



## Metallurgical Inverted Microscope

OLM 1

OLM 170



PROFESSIONAL MEASURING

PROFESSIONAL MEASURING

English version

### Operating Instructions Metallurgical Inverted Microscope

Version 1.1  
2025-09  
en  
OLM 170-BA-e-2511.docx

**de**

Weitere Sprachversionen  
finden Sie online unter

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**fr**

Vous trouverez d'autres  
versions de langue online  
sous

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**bg**

Други езикови версии ще  
намерите в сайта

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**el**

Άλλες γλωσσικές αποδόσεις  
θα βρείτε στην ιστοσελίδα

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**hr**

Other language versions are  
available on the page:

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**lv**

You can find other language  
versions on the website

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**pt**

More language versions can  
be found online at

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**sl**

Other language versions are  
available on the website

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**en**

Further language versions  
you will find online under

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**it**

You can find other language  
versions online at

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**cs**

Other language versions can  
be found on the website

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**et**

Other language versions can  
be found on the website

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**hu**

Additional language versions  
can be found on the  
following page:

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**nl**

Additional language versions  
can be found online at

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**ro**

Old language versions can  
be found on the website

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**sv**

Other language versions are  
available here

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**es**

Más versiones de idiomas  
se encuentran online bajo

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**pl**

Other language versions can  
be found at

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**da**

More language versions can  
be found on the website

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**fi**

Other language versions can  
be found at

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**lt**

Other language versions can  
be found on the website

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**no**

Andre språkversjoner finnes  
det på

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)

**sk**

Other language versions can  
be found on the website

[www.kern-  
sohn.com/manuals](http://www.kern-sohn.com/manuals)



**KERN & Sohn GmbH**  
Ziegelei 1  
72336 Balingen-Frommern  
Germany



+0049-[0]7433-9933-0



+0049-[0]7433-9933-149



info@kern-sohn.com



[www.kern-sohn.com](http://www.kern-sohn.com)

**KERN**®  
**OPTICS**

**KERN Optics OLM 1****Metallurgical Inverted Microscope****Operating Instructions Metallurgical Inverted Microscope**

Version 1.1 2025-09 English version

---

## Table of contents:

<b>1</b>	<b>Technical data.....</b>	<b>3</b>
<b>2</b>	<b>Declaration of conformity .....</b>	<b>4</b>
<b>3</b>	<b>Overview of the device.....</b>	<b>5</b>
3.1	Nomenclature .....	5
<b>4</b>	<b>Before use .....</b>	<b>8</b>
4.1	General information .....	8
<b>5</b>	<b>Basic information (general).....</b>	<b>9</b>
5.1	General information on warnings .....	9
5.2	Intended use .....	10
5.3	Improper use .....	10
5.4	Warranty .....	10
<b>6</b>	<b>Basic warnings and safety instructions.....</b>	<b>11</b>
6.1	Observe the notes in the operating instructions .....	11
6.2	Staff training .....	11
6.3	Security .....	11
<b>7</b>	<b>Transportation and storage.....</b>	<b>14</b>
7.1	Note .....	14
7.2	Transportation .....	14
7.3	Storage .....	14
7.4	Packaging/return transportation .....	14
<b>8</b>	<b>Unpacking and commissioning .....</b>	<b>15</b>
8.1	Unpacking.....	15
8.2	Initial commissioning .....	15
<b>9</b>	<b>Assembly.....</b>	<b>16</b>
9.1	Reflected light unit .....	17
9.2	Objectives .....	19
9.3	Eyepieces .....	20
9.4	Specimen stage .....	20
<b>10</b>	<b>Operation.....</b>	<b>21</b>
10.1	First steps .....	21
10.2	(Pre-)focusing .....	22
10.3	Adjusting the interpupillary distance .....	23
10.4	Diopter adjustment .....	23
10.5	Adjusting the magnification .....	24
10.6	Use the eyecups.....	25
10.7	Adjusting the illumination.....	26
<b>11</b>	<b>Changing the bulb .....</b>	<b>27</b>
<b>12</b>	<b>Use optional accessories .....</b>	<b>28</b>
12.1	Camera connection .....	28
<b>13</b>	<b>Troubleshooting .....</b>	<b>29</b>
<b>14</b>	<b>Service .....</b>	<b>32</b>

<b>15</b>	<b>Power supply .....</b>	<b>33</b>
15.1	Mains connection.....	33
<b>16</b>	<b>Maintenance, servicing, and disposal.....</b>	<b>34</b>
16.1	Cleaning .....	34
16.2	Maintenance , and Repair .....	34
16.3	Waste disposal .....	35
<b>17</b>	<b>Further information .....</b>	<b>36</b>

## 1 Technical data

<b>Kern model</b>	<b>OLM 170</b>
<b>Item number/type</b>	TOLM 170-A
<b>Dimensions (WxDxH)</b>	470x240x330 mm
<b>Tube type</b>	Trinocular
<b>Optical system</b>	Infinity
<b>Revolving nosepiece screw-in positions</b>	4
<b>Lens quality</b>	Infinity Plan
<b>Standard objectives</b>	5x 10x 20x 50x
<b>Eyepiece field width</b>	HWF
<b>Illuminance</b>	5W
<b>Illumination type</b>	LED
<b>Lighting equipment</b>	Incident light
<b>Condenser type</b>	Standard
<b>Input voltage Power supply / current [max]</b>	100–240 V 50/60Hz
<b>Input voltage device / current [max]</b>	5V, 1A
<b>Power supply type</b>	Plug-in power supply
<b>Focusing mechanism</b>	Coaxial coarse and fine drive
<b>Packaging dimensions</b>	500x420x300 mm
<b>Net weight</b>	7 kg
<b>Gross weight</b>	9 kg

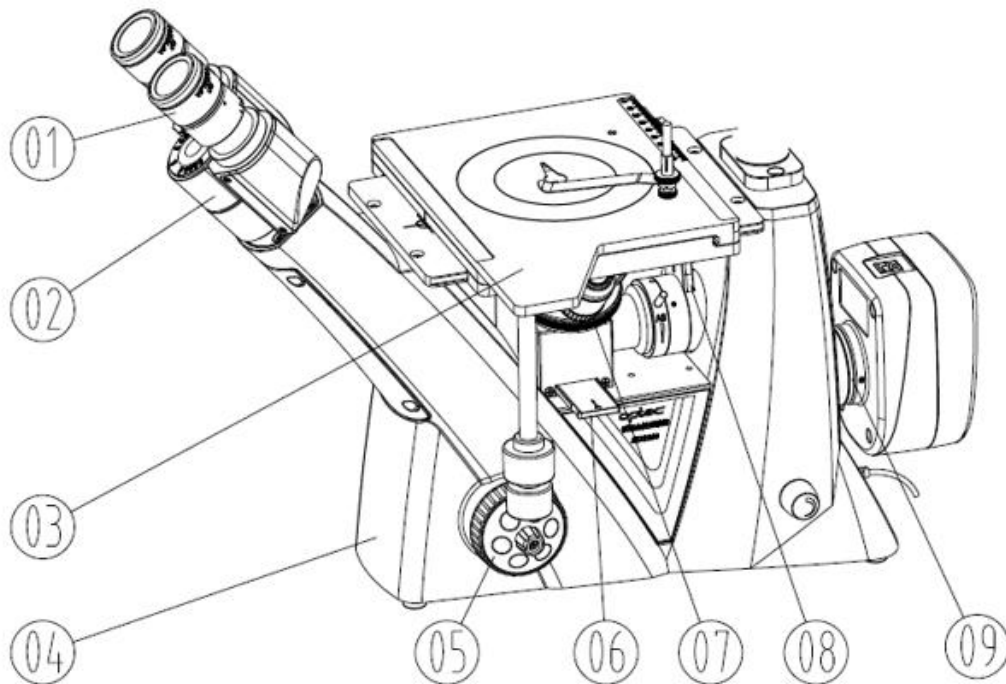
## **2 Declaration of conformity**

The current EC/EU declaration of conformity can be found online at:

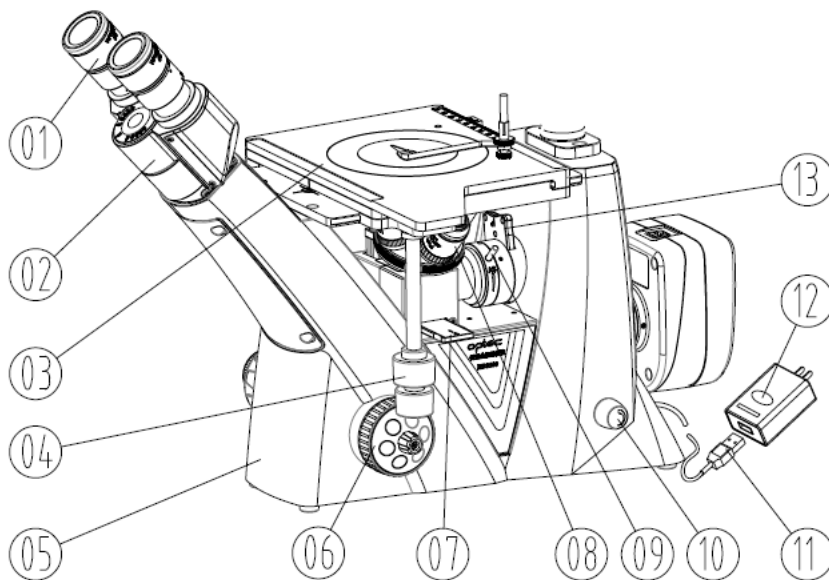
<https://www.kern-sohn.com/shop/de/DOWNLOADS/>

### 3 Overview of the device

#### 3.1 Nomenclature

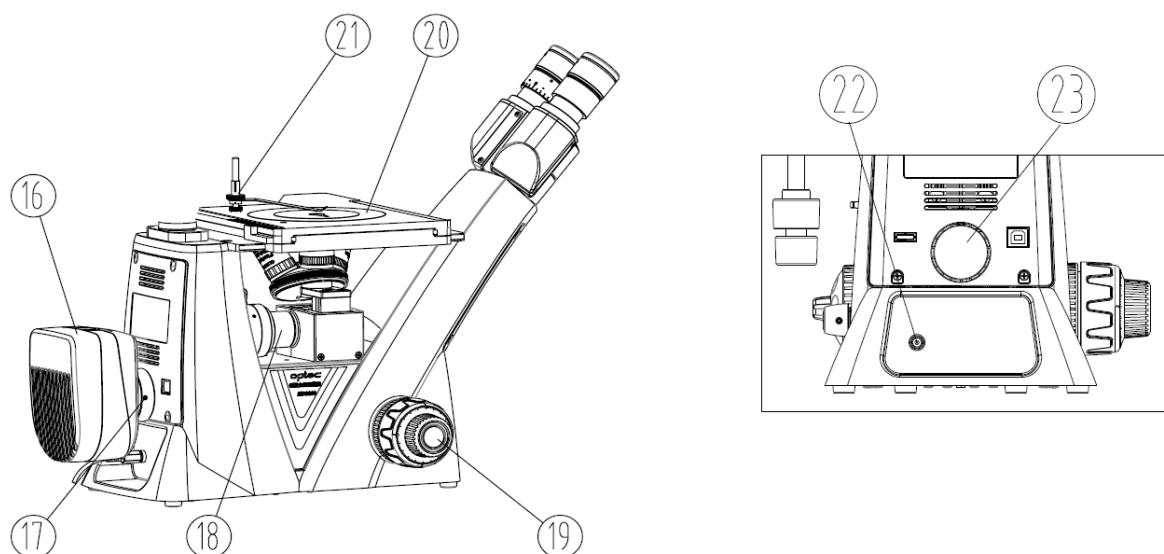


	Description
1	Eyepieces
2	Butterfly Siedentopf tube
3	Mechanical stage
4	Main body
5	Coarse and fine focusing knob
6	Analyzer
7	Nosepiece
8	Polarizer
9	0.5 x C-mount adapter for microscope camera



	Description
1	Eyepiece
2	Butterfly Siedentopf tube
3	Mechanical stage
4	Stage adjusting hand wheel
5	Main body
6	Coarse and fine focusing knob
7	Analyzer
8	Objective
9	Aperture diaphragm lever
10	Dimmer knob
11	USB power line
12	Power supply adapter
13	Polarizer





	Description
16	Microscope camera (optional)
17	Locking screw for camera
18	Illumination unit
19	Coarse and fine focusing knob
20	Ø110 Sample holder
21	Sample holder clip
22	DC Input Socket
23	0.5X C-mount adapter for microscope camera

## **4 Before use**

### **4.1 General information**

The packaging must be opened carefully to prevent the accessories inside from falling to the floor and breaking.

In general, a microscope should always be handled with great care, as it is a sensitive precision instrument. Avoiding abrupt movements during operation or transportation is therefore particularly important, especially to avoid endangering the optical components.

You should also avoid dirt or fingerprints on the lens surfaces, as in most cases this impairs the sharpness of the image.

If the performance of the microscope is to be maintained, it must never be disassembled. Parts such as objective lenses and other optical components should therefore be left as they are at the start of operation.





## 5 Basic information (general)


### 5.1 General information on warnings

Warnings are used in these operating instructions to warn you of possible personal injury or damage to property in certain situations.

Signal word	Description
<b>DANGER</b>	Failure to observe this warning will result in serious injury, permanent disability (e.g., loss of a limb), or death of the user or third parties.
<b>WARNING</b>	Failure to observe this warning may result in serious injury, permanent disability (e.g., loss of a limb), or death of the user or third parties.
<b>CAUTION</b>	Failure to observe this warning may result in minor injury or temporary impairment to the user or third parties (e.g., minor cuts).
<b>NOTE</b>	Failure to observe the instructions may result in damage to property

#### Symbols in warning notices :

Symbol	Meaning
<b>Warning signs</b>	Warning signs warn you of hazards that could potentially cause personal injury. The symbol indicates the type of hazard.
	Indicates general hazards or a hazardous location
	Warning of electrical voltage
	Warning of optical radiation
	Indicates electrostatic-sensitive devices

Symbol	Meaning
<b>Commandment sign</b>	Mandatory signs prescribe measures that you must take to prevent personal injury or property damage. The symbol indicates the necessary actions or items required to prevent damage.
	Indicates a prescribed action

## 5.2 Intended use

The OLM 170 is versatile and is mainly used for analyzing opaque and thick specimens, workpieces (surface, fracture edge, coating)

## 5.3 Improper use

Do not use the device in potentially explosive atmospheres or for measurements in liquids or on live parts.

Unauthorized structural changes, additions and conversions to the appliance are prohibited.

## 5.4 Warranty

The guarantee expires in the event of

- Non-compliance with our specifications in the operating instructions
- Use outside the described applications
- Modifying or opening the device
- Mechanical damage and damage caused by media, liquids, natural wear and tear
- Improper set-up or electrical installation
- Improper assembly or electrical installation

## 6 Basic warnings and safety instructions

### 6.1 Observe the notes in the operating instructions




Read the operating instructions carefully before commissioning/using the device, even if you already have experience with KERN devices. Always keep the instructions in the immediate vicinity of the device.

### 6.2 Staff training

The device may only be used by persons who have read and understood the operating instructions, in particular the chapter on safety.

### 6.3 Security

<b>⚠ WARNING</b>	
	<p><b>Read all safety information and instructions.</b> Failure to observe the safety information and instructions may result in electric shock, fire and/or serious injury.</p> <p><b>Keep all safety information and instructions for future reference.</b></p> <ul style="list-style-type: none"><li>• The design of the device must not be modified. This can lead to incorrect measurement results, safety defects and destruction of the device</li><li>• Do not operate the appliance in potentially explosive rooms or areas and do not install it there.</li><li>• Do not operate the device in an aggressive atmosphere.</li><li>• Do not immerse the appliance in water. Ensure that no liquids penetrate the inside of the device.</li></ul> <p>The device may only be used in a dry environment and under no circumstances in rain or relative humidity above the operating conditions.</p> <ul style="list-style-type: none"><li>• Protect the device from permanent direct sunlight.</li><li>• Do not expose the device to strong vibrations.</li><li>• Do not remove any safety signs, stickers or labels from the device. Keep all safety signs, stickers and labels in a legible condition</li><li>• Do not open the device</li><li>• The lamp generates a lot of heat during operation. Avoid touching the lamp housing during operation and for some time afterwards.</li><li>• Do not operate the device in an aggressive atmosphere</li></ul>

### **⚠ WARNING**



#### **Risk of injury due to electric shock!**

- Risk of short circuit due to penetration of liquids into the housing!
- Do not immerse the appliance or accessories in water. Make sure that no water or other liquids get into the housing.
- Work on electrical components may only be carried out by an authorized specialist company!
- Take care not to twist or kink the mains cable.
- Only use the original adapter supplied

### **⚠ WARNING**



#### **Choking hazard!**

Do not leave the packaging material lying around carelessly. It could become a dangerous toy for children.

- The appliance is not a toy and does not belong in the hands of children.
- This appliance can be dangerous if it is used improperly or not as intended by untrained persons! Observe the personnel qualifications!

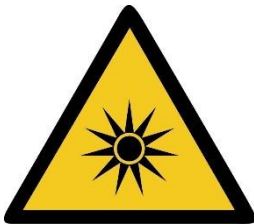
### **⚠ WARNING**



#### **Electrostatically sensitive device!**

- The device can be destroyed by electrostatic discharge. Connectors for RF signals are particularly at risk.
- Please observe the handling instructions for electrostatic-sensitive components.

### **⚠ WARNING**



#### **There is a risk from optical radiation!**

Gas discharge lamps, LED lights and other white light sources generate intense optical radiation, including UV (ultraviolet), visible light (VIS) and IR (infrared). This radiation can cause both skin and eye damage. The extent of the damage is determined by the wavelength, the duration of exposure and the operating mode (continuous or pulsed).

- Do not expose eyes and skin to radiation.
- Do not insert any reflective objects into the beam entrance.
- If necessary, use suitable protective equipment/protective clothing.
- Never remove the cover or cladding during operation.
- Never look into the eyepieces when the beam path is open (using the control lever for illumination) and an empty filter position is selected on the FL module. There is an acute risk of blindness here.

### CAUTION

Keep a sufficient distance from heat sources.

Do not use the device in environments with high humidity or water mist.



### NOTE

- To avoid damage to the device, do not expose it to extreme temperatures, extreme humidity, or moisture.
- Do not use harsh cleaners, abrasives, or solvents to clean the device.

## **7 Transportation and storage**

### **7.1 Note**

If you store or transport the device improperly, the device may be damaged. Observe the information on transporting and storing the appliance.

### **7.2 Transportation**

We recommend using the original packaging for shipping, transporting, or storing the microscope components. To prevent damage from vibrations, all movable parts that can be assembled and disassembled must be packed separately.

### **7.3 Storage**

Avoid exposing the device to direct sunlight, high or low temperatures, shocks, dust, and high humidity.

The suitable temperature range is 0 - 40 °C and a relative humidity of 85% should not be exceeded.

The appliance should always be placed on a firm, smooth and horizontal surface.

When the microscope is not in use, it is best to cover it with the dust cover supplied.

Dust or dirt inside the optics of a microscope can in many cases lead to irreversible malfunctions or damage.

Accessories consisting of optical elements, such as additional lenses, are preferably stored in a drying box with desiccant.

### **7.4 Packaging/return transportation**

Returns are only possible within the limits of the general terms and conditions. Keep all parts of the original packaging for any necessary return transportation.

- Only the original packaging is to be used for return transportation.
- Disconnect all connected cables and loose/movable parts before shipping.
- Refit any transportation locks provided.
- Secure all parts against slipping and damage.



## **8      Unpacking and commissioning**

### **8.1    Unpacking**



In the event of a return, please observe the instructions in the chapter "Packaging/return transportation"

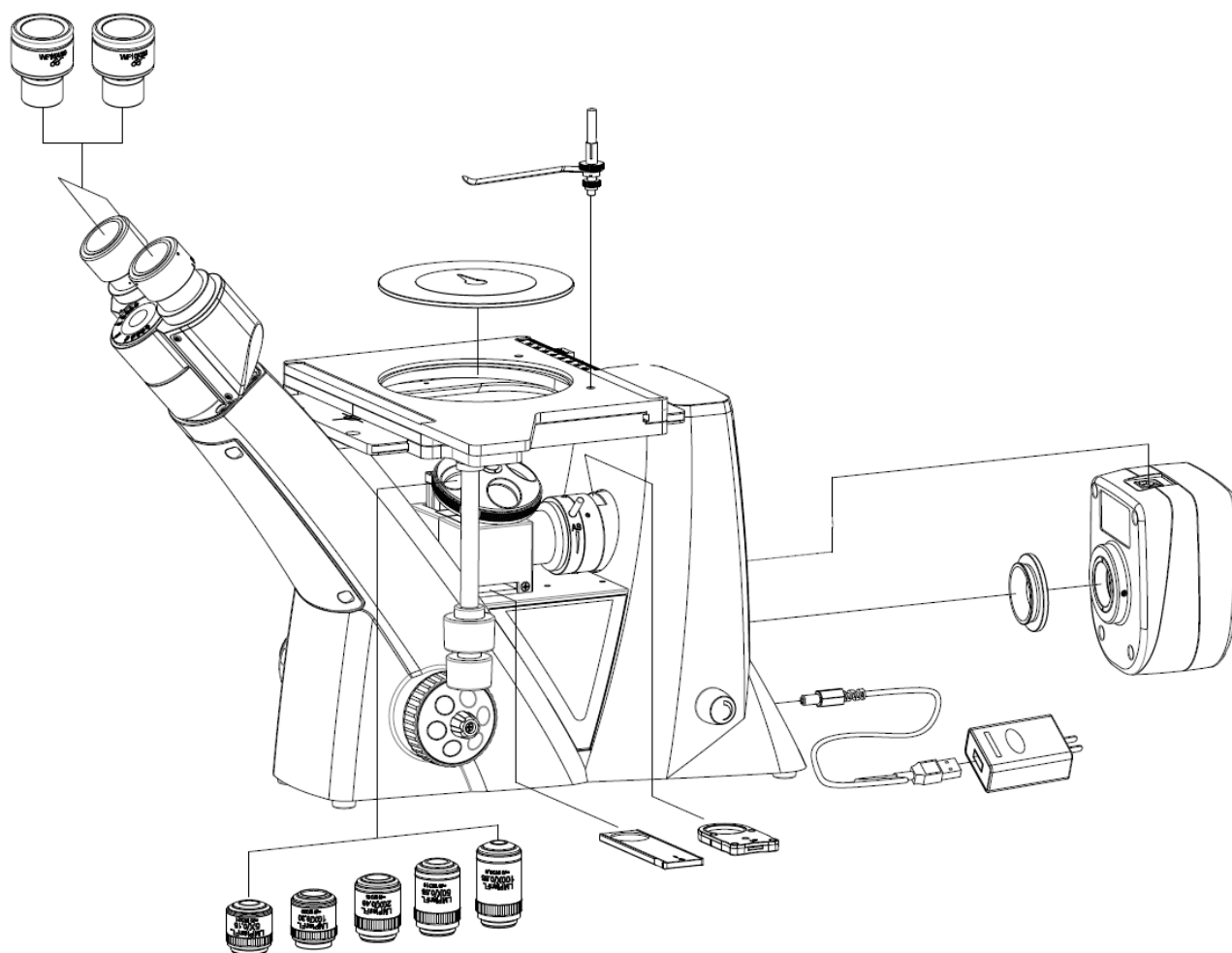
---

On receipt of the device, you should first check that no damage has occurred during transportation, that the outer packaging, the housing, other parts or even the device itself have not been damaged. If any damage is evident, please notify KERN GmbH immediately.

### **8.2    Initial commissioning**

To ensure that the microscope functions properly, it must be assembled as described in the chapter "9".

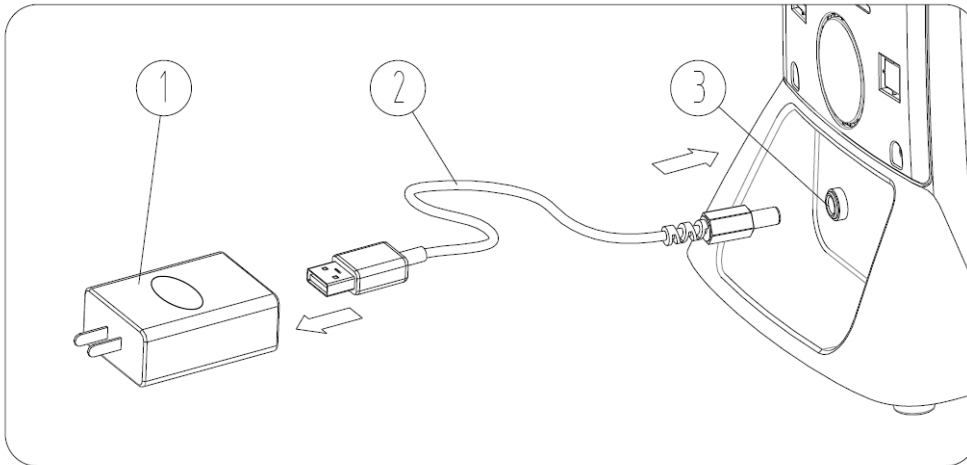
## 9 Assembly



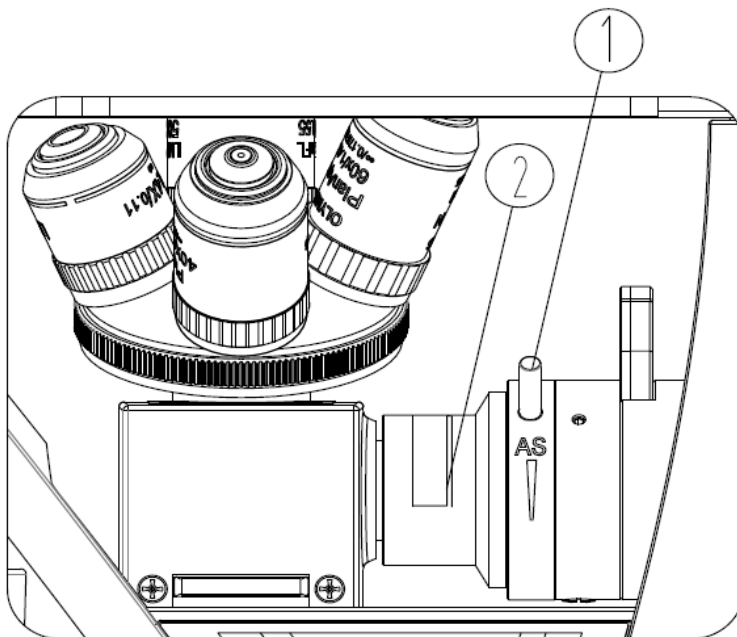
## 9.1 Reflected light unit

The reflected light unit consists of a light source (LED) located in the microscope housing and a polarization unit.

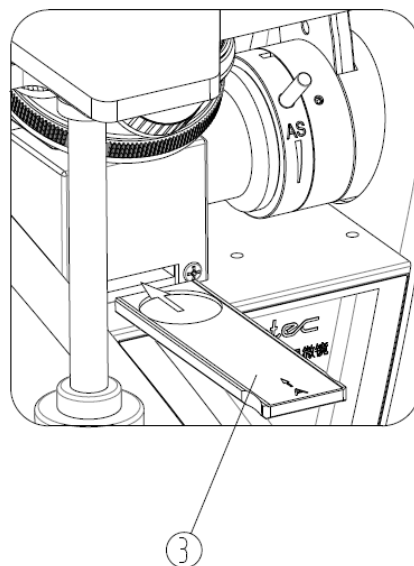
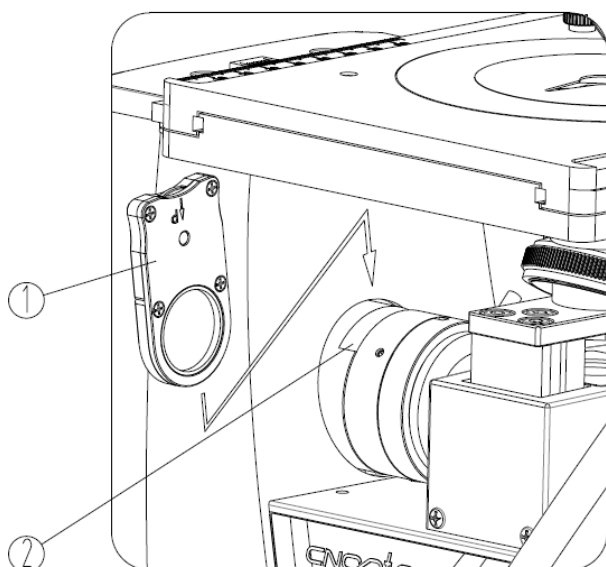
For operation, the USB power cable [2] including the power supply adapter [1] must be connected to the power socket [3] on the rear of the microscope.



The aperture diaphragm [1] and a gray filter [2], which must also be inserted in the beam path, are used to modify the light in bright field mode.



For the application of the polarization method, an analyzer slide [3] and a polarizer slide [1+2] are included in the scope of delivery, which must also be placed in the appropriate slots.



See also chapter 3.1

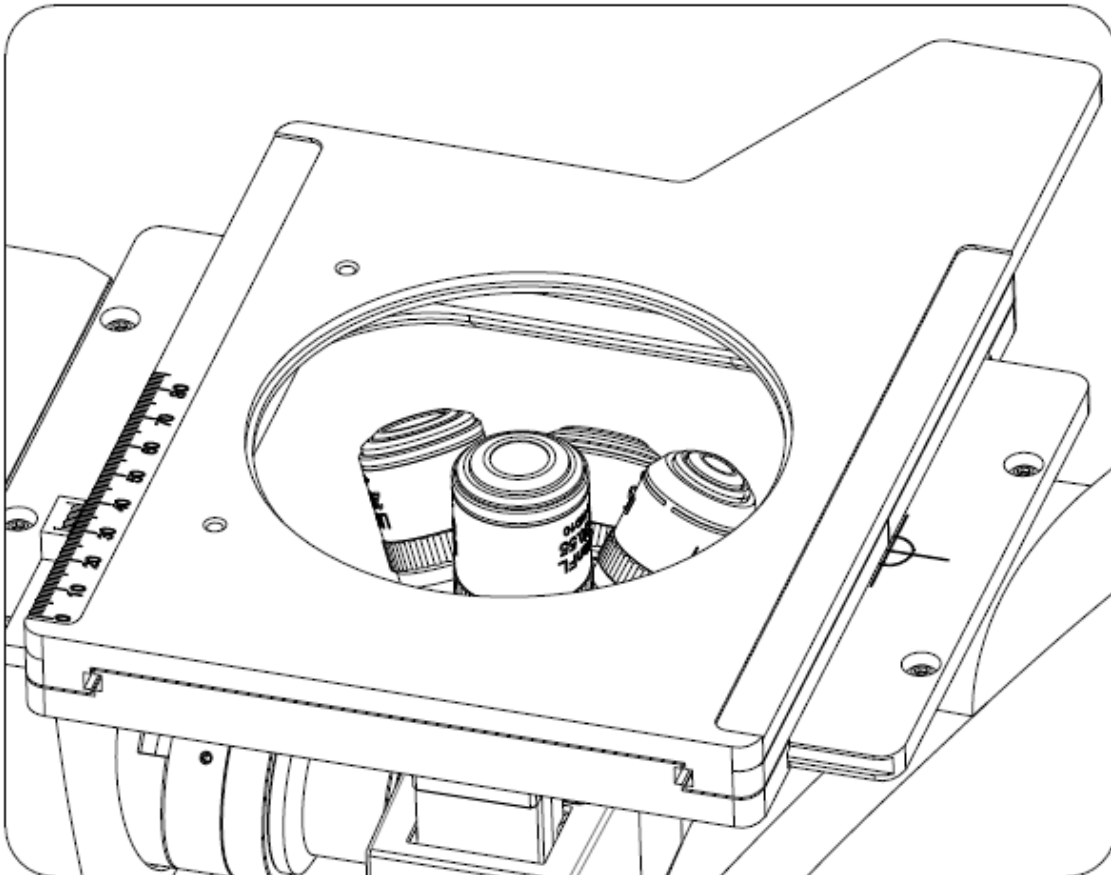
**Analyzer slide** / has the name "A" (7)

**Polarizer slide** / has the name "P" (13)

## 9.2 Objectives

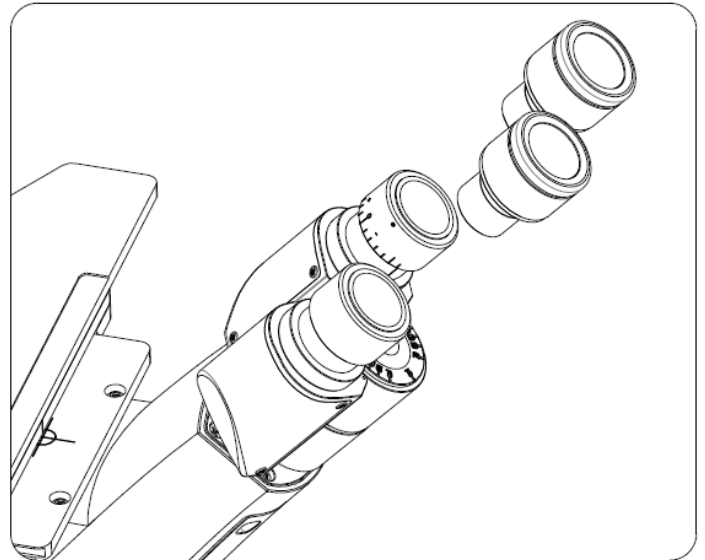
The nosepiece must be in its lowest position so that the objectives can be screwed into it. You can then pass the objectives through the opening of the specimen stage and screw them into the nosepiece, so that when you turn the nosepiece in a clockwise direction, the objective with the next strongest magnification appears. You must make sure that you do not touch the lenses with your bare fingers and that no dust enters the apertures.

To the screw locations which are not filled with an objective, you must attach the protective cap.



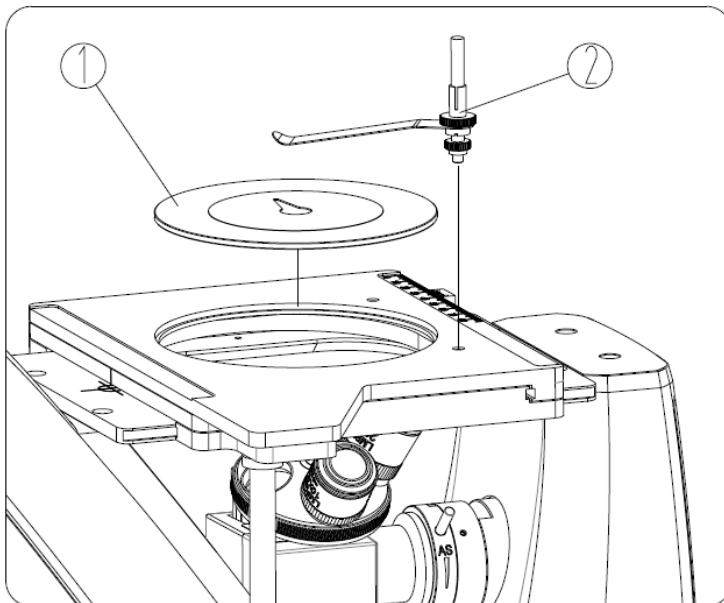
### 9.3 Eyepieces

You must always use eyepieces with the same magnification for both eyes. These are simply placed onto the tube connectors, once you have first removed the plastic protective caps. You should always make sure that you do not touch the lenses with your bare fingers and that no dust enters the apertures.



### 9.4 Specimen stage

The supplied stage plate [1] needs to be fitted to the opening of the specimen stage, in order to get a support area for relatively small observation objects and to protect the objectives which are located underneath. Furthermore, you can attach an object holder clip [2] to one of the threads on the stage surface.



***For information on connecting a microscope camera, see chapter 12 using optional accessories.***

## 10 Operation

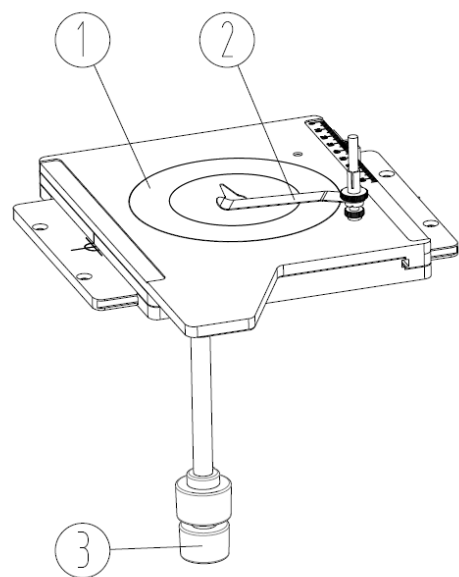
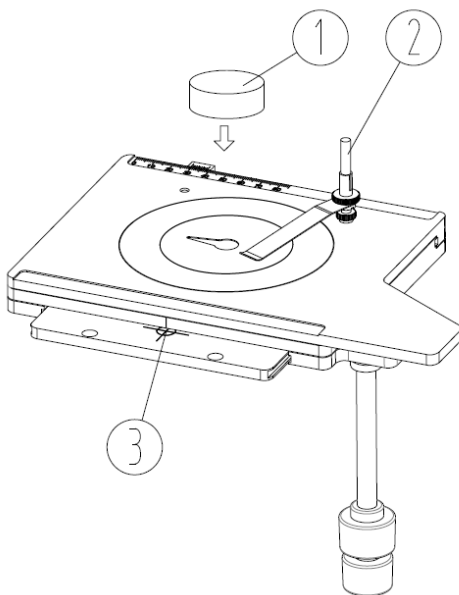
### 10.1 First steps

The very first thing to do is to establish the power connection by means of the mains plug. Now the illumination can be switched on via the main switch (dimmer).

The light intensity control (dimmer) should first be set to a low level so that the eyes are not immediately exposed to too much light when looking into the eyepieces for the first time.

The next step is to place an object on the specimen stage [1]. The object can be fixed on the stage using the object holder [2].

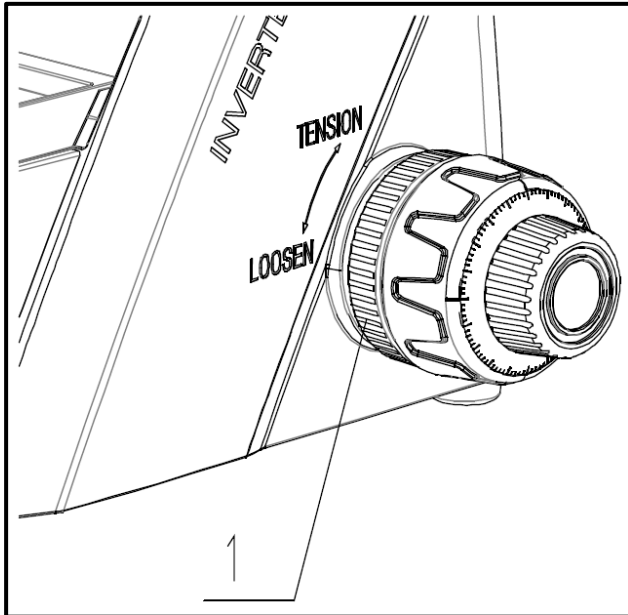
To move the spot of the object to be observed into the beam path, the dials on the right side of the stage must be operated accordingly (see figure on the right [3]). The marks for setting the stage center on the side of the object stage serve as orientation points (see figure on the left [3]).



## 10.2 (Pre-)focusing

When you are observing an object, you must have the correct distance to the objective to achieve a sharp image.

In order to find this distance at the beginning (without other default settings of the microscope) place the objective with the lowest magnification in the beam path, look through the right eyepiece with the right eye and turn it slowly using the coarse adjustment knob.



The simplest way of doing this would be to first raise the nosepiece (using the coarse adjustment knob) to the top position and then lower it slowly. As soon as an image is recognizable (no matter how sharp), then you should only adjust the focus using the fine adjustment knob.

### Adjusting the torque of the coarse and fine adjustment knob

Next to the left adjustment wheel for the coarse and fine adjustment knob there is a ring (*see illustration [1]*) which you can use to alter the torque of these wheels. Turning it in a clockwise direction reduces the torque and turning it in an anti-clockwise direction increases it.

On one hand, this function can help to make it easier to adjust the focus and on the other hand it can prevent the nosepiece from slipping down unintentionally.

### Important:

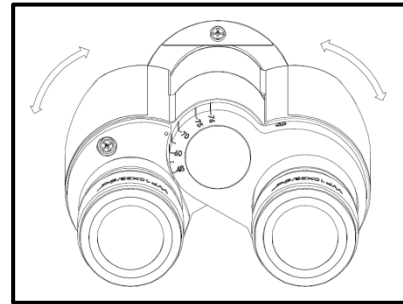
In order to avoid damaging to the focusing system, the left and right adjustment wheels for the coarse and fine adjustment knob must never be rotated at the same time in opposite directions.



### 10.3 Adjusting the interpupillary distance

With binocular viewing, the interpupillary distance must be adjusted accurately for each user, in order to achieve a clear image of the object.

While you are looking through the eyepieces, use your hands to hold the righthand and lefthand tube housing firmly. By pulling them apart or pushing them together, you can either increase or reduce the interpupillary distance (*see illustration*). As soon as the field of views of the lefthand and righthand eyepieces completely overlap each other, i.e. they combine to form a circular image, then the interpupillary distance is set correctly.



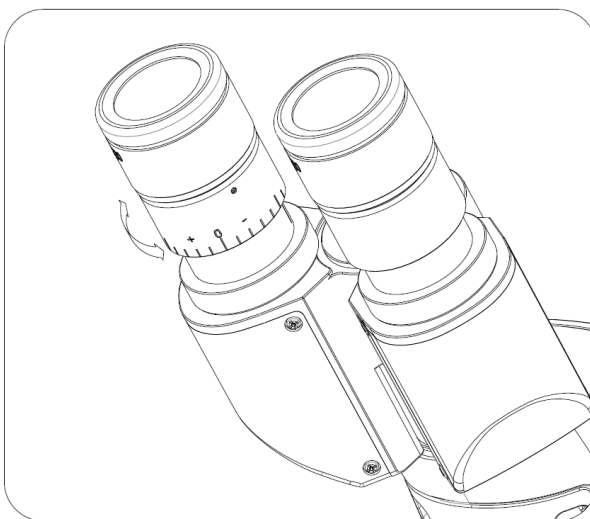
### 10.4 Diopter adjustment

The eye strengths of each eye of the microscope user can often be slightly different, which in daily life has no consequences. But when using a microscope this can cause problems in achieving precise focusing.

You can use a mechanism on both tube connectors (diopter adjustment rings) to compensate for this as follows.

1. Set the right diopter adjustment ring to position 0.
2. Look through the right eyepiece with the right eye and bring the object into focus by using the coarse and fine adjustment knob.
3. Then look through the left eyepiece with the left eye and use the diopter adjustment ring to focus the image.

To do this, you just need to turn the ring in both directions (*see illustration*), to find out where the image is at its most focussed.



## 10.5 Adjusting the magnification

After pre-focusing has been carried out using the objective with the lowest magnification (see *section 10.2*), you can then adjust the overall magnification using the nosepiece, as necessary. By turning the nosepiece you can bring any one of the four other objectives into the beam path.

When adjusting the nosepiece, you must take the following points into account:

- The required objective must be properly locked in place at all times.
- The nosepiece should not be rotated by holding individual objectives. You should use the black ring below the objectives.
- When rotating the nosepiece you must always make sure that the objective which is about to be positioned in the beam path does not touch the stage plate. This can lead to significant damage to the objective lens.  
We recommend that you always check from the side to make sure that there is sufficient leeway. If this should not be the case, the nosepiece must be lowered accordingly.

If you have focussed the object to be observed for a specific magnification, then if you select the objective with the next greatest magnification, the object will be slightly out of focus. Use the fine adjustment knob to make a slight adjustment and restore the focus.

## 10.6 Use the eyecups

The eye cups supplied with the microscope can basically be used at all times, as they screen out intrusive light, which is reflected from light sources from the environment onto the eyepiece, and the result is better image quality.

But primarily, if eyepieces with a high eye point (particularly suitable for those who wear glasses) are used, then it may also be useful for users who don't wear glasses, to fit the eye cups to the eyepieces.

These special eyepieces are also called High Eye Point eyepieces. They can be identified by the glasses symbol on the side. They are also marked in the item description by an additional "H" (example: HSWF 10x Ø 23 mm).

When fitting the eye cups, make sure that the diopter setting is not moved. We would therefore advise that you hold the diopter compensation ring on an eyepiece with one hand while you fit the eye cup with the other.

Before using the microscope, users who wear glasses must remove the eye cups, which you may find on High Eye Point eyepieces.

As the eye cups are made of rubber, you must be aware that when you are using them, they can become slightly dirty through grease residues. In order to maintain hygiene, we would therefore recommend that you clean the eye cups regularly (e.g. with a damp cloth).



Eyecups



High Eye Point Eyepiece  
(identified by the eyeglass symbol)

## **10.7 Adjusting the illumination**

To make sure that perfect image results are achieved during microscopic observation, it is important that the direction of light of the microscope is optimised.

The following components of the reflected light unit can be adjusted according to the application requirements.

### **Aperture diaphragm**

*(see chapter 9.1 )*

The aperture diaphragm allows the optimum compromise between contrast and resolution to be set for the microscopic image.

Opening and closing of this aperture is performed via the lever located on the top of the incident light unit.

### **Color filter**

*(see chapter 9.1 )*

The colour filter slider contains a permanently integrated grey filter. If required, this must be placed in the corresponding slot on the illumination unit.

### **Polarization unit (Analyzer/Polarizer)**

*(see chapter 9.1 )*

The OLM 170 series provide the possibility to apply the contrasting method of polarised light. For this purpose the analyzer and polarizer (both of them are included with the scope of delivery) are used.

In order to bring the analyzer into the beam path you must attach the analyzer slide to the slot, located underneath the nosepiece. Both the slide and the slot have the name "A".

Next to the field and aperture diaphragm the slot for the polarizer is located. Both the slide and the slot have the name "P". The integrated wheel on the polariser slide is facing out after attaching it to the slot. With the wheel you can control the required alignment of the polarizer.

## **11 Changing the bulb**

The OLM 170 is equipped with LEDs.

Due to the long service life of LED lighting, regular lamp replacement is not necessary with this microscope.

In most cases, problems with the lighting would therefore be caused by defects in the electrical system. In such a case, our Technical Service can help.

## 12 Use optional accessories

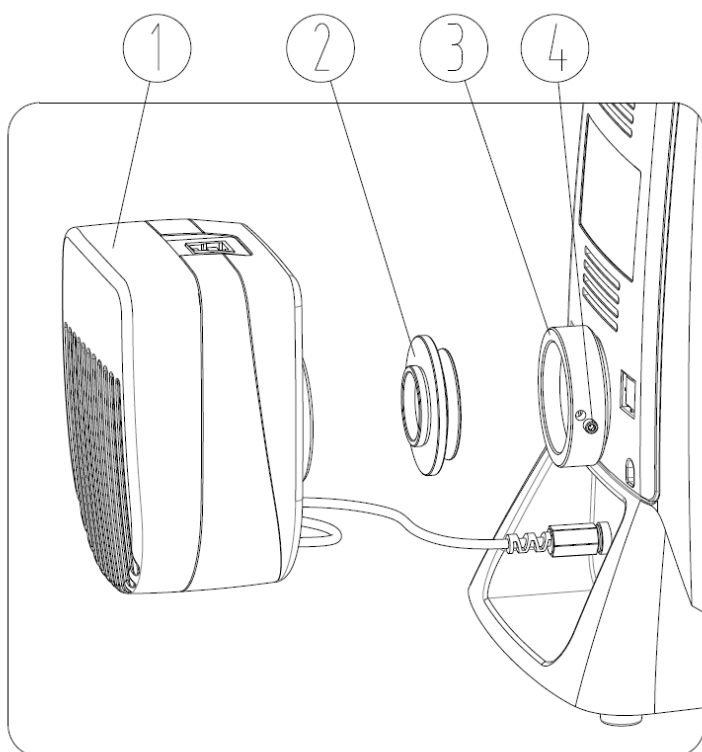
### 12.1 Camera connection

Due to an additional beam exit at the rear of the microscope it is possible to connect microscope cameras to the device, in order to digitally record images or sequences of images of an object being observed.

After removing the plastic cover on the camera adapter (C-mount 0.5x), which is already located on the camera connection on the back of the microscope, a camera that has a C-mount thread can now be screwed onto the adapter.

The following steps are recommended for optimal mounting:

1. Loosen the locking screw [4] on the camera connection [3] and remove the C-mount adapter [2].
2. Screw the C-mount adapter [2] onto the microscope camera [1].
3. Connect the microscope camera [1] together with the C-mount adapter [2] to the camera connection [3] and tighten the locking screw [4] again.



The light from the microscope illumination is permanently provided in the beam path for both the camera and the eyepieces, so that analog and digital observation is always possible at the same time.

## 13 Troubleshooting

Problem	Possible causes
The bulb does not light	The mains plug is not correctly plugged in
	There is no power at the socket
	Defective bulb
	Defective fuse
The bulb blows immediately	The specified bulb or fuse has not been used
The field of view is dark	The aperture diaphragm and/or field diaphragm are not opened wide enough
	The selector switch for the beam path is set to "Camera"
	The condenser is not correctly centered
You cannot adjust the brightness	The brightness control has been set incorrectly
	The condenser has not been correctly centred
	The condenser is too low
The field of view is dark or is not correctly illuminated	The objective is not positioned correctly on the beam path
	The selector switch for the beam path is between two settings
	The nosepiece is not correctly fitted
	The condenser is not correctly fitted
	An objective is being used which doesn't match the lighting area of the condenser
	The condenser has not been correctly centred
	The field diaphragm is closed too tightly
	The bulb is not correctly fitted
The field of view of one eye does not match that of the other eye	The interpupillary distance is not correctly adjusted
	Dioptré setting has not been carried out correctly
	Different eyepieces are used for the righthand and lefthand side
	The eyes are not used to using a microscope

Problem	Possible causes
Blurred details Bad image Bad contrast Vignetted field of view	The aperture diaphragm is not opened wide enough
	The condenser is too low
	The objective does not belong to this microscope
	The front lens of the objective is dirty
	An immersion object has been used without immersion oil
	The immersion oil contains air bubbles
	The condenser is not correctly centred
	The recommended immersion oil has not been used
Dirt or dust in the field of view	Dirt / dust on the objective
	Dirt /dust on the front lens of the condenser
	Dirt / dust on the eyepieces
One side of the image is blurred	Dirt / dust on the front lens of the condenser
	Dirt / dust on the object
	The stage was not correctly fitted
	The objective is not positioned correctly on the beam path
The image flickers	The nosepiece is not correctly fitted
	The upper side of the object is facing down
	The objective is not positioned correctly on the beam path
The coarse adjustment knob is difficult to turn	The condenser has not been correctly centred
	The rotational resistance brake is too tight
The stage moves down on its own The fine adjustment knob moves on its own	The angle table is blocked by a solid body
	The rotational resistance brake is not tight enough



When you move the table, the image becomes blurred	The stage was not correctly fitted
--	------------------------------------

## **14 Service**

If, despite studying these operating instructions, you still have questions about commissioning or operation, or if, contrary to expectations, a problem should occur, please contact your specialist dealer. The device may only be opened by trained service technicians authorized by KERN.

## 15 Power supply

### 15.1 Mains connection



The microscope may only be connected to the power supply if the information on the microscope (sticker) and the local mains voltage are identical.



**Important:**

- Check the mains cable for damage before commissioning
- Ensure that the power supply unit does not come into contact with liquids
- The mains plug must be accessible at all times.

## 16 Maintenance, servicing and disposal



Disconnect the device from the power supply before performing any maintenance, cleaning, or repair work.

### 16.1 Cleaning

The appliance must always be kept clean and regularly freed from dust.

Before wiping the appliance when it gets wet, make sure that the power is switched off.

Glass components should preferably be wiped lightly with a lint-free cloth if they become dirty.

To wipe oil stains or fingerprints from lens surfaces, the lint-free cloth is moistened with a mixture of ether and alcohol (70/30 ratio) and then cleaned

Ether and alcohol must always be handled with care as they are highly flammable substances. It is therefore essential to keep them away from naked flames and electrical appliances that are switched on and off and only use them in well-ventilated rooms.

However, organic solutions of this type should not be used to clean other components of the appliance. This could cause changes to the paintwork. It is sufficient to use a neutral cleaning agent for this purpose.

Other cleaning agents for the optical components include

- Special cleaner for optical lenses
- Special optical cleaning cloths
- Bellows
- Brush

If handled correctly and checked regularly, the microscope will function smoothly for many years.

### 16.2 Maintenance and Repair

Do not make any modifications to the device or install spare parts. Contact the manufacturer for repair or device inspection.

### 16.3 Waste disposal



Old appliances and accessories must not be disposed of with household waste.

The operator must dispose of the packaging and the device in accordance with the applicable national or regional regulations at the place of use. The device consists of various components and materials, such as:

- Electronic components (printed circuit boards, electrical cables)
- Plastic (housing)
- Metal

Improper disposal of the device can have harmful effects on humans and the environment.

Proper and environmentally friendly disposal can prevent harmful effects and recover raw materials.

## 17 Further information

The illustrations may differ slightly from the product.

The descriptions and illustrations in these operating instructions are subject to change without notice. Further developments to the device may result in such changes.



All language versions include a non-binding translation.  
The original German document is binding.