

**SLX Series**

# INSTRUCTION MANUAL

Model
SLX-1
SLX-2
SLX-3
SLX-4
SLX-5

Ver. 2.4 2023



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## 1. Warning

This microscope is a scientific precision instrument designed to last for many years with a minimum of maintenance. It is built to high optical and mechanical standards and to withstand daily use. We remind you that this manual contains important information on safety and maintenance, and that it must therefore be made accessible to the instrument users. We decline any responsibility deriving from incorrect instrument use that does not comply with this manual.

## 2. Safety Information



### Avoiding Electrical Shock

Before plugging in the power supply, make sure that the supplying voltage of your region matches with the operation voltage of the equipment and that the lamp switch is in off position. Users should observe all safety regulations of the region. The equipment has acquired the CE safety label. However, users have full responsibility to use this equipment safely. Please follow the guidelines below, and read this manual in its entirety to ensure safe operation of the unit.

### 3. Package content

#### 3.1 SLX-1



- ① Microscope body
- ② Eyepieces
- ③ Microscope stand
- ④ Stage clips (one pair)
- ⑤ Dust cover
- ⑥ Power supply

#### 3.2 SLX-2 / SLX-3



- ① Microscope body
  - SLX-2: binocular
  - SLX-3: trinocular
- ② Eyepieces
- ③ Microscope stand
- ④ Stage clips (one pair)
- ⑤ Dust Cover
- ⑥ Power supply
- ⑦ Allen Wrench (SLX-3 only)
  - SLX-2: one (2mm)
  - SLX-3: two (2mm and 3mm)

### 3.3 SLX-4 / SLX-5



- ① Microscope body
  - SLX-4: binocular
  - SLX-4: trinocular
- ② Eyepieces

- ③ Overhanging stand
- ④ Focus
- ⑤ Dust cover
- ⑥ Allen wrench

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## 4. Unpacking

The microscope is housed in a moulded Styrofoam container. Remove the tape from the edge of the container and lift the top half of the container. Take some care to avoid that the optical items (objectives and eyepieces) fall out and get damaged. Using both hands (one around the arm and one around the base), lift the microscope from the container and put it on a stable desk.



Do not touch with bare hands optical surfaces such as lenses, filters or glasses. Traces of grease or other residuals may deteriorate the final image quality and corrode the optics surface in a short time.

## 5. Intended use

### Standard models

For research and teaching use only. Not intended for any animal or human therapeutic or diagnostic use.

### IVD Models

Also for diagnostic use, aimed at obtaining information on the physiological or pathological situation of the subject.

## 6. Symbols and conventions

The following chart is an illustrated glossary of the symbols that are used in this manual.



### CAUTION

This symbol indicates a potential risk and alerts you to proceed with caution.

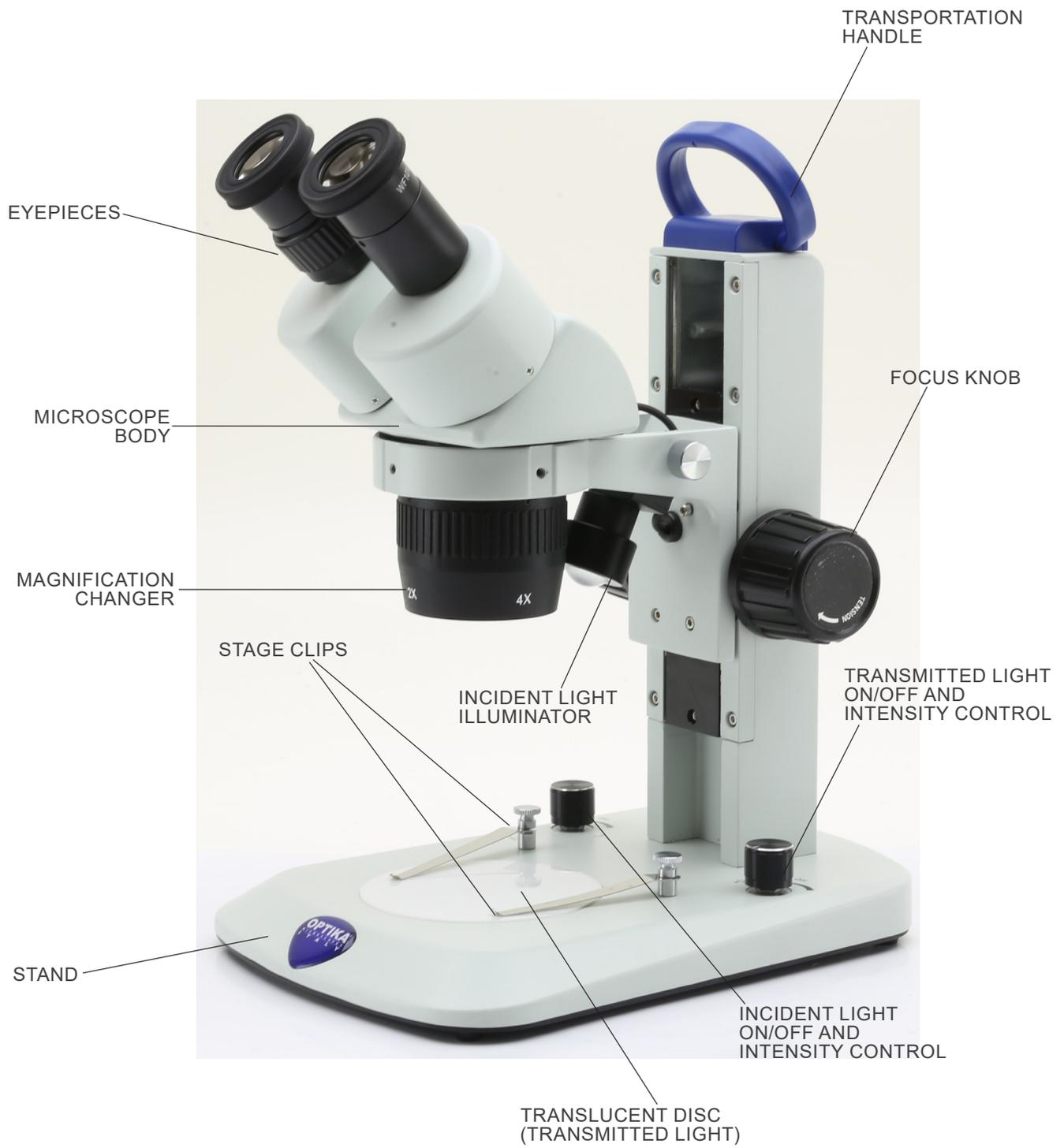


### ELECTRICAL SHOCK

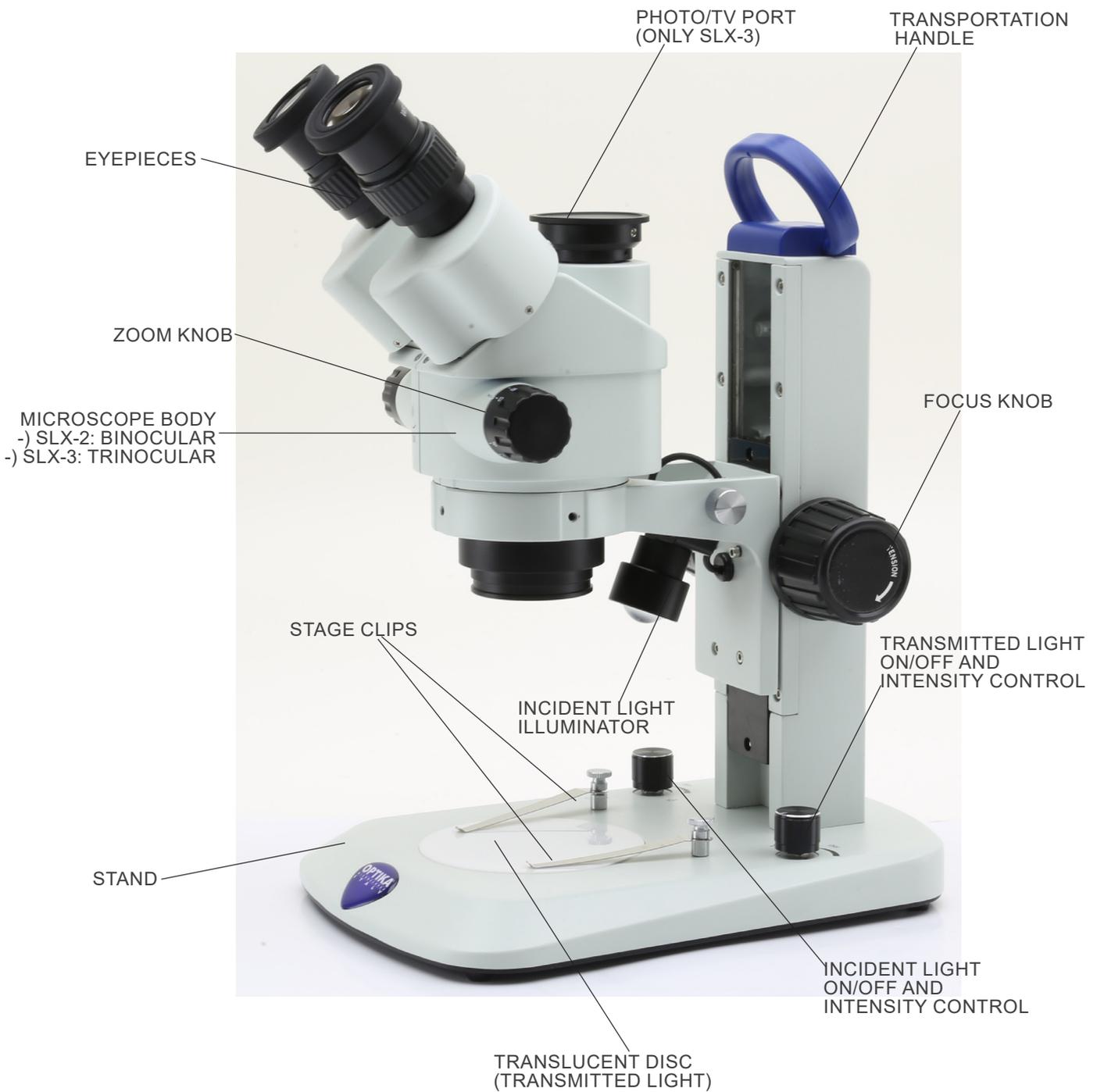
This symbol indicates a risk of electrical shock.

## 7. Instrument description

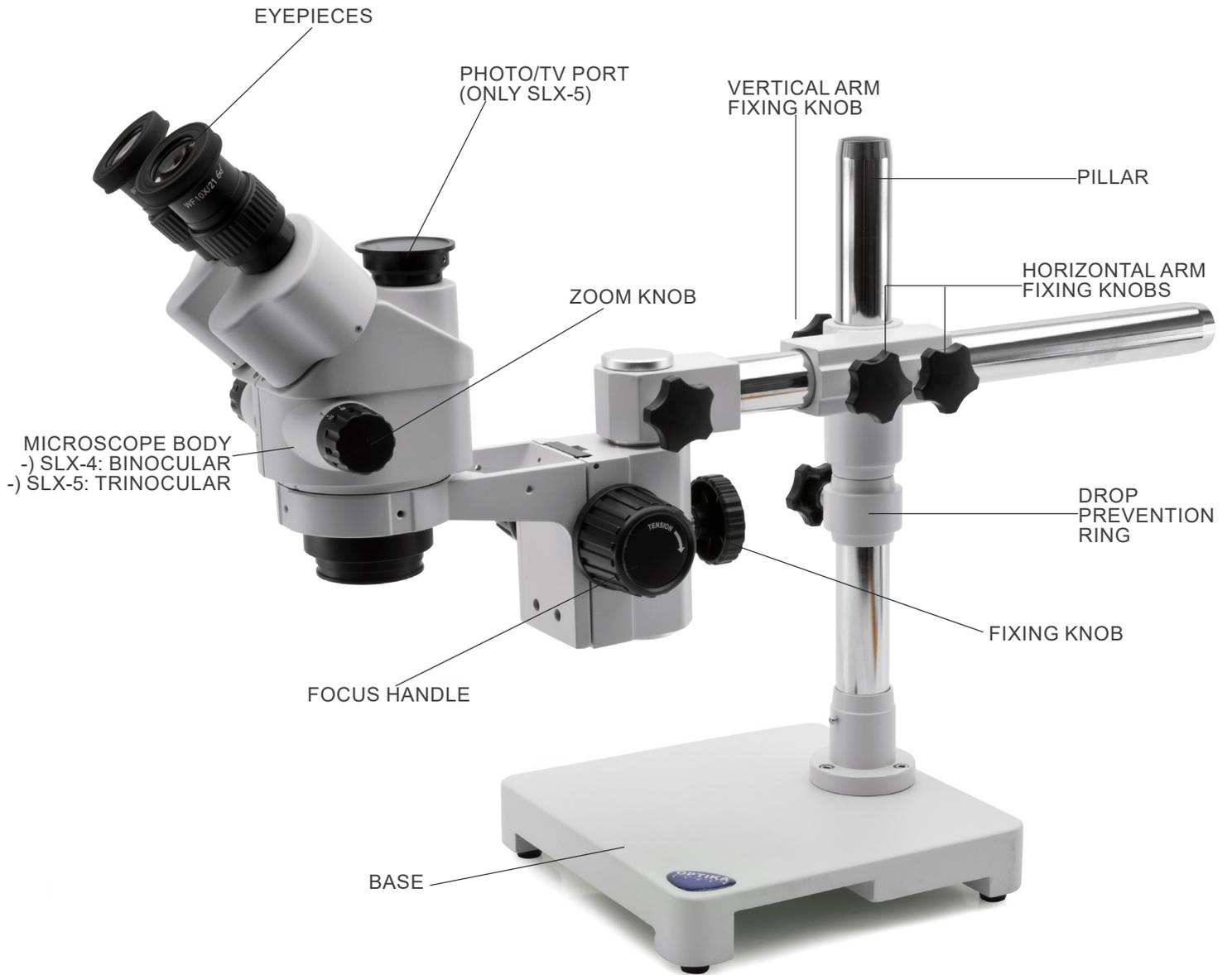
### 7.1 SLX-1



7.2 SLX-2 / SLX-3



7.3 SLX-4 / SLX-5



## 8. Assembly

### 8.1 Assembling procedure

#### 8.1.1 SLX-1 / SLX-2 / SLX-3

- The microscope is shipped from the factory without batteries.

1. Open the lid of the battery compartment. (Fig. 1)



2. Insert 3x AA NiMh 1.2V rechargeable batteries (respecting the polarity of each battery). (Fig. 2)
3. Close the lid.



4. Insert the microscope body in the holder. (Fig. 3)



5. Lock the fixing knob ①. (Fig. 4)



6. Remove the eyepieces dust caps and insert the eyepieces in the empty eyepiece sleeve. (Fig. 5)



7. Connect the jack of the power supply to the socket in the rear part of the microscope base. (Fig. 6)



### 8.1.2 SLX-4 / SLX-5

1. Screw the pillar on the base. (Fig. 7)



2. Tighten the screw to lock the pillar. (Fig. 8)



3. Insert the drop preventing ring and fix it at the desired height by screwing the fixing knob. (Fig. 9)



4. Insert the horizontal arm and secure it with the fixing screw ①. (Fig. 10 - 11)



5. Install the head holder. Unscrew the locking knob ③ and insert the arm for the focus support from above ② into the hole of the horizontal arm. (Fig. 12 - 13)
6. Once fully inserted, tighten the fixing screw ④ (Fig. 13)



7. Insert from below the focusing system, tighten the fixing screw ⑤ and re-tighten the locking knob ③ from below. (Fig. 14 - 15)
8. Install the microscope body as explained in chapter 8.1.1



## 9. Use of the microscope

### 9.1 Adjust interpupillary distance

1. Hold the right and left eyepiece tube with both hands and adjust the interpupillary distance by moving the two parts (Fig. 16) until one circle of light can be seen.
  - If two circles appear, the interpupillary distance is too big.
  - If two overlapped circles appear, the interpupillary distance is too small.



### 9.2 Focus

Put the sample to be observed on the stage plate and focus the sample using the focusing knobs of the stand ①. (Fig. 17)



### 9.3 Adjusting the tension of the focus knob

- **This adjustment allows to increase or decrease the tension of the knob by avoiding an involuntary descent of the microscope body under its own weight. Adjust the tension just above the point where the focus is stable.**
1. Grab the focus knobs with both hands and, holding left knob rotate the right one in the direction shown in Fig. 18 to increase the tension.
    - Tension increases or decreases according the sense of rotation of the right focus knob.



## 9.4 Diopter compensation

- **This compensation makes possible for people wearing glasses to adjust the microscope to their eyes and use the microscope without glasses.**
1. Put the zoom ② down to the lowest magnification and focus the specimen with the focusing knobs ③. (Fig. 19)
  2. Put the zoom to the maximum magnification and repeat the focusing.
  3. Return to the lowest magnification: the specimen will be out of focus.
  4. Adjust the diopter compensation ring of the right eyepiece ④ until the image of the right eyepiece is clear and sharp (Fig. 20). Repeat the procedure for the left eyepiece.
  5. Then, check the focus of the image for the whole zoom range. It should now be perfectly parfocal (focus is always maintained during the change of magnification).



## 9.5 Magnification

### SLX-1

1. Rotate the magnification changer ⑤ to insert the desired lens in the optical path. (Fig. 21)
- Rotation in clockwise direction will move from 2X to 4X lens.
  - Counterclockwise rotation will change from 4X to 2X.



### SLX-2 / SLX-3

1. Select the desired magnification by adjusting the zoom knob ⑥.
- Change the eyepieces and/or add an appropriate additional lens if necessary.
  - The microscope body is equipped with a “magnification lock” function that allows to obtain a precise setting of the desired magnification. Magnification lock can be activated or deactivated by operating with the provided Allen wrench in the hole ⑦ placed in front of the microscope body. (Fig. 22)



## 9.6 Use of additional lens

- Additional lenses can be used on models SLX-2 / SLX-3 / SLX-4 / SLX-5.
- Screw the desired additional lens on the microscope body. (Fig. 14)
  - Each additional lens has a specific Working Distance (see table below).
  - (SLX-2 / SLX-3 only): The stroke of the focus adapter could not compensate the different working distances of the several additional lenses.



Total magnification used can be calculated as:  
 Eyepiece magnification \* Zoom magnification \* Objective lens magnification.

Eyepiece	10X		15X		20X	
Field number	21		15		10	
Objective	Total mag.	F.O.V. (mm)	Total mag.	F.O.V. (mm)	Total mag.	F.O.V. (mm)
0,5X (W.D.165 mm)	3.5X-22.5X	59.99-9.32	5.25X-33.75X	28.57-4.44	7X-45X	14.28-2.22
0.75X (W.D. 114 mm)	5.25X-33.75X	40-6.21	7.87X-50.62X	19.06-2.96	10.50X-67.5X	9.52-1.48
1X (W.D. 100 mm)	7X-45X	29.99-4.66	10.5X-67.5X	10.95-2.22	14X-90X	7.14-1.11
1.5X (W.D. 47 mm)	10.50X-67.5X	20-3.10	15.75X-101.25X	9.52-1.48	21X-135X	4.76-0.74

### 9.6.1 Use of 0.5X additional lens (ST-085.1)

0.5X additional lens has a Working Distance of 165 mm and therefore the total stroke of the focus pillar cannot compensate. In order to let the 0.5X additional lens working properly (when used with SLX-2 / SLX-3 models), proceed as follows:

- Screw the additional lens on the microscope body as already described in chapter 9.6.
- Uninstall the microscope body from the head holder.
- Install the provided spacer ① in the head holder and screw the fixing knob ②. (Fig. 24)
- Re-install the microscope body onto the spacer and screw the fixing knob ③. (Fig. 25)
- Begin working normally.

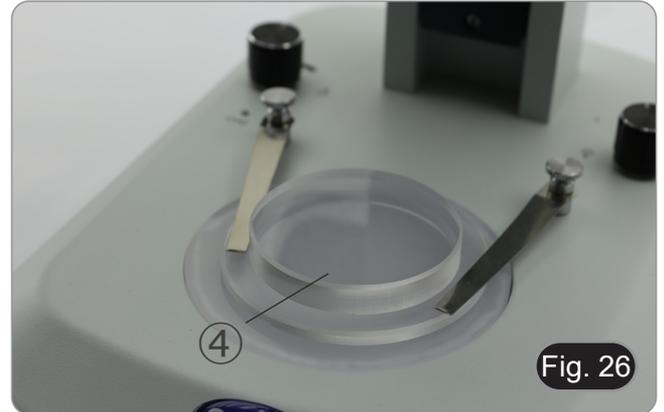


### 9.6.2 Use of 1.5X additional lens (ST-086.1)

1.5X additional lens has a Working Distance of 47 mm and, in case of very thin specimens (when working with SLX-2 / SLX-3 models), the microscope cannot get a proper focus.

In order to overcome this effect, the 1.5X lens is provided with a transparent spacer ④ that must be placed on the base plate (Fig. 26).

Once placed the transparent spacer, the user can put the specimen on the spacer and begin the observation as usual.



### 9.7 Use of illumination

1. Turn the transmitted light knob ⑤ in order to turn ON/OFF or to change the intensity of the transmitted light LED. (Fig. 27)
  2. Turn the incident light knob ⑥ in order to turn ON/OFF or to change the intensity of the incident light LED.
- It is possible to use both illuminations at the same time.



### 9.8 Use with rechargeable batteries

When the power supply is connected to the microscope socket, the "CHG" led ⑦ is lit. (Fig. 28)

RED light: battery with low charge or recharging  
GREEN light: battery charged.

- NOTE: when the power supply is disconnected, the CHG led is always off.



### 9.9 Use of eye shields

#### • Use with eyeglasses

Fold rubber eyeshields with both hands. Folded eyeshields avoid scratching the lenses of eyeglasses. (Fig. 29)



- **Use without eyeglasses**

Raise eye shields and observe at the microscope placing eyes to the shields, avoiding external light to disturb the observation. (Fig. 30)



## 9.10 Use of overhanging stand

### Moving the horizontal arm

1. Unlock the knob on the right side of the horizontal arm ①. (Fig. 31)



2. The arm can be extended or shortened according to specific needs. (Fig. 32)



### Swivel the head

1. Unlock the fixing knob ② and rotate the head to the desired swivel angle (left or right), then tighten the knob again. (Fig. 33)



### Rotating the horizontal arm

1. Loosen the horizontal arm fixing knob ② and rotate the arm, then tighten again the fixing knob. (Fig. 34)
  - **NOTE: 180° rotation of the microscope with respect to the base could cause a rollover of the entire system.**



## 10. Microphotography

### 10.1 Use of C-mount adapter

1. Loosen the clamping screw ① on the trinocular port and remove the dust cap ②. (Fig. 35)



2. Screw the C-mount adapter ③ to the camera ④ and insert the round dovetail of the C-mount into the empty hole of the trinocular port (Fig. 36), then tighten the clamping screw ①.



### 10.2 Use of Reflex cameras

1. Insert the Reflex adapter ① into the relay tube ②.
  2. Screw the "T2" ring ③ (not provided) to the reflex adapter.
  3. Connect the Reflex camera ④ to the "T2" ring just installed. (Fig. 37)
  4. Mount the other end of the relay tube ② into the empty hole of the trinocular port, then tighten the clamping screw. (Fig. 35)
- "T2" ring is not provided along with the microscope, but is commercially available.
  - While shooting dark specimens, darken eyepieces and viewfinder with a dark cloth to minimize the diffused light.
  - To calculate the magnification of the camera: objective magnification \* camera magnification \* lens magnification.
- **When using an SLR camera, mirror movement may cause the camera to vibrate.**
  - **We suggest lifting the mirror, using long exposure times and a remote cord.**



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## 11. Maintenance

### Microscopy environment

This microscope is recommended to be used in a clean, dry and shock free environment with a temperature of 5°-40°C and a maximum relative humidity of 75 % (non condensing). Use a dehumidifier if needed.

### To think about when and after using the microscope



- The microscope should always be kept vertically when moving it and be careful so that no moving parts, such as the eyepieces, fall out.
- Never mishandle or impose unnecessary force on the microscope.
- Never attempt to service the microscope yourself.
- After use, turn off the light immediately, cover the microscope with the provided dust-cover, and keep it in a dry and clean place.

### Electrical safety precautions



- Before plugging in the power supply, make sure that the supplying voltage of your region matches with the operation voltage of the equipment and that the lamp switch is in off- position.
- Users should observe all safety regulations of the region. The equipment has acquired the CE safety label. However, users do have full responsibility to use this equipment safely.

### Cleaning the optics

- If the optical parts need to be cleaned try first to: use compressed air.
- If that is not sufficient: use a soft lint-free piece of cloth with water and a mild detergent.
- And as a final option: use the piece of cloth moistened with a 3:7 mixture of ethanol and ether.
- **Note: ethanol and ether are highly flammable liquids. Do not use them near a heat source, near sparks or near electric equipment. Use these chemicals in a well ventilated room.**
- Remember to never wipe the surface of any optical items with your hands. Fingerprints can damage the optics.
- Do not disassemble objectives or eyepieces in attempt to clean them.

**For the best results, use the OPTIKA cleaning kit (see catalogue).**

If you need to send the microscope to Optika for maintenance, please use the original packaging.

## 12. Troubleshooting

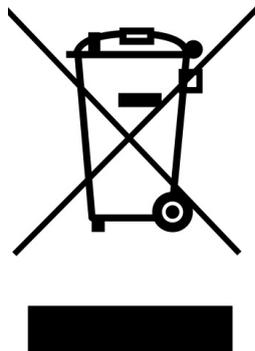
Review the information in the table below to troubleshoot operating problems.

PROBLEM	CAUSE	SOLUTION
<b>I. Optical Section:</b>		
The illumination is ON, but the field of view is dark.	The plug is not connected to the illumination	Connect the cable
	The brightness is too low	Adjust to a proper setting
The edge of the field of view is vignetted or the brightness is asymmetric.	The incident illuminator is not correctly oriented	Change the angle of the incident illuminator
Dust and stains can be seen in the field of view.	There are stains and dust on the specimen	Clean the specimen
	There are stains and dust on the eyepiece	Clean the eyepiece
Poor image quality: <ul style="list-style-type: none"> <li>The image is not sharp</li> <li>The contrast is not high</li> <li>The details are not clear</li> </ul>	The lenses (additional lens, objective, eyepieces) are dirt	Thoroughly clean all the optical system
One side of the image is out of focus.	The specimen is out of place (tilted)	Place the specimen flat on the stage.
<b>II. Mechanical Section:</b>		
The focus knob is hard to turn.	The tension adjustment collar is too tight	Loosen the tension adjustment collar
The focus is unstable.	The tension adjustment collar is too loose	Tighten the tension adjustment collar
<b>III. Electric Section:</b>		
The LED doesn't turn on.	No power supply	Check the power cord connection
The brightness is not enough	The brightness adjustment is low	Adjust the brightness
The light blinks	The power cord is poorly connected	Check the power cord
<b>IV. Viewing tube assembly:</b>		
The field of view of the two eyes is different	The interpupillar distance is not correct	Adjust the interpupillar distance
	The diopter correction is not right	Adjust the diopter correction
	The viewing technique is not correct, and the operator is straining the eyesight	When look into the eyepieces, do not stare at the specimen but look at the whole field of view. Periodically, move the eyes away to look at a distant object, then back into the eyepieces
<b>V. Microphotography and video:</b>		
The image is unfocused	Incorrect focusing	Adjusting the focus system as in the present manual
Bright patches appear on the image	Stray light is entering the microscope through the eyepieces	Cover the eyepieces and the viewfinder with a dark cloth

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## Equipment disposal

Art.13 Dlsg 25 July 2005 N°151. "According to directives 2002/95/EC, 2002/96/EC and 2003/108/EC relating to the reduction in the use of hazardous substances in electrical and electronic equipment and waste disposal."



The basket symbol on equipment or on its box indicates that the product at the end of its useful life should be collected separately from other waste. The separate collection of this equipment at the end of its lifetime is organized and managed by the producer. The user will have to contact the manufacturer and follow the rules that he adopted for end-of-life equipment collection. The collection of the equipment for recycling, treatment and environmentally compatible disposal, helps to prevent possible adverse effects on the environment and health and promotes reuse and/or recycling of materials of the equipment. Improper disposal of the product involves the application of administrative penalties as provided by the laws in force.

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