Achios-X inverso

metallurgical



euromex microscopes holland

user manual

v.631431

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1. Introduction

Thank you for purchasing the Euromex Achios-X Inverso. The Euromex Achios-X Inverso microscopes are developed for use in the life science sector. Specific attention to production methods resulted also in an excellent price/performance ratio. Please read this manual carefully before using this product to ensure correct and safe usage

- The content of this manual is subject to change without notice
- The appearance of the actual product can differ from the models described in this manual
- Not all equipment mentioned in this manual has to be part of the set you have purchased
- All optics are anti-fungus treated and anti-reflection coated for maximum light throughput

2. General safety instructions

Intended use: a non-medical device

This device is intended for general observation of cells and tissues, with transmitted/reflected illumination and with the specimen fixed on a slide

2.1 Suffocation hazard

The packaging can contain protective plastic bags without perforations, as well as dust protection bags that could be pulled over the head of a child. To avoid danger of suffocation:

- Keep the bags away from babies and children
- Tie a knot in plastic bags before throwing them out
- Plastic bags should be stored out of reach of children
- The installation and use of this product must always be supervised by a qualified adult

2.1 Dangers associated with the operation

- Improper use could result in injury, malfunction or damage to property. It must be ensured that the operator informs every user of existing hazards
- Danger of electrocution. Disconnect the power to the entire lighting system before installing, adding or changing any component
- Not to be used in corrosive or explosive environments
- Avoid direct exposure of eyes to the collimated light beam or direct light from the light guides or fibres
- To avoid a hazard to children, account for all parts and keep all packing materials in a safe place

2.2 Photobiological safety LED, important safety instructions

- Avoid direct eye exposure to any LED light source while switched on
- Before looking through the eyepieces of the device, lower the intensity of the LED illumination
- Avoid long and high-intensity exposure to LED light because this may cause acute damage to the retina of the eye

2.3 Prevention of biological and infectious hazards

Infectious, bacterial or viral biohazard substances under observation may be a risk to the health of humans and other living organisms. Special precautions should be taken during in vitro medical procedures:

- **Biological hazards**: keep a logbook of all the biological substances or pathogenic microorganisms that were under observation with the device and show it to everybody before they use the device or before they do some maintenance work on the device! Agents can be bacterial, spores, enveloped or non-enveloped virus particles, fungi or protozoa
- **Contamination hazard:**
  - A sample that is properly enclosed with a cover glass never comes in direct contact with the device parts. In that case prevention of contamination lies in the handling of the slides; as long as the slides are decontaminated before use and are undamaged and treated normally, there is virtually zero risk of contamination
  - A sample that is mounted on a slide without cover glass, can come in contact with components of the device and may be a hazard to humans and/or the environment. Therefore, check the device and accessories on possible contaminations. Clean the device's surfaces and its components as thoroughly as possible. Should you identify a possible contamination, inform the local responsible person in your organisation

- Operators could be contaminated from other activities and cross-contaminate components of the device. Therefore, check the device and accessories on possible contaminations. Clean the device's surfaces and its components as thoroughly as possible. Should you identify a possible contamination, inform the local responsible person in your organisation. it is recommended to wear sterile gloves when preparing the slides and handling the device in order to reduce contamination by the operator

- **Infection hazard:** direct contact with the focusing knobs, stage adjustments, stage and eyepieces/tubes of the device can be a potential source of bacterial and/or viral infections. The risk can be limited by using personal eyeshades or eyepieces. You can also use personal protections such as operation gloves and/or safety goggles, which should be changed frequently to minimize the risk
- **Disinfectant hazards:** before cleaning or disinfecting, check if the room is adequately ventilated. If not, wear respiratory protective gear. Exposure to chemicals and aerosols can harm human eyes, skin and respiratory system. Do not inhale vapours. During disinfection, do not eat, drink or smoke. Used disinfectants must be disposed of according to local or national regulations for health and safety

2.4 Disinfection and decontamination:

- Exterior casing and mechanical surfaces must be wiped with a clean cloth, dampened with a disinfectant
- Soft plastic parts and rubber surfaces can be cleaned by gently wiping a clean cloth, dampened with a disinfectant. Discoloration can occur if alcohol is used
- The front lens of eyepieces and objectives are sensitive to chemicals. We recommend not to use aggressive disinfectants but to use lens paper or a soft fibre-free tissue, damped in cleaning solution. Cotton swabs may also be used. We recommend you use personal eyepieces without eyeshades in order to minimize risk
- Never immerse or dip the eyepiece or objective into a disinfectant liquid! This will damage the component
- Never use abrasive compounds or cleaners that may damage and scratch optical coatings
- Properly clean and disinfect all possible contaminated surfaces of the device or contaminated accessories before storing for future use. Disinfection procedures must be effective and appropriate
- Leave the disinfectant on the surface for the required exposure time, as specified by the manufacturer. If the disinfectant evaporates before the full exposure time, reapply disinfectant on the surface
- For disinfection against bacteria, use a 70% aqueous solution of isopropanol (isopropyl alcohol) and apply for at least 30 seconds. Against viruses, we recommend to refer to specific alcohol or non-alcohol based disinfection products for laboratories

Before returning a device for repair or maintenance through a Euromex dealer, an RMA (return authorization form) together with a decontamination statement must be filled in! This document - available from Euromex for any reseller- must be shipped together with the device at all times

Handle with care

- This product is a high quality optical instrument. Delicate handling is required
- Avoid subjecting it to sudden shocks and impacts
- Impacts, even small ones, can affect the precision of the instrument

Handling the LED

Note: Always disconnect the power cord from your device before handling the LED bulb and power unit and allow the system to cool down approximately 35 minutes to avoid burns

- Never touch the LED with your bare hands
- Dirt or fingerprints will reduce the life span and can result in uneven illumination, lowering the optical performance
- Use only original Euromex replacement LEDs
- The use of other products may cause malfunctions and will void warranty
- During use of the device, the power unit will get hot; never touch it while in operation and allow the system to cool down approximately 35 minutes to avoid burns

Dirt on the lenses

- Dirt on or inside the optical components, such as eyepieces, lenses, etc., affects the image quality of your system negatively
- Always try to prevent your device from getting dirty by using the dust cover, prevent leaving fingerprints on the lenses and clean the outer surface of the lens regularly
- Cleaning optical components is a delicate matter. Please, read the cleaning instructions further on in this manual

2.5 Environment, storage and use

- This product is a precision instrument and it should be used in a proper environment for optimal use
- Install your product indoors on a stable, vibration free and level surface in order to prevent this instrument to fall thereby harming the operator
- Do not place the product in direct sunlight
- The ambient temperature should be between 5 to +40°C and humidity should be within 80% and 50%
- Although the system is anti-mold treated, installing this product in a hot, humid location may still result in the formation of mold or condensation on lenses, impairing performance or causing malfunctions
- Never turn the right and left focus knobs in opposite directions at the same time or turn the coarse focus knob past its farthest point as this will damage this product
- Never use undue force when turning the knobs
- Make sure that the device can dissipate its heat (fire hazard)
- Keep the device away from walls and obstructions for at least approximately 15 cm
- Never turn the device on when the dust cover is in place or when items are placed on the device
- Keep flammable fluids, fabric, etc. well out of the way

Disconnect power

Always disconnect your device from power before doing any maintenance, cleaning, assembling or replacing LEDs to prevent electric shocks

Prevent contact with water and other fluids

Never allow water or other fluids to come in contact with your device, this can cause short circuiting your device, causing malfunction and damage to your system

Moving and assembling

- This device is a relatively heavy system, consider this when moving and installing the system
- Always lift the device by holding the main body and base of the device
- Never lift or move the device by its focusing knobs, stage or head
- When needed, move the device with two persons instead of one

3. Components



3.1 Components

A. Eyepieces
B. Diopter adjustment
C. Eyepiece tubes
D. Ergo head
E. Not used
F. Aperture diaphragm
G. X-Y Stage control handle
H. Field diaphragm
I. Coarse and fine focusing knobs
J. Stage
K. Objectives
L. Nosepiece for 5 objectives
M. Contrast selector wheel
N. Not used
O. Coarse and fine focusing knobs (left side)
P. On/off switch
Q. Dial/switch and brightness adjustment
R. Handle
S. Lamp house
T. Field- and aperture diaphragm adjustment
U. Filterholder
V. Power input
W. Illumination connector
X. Photo port
Y. Light path selector
Z. Display

4. Setup

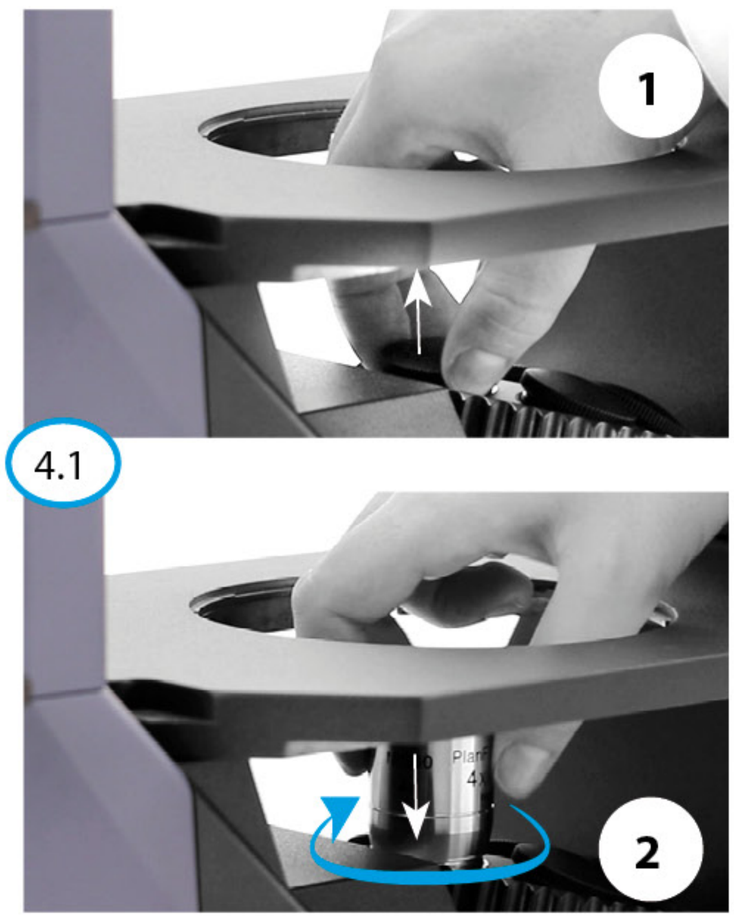
4.1 Mounting the objectives

The objectives are preinstalled, but incase additional objectives need to be installed/removed follow these steps

- Remove object plate from the stage.
- Remove dust cap of the objective hole that is in the light path (1)
- Turn the nosepiece until it clicks in place, remove dust cap and mount the objective Mount all objectives in this way

The display shows which objective has been preinstalled, this can always be changed, in the menu. This menu is also used for adding objectives

- Place the objective (2)



4.2 Attaching the head

- Remove the dust cap (1)
- Make sure the screw is fully retracted (2)
- Remove dustcap of the head (3)
- Slide the head in its place under the lugs (4)
- Fix the head with the Allen key (5)



4.3 Inserting the eyepieces

- Remove the dust caps by unlocking them with a small Allen key (1)
- Slide the eyepieces in (2)
- Lock them when required (3)



4.4 Swapping fine control knobs

The fine control knobs of each side can be exchanged from side to side per user preference. The knobs are magnetically fixed to the coarse control knobs. Use moderate force to disconnect the magnectic knob and swap them out. See illustrations on the next page







5. Operation

5.1 Turning the power on

- Connect the lamp unit to the power unit at the back of the microscope, keep the red dot on top (1)
- Connect the power supply to the power unit (2, 3)
- Turn the main switch on the back of the microscope body to "-" (ON) (4)





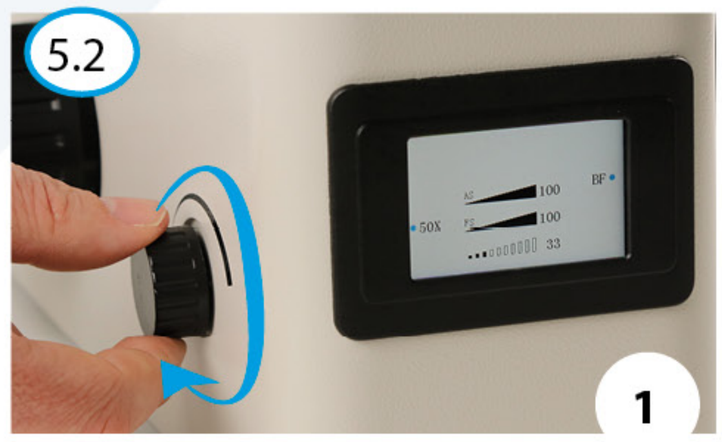


5.1



5.2 Adjusting the illumination brightness

Turn the potentiometer counter clockwise to dim the light, and clockwise to increase it. This potentiometer is also used to operate the Smart Light Control (1)



5.2.1 Selecting the illumination

Turn the contrast selector wheel (M) to switch between brightfield, darkfield, and polarization. An indication mark shows the contrast method in use (2)



5.3 Mechanical stage

5.3.1 Placement of object plates

A variety of object plates are supplied with the microscope. Select the one of preference and simply place them in the hole of the stage. Please note that only on the black round object plate can be fitted with an object clamp.
The object clamp is screwed into the black object plate



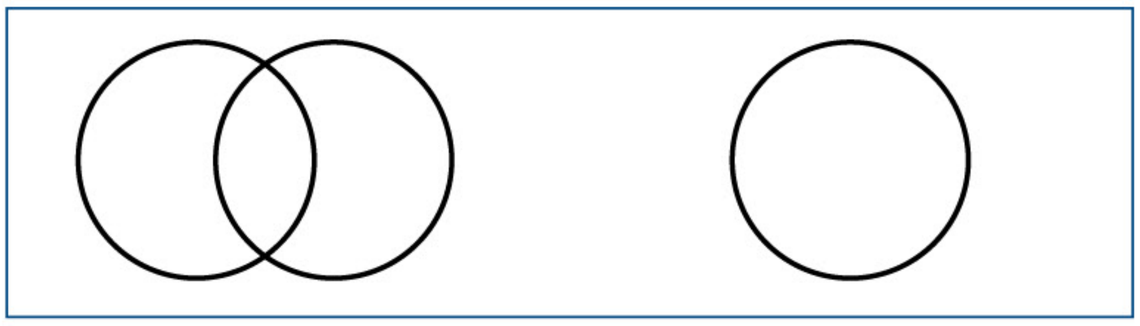
5.3.2 Use of the mechanical stage

The X/Y movemenent of the mechanical stage is controlled by by the control knobs on handle at the right side of the microscope (G). The mechanical stage control knobs can be used to in any direction to prevent fatigue



5.4 Adjusting the interpupillary distance

By rotating the binocular part while looking through the eyepieces, adjust the distance between the eyepieces so that the right and left view fields overlap to a single image from eyepieces



Field of view before adjustment

Field of view after adjustment



5.5 Diopter adjustment of the eyepieces

In order to compensate for human eye differences, distortion, thickness differences in cover glasses and tune for the best parfocality between objectives, one can use the diopter to do so. Take a good prepared slide for your reference:

- Set (both) the diopter adjustments of the eyepieces to “0”
- Select the 10x objective, look for a interesting area on the specimen and focus on this area
- Select the 40x objective and focus on the specimen

⚠ ***Warning:*** don’t change the coarse and fine adjustment anymore

- With your dominant eye open (close your other eye), rotate the diopter adjustment from “+” to “–“ untill the selected area get as sharp as possible
- If during this operation the image becomes unsharp, take your eyes from the eyepieces and turn the diopter adjustment, without looking into the eyepieces, a few divisions back from “-” to “+“ .
- Look into the eyepiece again and turn the diopter adjustment from ‘+’ to ‘-‘ untill the selected area on your specimen gets the optimal sharpness
- Repeat for your non-dominant eye, and with the second diopter

Verification:

- Take your eyes from the eyepieces and look for 2 seconds to a far point in the room in order to “reset” your eyes
- Look again into the eyepieces. If the adjustment is not good, repeat the operation till you reach the same sharpness for the 10x and 40x objective without touching the coarse and micrometric adjustments

5.6 The correct eye point

The eye point is the distance from the eyepiece to the user’s pupil. To obtain the correct eye point, move the eyes towards the eyepieces until a sharp image is reached at a full field of view

5.7 Focus friction control

In the event the nosepiese lowers by itself, or focusing is too heavy the friction needs to be adjusted

- Too light (the nosepiece may lower itself on its own accord) turn the innermost dial counterclockwise
- Too heavy (you may experience difficulty focusing) turn clockwise



Note: Never attempt the following operations, as they might result in product malfunction

- Rotating the left and right focus knobs in opposite directions
- Rotating the coarse and fine focus knobs past their limit

5.8 Adjusting the aperture - and field diaphragm

The diaphragms are motorized for ease of use, the positions are memorized by the system. If centering is needed, please use the following steps

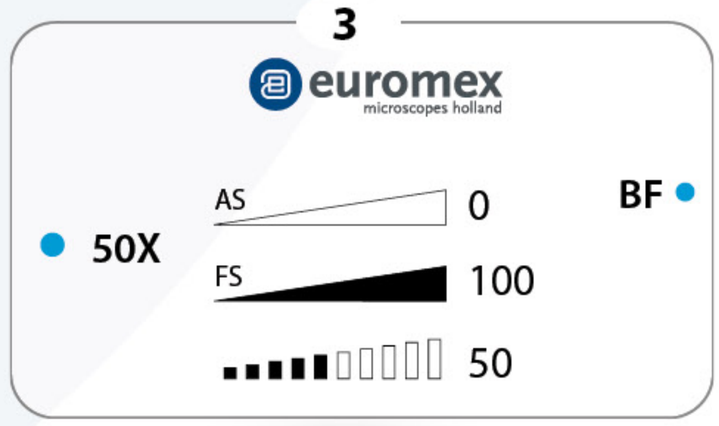
5.8



5.8.1 Aperture diaphragm (AS, 1)

1. Put the 50x objective in the light path
2. Put a sheet of paper on the stage and focus
3. Open the field diaphragm (FS) completely
4. Close the aperture diaphragm (AS) completely (3)
5. Check if the field of view (FoV) is evenly lit
6. If part of the FoV is darker (4), use an Allen key - on the right 2 adjustment holes on the side of the lamp house - to center (5)

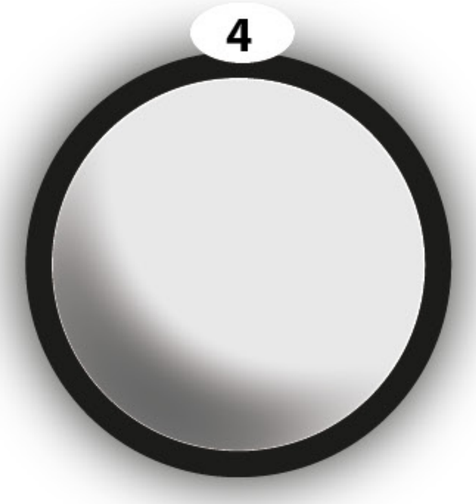
3



5.8.2 Field diaphragm (FS, 2)

1. Put the 10x objective in the light path
2. Put a sheet of paper on the stage and focus
3. Open the aperture diaphragm (AS) completely
4. Close the field diaphragm (FS) completely (6)
5. Focus on the edges of the diaphragm and open the FS until the edges are close to the edge of the field of view (7)
6. If not centered correctly, use an Allen key - on the left 2 adjustment holes on the side of the lamp house - to center (5)

4



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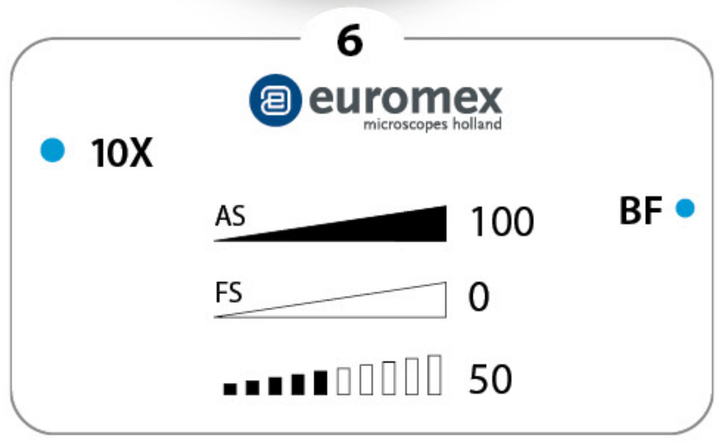

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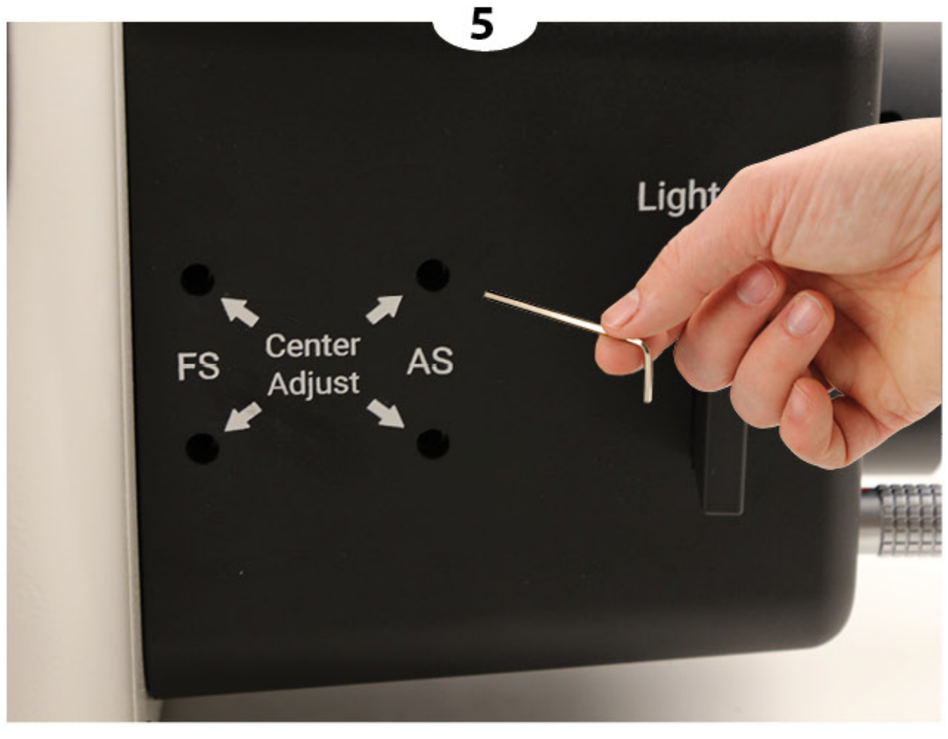

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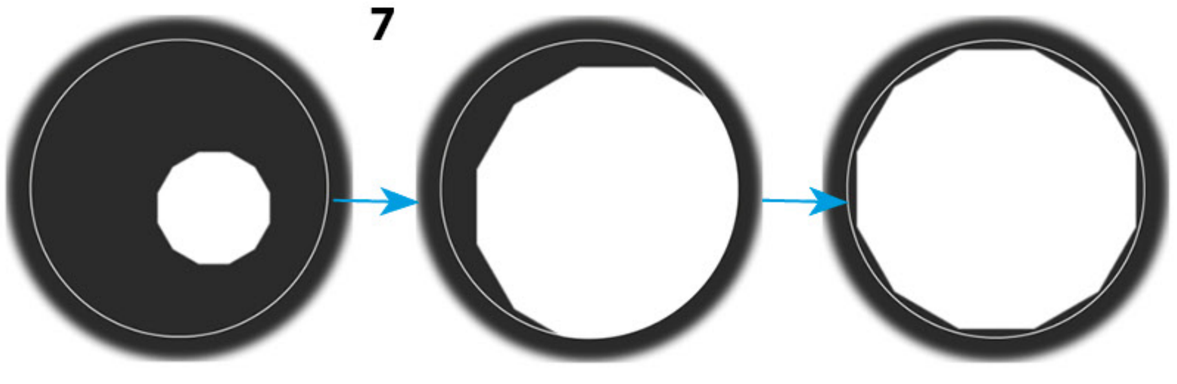
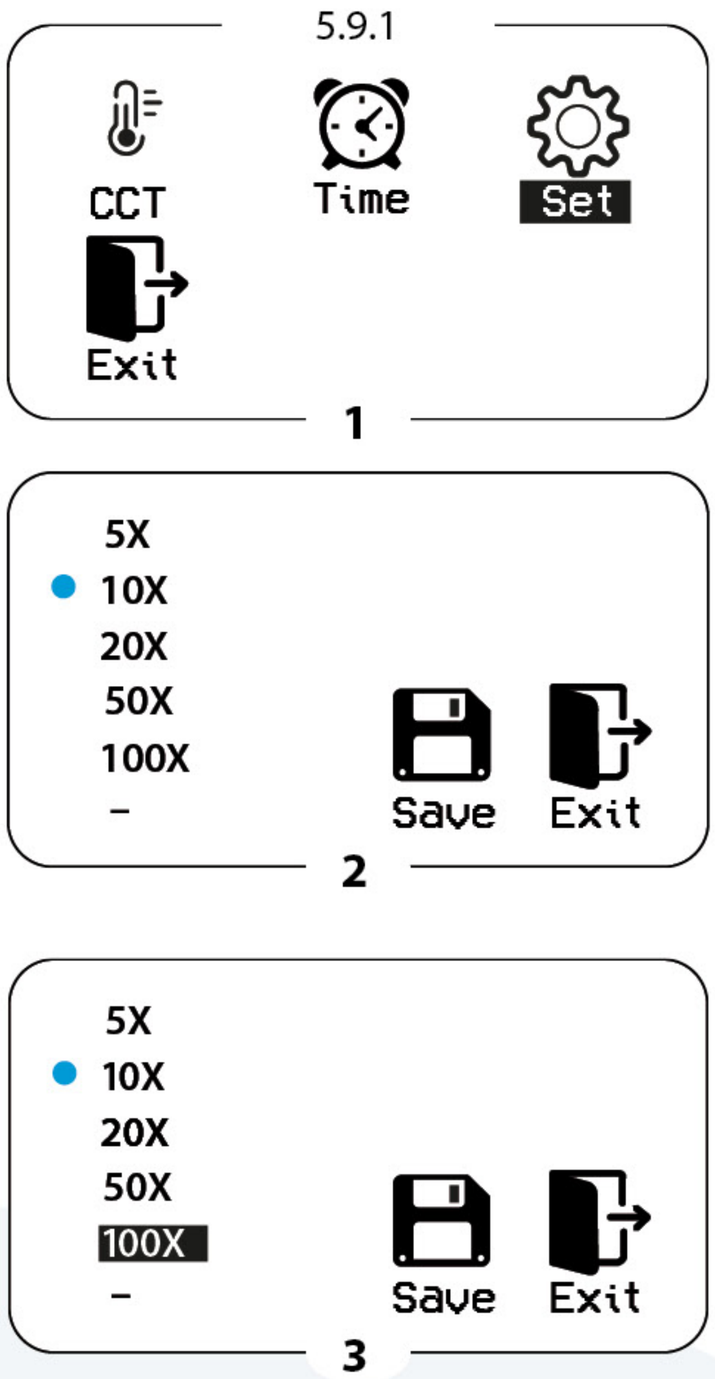


5.9 Operating the LCD display

5.9.1 Adjusting the display

- Changing of the settings is done with the dial/switch on the side of the body, which is either turned, pushed or pushed and held
- Press the dial/switch, until menu is shown (1). Turn it to select "Set" and press again (2)
- Turn dial/switch to select f.i. 100x (3, in case you want to remove it) and press (4)
- Turn the dial/switch to select "-" (5) and press
- Turn the dial/switch to select "Save" (6)
- Turn the dial to select "Exit" and press to exit the menu

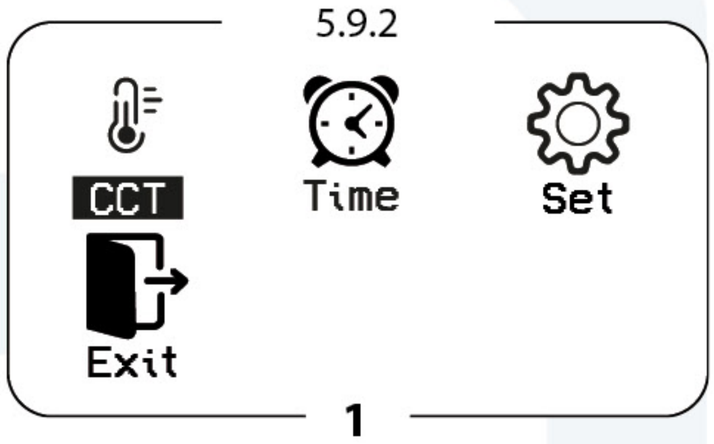


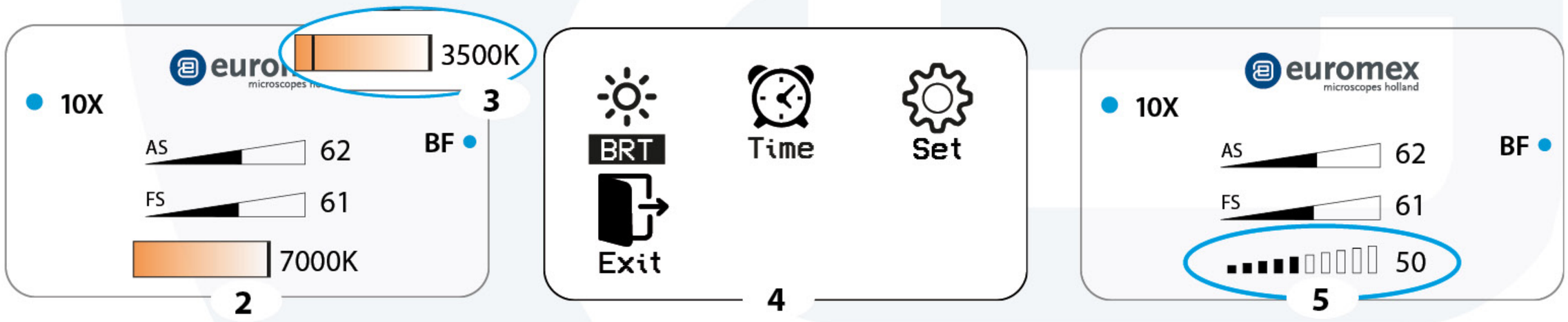




5.9.2 Color temperature/brightness adjustment switch:

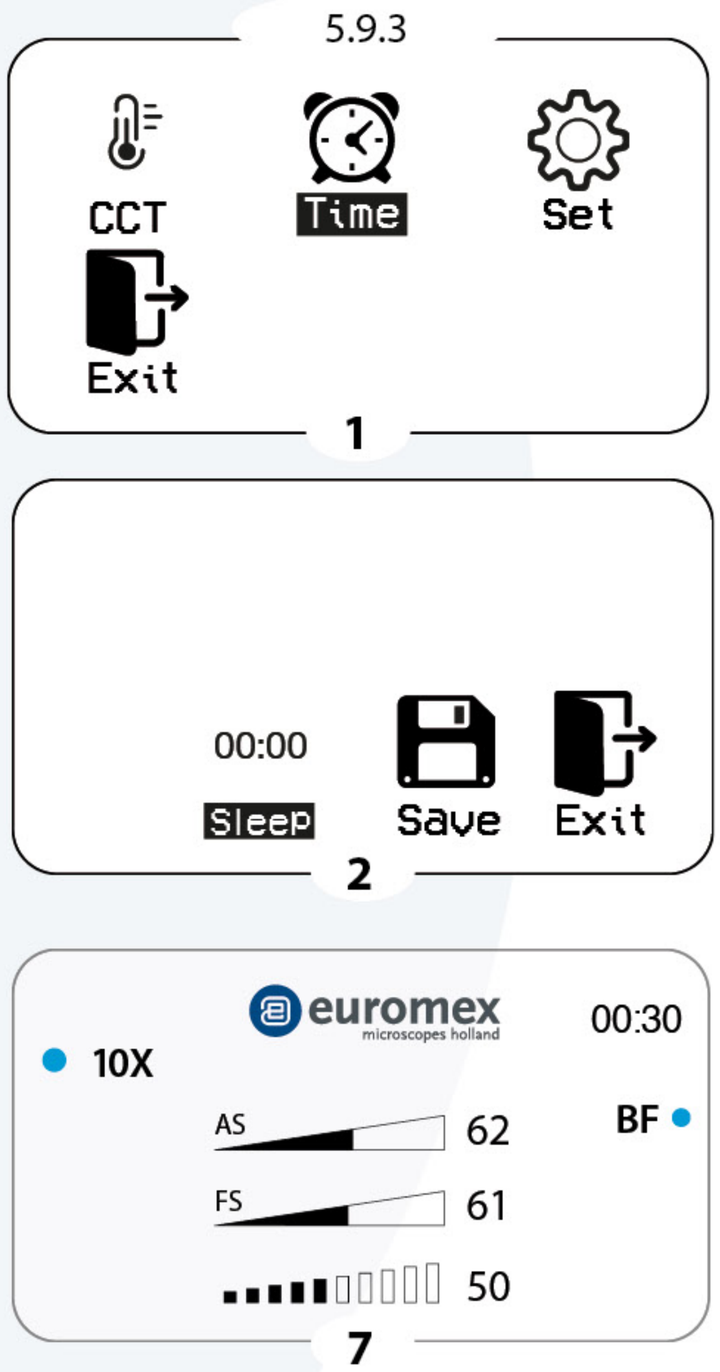
- Select **CCT** using the dial/switch (1), click to enter the color temperature adjustment state (2)
- Turn the dial/switch, the color temperature decreases, and vice versa. (3) The color temperature adjustment ranges from 3000K to 7000K
- To exit the CCT menu, hold the dial/switch. Display shows "BRT" (4)
- Click the dial/switch to enter the brightness adjustment state - the general working state. When turning the dial/switch, the brightness increases, and vice versa (5)





5.9.3 Automatic shut down

- Select "Time" in the menu, click to enter the time setting state (1)
- Click on "sleep" (2), then choose the duration before shutdown (3, 4)
- Click again to go to "sleep", then select "Save" (6), and subsequently "Exit"
- Note the time shown on the display (7)
- Turning the dial/switch can achieve an increase or decrease in time, with a score grid value of 5 minutes. Up to 8 hours can be set. In this example the microscope is set to shut down after 30 minutes



5.9.4 Sleep

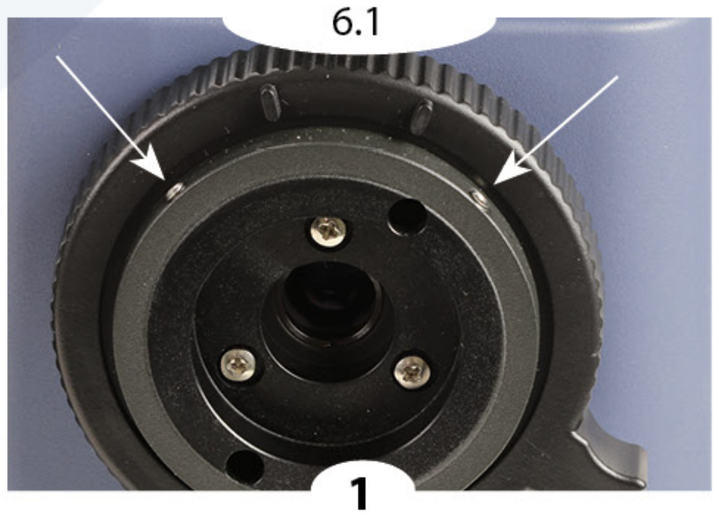
- Press the dial/switch to enter sleep mode immediately
- Press the dial/switch again to exit sleep mode

SLEEP

6. Camera

6.1 Setup

- Make sure the screws fixating the camera are fully retracted (1)
- Attach the camera to the adapter and insert into the camera port (2)
- Fixate camera, using an Allen screwdriver (2)

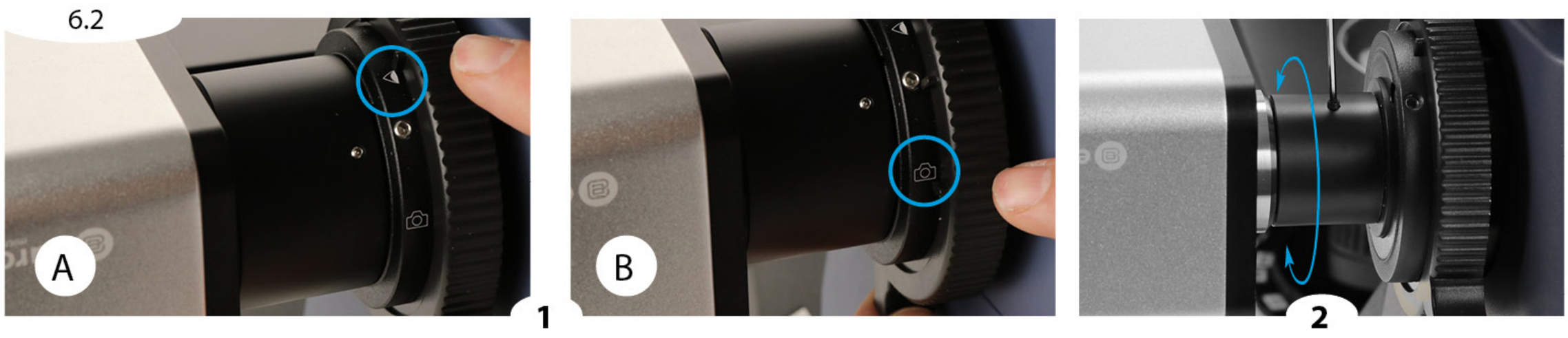


6.2 Parfocality

- Make sure the light is directed to the eyepieces (1A)
- Focus on a sample while looking through the eyepieces
- Loosen the screw on the side of the adapter (2)
- Direct the light to the camera (1B)
- Turn the tube while holding the camera, thus focusing the digital image

Note: The parfocality adjustment may differ when using other adapters





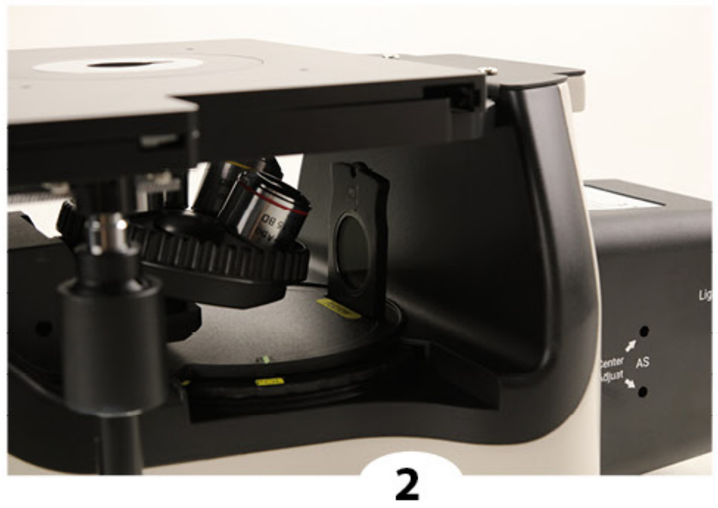
7. Using filters

There are two sorts of filters that can be used

- Polaristation filter (1). This is placed behind the revolving nosepiece. Slide the filter in its slot (2). Push fully down to engage the filter into the light path (3). Pull slightly up to when not in use
- Colour filters. These are placed in the back at the lamp house. Select the color of preference and slide the filter into the “light filter” slot (4, 5)



1



2



3



4



5

Notes

Notes

Notes

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