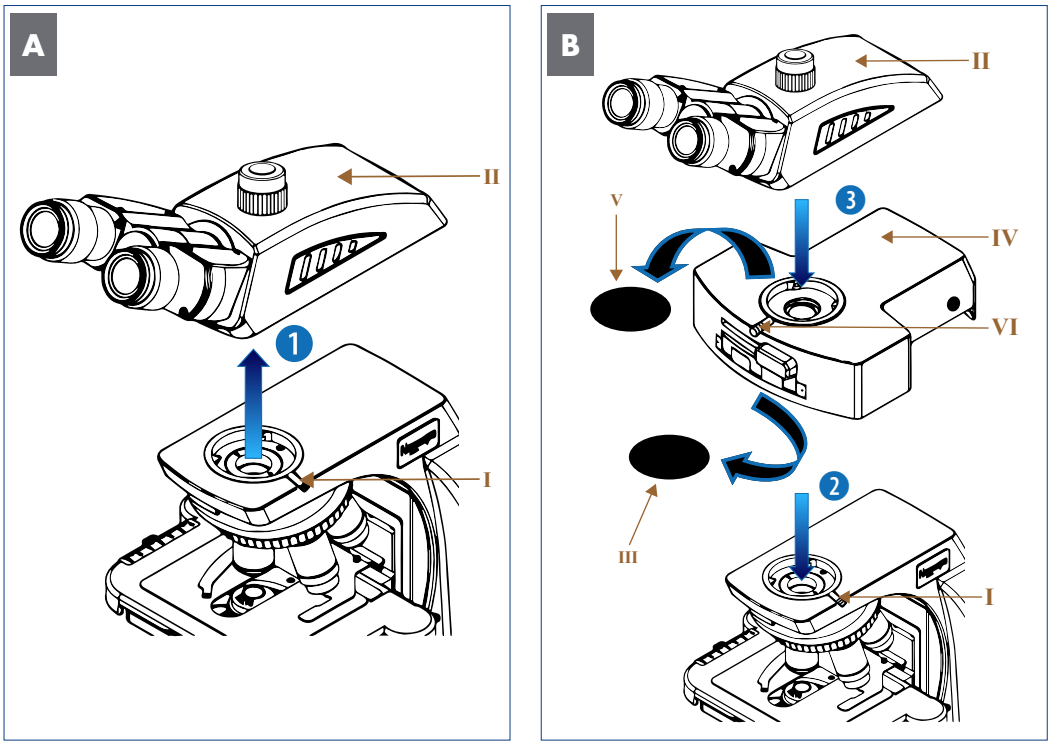


Illustration 035: A/B: Installation of the LED fluorescent attachment.

Step by step...

1 Loosen the viewing head holding screw (I) for the trinocular viewing head and carefully lift the microscope head (II) off the microscope body.

2 Remove the black protective cap (III) from the bottom of the LED fluorescent attachment (IV) and place the attachment correctly on the microscope body. Tighten the viewing head holding screw (I).

3 Unscrew the upper black protective cap (V) with the Allen key provided. Carefully place the trinocular viewing head (II) on the LED fluorescent attachment (IV) and tighten the attachment holding screw (VI) until the attachment is firmly installed.

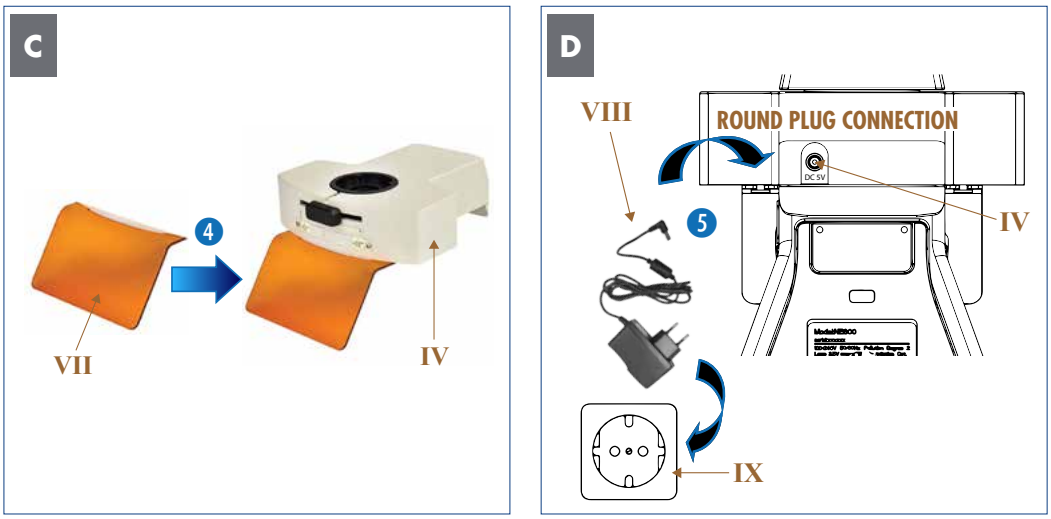


Illustration 036: C/D: Installation of the LED fluorescent attachment.

4 Slide the orange protective shield (VII) into the two fixtures at the bottom of the LED fluorescent attachment (IV).

Before each fluorescent observation, check that the orange radiation shield is properly attached to the LED fluorescent attachment to protect your eyes from stray light.

The protective shield is only pushed into the device. It can easily come out of the anchorage.

5 Connect the adapter (VIII) to the round plug connection of the LED fluorescent attachment (IV). Insert the main power plug of the adapter into the power socket (IX).

5.4.5. Settings for reflected light fluorescent observation

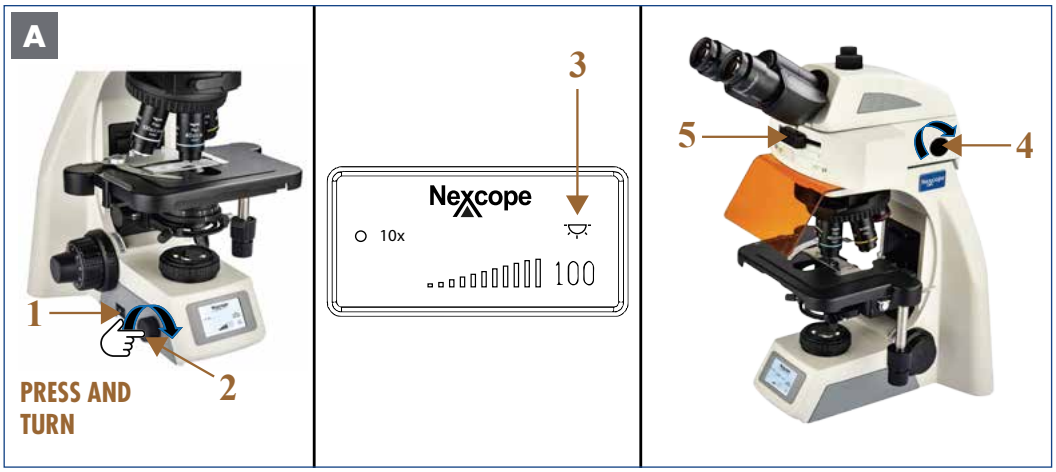


Illustration 037: A: Settings for reflected light fluorescent microscopy.

Move On/Off switch (1) to position I to turn on the microscope.

BEFORE YOU START fluorescence observation, it is recommended to set the microscope in bright field mode. This includes sample placement, adjustment of the interpupillary distance, pre-focussing, diopter compensation and setting the illumination according to Koehler.

Focus the specimen with 10x objective in bright field.

PUSH and TURN the brightness control knob (2) in the direction of the arrow to switch off the transmitted light (3).

Turn the ON/OFF knob of the LED fluorescent attachment (4) in the direction of the arrow to start the device and control the lighting.

Set the desired fluorescent module using the slider (5).

The following lighting control elements play a key role in fluorescent microscopy:
- field diaphragm, aperture diaphragm, condenser
  ➔ Optimisation of contrast and light yield

By closing the aperture diaphragm on the condenser, about 90 % of the interfering fluorescent can be eliminated.

At the end of the observation, remove the LED fluorescent attachment so as not to endanger other users.

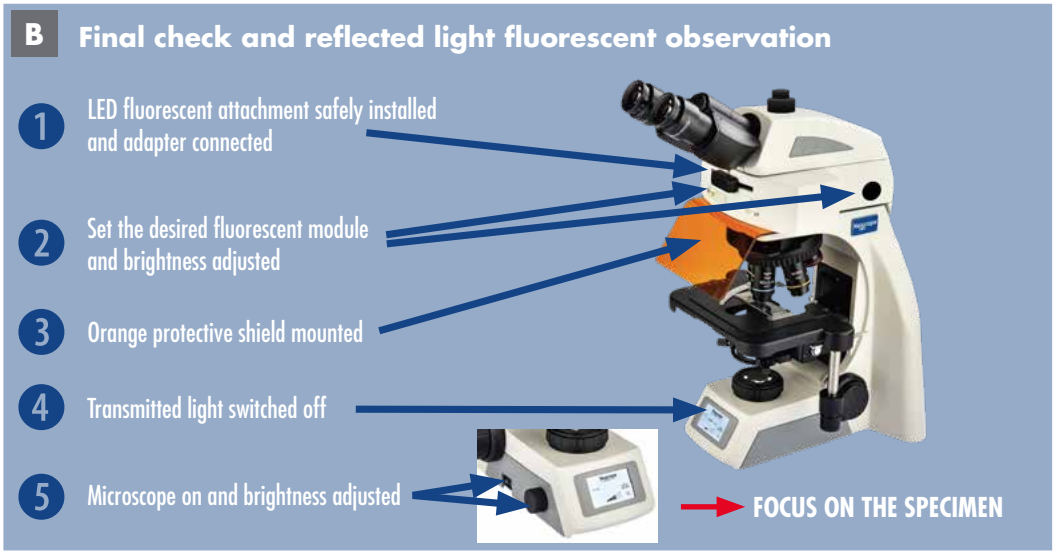


Illustration 038 B: Settings for fluorescent observation: Final check and observation.

6. EQUIPMENT OVERVIEW

6.1. Main specifications

Components Name	Specification		620T
Optical system	Infinite optical system		●
Viewing Head	Seidentopf Binocular Head, 30° Inclined, Interpipillary 47-78mm		○
	Seidentopf Trinocular Head (50:50)		●
	Seidentopf Trinocular Head (0:100/100:0)		○
	Digital Viewing Head		○
	Wireless Digital Viewing Head		○
Eyepiece	Wide Field Eyepiece EW10X/22		●
Nosepiece	Backward Quintuple Nosepiece		–
	Encoded Quintuple Nosepiece		●
Objective	Infinite Plan Achromatic Objective (NIS45) 20×		–
	Infinite Plan Achromatic Objective (NIS45) 4×,10×,40×,100×		–
	Infinite Plan Achromatic Objective (NIS60)	2x	○
		20x	○
	Infinite Plan Achromatic Objective (NIS60) 4×,10×,40×,100 (Oil)×		●
	Plan Phase Contrast Objective 10×,20×,40×,100×		○
Focusing	Coaxial Coarse and Fine Adjustment, Fine Division 0.002 mm, Moving Range 28 mm		●
Condenser	Abbe Condenser (Insert), NA 1.25		●
	Phase Contrast Slider (10/20/40) Phase Contrast Slider (100) Dark Filed Slider		○
Stage	Synchronous Belt Stage: 185×142 mm Moving Range: 78×54 mm		○
	Synchronous Belt Stage: 185×142 mm Moving Range: 78×54 mm Dural Platform		●
Illumination	3W LED		●
Filter	Green		○
APP	Camera Operating System And All Functions of Brightness Adjustment Knob		○
Simple Polarization Set			○
LED fluorescent attachment	2 fluorescent modules + bright field module • B band fluorescent module: FL-B (blue excitation) • G band fluorescent module: FL-G (green excitation) 3W LED		○
Photographic Interface	C Mount	1x	●
		0.5x	○

Note: ● Standard Outfit, ○ Optional, – Not offered

6.2. Objective parameters

Type	Magnification	Numerical Aperture (N.A.)	Working Distance (mm)	Conjugate Distance
Plan Achromatic Objective (NIS45)	4×	0.10	20.6	∞
	10×	0.25	17.9	∞
	20×	0.40	6.4	∞
	40×	0.65	1.5	∞
	100× (Water)	1.1	0.16	∞
Plan Achromatic Objective (NIS60)	2×	0.06	7.5	∞
	4×	0.10	30	∞
	10×	0.25	10.2	∞
	20×	0.40	4.8	∞
	40×	0.65	1.5	∞
	100× (Water)	1.10	0.2	∞
	or 100× (Oil)	1.25	0.2	∞
Plan Phase Contrast Objective	10×	0.25	10.2	∞
	20×	0.40	4.8	∞
	40×	0.65	1.5	∞
	100× (Oil)	1.25	0.2	∞

7. TROUBLE SHOOTING GUIDE

Under certain conditions performance of the unit may be adversely affected by factors other than defects. If problems occur, please review the following list and take action as needed. If you cannot solve the problem after checking the entire list, please contact Bresser GmbH for assistance.

7.1. Optical system

PROBLEM	CAUSE	SOLUTION
The edge of the field of view is dark or the brightness is not uniform	The nosepiece is not in the located position (objective and light path not coaxial)	Check that the nosepiece is locked in place
	The phase contrast slider is not located in the proper position	Check that the phase contrast slider is locked in place
	A lens (the objective, condenser, eyepiece or collector) is dirty.	Clean all components thoroughly
Dirt or dust is visible in the field of view	A lens (the objective, condenser, eyepiece or collector) is dirty.	Clean all components thoroughly
	Dirt/dust on the specimen	Clean it thoroughly
	The condenser is too low	Adjust the height of condenser
Visibility is poor Image is not sharp; Contrast is poor; Details are indistinct	Specimen is not covered	Place a cover glass on the object
	The thickness of the cover glass is not suitable	Use standard cover glass with thickness of 0.17 mm
	Specimen is placed reversely	Place the slide on the stage with the cover glass facing up
	Dry objective has oil on it (especially for 40x objective)	Clean it thoroughly
	A lens (the objective, condenser, eyepiece or collector) is dirty.	Clean all components thoroughly
	Water/immersion oil is not used with the 100x objective	Use water/immersion oil for the oil objective
	Bubbles are visible in the water or immersion oil	Remove bubbles in the water/ immersion oil
	Immersion oil is unspecified	Use specified oil
	The aperture iris diaphragm is stopped down too far	Adjust the aperture iris diaphragm properly
	Dirt or dust on the eyepiece	Clean it thoroughly
	Diaphragm of the phase contrast slider is not centered	Center the diaphragm of the phase contrast slider
	The objective used is not fit to the phase contrast observation	Use the appropriate objective
	The diaphragm of phase contrast slider is not coincident with the objective phase ring	Adjust the diaphragm to match the objective phase ring
	The condenser is too low	Adjust the height of the condenser

PROBLEM	CAUSE	SOLUTION
One side of image is blurred	Condenser is not properly centered or inclined	Reinstall the condenser and center the condenser with the centering screws
	The nosepiece is not properly engaged	Engage the nosepiece properly
	The specimen is not clamped	Fix the sample with the specimen clamp
The image shift during focusing	The object moves on the stage	Fix the sample on the stage with the specimen clamp
	The nosepiece is not properly engaged	Turn the nosepiece until it audibly “clicks” into place
The brightness is not enough	The lighting is set too low	Set the appropriate brightness using the brightness control knob
	The condenser is too low	Adjust the height of condenser
	Condenser is not properly centered	Center the condenser

7.2. Mechanical system

PROBLEM	CAUSE	SOLUTION
The image cannot focus when using high magnification objective	The specimen is placed inversely The coverslip is too thick	Rotate the object with the cover glass facing up Use the standard cover glass with a thickness of 0.17 mm
The objective touches the specimen when changed from low magnification to high magnification	The specimen is placed inversely The cover glass is too thick	Rotate the object with the cover glass facing up Use the standard cover glass with a thickness of 0.17 mm
The specimen can not be moved freely	The specimen holder is not fixed	Fix it
Field of view of one eye does not match that of the other	The interpupillar distance is not correct	Adjust again
The eyes get tired quickly	No diopter adjustment The brightness is not suitable	Adjust the diopter correctly Adjust the voltage of lamp
The coarse focus knob is hard to run	The tension adjustment collar is too tight	Loose the tension adjustment
Defocus during observation	The tension adjustment collar is too loose	Tighten the tension adjustment

7.3. Electrical system

PROBLEM	CAUSE	SOLUTION
The lamp cannot light when the switch is turned on	No power supply	Check the connection of the power cord
	The connector of LED lamp is not properly inserted into the circuit board	Insert it correctly
	The LED lamp is broken	Replace the lamp
The lamp burns out suddenly	Use an unspecified lamp The voltage is too high	Use the specified lamp to replace, if the problem is not solved, contact your customer service
The brightness is not enough	Using an unspecified lamp The voltage is too low	Increase the voltage in the specified range
The LED lamp flickers or the brightness varies	The lamp is going to burn out	Replace it
	The connector of LED lamp is not properly inserted into the circuit board	Check and insert it firmly

8. WARRANTY

The regular warranty period is 2 years and starts on the day of purchase. For full warranty terms and services, please visit **www.bresser.de/warranty_terms**.

9. NOTES/COMMENTS

9. NOTES/COMMENTS

Nexcope®
Scientific research microscope

Exclusive distribution for Germany and BeNeLux:

BRESSER®

BRESSER GmbH
Nexcope Service
Gutenbergstr. 2
DE-46414 Rhede
Germany

www.bresser.de
service.nexcope@bresser.de

Manual_NE-620T_en_NEXCOPE_v052022a