

**Stereo microscope Stemi 305**  
**Operating Manual**



You have acquired a product made by ZEISS. Please read this operating manual before using your instrument for the first time to make sure that its quality is maintained and you can utilize your instrument reliably for a long time.

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Knowledge of this manual is required for operation of the instrument. Would you therefore please familiarize yourself with the contents of this manual and pay special attention to instructions concerning the safe operation of the device.

We reserve the right to perform modifications in view of technical progress; this operating manual is not subject to revision.

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## 1 INTRODUCTION

### 1.1 General information

The stereo microscope Stemi 305 has been designed, produced and tested in compliance with the standards DIN EN 61010-1 (IEC 61010-1) and IEC 61010-2-101 "Safety Requirements for Electrical Measuring, Control and Laboratory Equipment".

The device meets the requirements of the EC Directive 98/79/EC Annex 1 regarding ivd products and the EC RoHS Directive 2011/65/EC and carries the **CE** mark.

This operating manual contains information and warnings to be observed by the operator.

The devices must be disposed of in compliance with the WEEE Directive 2012/19/EC.

In this operating manual, the following warning and information symbols are used:



#### **CAUTION**

*This symbol indicates a possible hazard to the user.*



#### **CAUTION**

*LED risk group 2 acc. to DIN EN 62471:2009 Optical radiation is emitted.  
Do not look into the beam. This may damage your eyes.*



#### **CAUTION: High-energy UV radiation!**

*Risk of damage to eyes and skin!*



#### **CAUTION**

*Hot surface!*



#### **CAUTION**

*Remove the power plug before any intervention in the instrument!*



#### **ATTENTION**

*This symbol indicates a possible hazard to the instrument or system.*



#### **NOTICE**

*This symbol indicates information which deserves special attention.*

## 1.2 Notes on instrument safety



If it becomes apparent that the safety measures are no longer effective, the device must be taken out of service and secured against being used again unintentionally. Please contact a ZEISS service agency or the Carl Zeiss Microscopy Service to have the instrument repaired.

The Stemi 305 Information regarding instrument safety and installation conditions 435063-6044-008 and the Stemi 305 short operating instructions 435063-8044-000 as well as the operating instructions regarding the light sources also must be observed.



Do not operate the devices included in the scope of supplies in a potentially explosive atmosphere, in the presence of volatile anaesthetics or flammable solvents such as alcohol, gasoline or similar substances.



The devices may only be operated by instructed persons who have been informed about the possible risks in conjunction with the use of microscopes and the fields of application in question. The microscope is a high-precision device that may be impaired in its performance or even destroyed if handled improperly.



Before commissioning the instrument, make sure that the existing power supply is suitable for the instrument.



Make sure that the mains plug is removed from the socket before the instrument is opened.



The devices are not equipped with special equipment protecting them from corrosive, potentially infectious, toxic and radioactive or other samples that may be hazardous to health. If you handle such samples, be sure to observe all legal requirements, in particular the relevant national accident prevention regulations.



The LED reflected-light illuminators and the LED transmitted-light illuminators have been classified as belonging to LED risk group 2 acc. to DIN EN 62471:2009. Avoid looking directly into the LED light.



If the device is operated with an external cold light source (high-energy light), never look directly into the fibre optic output of the cold light source. Otherwise, there is a risk of dazzling and blindness.



Never cover the open light guide socket or the fibre optic output. There is a fire hazard!

In all cases avoid covering the open light guide socket or the fibre optic output with your hand or other parts of your body. There is a risk of burns!





Safe disconnection from the power supply is ensured exclusively by removing the mains plug. The switch on the microscope only switches into standby mode.



Do not replace detachable mains cables by inadequately designed mains cables. Only the specified power supply lines may be used.



The microscope and the controller K LED are equipped with a desktop power unit each allowing line voltages in the range from 100 to 240 V  $\pm 10\%$ , 50 / 60 Hz, without the need for changing the voltage setting on the device.



The desktop power unit meets the requirements of protection class II (with protective insulation). If its casing is damaged, put the power unit out of operation. The microscope may only be operated with the desktop power unit supplied with the instrument.



Changing the lamps on the cold light source is only admissible in accordance with the manufacturer's operating manual. If the appropriate instructions are not complied with, there is a risk of burns and explosion when changing the lamp.



Defective devices should not be disposed of with household waste; dispose of them in compliance with the statutory provisions.



Samples must also be disposed of appropriately in accordance with the applicable statutory provisions and internal work instructions.



The stereo microscope Stemi 305 incl. its original accessories may only be used for the applications described in this operating manual. The manufacturer cannot assume any liability for other applications, including those of individual modules or single components. Changes to and maintenance on this device and on devices which are operated together with the microscope may only be performed by our service or by authorized persons. The manufacturer of the devices does not accept any liability for damage due to unauthorized interventions in the device. Moreover, such interventions invalidate all guarantee / warranty claims.





Dirt and dust may impair the performance of the device. The device must therefore be protected from such influences to the greatest possible extent and covered with the dust cover when not in use. Before covering the device, always make sure that it is definitely switched OFF. Considerable temperature fluctuations, direct exposure to sunlight and vibrations should be avoided.





Blocking or covering ventilation louvers may result in heat accumulation which may damage the device and in extreme cases even cause fire. Always keep ventilation louvers free and do not insert or allow any objects to fall into them. All electrical components and parts must be located at a distance of min. 15 cm from flammable objects and walls.


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 When operating a Stemi 305 cam, please refer to the appropriate operating instructions incl. the safety provisions contained in them before commissioning the device.

 If it is intended to operate the Stemi 305 with an external fibre optical cold light source, please refer to the appropriate operating instructions incl. the safety provisions contained in them before commissioning the light source.

 The desktop power unit must not get into contact with moisture.

 For transport over an extended distance, the device must be dismantled partially and transported in its original packaging.

 To transport the device over an extended distance, use the original packaging or the transport case Stemi 305/508.

 To connect the LED illuminators of the Stemi 305 system, six-pin modular connectors are used which are known from telecommunications (type: RJ 12).

Only the LED illuminators pertaining to the Stemi 305 may be connected to the RJ 12 sockets in the microscope body and in the stands of the Stemi 305. Only the connection cables supplied with the device may be used.

The use of commercially available cables with RJ 12 connectors or the connection of fax units, modems or other telecommunication equipment to the RJ 12 sockets of the Stemi 305 is prohibited.

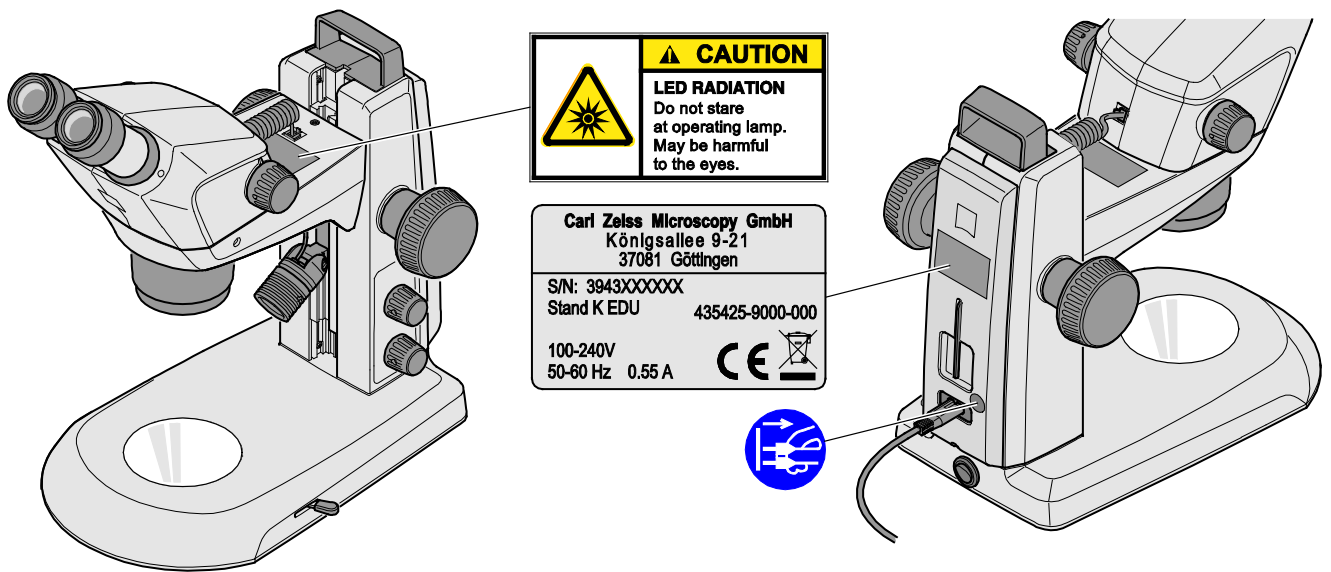
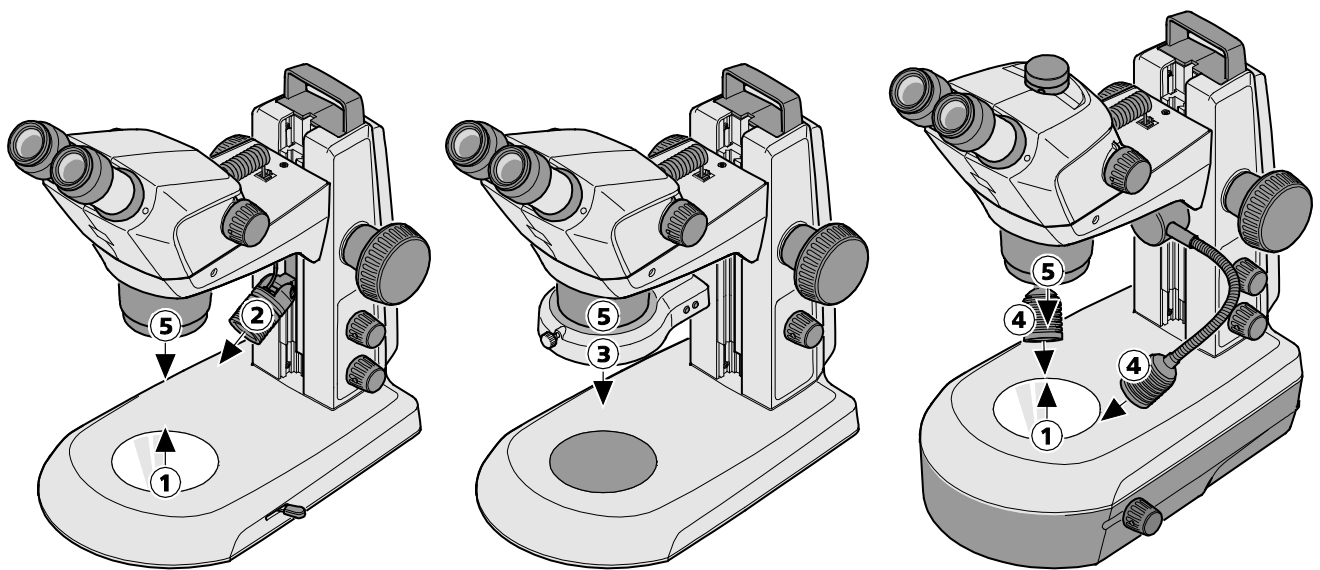


Fig. 1 Warning and information labels on the device



- 1 LED aperture, transmitted-light illuminators
- 2 LED aperture, spot illuminator K LED
- 3 LED aperture, ring illuminator K LED, segmentable
- 4 LED aperture, double spot illuminator K LED
- 5 LED aperture, integrated vertical illuminator

Fig. 2 Warning labels and apertures for LED radiation

### **1.3 Warranty notes**

The manufacturer guarantees that the device is free from material or manufacturing defects when delivered. Any defects which may have occurred must be reported to us immediately and steps be taken to minimize damage. If notified of such a defect, the device manufacturer is obligated to rectify it at his discretion, either by repairing the instrument or by delivering an intact replacement. No guarantee is provided for defects caused by natural wear (wearing parts in particular) and improper use.

The instrument manufacturer shall not be liable for damage caused by faulty operation, negligence or any other tampering with the device, particularly the removal or replacement of instrument components, or the use of accessories from other manufacturers. Such actions will render all warranty claims invalid.

No maintenance or repair work may be performed on the microscopes which exceed the activities specified in this operating manual. Repair may only be performed by ZEISS Service or by persons specifically authorized by it. Should any malfunctions occur on the device, please first contact the Carl Zeiss Microscopy Service or, abroad, the ZEISS representative in your area.

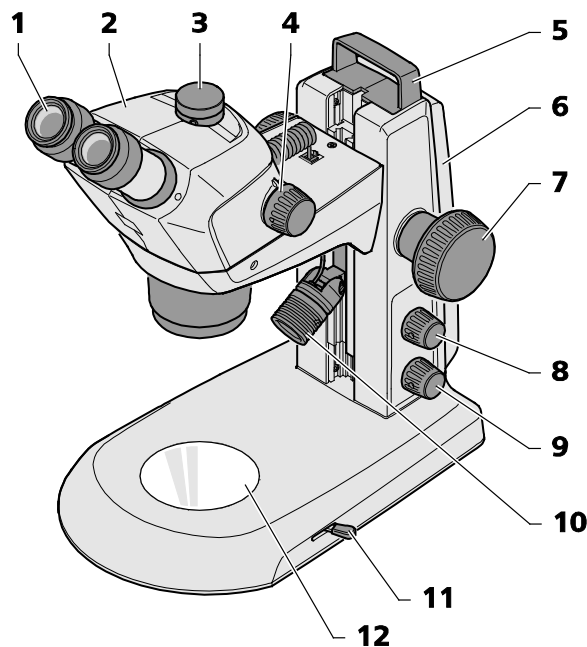
## 2 DESCRIPTION

### 2.1 Indication for use

The stereo microscopes Stemi 305 are microscopes for magnifying spatial observation of small objects. They have been designed and built for training purposes in schools, universities and natural science facilities. They are used, moreover, in biological and medical laboratories, in industrial manufacture and quality assurance.

Stemi 305 is envisaged for applications in biology and in medicine for the analysis of blood and/or tissue samples from the human body. Applications in the field of diagnostic medicine are explicitly excluded, except for the field of medical research.

### 2.2 Microscope system

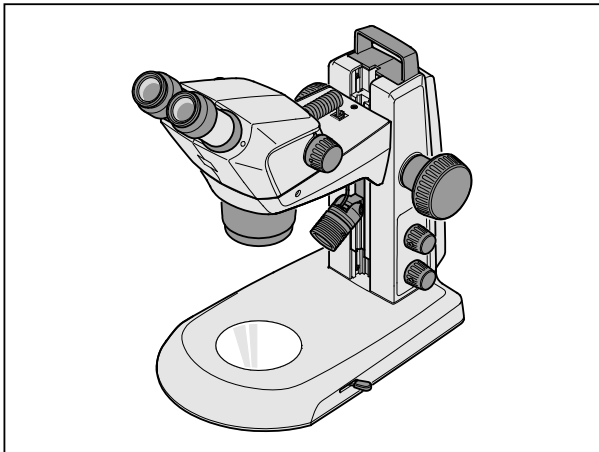


- |  |  |
|--|--|
| <p>1 Eyepiece in eyepiece tube (eyepiece 10x/23)</p> <p>2 Microscope body (trinocular) with installed vertical illuminator</p> <p>3 Interface for cameras with C-mount connector</p> <p>4 Zoom button to adjust the magnification</p> <p>5 Handle</p> <p>6 Stand (model K EDU)</p> <p>7 Focusing drive to focus the specimen</p> | <p>8 Rotary/push-button for switching ON and OFF the illuminators or the additional reflected-light illumination and for adjusting the illumination intensity</p> <p>9 Rotary/push-button for switching ON and OFF the transmitted-light illumination and for adjusting the illumination intensity</p> <p>10 Reflected-light illumination (spot illuminator K LED)</p> <p>11 Lever for adjusting the transmitted-light illuminator – bright field or dark field on the stand K EDU</p> <p>12 Insert plate for placing the specimen</p> |
|--|--|

**Fig. 3 Microscope system Stemi 305**



The illustrated microscope equipment shows an example and may differ from the ones actually existing!

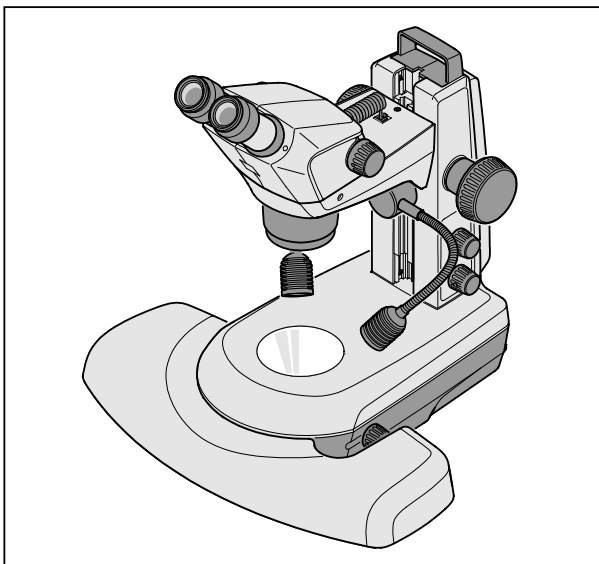


**Fig. 4 Stemi 305 EDU microscope set**

### 2.3 Microscope sets and fields of application

#### Stemi 305 EDU:

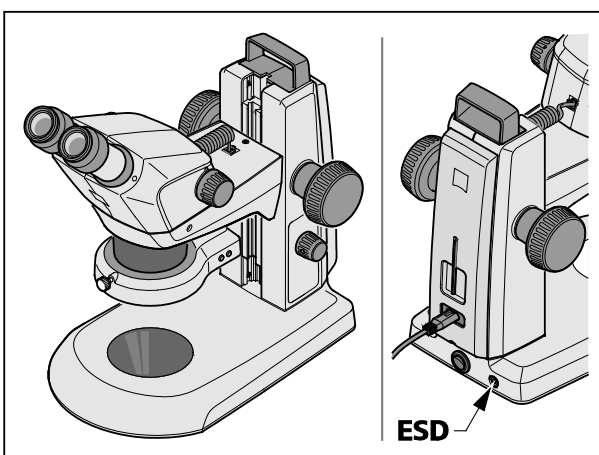
- Stemi 305 body in stand K EDU
- integrated controllable vertical illuminator
- reflected-light spot illuminator with height and angle adjustment, zoomable
- flat transmitted-light unit for bright and dark field
- for training in tutorial rooms and training institutes



**Fig. 5 Stemi 305 LAB microscope set**

#### Stemi 305 LAB:

- Stemi 305 body in stand K LAB
- integrated controllable vertical illuminator
- double spot illuminator with height and angle adjustment
- reflected-light module for bright and dark field and relief contrast
- hand rest (optional)
- for separation and documentation in the laboratory



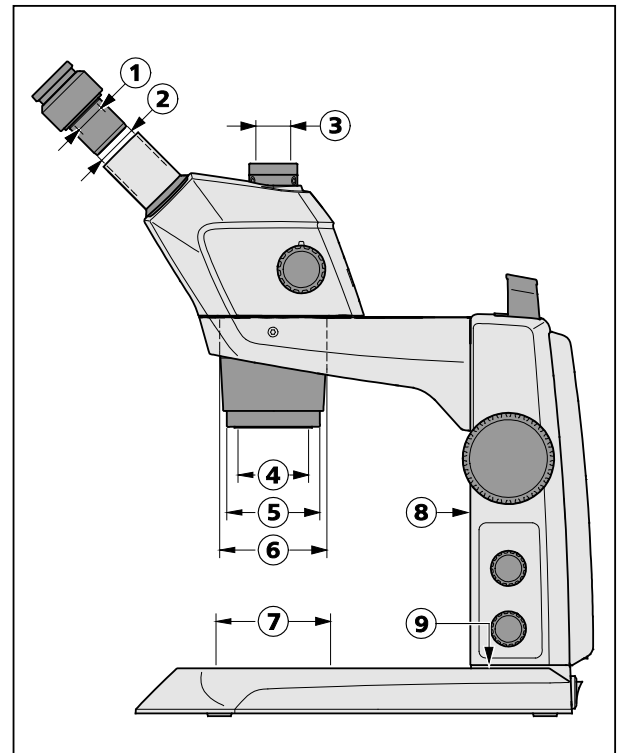
**Fig. 6 Stemi 305 MAT microscope set**

#### Stemi 305 MAT:

- Stemi 305 ESD body in stand K MAT
- integrated controllable vertical illuminator
- segmentable ring illuminator for reflected light
- for industrial quality assurance and manufacture
- ESD-capable thanks to its antistatic surface

## 2.4 Interfaces on the microscope body Stemi 305

- 1 Optional mount for eyepiece plates  
Ø 26 mm
- 2 Eyepiece tube Ø 30 mm to replace the eyepieces
- 3 Integrated camera adapter 0.5x with C-mount connector for cameras up to 2/3" (only for Stemi 305 trino)
- 4 Internal thread M52x1.0 to accommodate front optics and other accessories
- 5 Mount Ø 66 mm for ring illuminator
- 6 Mount Ø 76 mm for microscope body
- 7 Mount Ø 84 mm for tables, insert plates
- 8 Guide for mounting a reflected-light spot illuminator
- 9 M8 thread to mount retaining arms (only stand K)

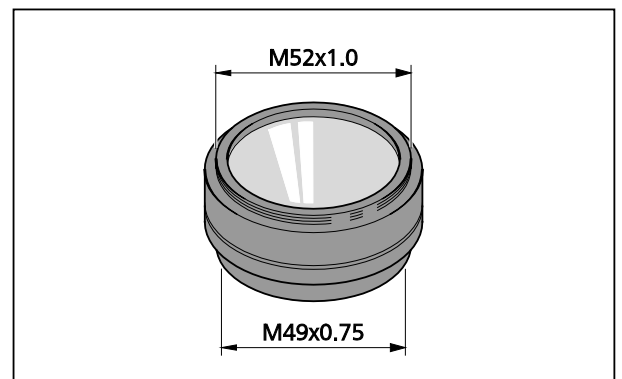


**Fig. 7 Interfaces on the Stemi 305 with stand K LED (schematic diagram)**

Thanks to the interface Ø 76 mm, the Stemi 305 can also be used in conjunction with other stands of the modular kit of the Stereo system – and other ZEISS stereo microscopes such as e.g. the Stemi 508, may also be inserted in the stands K.

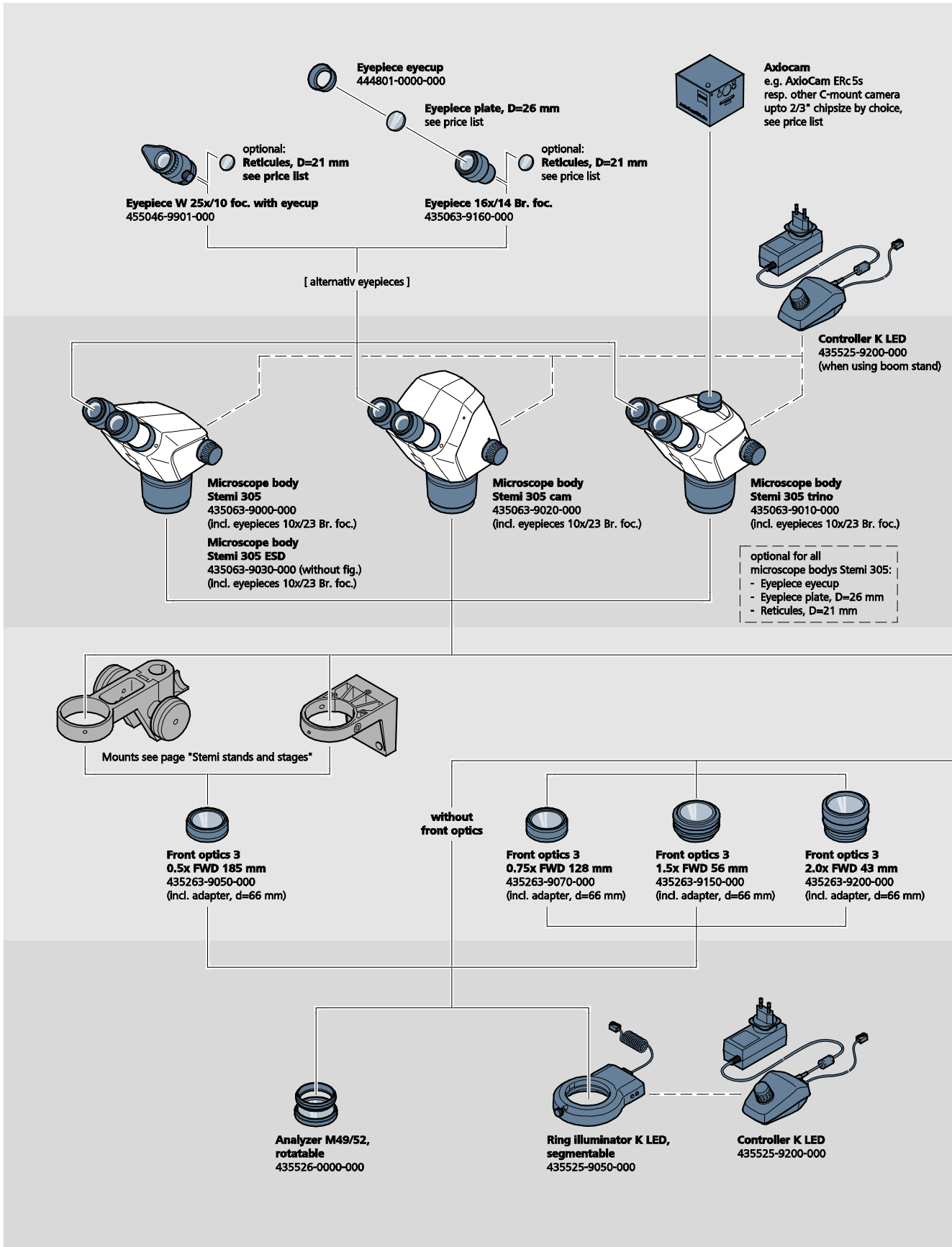
### Front optics, Stemi 305

- External thread M52x1.0 for fastening in the zoom body Stemi 305
- Internal thread M49x0.75 to accommodate optical filters and analyzer for pol.

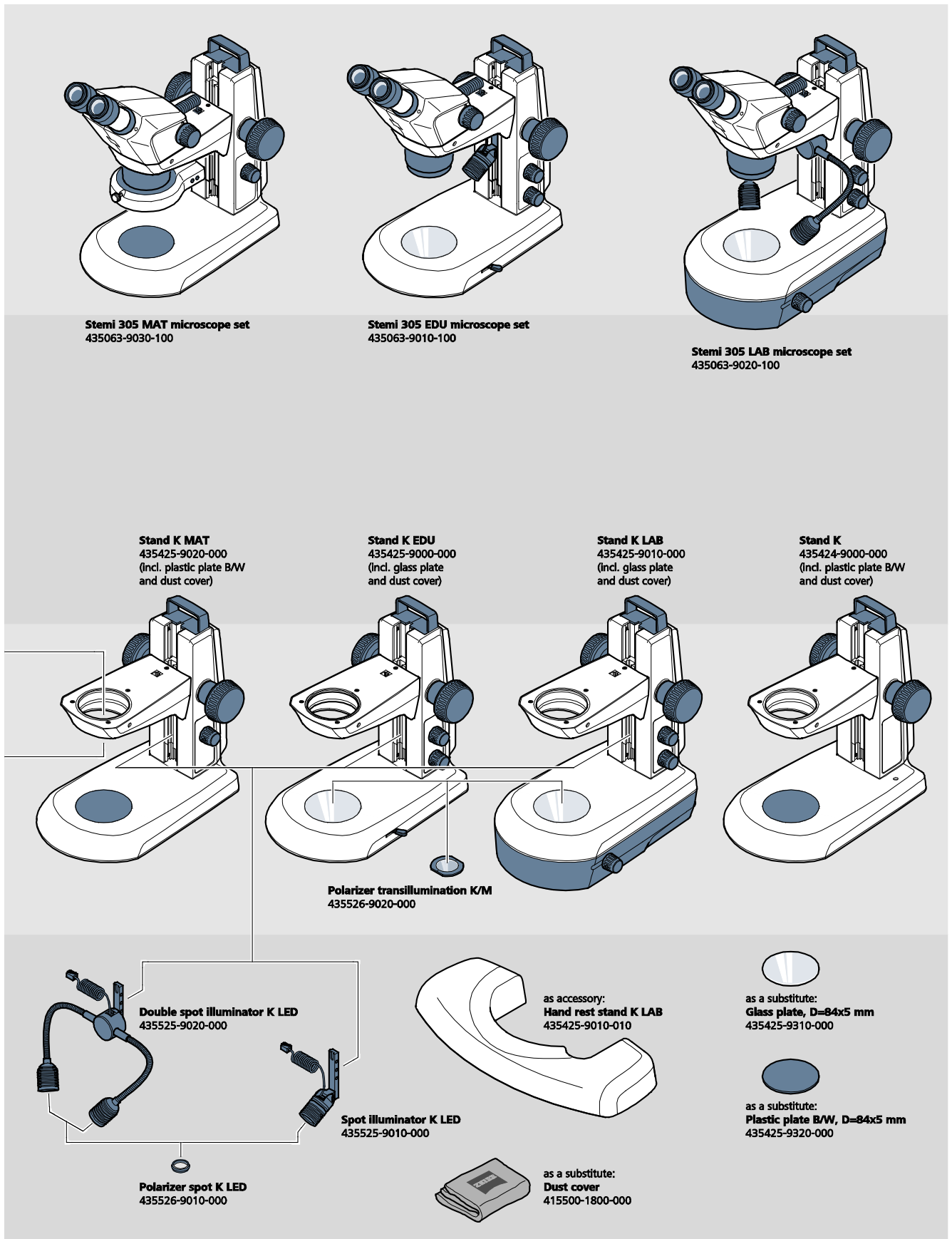


**Fig. 8 Front optics, Stemi 305 (example)**

2.5 System overview



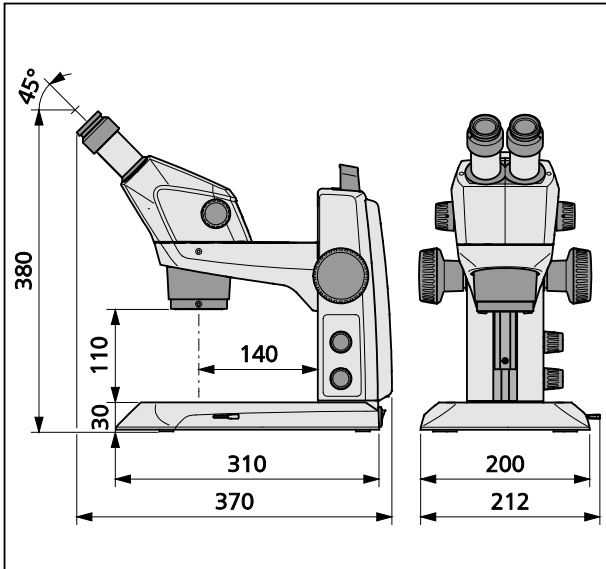




**2.6 Technical data**

**Microscope system Stemi 305 EDU**

**Dimensions**

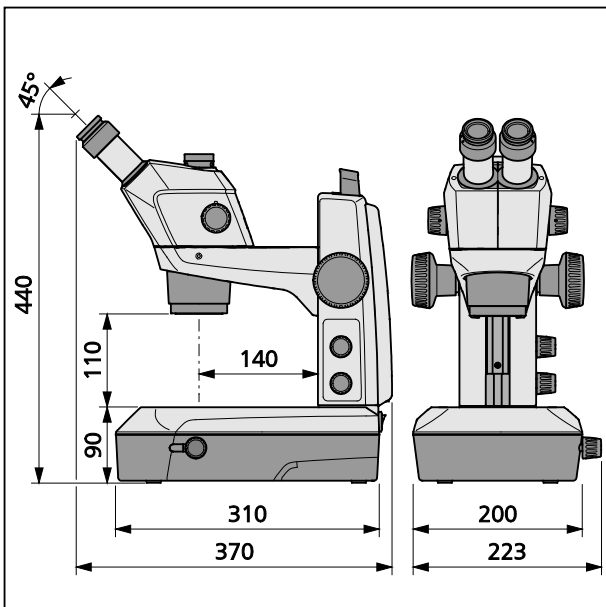


**Weight**

Stemi 305 in stand K EDU.....4.6 kg

**Microscope system Stemi 305 LAB**

**Dimensions**



**Weight**

Stemi 305 in stand K LAB .....6.2 kg

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### Ambient conditions

#### Storage (in packaging)

Admissible ambient temperature..... +10 to +40 °C  
Admissible relative humidity..... max. 75 % at +35 °C (non-condensing)

#### Transport (in packaging)

Admissible ambient temperature..... -40 to +70 °C

#### Operation

Admissible ambient temperature..... +10 to +40 °C  
Admissible relative humidity ..... max. 75 %  
Atmospheric pressure .....800 hPa to 1060 hPa  
Pollution degree ..... 2  
Field of application .....closed rooms  
Height of field of application..... max. 2000 m

### Operating data – desktop power units, microscope and controller K LED

Safety Class .....II  
Type of enclosure .....IP 20  
Electrical safety..... acc. to DIN EN 61010-1 (IEC 61010-1)  
taking CSA and UL regulations into account  
Pollution degree ..... 2  
Overvoltage category ..... 2  
Line voltage..... 100 to 240 V ±10 %  
Due to the fact that the instrument features a multi-voltage power supply unit, change-over of the device voltage not required!  
Line frequency..... 50 Hz – 60 Hz  
Power consumption: Desktop power unit with connected microscope.....max. 40 VA  
Output desktop power unit for microscope  
and for Controller K LED ..... 12 V DC, max. 2 A  
Input desktop power unit for microscope  
and for Controller K LED ..... 100-240 V, 50-60 Hz, max. 0.55 A


---

**Optical risk group classification acc. to DIN EN 62471:2009**

|   |  |
|---|--|
| Overall device.....   | LED risk group 2 acc. to DIN EN 62471:2009 |
| Integrated vertical illumination.....                       | LED risk group 2 acc. to DIN EN 62471:2009 |
| Spot illuminator K LED (reflected illumination) .....       | LED risk group 2 acc. to DIN EN 62471:2009 |
| Double spot illuminator K LED (reflected illumination)..... | LED risk group 2 acc. to DIN EN 62471:2009 |
| Transmitted-light unit in stand K LAB .....                 | LED risk group 2 acc. to DIN EN 62471:2009 |
| Transmitted-light unit in stand K EDU .....                 | LED risk group 2 acc. to DIN EN 62471:2009 |
| LED reflected illumination, peak at 460 nm, .....           | LED risk group 2 acc. to DIN EN 62471:2009 |
| LED transmitted illumination, peak at 465 nm, .....         | LED risk group 2 acc. to DIN EN 62471:2009 |

## 3 INSTALLATION

### 3.1 General information

 Before installing and commissioning the device, make sure to read the **Notes on Instrument Safety** carefully (see Section 1.2, Page 8).

The Stemi 305 with the necessary tools and optional equipment is delivered in several standard packages.

- Take all units out of the packaging and check them for completeness according to the delivery note.

 For installation and/or transport of the microscope or the stand, exclusively use the handle (Fig. 3/5) provided to this effect.

- Remove transport securing devices (adhesive tapes etc.).
- Keep original packaging for a possibly extended period of storage or return of the device to the manufacturer or dispose of it appropriately.

### 3.2 Installing the stereo microscope

- Place stand on a level, firm support.
- If the Stemi 305 body (Fig. 10/2) has not yet been mounted, insert it in the Stemi mount (Fig. 10/4), align it and secure it using the clamping screw (Fig. 10/6).  
The appropriate Allen key (Fig. 10/9) is located in the support on the back of the device.
- If the two eyepieces (Fig. 10/1) have not yet been mounted, insert them both to their stop in the eyepiece tube.
- Remove the two protective caps from the eyepieces (Fig. 9/1) and remove the protective cap (Fig. 9/2) from the objective by turning.

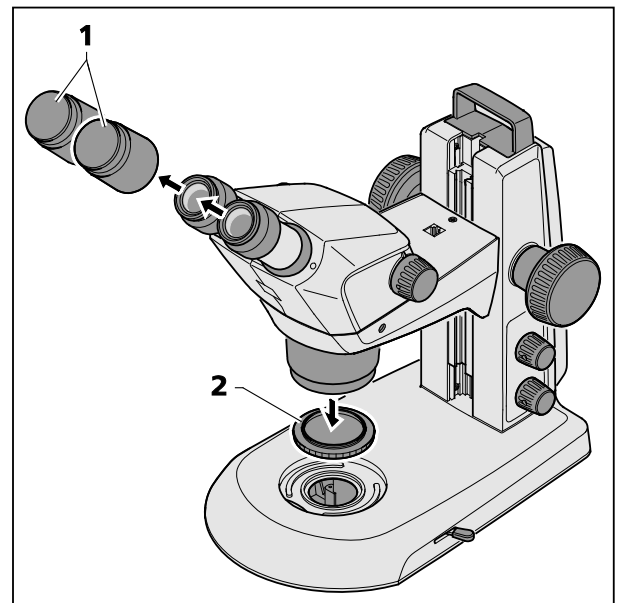


Fig. 9 Removing caps

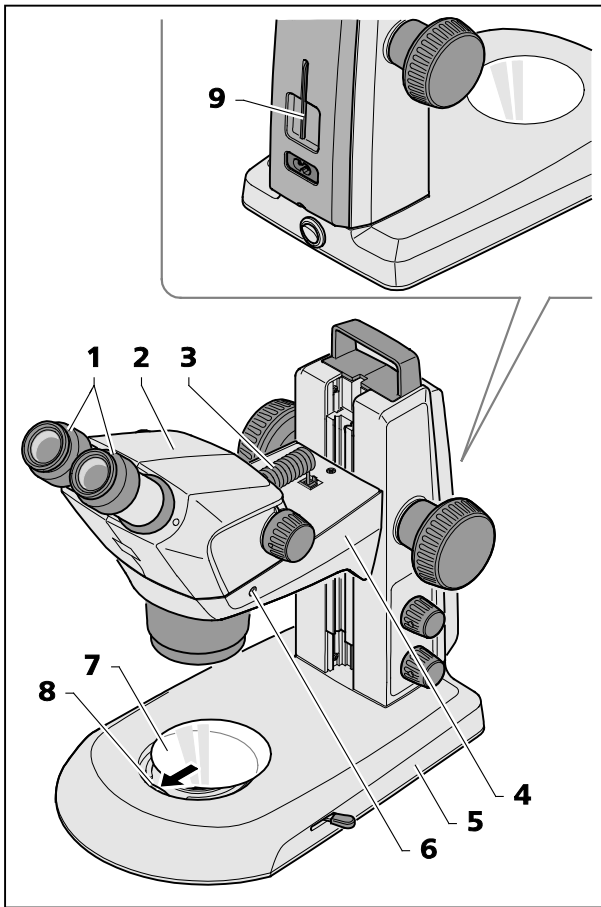


Fig. 10 Installing the stereo microscope

- Insert the connection cable (Fig. 10/3) supplied with the device into the socket on the Stemi body and in the socket on the Stemi mount.
- Insert glass plate or B/W plastic plate (Fig. 10/7) in the mount in the base of the stand. To this effect, press the glass plate or the B/W plastic plate against the spring (Fig. 10/8) and make it lock in.



Installation of an additional reflected-light illuminator has been described in Section 3.3.1 on page 23.

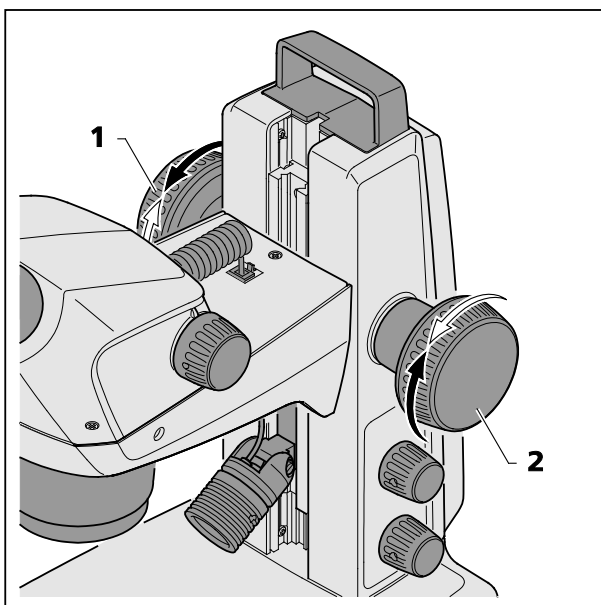


Fig. 11 Setting the ease of motion of the focusing drive



If necessary, the ease of motion of the focusing drive can be set as required on a case-by-case basis by adjusting the two focusing buttons (Fig. 11/1 and 2) in opposite directions.



The ease of motion must not be set so loosely that the drive moves downwards by itself. This might damage the microscope or the specimen.

### 3.3 Mounting optional components

#### 3.3.1 Mounting additional reflected-light illuminator

Various reflected-light illuminators can be used, depending on the case of application.

For fastening, defined interfaces have been provided on the microscope.

##### 3.3.1.1 Mounting spot illuminator K LED or double spot illuminator K LED

- Move the microscope body (Fig. 12/1) into its uppermost position via the focusing knob (Fig. 12/2).
- Insert the spot illuminator (Fig. 12/7) in the stand by sliding the holder (Fig. 12/5) into the stand guide (Fig. 12/4) from below and push it upwards into the required position.
- Plug the connection cable (Fig. 12/6) of the spot illuminator into the lower socket of the Stemi mount (Fig. 12/3).



The double spot illuminator is mounted in an analogical manner.

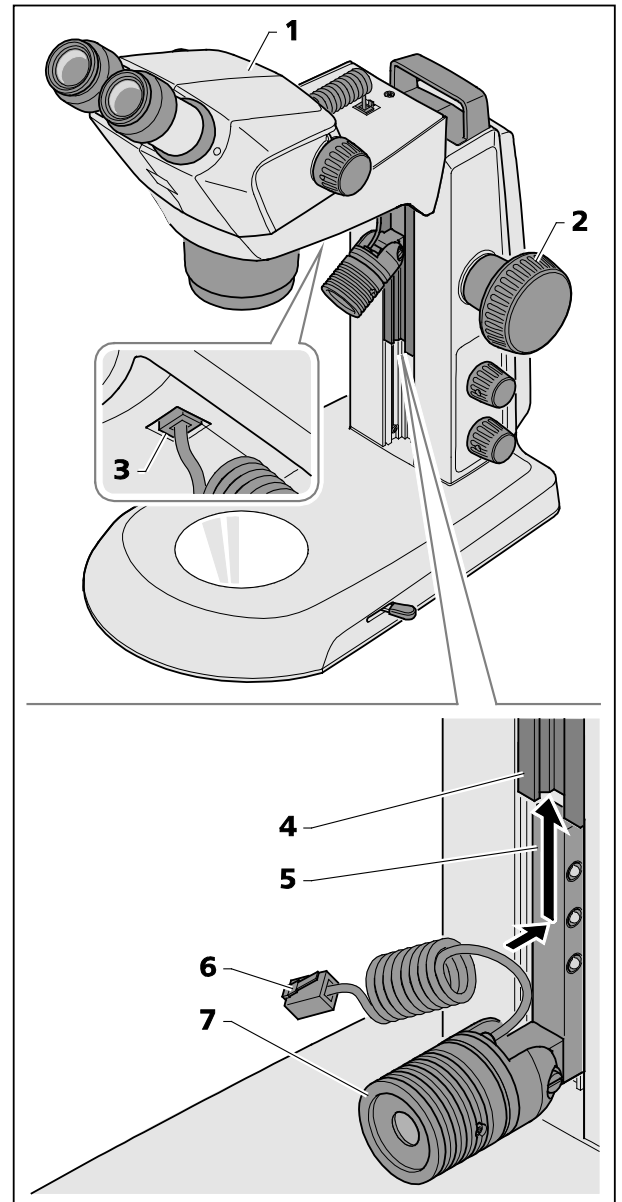
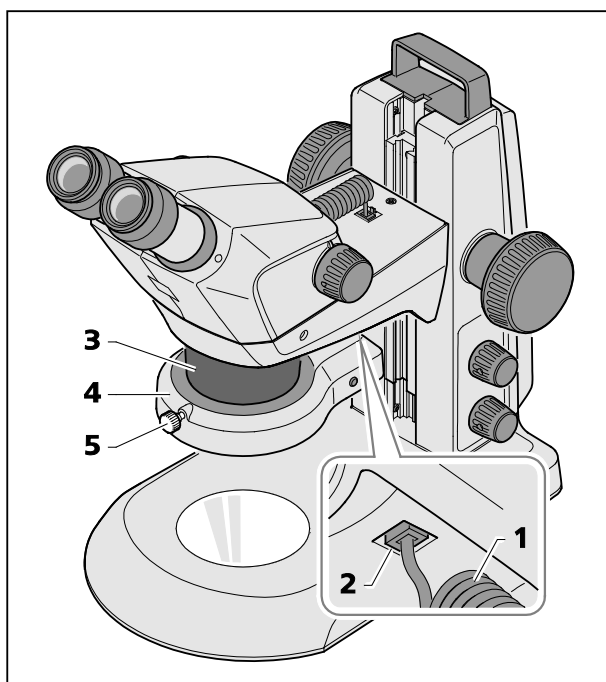


Fig. 12 Mounting spot illuminator

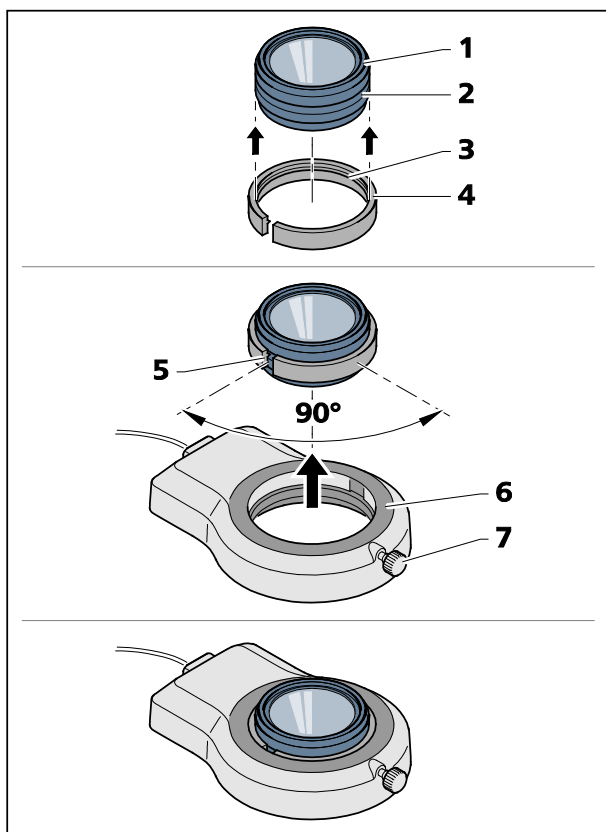


**Fig. 13** Mounting ring illuminator on microscope body

### 3.3.1.2 Mounting ring illuminator K LED (segmentable)

#### Mounting ring illuminator to microscope body

- Insert the connection cable (Fig. 13/1) of the ring illuminator (Fig. 13/4) into the lower socket (Fig. 13/2) of the Stemi mount and into the socket of the ring illuminator.
- Push ring illuminator onto the microscope body (Fig. 13/3) from below, and secure using the knurled screw (Fig. 13/5).



**Fig. 14** Mounting ring illuminator to front optics 3

#### Mounting ring illuminator to front optics 3

- Put the slotted adapter (Fig. 14/4) supplied with the device (OD 66 mm, ID 58 mm) onto the front optics (Fig. 14/1) from below. The circumferential bead (Fig. 14/3) inside the adapter must lock into the outer groove (Fig. 14/2) of the front optics.
- Push ring illuminator (Fig. 14/6) onto the AD of the adapter and secure it by means of clamping screw (Fig. 14/7).




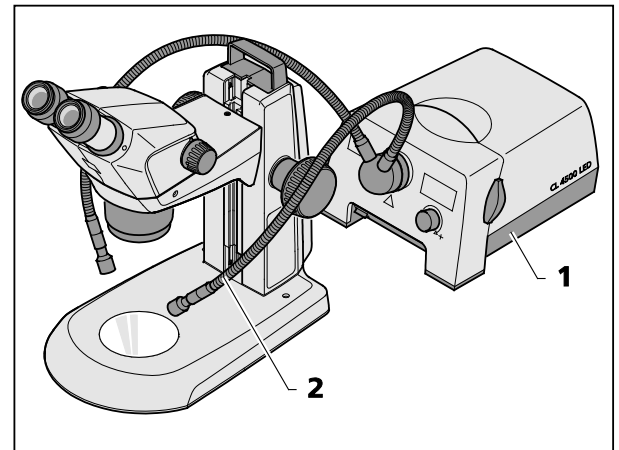
The best clamping effect is achieved if the slot (Fig. 14/5) of the adapter and the clamping screw (Fig. 14/7) of the illuminator are offset by approx. 90°.



### 3.3.1.3 External fiber-optic illumination

- Switch on external fiber-optic illumination (Fig. 15/1), adjust illumination intensity and set illumination by bending the two goose necks (Fig. 15/2) so that the specimen is optimally lit.

 To this effect, refer also to the separate operating instructions regarding the cold light source.



**Fig. 15** Mounting external fiber-optic illumination

### 3.3.1.4 Placing reversible eyepiece cup onto the eyepiece


The eyepieces feature rubber protection rings for spectacles to avoid the spectacles being scratched. These rings may be replaced at choice by reversible eye cups (Fig. 16/1).

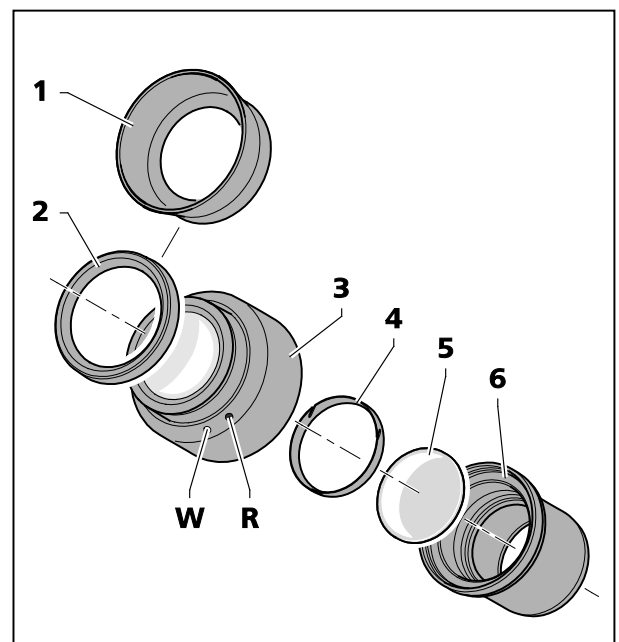
- To this effect remove the protection rings for spectacles (Fig. 16/2) from the eyepieces and position the eye cups (Fig. 16/1).

### 3.3.1.5 Insert the eyepiece plate into the eyepiece.

The adjustable eyepieces are intended for use with eyepiece plates.

- Unscrew stop (Fig. 16/6) out of the eyepiece (Fig. 16/3).
- Pull locking ring (Fig. 16/4) out.
- Insert eyepiece plate (Fig. 16/5).
- Insert locking ring and re-fasten stop.

 If eyepiece plates are inserted by the customer, it must be ensured that the writing is mirror-inverted before insertion into the eyepiece, and true to side after insertion.

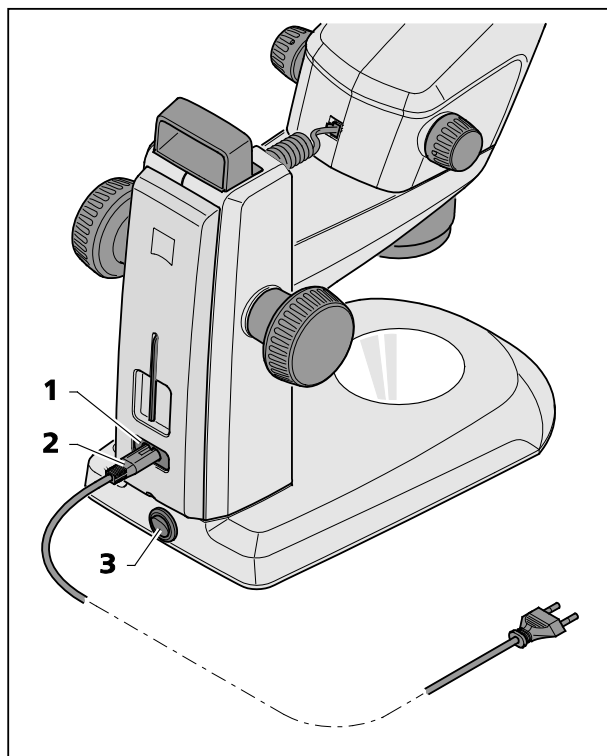


**Fig. 16** Inserting the eyepiece plate

 Fine cotton gloves should be worn to insert or replace eyepiece plates.

The slight image offset which is due to the additional glass distance is taken into account on the diopter scale by the zero position not being indicated by the white dot (Fig. 16/**W**), but by a red dot (Fig. 16/**R**).

 Eyepieces with pre-inserted eyepiece plates are available directly from ZEISS.



**Fig. 17** Connecting the stereo microscope

### 3.4 Connecting stereo microscope to the power supply

- Insert the mains cable (Fig. 17/**2**) in the mains supply socket (Fig. 17/**1**) of the stand.
- Connect the mains cable (Fig. 17/**2**) to a mains supply socket outlet.

### 3.5 Switching stereo microscope ON or OFF

- Use the power switch (Fig. 17/**3**) to switch the stereo microscope ON or OFF.



Safe disconnection from the power supply is ensured exclusively by removing the mains plug. The switch on the stereo microscope only switches into standby mode.




Do not replace detachable mains cables by inadequately designed mains cables. Only the specified power supply lines may be used.

## 4 OPERATION


### 4.1 Adjusting the stereo microscope


The stereo microscope has been connected and switched ON.

1. Place specimen (Fig. 18/7) centrally on the glass or plastic plate (Fig. 18/6) and illuminate it (Fig. 18/5).


 The functionality of the knob for the reflected-light illuminator has been described in Section 4.2 on page 28.

2. Set diopter compensation on the adjustable eyepieces (Fig. 18/1) to "0".

 "0" on white dot (without eyepiece plate). "0" on red dot (with eyepiece plate), see Fig. 19.

 Check that the eyepieces are inserted into the tube to their stop.

3. Set individual eye distance by shifting the eyepiece tube laterally (Fig. 18/2), until only **one** complete light circle (specimen field) is visible when looking into the eyepieces with both eyes.

 To this effect, a distance of approx. 2 cm must be maintained between the eye and the eyepiece.

4. Initially, set the zoom (Fig. 18/3) to the smallest magnification.


5. Focus on a small distinct detail in the center of the specimen (Fig. 18/4).

6. Adjust maximum zoom value (Fig. 18/3). Magnification will probably make the distinct detail appear blurred and no longer in the image center.

7. Sharpen the specimen by focusing, then shift the specimen to re-search for the detail and focus "sharply" again (Fig. 18/4).

8. Afterwards, reset to the lowest zoom value and correct any image blurring for each eye separately by diopter compensation **on the adjustable eyepieces** (not on the focusing knob, Fig. 18/4) (compensation of visual defect).

After adjustment of the stereo microscope, the image focus remains unchanged over the entire zoom range.

 After change of the observer, repeat steps **3. to 8.**

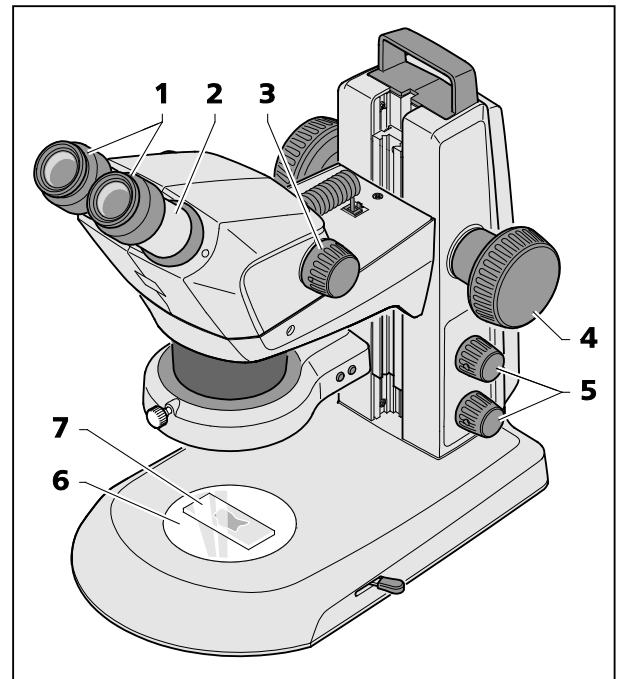


Fig. 18 Adjusting the stereo microscope

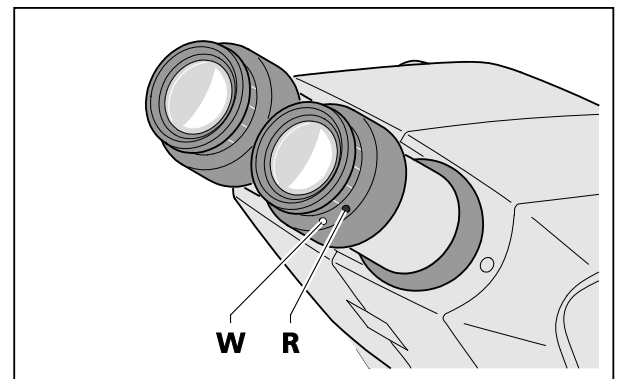
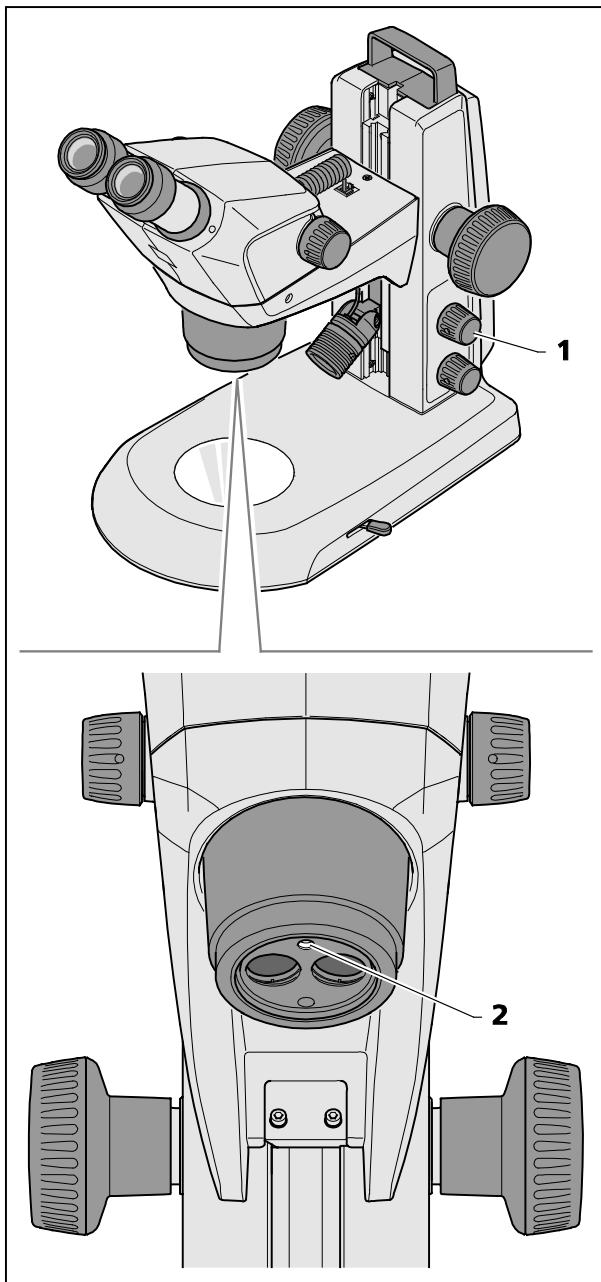


Fig. 19 Adjusting the eyepieces



**Fig. 20** Setting the vertical illuminator

## 4.2 Setting reflected-light illumination

### 4.2.1 Integrated vertical illuminator


Each Stemi 305 body features a vertical illuminator of its own.

If no second reflected-light illumination has been installed, the vertical illuminator is operated as described below:

- Press the knob (Fig. 20/1) once to switch the vertical illuminator (Fig. 20/2) alternately ON or OFF.
- Turning of the knob serves to adjust the illumination intensity.


If a second reflected-light illumination has been installed, the reflected-light illuminators are operated as described below:

- Press the knob successively to set four illumination states:
  1. Press: to switch the vertical illumination ON.
  2. Press: to switch the second reflected-light illuminator ON (vertical illumination OFF).
  3. Press: to switch both reflected-light illuminators ON.
  4. Press: to switch both reflected-light illuminators OFF.
- By turning the knob, the illumination intensity of the switched-ON reflected-light illuminator can be adjusted.


 When mixing both reflected-light illuminators, the intensity of the additionally installed reflected-light illuminator (spot illuminator, double-spot illuminator, ring illuminator, etc.) is adopted. In this case, only the vertical illumination is adjusted by turning the knob. Now, the required intensity of the vertical light is blended in with the reflected-light illuminator.

#### 4.2.2 Spot illuminator

- Push spot illuminator in the guide to the required height (Fig. 21/2).

 In the lower positions, an oblique light effect is created to produce cast shadows for enhancing surface structures.

- Set the angle (Fig. 21/1) via the pivot of the spot illuminator so that the object is optimally illuminated.
- Set size and brightness of the spot by axially shifting the focusing unit (Fig. 21/3) (illumination zoom).

 For switching the illumination intensity ON and OFF and adjusting the illumination intensity refer to Section 4.2.1, page 28.

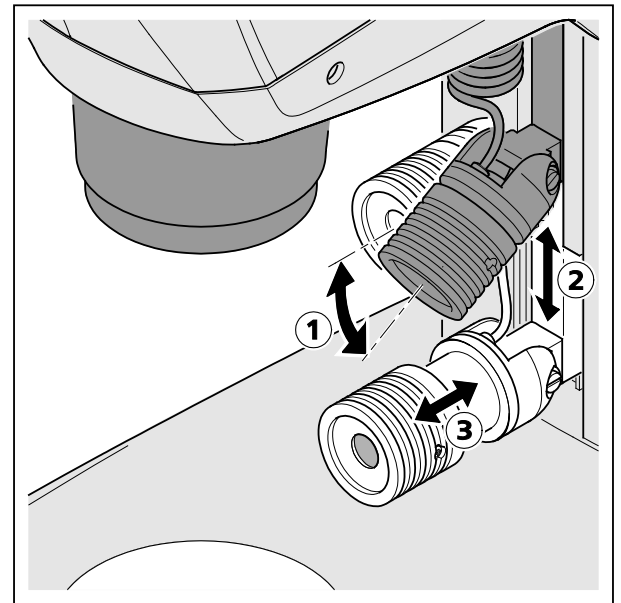




Fig. 21 Setting the spot illuminator

#### 4.2.3 Double spot illuminator

- Move the microscope body to its uppermost position via the focusing knob (Fig. 22/1). Push double spot illuminator (Fig. 22/2) to the required level within the guide.
- Bend the two goose necks (Fig. 22/3) to adjust the spots so that the specimen is optimally illuminated.

 For switching the illumination intensity ON and OFF and adjusting the illumination intensity refer to Section 4.2.1, page 28.

 Here again, an oblique light effect can be produced in the lower positions with the goose neck set horizontally.

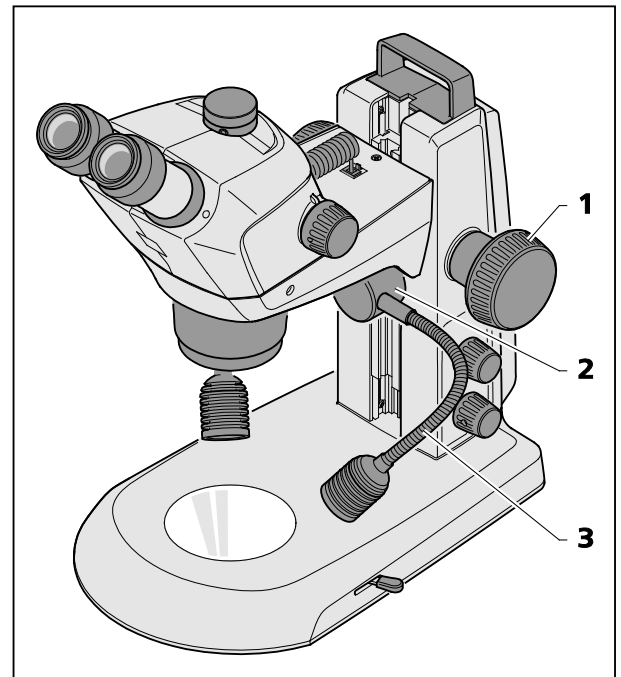

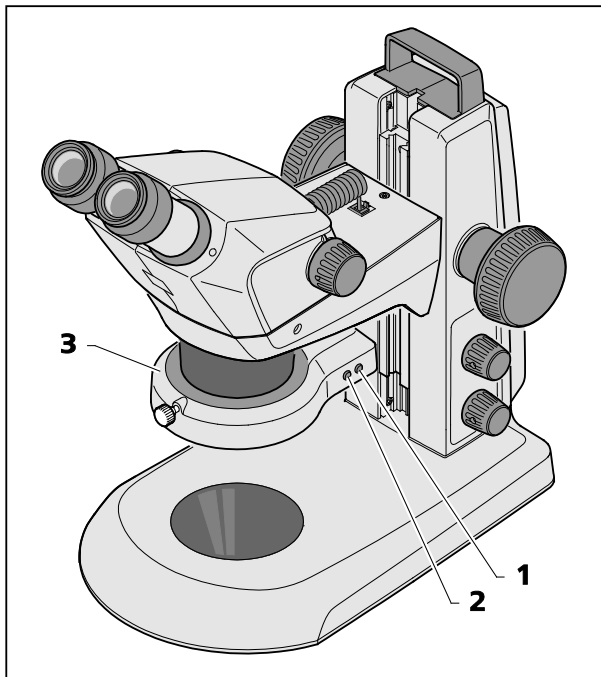



Fig. 22 Double spot illuminator

 The spot illuminator and the double spot illuminator have a thread M24 for placing polarization filters in front. The appropriate analyzer is screw-fastened in the M52x1.0 thread of the microscope body (Fig. 7/4).  
By turning the spot polarizers, overexposure reflexes on the specimen can be reduced.



**Fig. 23 Ring illuminator**

#### 4.2.4 Ring illuminator

- By pressing the front button (Fig. 23/2) successively, the user can change over between four illumination states of the ring illuminator (Fig. 23/3):
    1. Press: full circle
    2. Press: semi-circle
    3. Press: quadrant
    4. Press: two quadrants (opposite each other)
  - When switching the semi-circle or quadrant illumination ON, the specimen is first illuminated from the rear (from the direction of the stand column).
  - By pressing the rear button once briefly (Fig. 23/1), the adjusted segment is turned forward clockwise by one quarter turn in each case.
  - By pressing and keeping the rear button (Fig. 23/1) pressed for over 2 seconds, the adjusted segment is set into continuous rotation (rotation steps of 1/8 circle, 1 second per turn in each case).
  - By pressing the rear button once more (Fig. 23/1), rotation is stopped and the specimen is backlit again.
-  For switching the illumination intensity ON and OFF and adjusting the illumination intensity refer to Section 4.2.1, page 28.

#### 4.2.5 Controller K LED

The controller K (Fig. 24/4) is used to activate the vertical illumination of the Stemi 305 body or the ring illuminator in case of applications with boom stands A or U or additional stands.

- Mount the stands A and U including the fastening of the Stemi 305 body to the Stemi mount as described in the operating instructions for the boom stands.
- Screw-fasten front lens system 0.5x/185 mm (Fig. 24/9) to the microscope body.
- When using the ring illuminator, adapt the latter to the front lens system (Fig. 24/9) using the adapter supplied with the device (ID 58 mm, OD 66 mm).
- Secure the adhesive side of the magnetic plate (Fig. 24/7) to the swivel arm stand.
- Plug the connection cable supplied with the device (1 m long) (Fig. 24/2) into the socket (Fig. 24/8) on the microscope body or the ring illuminator and into the socket (Fig. 24/3) on the back of the Controller K (Fig. 24/4).
- Place Controller K (Fig. 24/4) next to the magnetic plate (Fig. 24/7).
- Connect Controller K to the power supply using the power unit (Fig. 24/1).
- Align swivel arm stand (Fig. 24/6) to enable an ergonomic working position.
- Turn the knob (Fig. 24/5) on the Controller K to switch the vertical illuminator (or the ring illuminator) ON and adjust illumination intensity by turning the knob.
- Place specimen in the illuminated specimen field.
- Set the stereo microscope to its initial setting, see Section 4.1 on page 27.

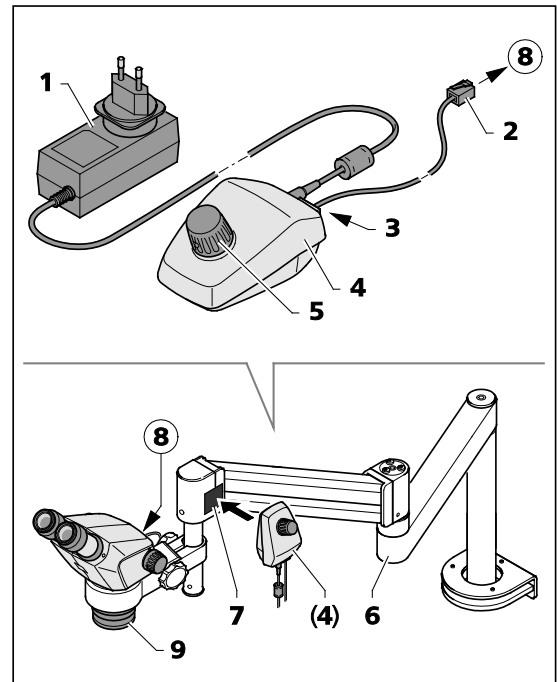
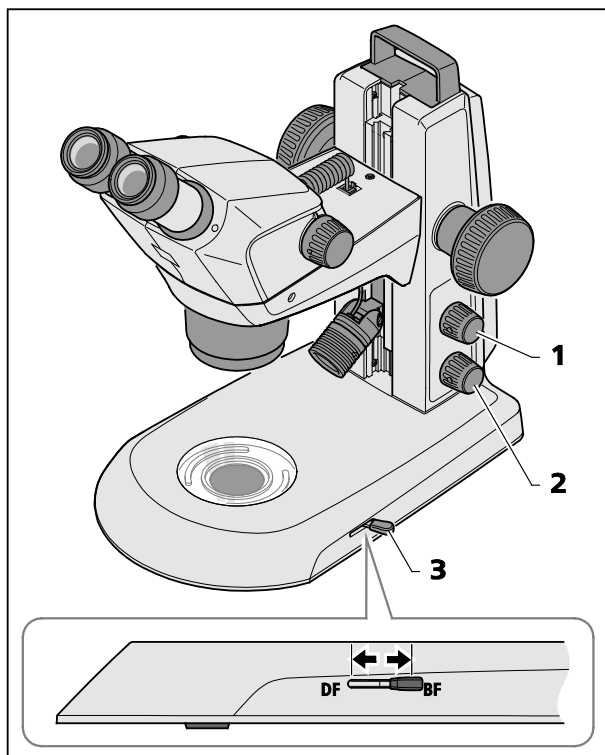


Fig. 24 Controller K LED



**Fig. 25** Transmitted-light module in stand K EDU

### 4.3 Transmitted-light illuminators

#### 4.3.1 Transmitted-light module in stand K EDU

- Switch transmitted-light illumination ON by pressing the lower knob (Fig. 25/2).
- With the transmitted light ON, turn this knob to adjust the illumination intensity.
- Change over by adjusting the lever (Fig. 25/3) between the bright field and the dark field illumination.
  - Front position: Dark field (DF)
  - Rear position: Bright field (BF)



Press the upper knob (Fig. 25/1) to blend in reflected light (see Section 4.2 on page 28).



#### 4.3.2 Transmitted-light unit in stand K LAB

- Switch transmitted-light illumination ON by pressing the lower knob (Fig. 26/1).
- With the transmitted light ON, turn this knob to adjust the illumination intensity.
- Adjust the bright field (BF) by pushing the sliding knob (Fig. 26/2) into its rear position (BF).
- Turn the sliding knob (Fig. 26/2) to swing the clear or diffuse mirror into position or to adjust the inclination angle.

- ☞ Clear mirror for high-contrast bright field, diffuse mirror for homogenous bright field.
- Change over to dark field illumination (DF) by pushing the sliding knob (Fig. 26/2) into its front position.
- Turn the mirror until the specimen structures are brightly lit against the dark background.

- ☞ By pushing the sliding knob (Fig. 26/2) into a central position and by tilting the mirror, oblique light effects (RC) are created which are very well suited to display non-coloured specimens.

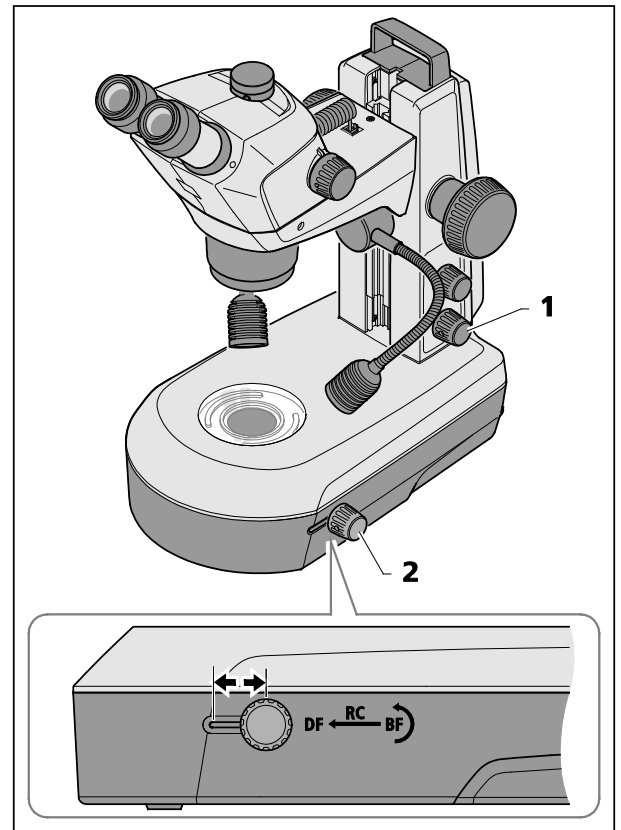


Fig. 26 Transmitted-light unit in stand K LAB

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## 5 CARE, MAINTENANCE AND SERVICE

### 5.1 Care

Care of the devices is restricted to the following operations:



The devices are not equipped with special equipment protecting them from corrosive, potentially infectious, toxic and radioactive or other samples that may be hazardous to health. If you handle such samples, be sure to observe all legal requirements, in particular the relevant national accident prevention regulations.



- Remove contamination in accordance with the national accident prevention regulations.
- Disconnect the devices from the mains power after use. Protect the devices from dust and moisture by using a suitable cover (protective device cover).
- Never expose the devices to inadmissible climate conditions (high humidity and temperature).



Disconnect the devices from the mains power before cleaning. Make sure, that no cleaning fluids penetrate into the device.

Tenacious impurities on glass surfaces such as fingerprints and traces of grease, are best removed using a cotton wool bud wound around a round wooden stick and very little distilled water or non-aggressive solvent:

- Distilled water: Clean glass surface with the slightly moistened cotton wool bud from the center to the edge, using circular movements.
- Cleaning solution for optics, consisting of 15 % isopropanol and 85 % surgical spirit (gasoline): Clean glass surface by the slightly moistened cotton wool bud from the center to the edge, using circular movements.
- Remove dust from optical surfaces using a brush with natural bristles or blow using rubber bellows (air blower).
- Clean plastic parts using commercially available cleaning products (no solvents!). Tenacious impurities can be treated carefully with benzine or white spirit.
- All labels on the components and on the desktop power unit may only be cleaned using a dry cotton cloth.

## 5.2 Maintenance

### 5.2.1 Replacing the power unit



Only the desktop power unit specified by the manufacturer may be used.



Make sure that the mains plug is removed from the socket before the instrument is opened.

- Remove the mains plug of the power cable from the socket.
- Remove the power cable from the back of the device.
- Use an Allen key to release the screw (Fig. 27/1) on the underside of the housing cover.
- Pull off housing cover (Fig. 27/2) slightly at the bottom, then press it upwards.
- Release the plug (Fig. 27/3) and remove the faulty desktop power unit (Fig. 27/4).
- Insert the new desktop power unit and connect the plug.
- Press the upper part of the housing cover into place and push housing cover down.
- Secure housing cover by means of the screw.
- Insert the power cable on the back of the device.
- Insert the mains plug into a mains supply socket.

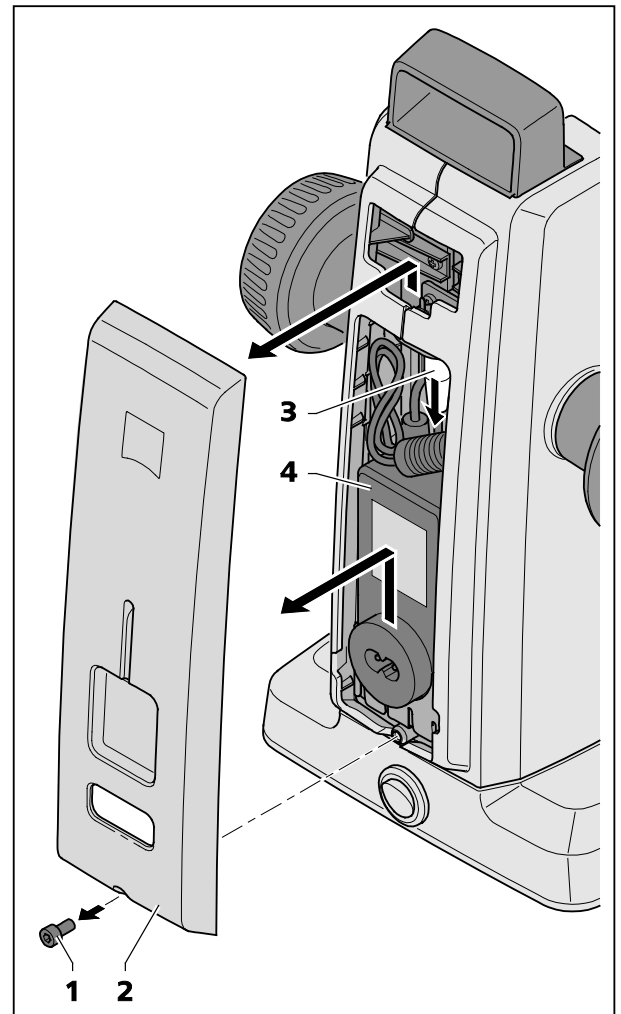
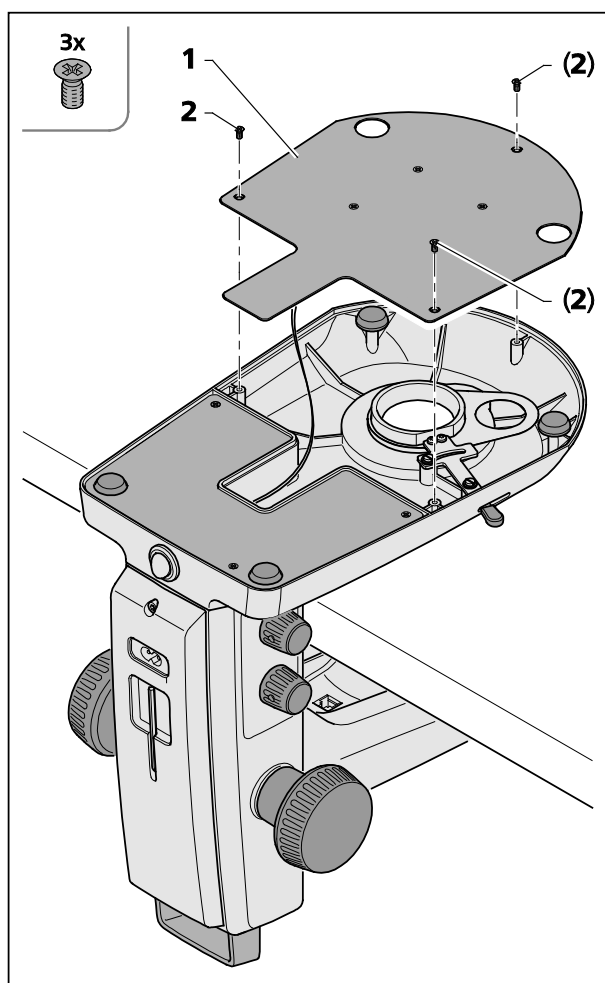


Fig. 27 Changing the power unit



**Fig. 28** Opening the stand cover plate,  
stand K EDU

### 5.2.2 Opening the stand cover plate, stand K EDU

The stand cover plate (Fig. 28/1) may be removed for cleaning or to remove any foreign matter which might have fallen in inadvertently.

- To this effect, release the three recessed head screws (Fig. 28/2), lift off the stand cover plate (Fig. 28/1) carefully and then put it aside.
- Make sure that the cable is not disconnected from the stand cover plate (Fig. 28/1).





To clean the LED board, use a soft lintfree cloth, a cotton wool bud wound around a round wooden stick or a brush with natural bristles, possibly moistened slightly in distilled water.

### 5.2.3 Opening the stand cover plate, stand K LAB

The transmitted-light base (Fig. 29/1) can be removed from the stand cover plate (Fig. 29/3) for cleaning or for removal of any foreign matter which might have fallen in inadvertently.

- Release the three screws (Fig. 29/2) from the stand cover plate (Fig. 29/1) using an Allen key SW 2.5 and put them aside.
- Carefully lift the stand cover plate (Fig. 29/3) off the transmitted-light base (Fig. 29/1) and put the stand aside.

 Make sure that the cable (Fig. 29/4) is not disconnected from the transmitted-light base (Fig. 29/1).

 To clean the LED, the optical elements and the mirror, use a soft lintfree cloth, a cotton wool bud wound around a round wooden stick or a natural hair brush, possibly moistened slightly in distilled water.

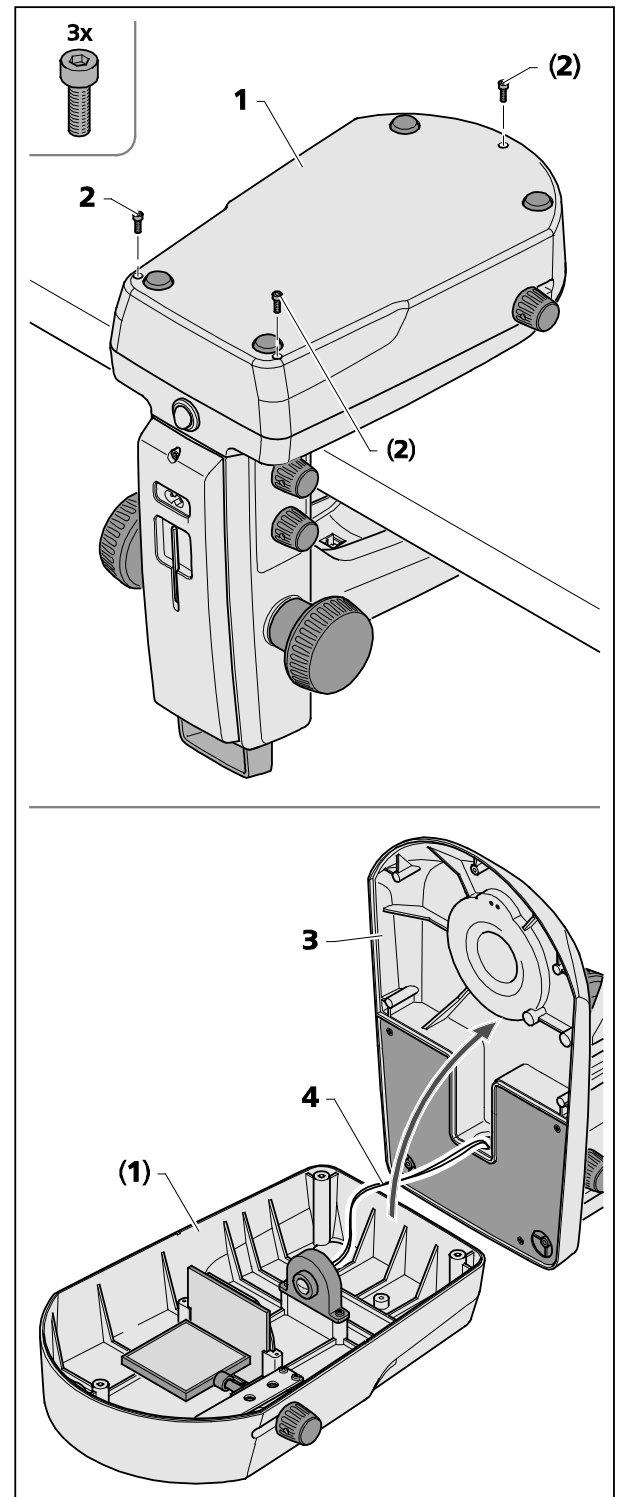


Fig. 29 Opening the stand cover plate, stand K LAB

**5.2.4 Wearing parts**

The following wearing parts can be ordered directly from ZEISS:

| Description   | Order No.       | Remark      |
|---|-----------------|-------------|
| Transparent glass plate, d = 84 mm  | 435425-9310-000 |             |
| S/W plastic plate, d = 84 mm  | 435425-9320-000 |             |
| Eyepiece PL 16x/16 Br foc.  | 444054-9000-000 |             |
| Eyepiece cup  | 444801-0000-000 | required 2x |
| Eyepiece 16x/14 Br foc.   | 435063-9160-000 |             |
| Eyepiece W 25x/10 foc.  | 455046-9901-000 |             |
| Set of small components consisting of: <ul style="list-style-type: none"> <li>- 2x spiral cables RJ 12</li> <li>- 1x cable RJ 12, length 1 m</li> <li>- 2x caps, eyepiece</li> <li>- 1x cap, microscope body</li> <li>- 1x Allen key, SW 3</li> <li>- 1x M6 clamping screw, microscope mount</li> <li>- 2x M6 clamping screws for C mount</li> <li>- 2x rubber rings, eyepiece</li> </ul> |                 |             |
| Protective dust cover, stand K  | 415500-1800-000 |             |
| Cover, C-mount Stemi 305 trino  |                 |             |

**5.3 Service**

All interventions in mechanical, optical and electronic internal stereo microscope components may only be performed by Carl Zeiss Service or by specifically **authorized** qualified staff.

To ensure your stereo microscope is optimally set and also operates correctly over an extended period of time, we recommend that you conclude a service/maintenance contract with ZEISS.

For reordering or in case of service, contact your nearest regional ZEISS representative.

#### **5.4 Product disposal**

The product was developed, tested and produced in accordance with the valid regulations and guidelines for environmental law of the European Union.

The product and its accessories comply with the EU-regulations 2011/65/EC (RoHS) and 2012/19/EC (WEEE), and the German Electrical and Electronic Equipment Act (ElektroG).

The product contains electronic components which must be disposed of according to the requirements of the 2002/19/EC WEEE Directive and not as domestic waste. In addition, the national regulations must be complied with.

For details on disposal and recycling please refer to your relevant ZEISS sales or service organization.

**6 APPENDIX****6.1 List of abbreviations**

|     |  |
|-----|--|
| BF  | Bright field   |
| CL  | Cold Light   |
| DIN | Deutsche Industrie-Norm (German Industrial Standard) |
| DF  | Dark field   |
| EN  | Europäische Norm (European Standard)                 |
| IEC | International Electrotechnical Commission            |
| IP  | Internal Protection (Type of enclosure)              |
| IvD | In-vitro diagnostics                                 |
| LED | Light Emitting Diode                                 |
| RC  | Relief contrast (oblique light)                      |
| S/W | Schwarz/weiß (black / white)                         |
| UV  | Ultra-violet   |



**6.2 Troubleshooting**

| <b>Description of fault</b>  | <b>Cause of error</b>  | <b>Troubleshooting</b>  |
|--|--|---|
| Stereo microscope illumination cannot be switched ON.                    | Power supply interrupted.<br>Power switch not switched ON                              | Check or establish connection to power supply. Switch power switch on back of stereo microscope ON.   |
|  | Power unit faulty.   | Replacing the power unit, see Section 5.2 on page 35  |
| Vertical reflected-light illumination is not lit.                        | Power supply cable RJ 12 not plugged in.   | Insert RJ plug correctly, see Section 3.2 or 3.3 on pages 21 and 23   |
| Additional reflected-light illuminators are not lit.                     | Power supply cable RJ 12 not plugged in.<br>Reflected light not switched ON or dimmed. | Insert RJ plug correctly, see Section 3.2 or 3.3 on pages 21 and 23<br>Press and turn knob Fig. 20/1 several times to switch reflected light ON and to increase its intensity; see Section 4.2 on page 28 |
| Transmitted-light illuminator does not light up                          | Transmitted light not switched ON or dimmed.   | Press and turn rotary / push-button Fig. 25/2 to switch illumination ON and to increase its intensity; see Section 4.3 on page 32   |
|  | Transmitted light not connected.   | Open stand K EDU or K LAB and according to Section 5.2.3 on page 37<br>connect the plug-in connectors of the LED illumination.  |
| Transmitted-light illuminator dirty or control lever cannot be actuated. | Liquids or foreign matter in the transmitted-light unit.                               | Open and clean stand K EDU or K LAB and eliminate foreign matter according to Section 5.2.3 on page 37  |
| Microscope mount moves down by itself.                                   | Focusing drive too easy to move.   | Set ease of motion of the focusing drive, see Section 3.2 on page 21  |

Should any other faults occur or should you have queries regarding troubleshooting, please contact your regional ZEISS representative.

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