OPTIKA®
ITALY

SZ Series

INSTRUCTION MANUAL

Model
SZX-B
SZX-T
SZX-BA
SZX-TA
SZO-B
SZO-T
SZ-A1
SZ-A6
SZ-ST1
SZ-ST2
SZ-ST3
SZ-ST7
SZ-ST8
SZ-STL1
SZ-STL2
SZ-STLX

Ver. 1.0 2019

CE

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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 uses that does not comply with this manual.

2. 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.

3. 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.

4. Intended use

Standard models

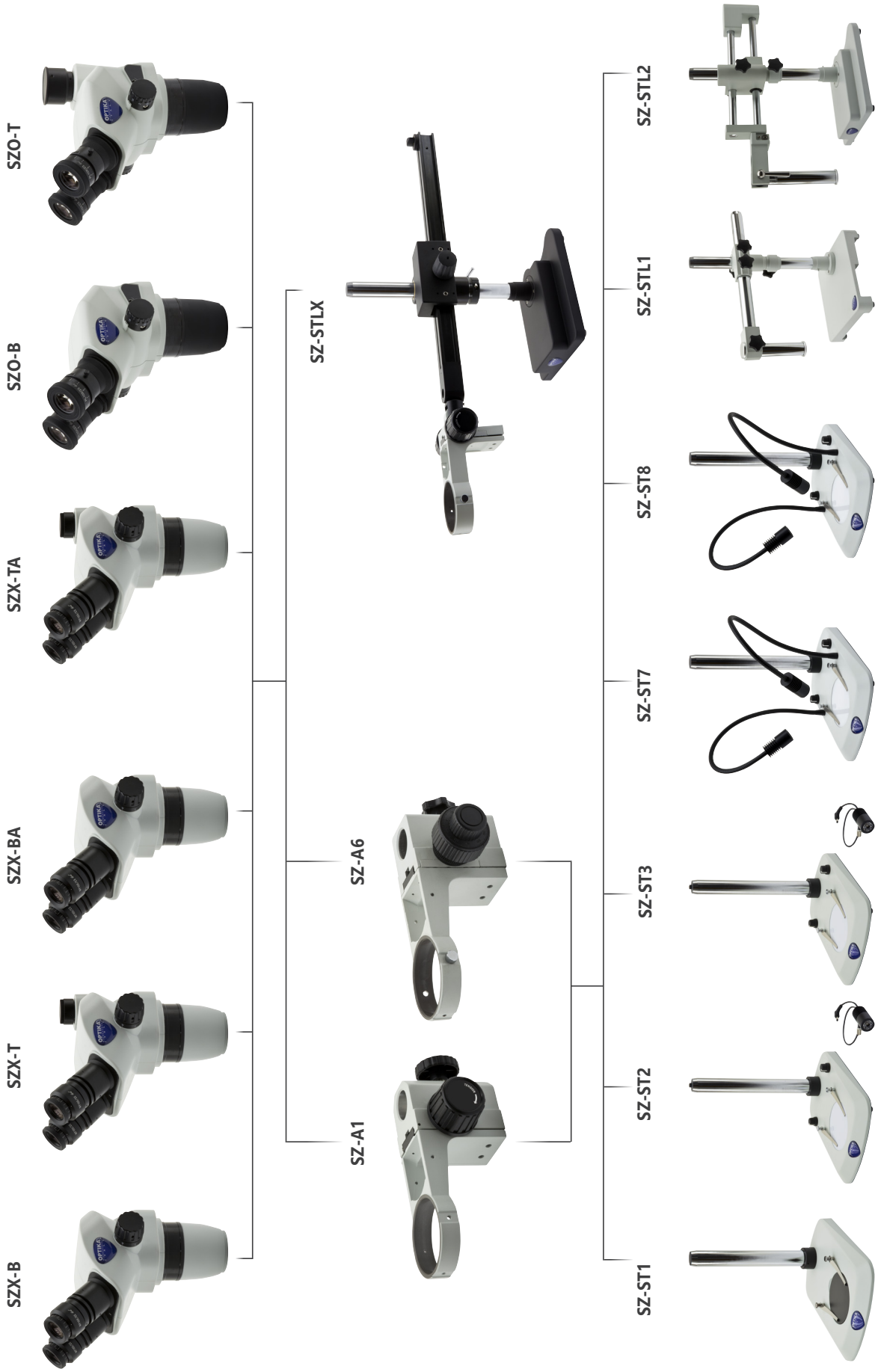
For research and teaching use only. Not intended for any animal or human therapeutic or diagnostic use.

IVD Models

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

5. Overview

5.1 System Diagram

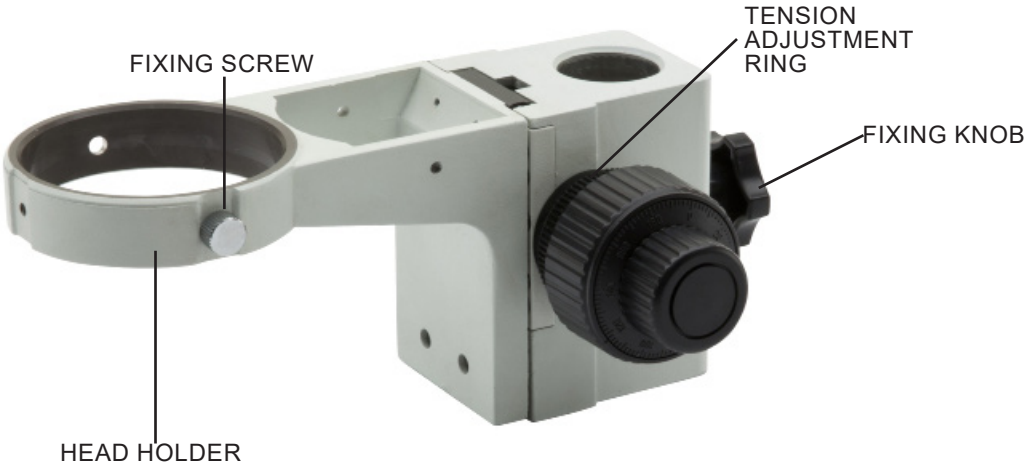


5.2 SZX-B / SZX-T - SZX-BA / SZX-TA

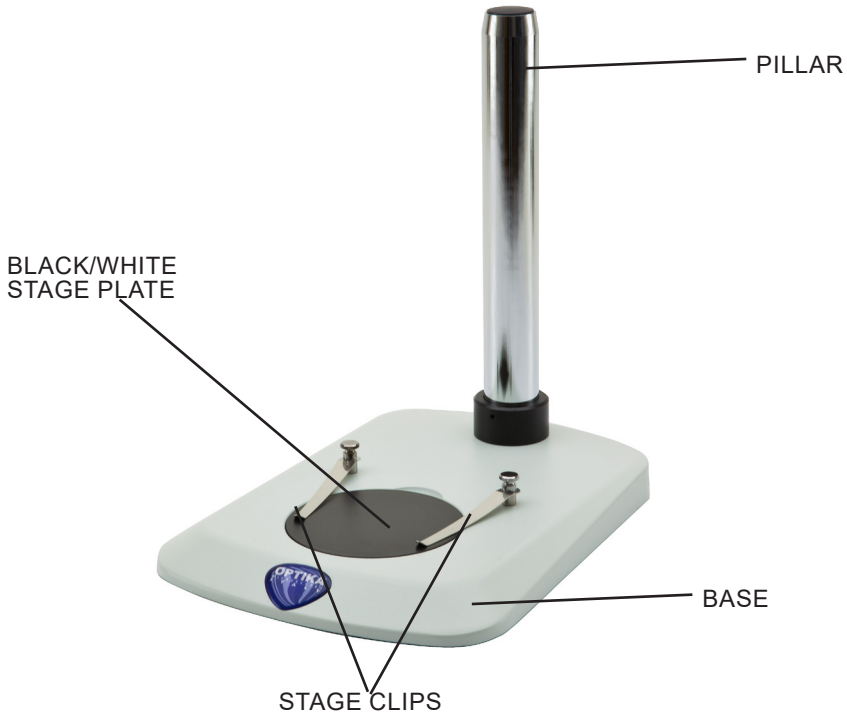
5.3 SZO-B / SZO-T

5.4 SZ-A1

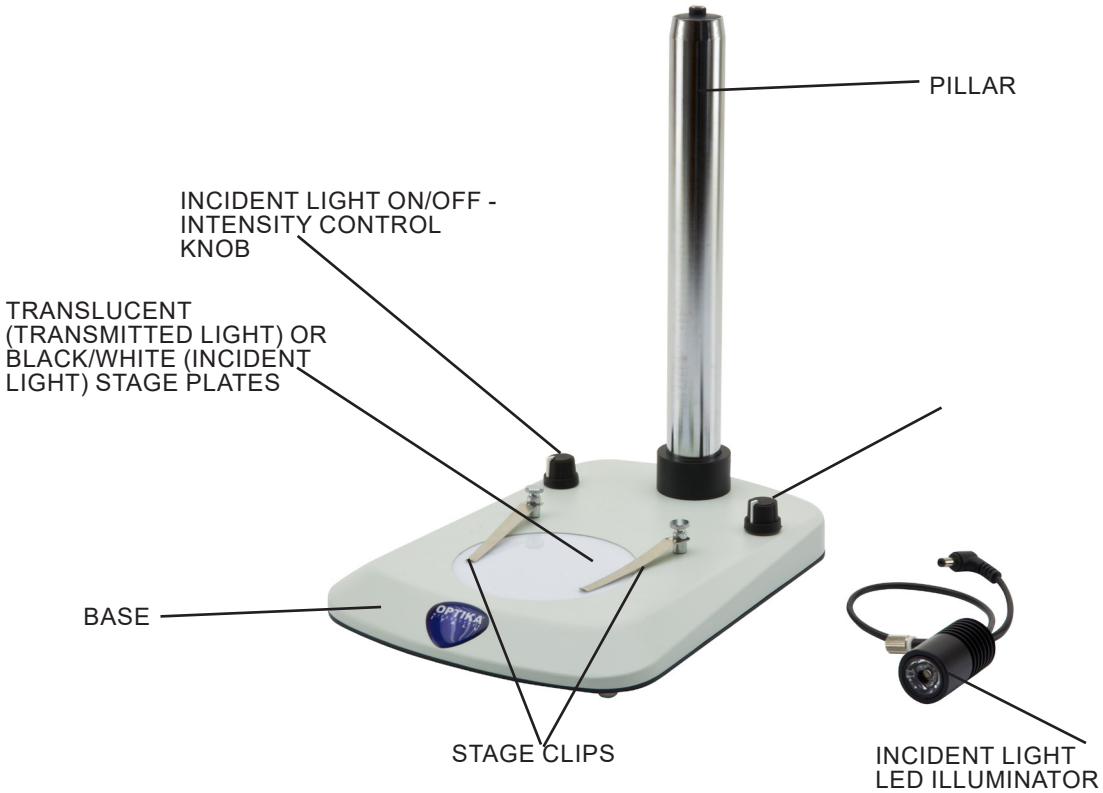
5.5 SZ-A6



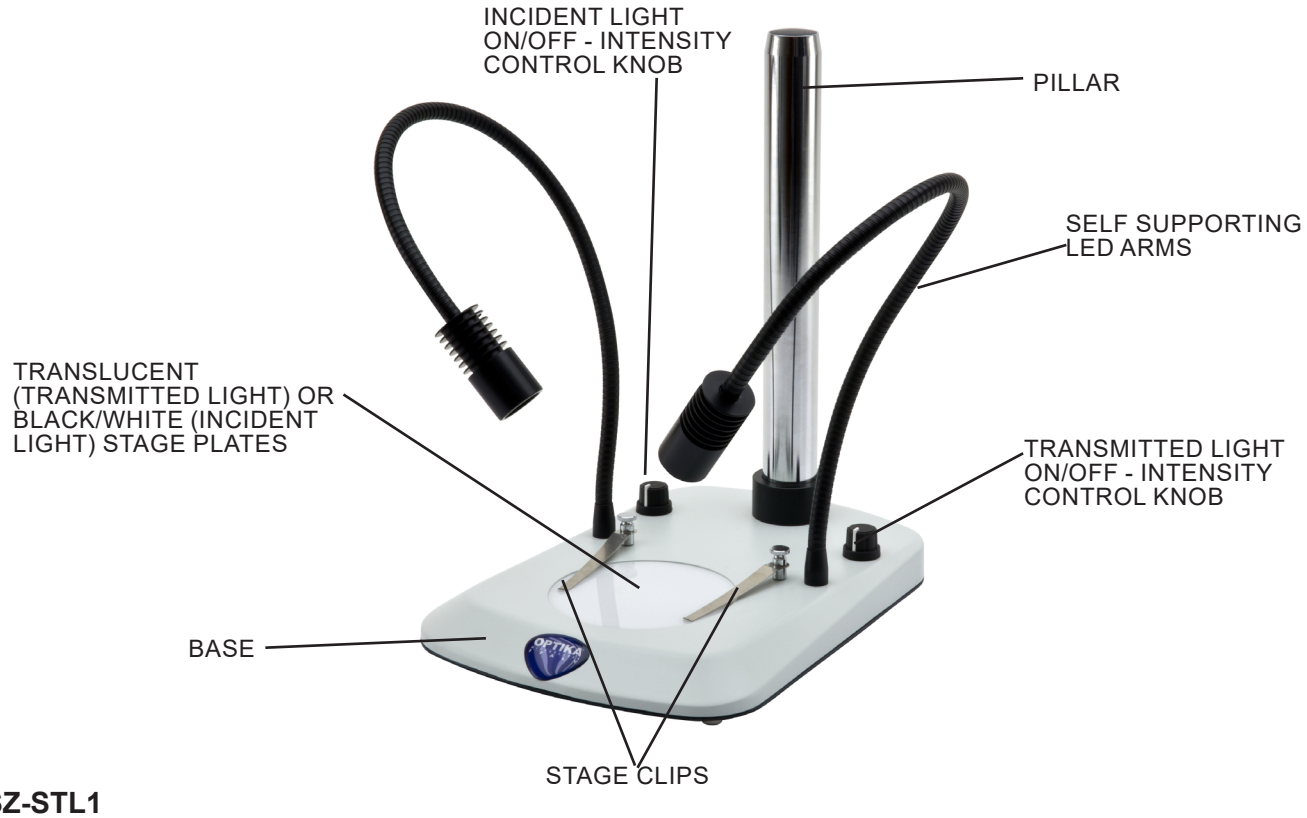
5.6 SZ-ST1



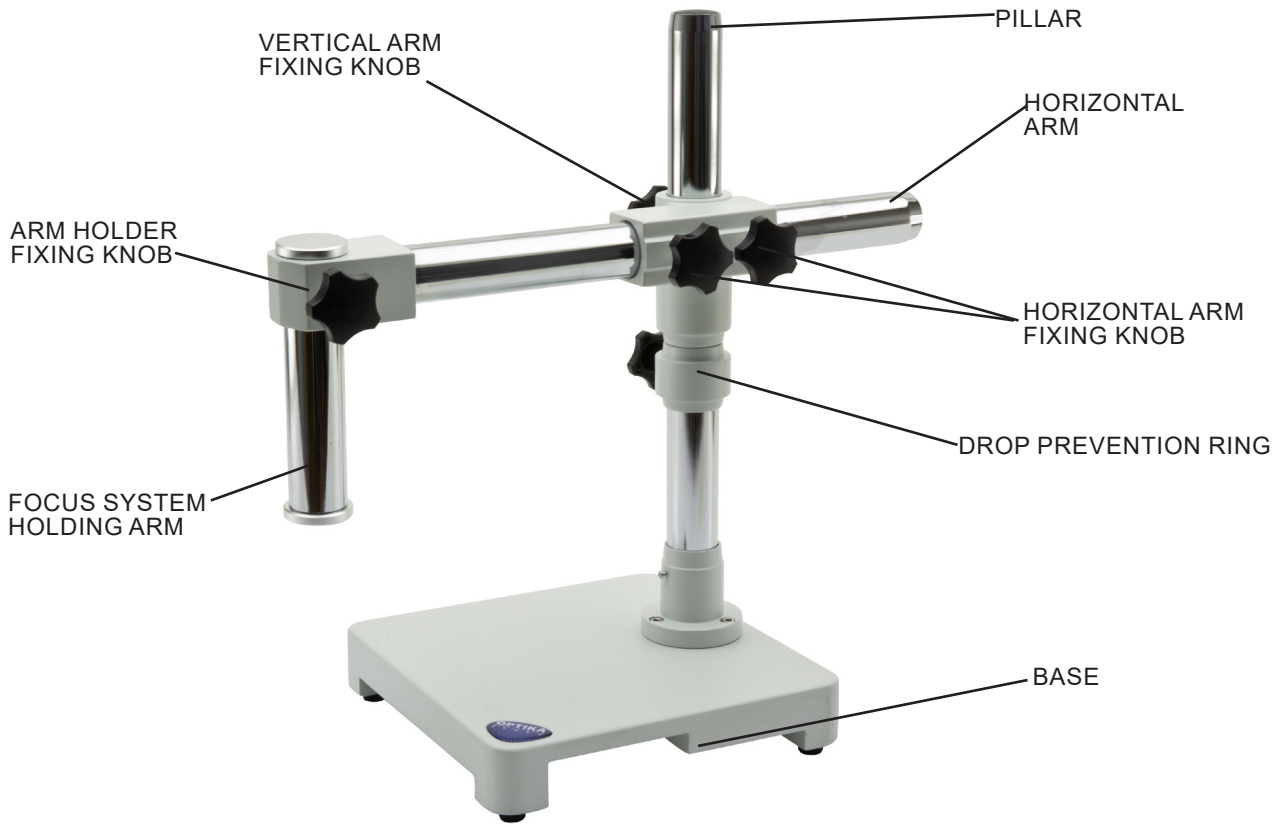
5.7 SZ-ST2 / SZ-ST3



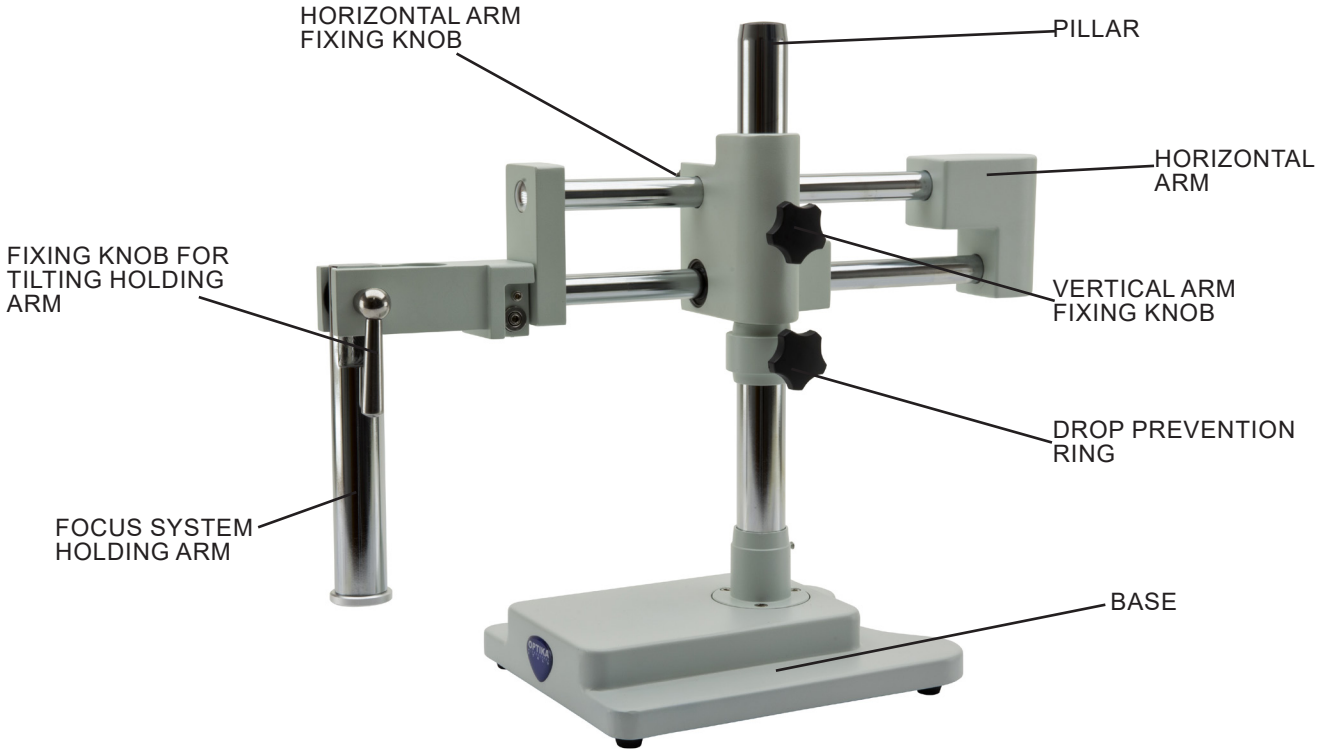
5.8 SZ-T7 / SZ-T8



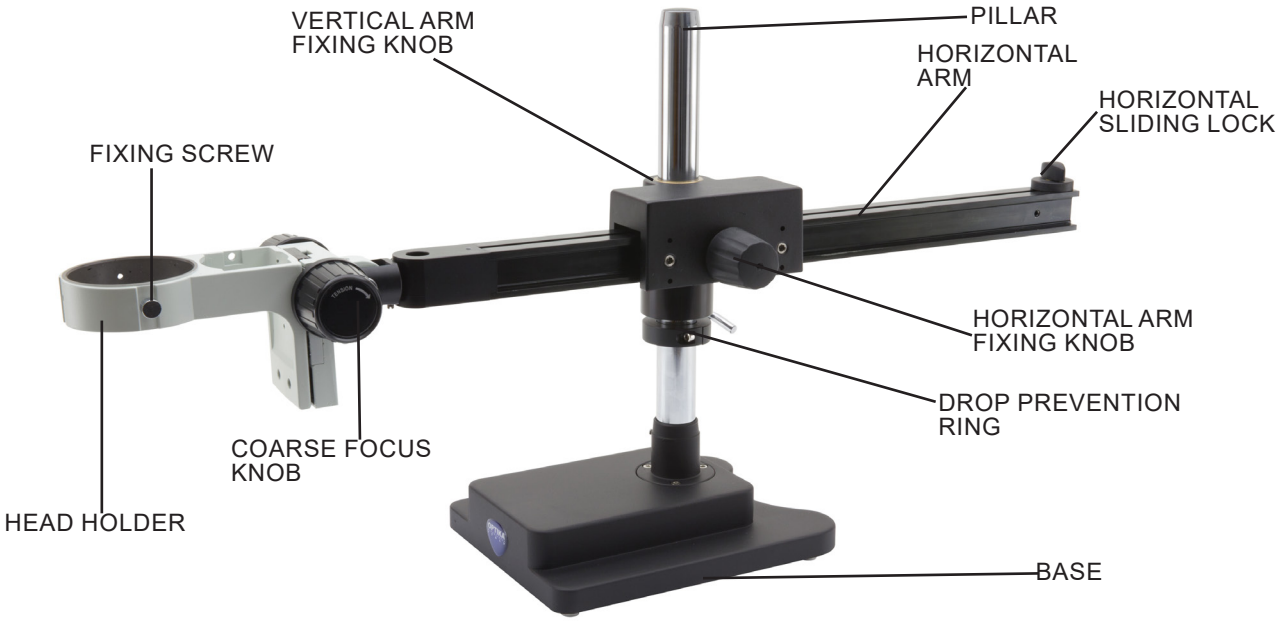
5.9 SZ-STL1



5.10 SZ-STL2



5.11 SZ-STLX



6. 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.

7. Assembling

Once opened the box, the microscope parts are the following:

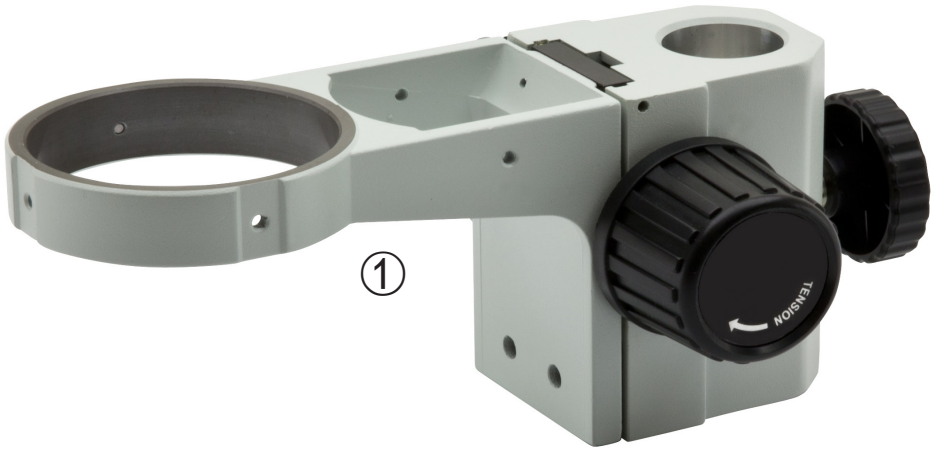
7.1 SZX-B / SZX-T - SZX-BA / SZX-TA

① Microscope body
(SZX-B/BA Binocular) / SZX-T/TA Trinocular)
② Eyepieces
③ Allen wrenches (only for SZX-T/TA)
④ Dust cover
⑤ Ring for photo port (only for SZX-T/TA)

7.2 SZO-B / SZO-T

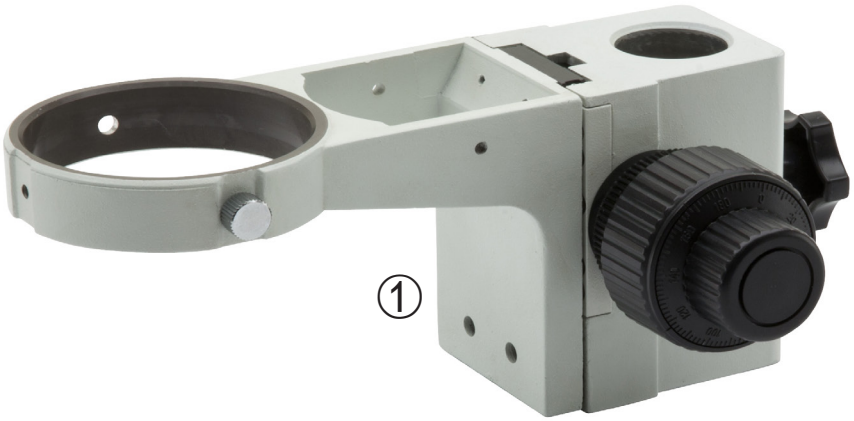
① Microscope body
(SZO-B Binocular) / SZO-T Trinocular)
② Eyepieces
③ Allen wrenches (only for SZO-T)
④ Dust cover
⑤ Photo tube (only for SZO-T)

7.3 SZ-A1



① Coarse focus system

7.4 SZ-A6



① Coarse/fine focus system

7.5 SZ-ST1

① Base
② Stage clips (one pair)
③ Black/white plate

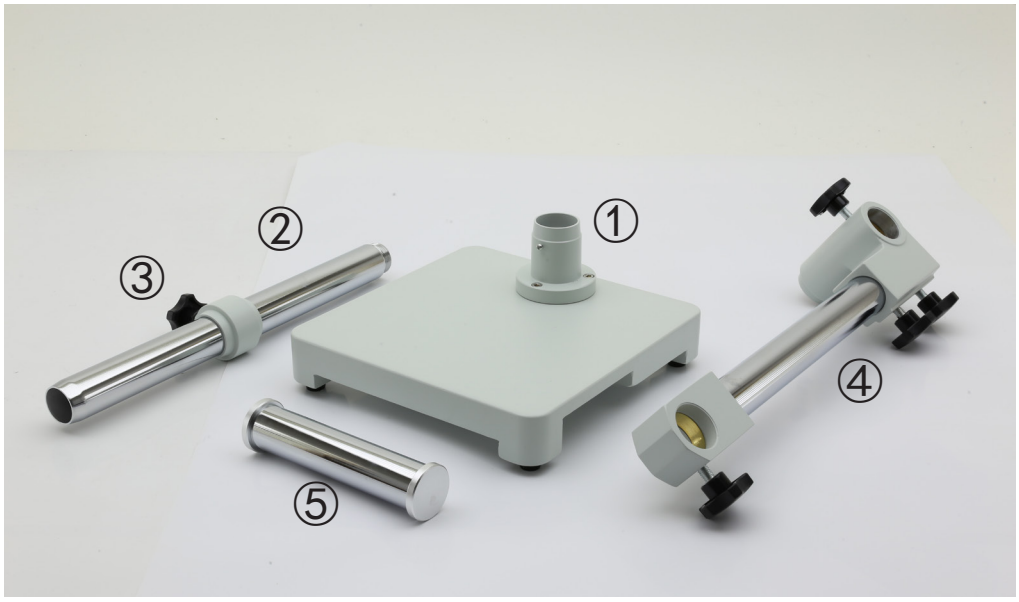
7.6 SZ-ST2 / SZ-ST3

① Base
② Transparent disc
③ Stage clips (one pair)
④ Incident light illuminator
⑤ Black/white plate
⑥ Power supply

7.7 SZ-ST7 / SZ-ST8

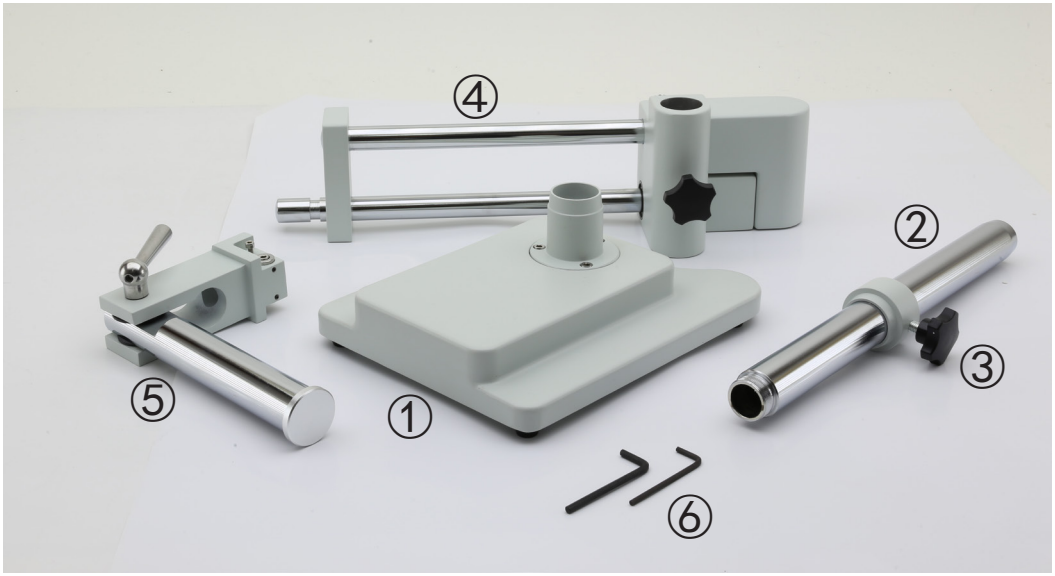
① Base
② Transparent disc
③ Stage clips (one pair)
④ Black/white plate
⑤ Power supply

7.8 SZ-STL1



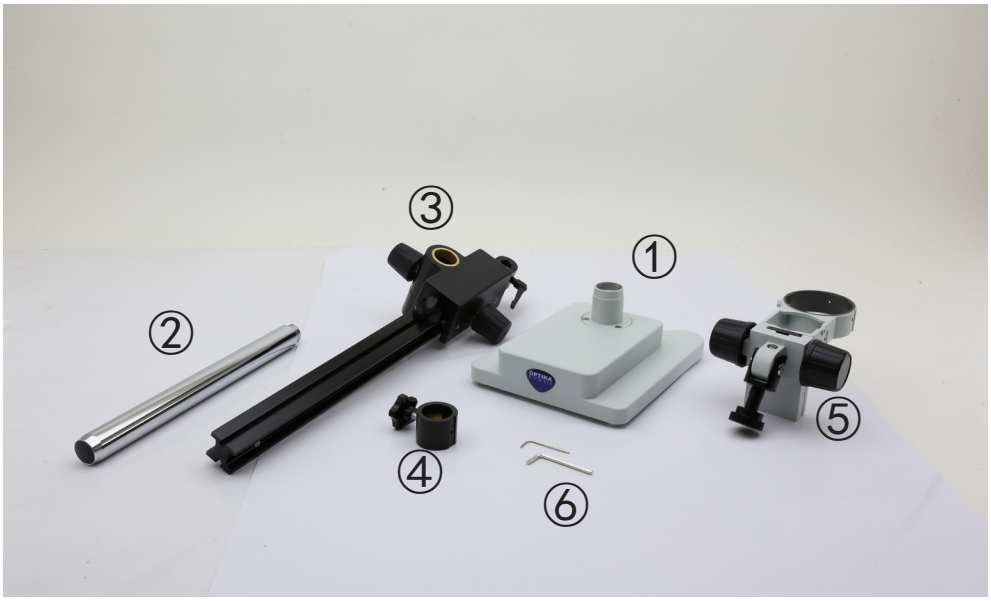
① Base
② Vertical arm
③ Drop prevention ring
④ Horizontal arm
⑤ Focus holder arm

7.9 SZ-STL2



① Base
② Vertical arm
③ Drop prevention ring
④ Horizontal arm
⑤ Focus holder arm
⑥ Allen wrenches

7.10 SZ-STLX



① Base
② Vertical arm
③ Horizontal arm
④ Drop prevention ring
⑤ Focus system
⑥ Allen wrenches

7.11 Assembling procedure

7.11.1 SZ-A1 / SZ-A6

- The mounting of the SZ-A1 and SZ-A6 focusing systems applies to all bases except SZ-STL1, SZ-STL2 and SZ-STLX. For the assembling procedure on these bases, please refer to the specific section.

1. Place the focusing system on the column and, once the desired height is reached, tighten the locking knob ① located on the back of the focusing system. (Fig. 1)

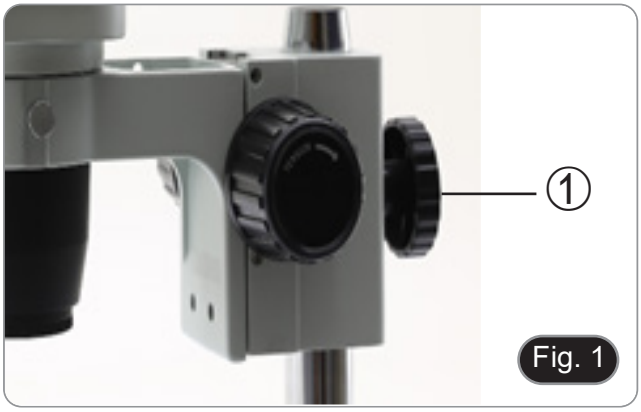


Fig. 1

7.11.2 SZ-ST1

1. Remove the base from its packaging and place it on a flat surface. The base is already assembled from the factory and does not require any further assembly procedure other than that of mounting the focusing system.

7.11.3 SZ-ST2 / SZ-ST3

1. Install the LED spotlight for incident light as shown in Fig. 2.
- By loosening the fixing screw ② you can change the angle of inclination of the spotlight to optimize the illumination on the sample.

Fig. 2

2. Insert the cable plug into the socket at the top of the pillar ③. (Fig. 3)

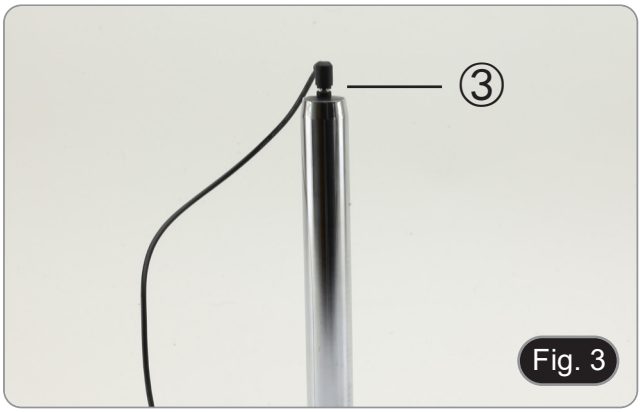


Fig. 3

3. Connect the power supply plug to the socket on the back of the microscope base. (Fig. 4)


Fig. 4

7.11.4 SZ-ST7 / SZ-ST8

1. Remove the base from its packaging and place it on a flat surface. The base is already assembled from the factory and does not require any further assembly procedure other than that of mounting the focusing system.
2. Connect the power supply plug to the socket on the back of the microscope base. (Fig. 4)

7.11.5 SZ-STL1

1. Screw the pillar on the base. (Fig. 5)


Fig. 5

2. Tighten the screw to lock the pillar. (Fig. 6)


Fig. 6

3. Insert the drop preventing ring and fix it at the desired height by screwing the fixing knob. (Fig. 7)


Fig. 7

4. Insert the horizontal arm and secure it with the fixing screw ①. (Fig. 8 - 9)


Fig. 8

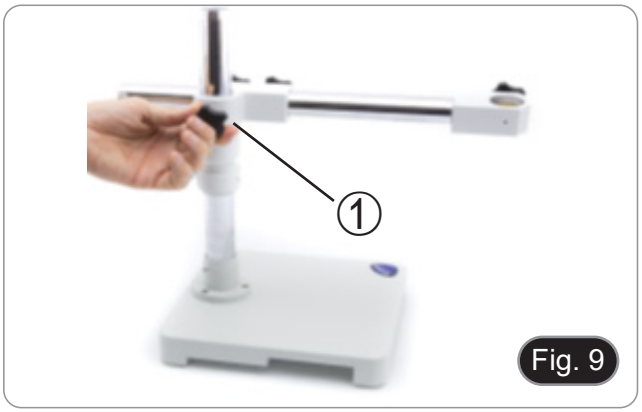


Fig. 9

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. 10-11)

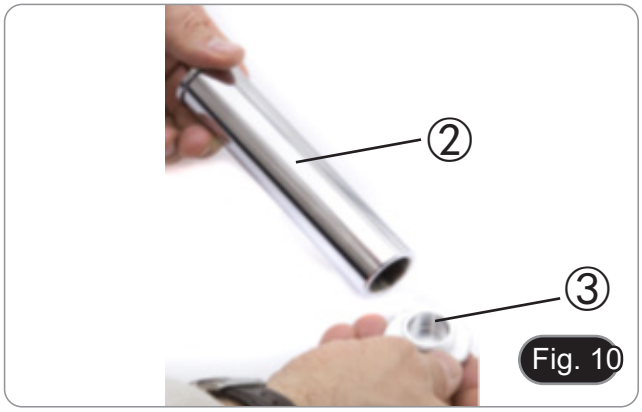


Fig. 10

6. Once fully inserted, tighten the fixing screw ④ (Fig. 11)

Fig. 11

7. Insert from below the focusing system, tighten the fixing screw ⑤ and re-tighten the locking knob ③ from below. (Fig. 12-13)

Fig. 12

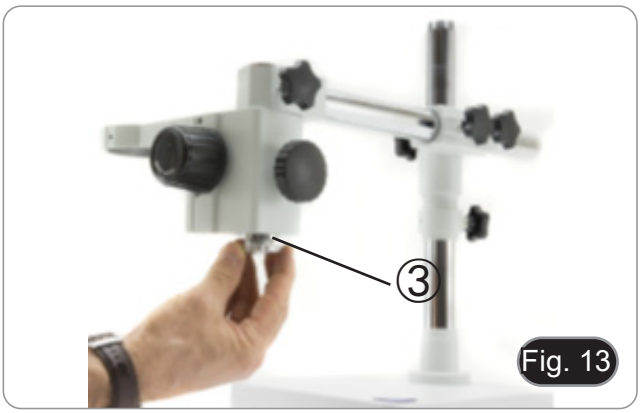


Fig. 13

7.11.6 SZ-STL2

1. Screw the pillar on the base. (Fig. 14)


Fig. 14

2. Tighten the screw to lock the pillar. (Fig. 15)


Fig. 15

3. Insert the drop preventing ring and fix it at the desired height by screwing the fixing knob. (Fig. 16)


Fig. 16

4. Insert the horizontal arm and secure it with the fixing screw ① (Fig. 17).

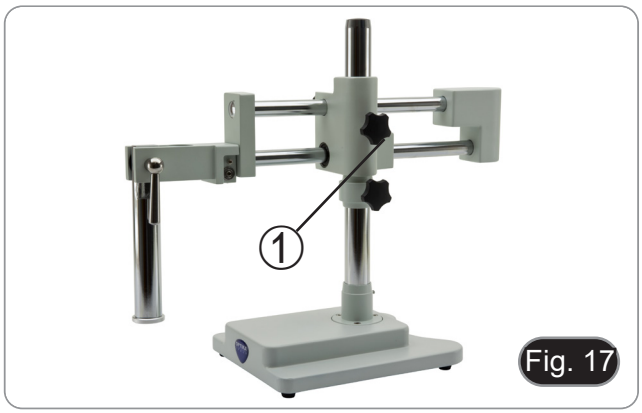


Fig. 17

5. For a bigger safety, lock the fixing screw ② with the provided Allen wrench. (Fig. 18)

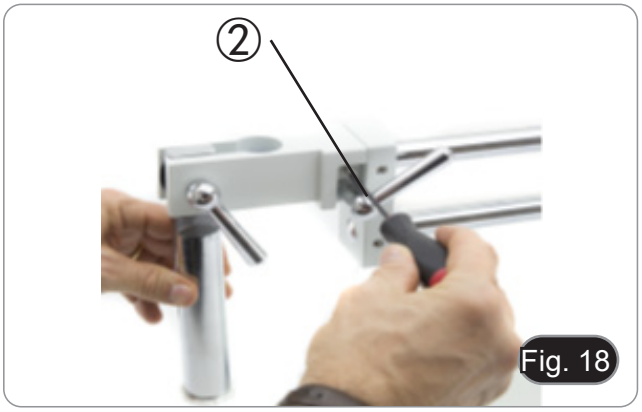


Fig. 18

6. Install the head holder. Unscrew the prevention knob ③ and insert the head holder from below in the vertical arm. Lock the fixing knob ④. At the end screw again the prevention knob ③. (Fig. 19-20)

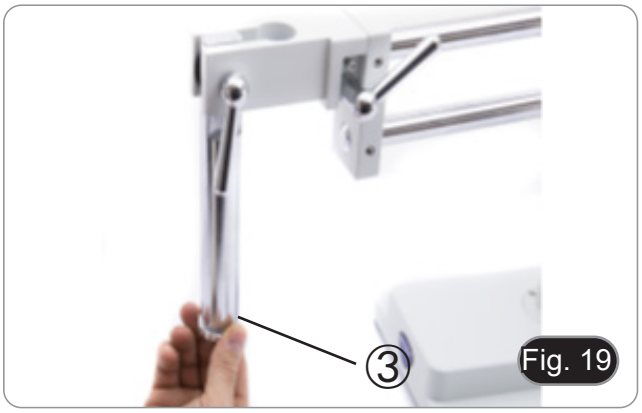


Fig. 19

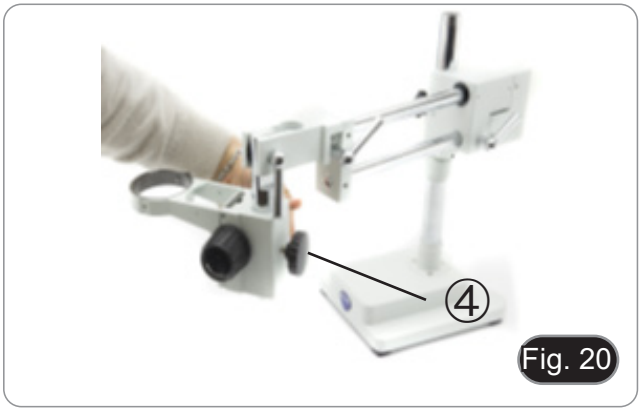


Fig. 20

7.11.7 SZ-STLX

1. Screw the pillar on the base. (Fig. 21)


Fig. 21

2. Tighten the screw to lock the pilla. (Fig. 22)


Fig. 22

3. Insert the drop preventing ring and fix it at the desired height by screwing the fixing knob. (Fig. 23)


Fig. 23

4. Insert the horizontal arm and secure it with the fixing screw ①. (Fig. 24)

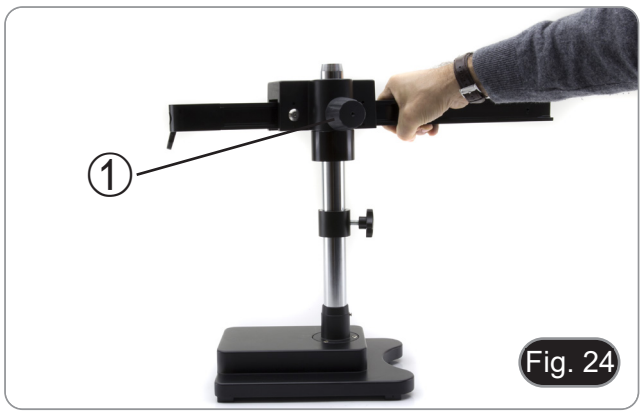


Fig. 24

5. Head holder can be installed in several ways according to specific need of the user.

Installation mode n° 1: (Fig. 25-27)
Insert the rear part of the head support (round black part) ③ (Fig. 25) from the top into the hole of the horizontal arm ④ and screw in the prevention knob ② from the bottom.

- **This mode allows the installation of heavy heads (or with heavy cameras installed on top of the head).**

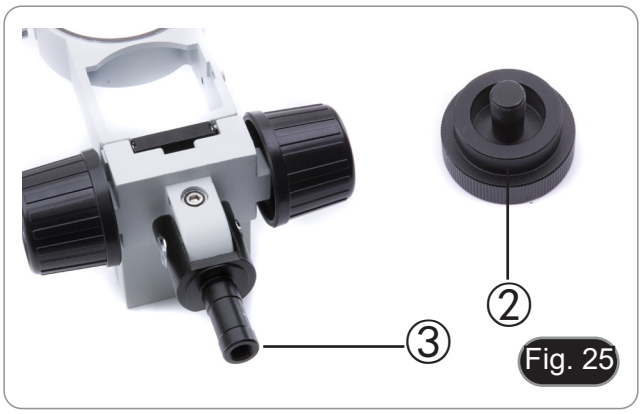


Fig. 25

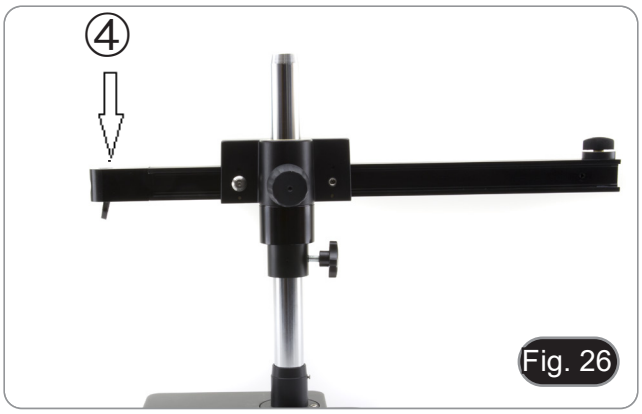


Fig. 26


Fig. 27

Installation mode n° 2:
Insert the rear part of the head support (round black part) ③ (Fig. 28) from below into the hole in the horizontal arm and screw in the prevention knob ② from above.

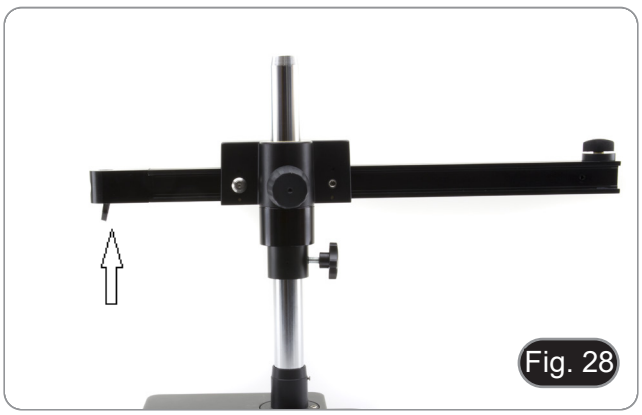


Fig. 28

- **These two modes allow the tilting of the head. (Fig. 29)**


Fig. 29

Installation mode n° 3: (Fig. 30)
Insert the back part of the head holder (black round part) ③ (Fig. 25) in the hole at the end of the horizontal arm and tighten the knob ⑤.

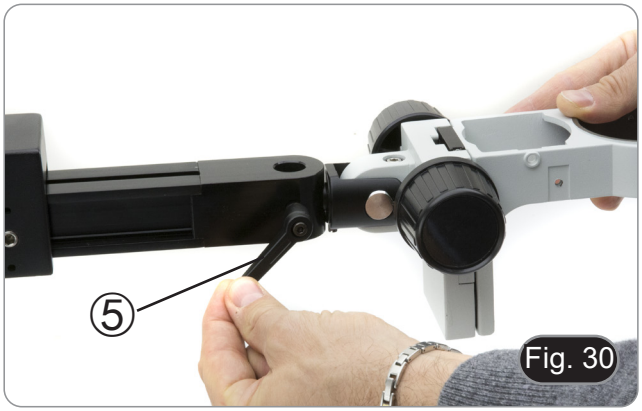


Fig. 30

- **This mode allows the swivel of the head. (Fig. 31).**


Fig. 31

7.11.8 Installing the head (all models)

Install the head and screw the fixing knob. (Fig. 32)


Fig. 32

7.11.9 Installing the eyepieces (all models)

1. Remove the dust caps from the eyepiece sleeves and insert the eyepieces. (Fig. 33)
2. Lock the eyepieces by tightening the locking screw ①.

Fig. 33

7.11.10 Installing the photo port (SZX-T/TA)

1. Loosen the fixing screws ① of the supplied photo port and remove the existing photo port. (Fig. 34)

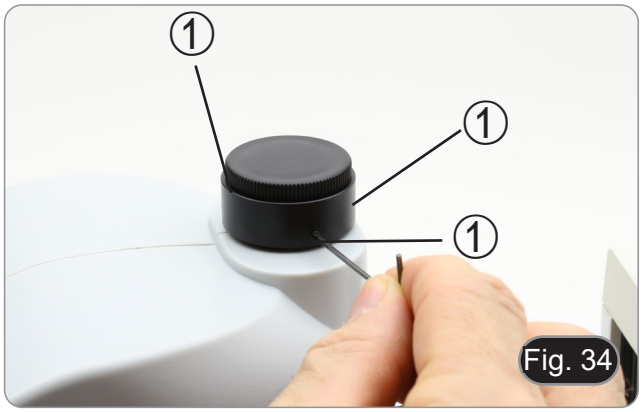


Fig. 34

2. Insert the ring of the photo port ② making sure to leave the fixing screw of the photo adapter ③ facing right. (Fig. 35)
3. Lock the fixing screws ①. (Fig. 34)

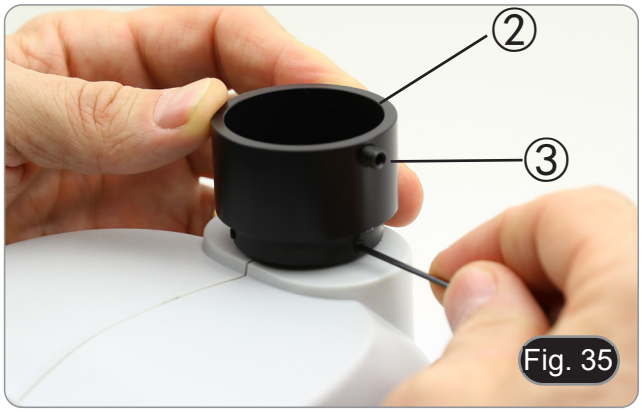


Fig. 35

8. Using the microscope

8.1 Adjusting interpupillary distance

Hold the right and left eyepiece tube with both hands and adjust the interpupillary distance by moving the two parts until one circle of light can be seen. If two circles appear, the interpupillary distance is too big, and if two overlapped circles appear, the interpupillary distance is too small. (Fig. 36)

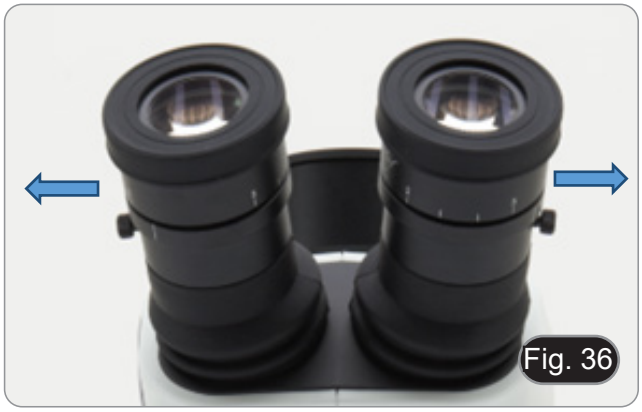


Fig. 36

8.2 Focusing

Put the sample to be observed on the stage plate and focus the sample using the focusing knobs ①. If necessary adjust the height of the microscope head along the vertical stand. Remember to lock the lock screw ② after aligning the height of the microscope. (Fig. 37)

Fig. 37

8.3 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.**

8.3.1 SZ-A1

Grab the knobs ③ both hands and, while holding the left knob, turn the right knob. The tension increases or decreases depending on the direction of rotation of the right knob. (Fig. 38)

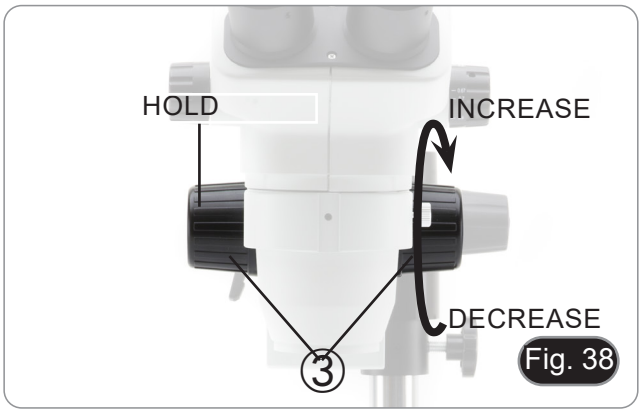


Fig. 38

8.3.2 SZ-A6

Turn the adjusting ring ④ clockwise until the desired tension is achieved.
Turning it counterclockwise will cause the tension to drop, resulting in a loss of focus. (Fig. 39)

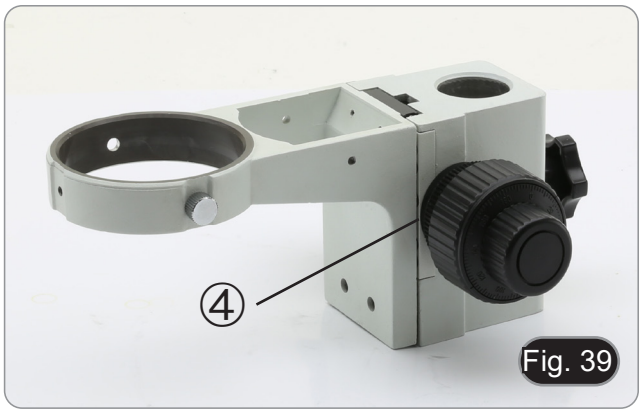


Fig. 39

8.4 Focus lock lever (SZ-A6)

The lock lever serves as the focus memory function. After focusing the sample, pull the lever ① towards the front of the microscope and lock it. (Fig. 40). This defines the upper focus point. Now you can move the focus of the microscope with the coarse knob, replace the sample and then bring the system back to the upper point: the sample will be approximately in focus and you will only have to make a fine adjustment to obtain the optimal focus. The micrometric movement is not affected by the focus block.

- **To remove the lock, move the lever in the opposite direction to the one used for the lock.**

Fig. 40

8.5 Dioptric 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 down to the lowest magnification ② and focus the specimen with the focusing knobs ③. (Fig. 41)
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 (Fig. 42) until the image of the right eyepiece is clear and sharp. Repeat the procedure for the left eyepiece.
5. Check the focus of the image for the whole zoom range. It should be perfectly parfocal (focus is maintained during the change of magnification).

Fig. 41

Fig. 42

8.6 Magnification

1. Select the desired magnification by adjusting the zoom knob ①. (Fig. 41)

- Change the eyepieces and/or add an appropriate additional lens if needed.
- **Only for SZO series**: The microscope body is equipped with a “click-stop” function that allows to obtain a precise setting of the desired magnification (Fig. 43). Click stop can be activated or deactivated by operating with the provided Allen wrench in the hole placed in the right side of the microscope body.

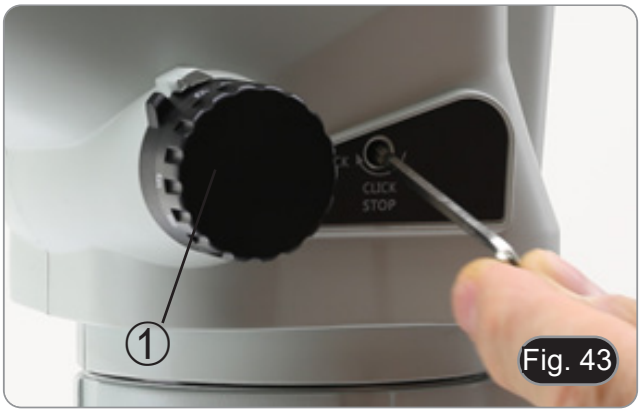


Fig. 43

8.7 Use of additional lens

1. Screw the desired additional lens on the microscope body. (Fig. 44)

- Each additional lens has a specific Working Distance.
- The stroke of the focus adapter could not compensate the different working distances of the several additonal lenses.
- In the event that the focus support fails to focus the sample, the entire body of the microscope must be raised or lowered.


Fig. 44

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

SZX Series (0.67x - 4.5x / F.N. 22mm)

Eyepiece	10x		15x		20x		25x	
Field Number (mm)	22		16		12		9	
Objective	Total Mag.	Field Of View (mm)	Total Mag.	Field Of View (mm)	Total Mag.	Field Of View (mm)	Total Mag.	Field Of View (mm)
0.3X	2.01X-13.5X	109.45-16.30	3.02X-20.25X	79.60-11.85	4.02X-27X	59.70-8.89	5.03X-33.75X	44.78-6.67
0.5X	3.35X-22.5X	65.67-9.78	5.03X-33.75X	47.76-7.11	6.7X-45X	35.8-5.33	8.38X-56.25X	26.87-4.00
0.75X	5.03X-33.75X	43.78-6.52	7.54X-50.63X	31.84-4.74	10.05X-67.5X	23.88-3.56	12.56X-84.37X	17.91-2.67
1X	6.7X-45X	32.84-4.89	10.05X-67.5X	23.88-3.56	13.4X-90X	17.91-2.67	16.75X-112.5X	13.43-2.00
1.5X	10.05X-67.5X	21.89-3.26	15.08X-101.25X	15.92-2.37	20.1X-135X	11.94-1.78	25.13X-168.75X	8.96-1.33
2X	13.4X-90X	16.42-2.44	20.1X-135X	11.94-1.78	26.8X-180X	8.96-1.33	33.5X-225X	6.72-1.00

SZX-A Series (0.65x - 5.5x / F.N. 23mm)

Eyepiece	10x		15x		20x		25x	
Field Number (mm)	23		16		12		9	
Objective	Total Mag.	Field Of View (mm)	Total Mag.	Field Of View (mm)	Total Mag.	Field Of View (mm)	Total Mag.	Field Of View (mm)
0.3X	1.95X-16.5X	117.95-13.94	2.93X-24.75X	82.05-9.70	3.9X-33X	61.54-7.27	4.88x-41.25x	46.15-5.45
0.5X	3.25X-27.5X	70.77-8.36	4.88X-41.25X	49.23-5.82	6.5X-55X	36.92-4.36	8.13x-68.75X	27.69-3.27
0.75X	4.88X-41.25X	47.18-5.58	7.31X- 61.88X	32.82-3.88	9.75X-82.5X	24.62-2.91	12.19x-103.13X	18.46-2.18
1X	6.5X-55X	35.38-4.18	9.75X-82.5X	24.62-2.91	13X-110X	18.46-2.18	16.25X-137.5X	13.85-1.64
1.5X	9.75X-82.5X	23.59-2.79	14.63X-123.75X	16.41-1.94	19.5X-165X	12.31-1.45	24.38X-206.25X	9.23-1.09
2X	13X-110X	17.69-2.09	19.5X-165X	12.31-1.45	26X-220X	9.23-1.09	32.5X-275X	6.92-0.82

Serie SZO (0.67x - 4.5x / F.N. 23mm)

Eyepiece	10x		15x		20x		25x	
Field Number (mm)	23		16		12		9	
Objective	Total Mag.	Field Of View (mm)	Total Mag.	Field Of View (mm)	Total Mag.	Field Of View (mm)	Total Mag.	Field Of View (mm)
0.3X	2.01X-13.5X	114.43-17.04	3.02X-20.25X	79.60-11.85	4.02X-27X	59.70 -8.89	5.03X-33.75X	44.78-6.67
0.5X	3.35X-22.5X	68.66-10.22	5.03X-33.75X	47.76-7.11	6.7X-45X	35.82-5.33	8.38X-56.25X	26.87-4.00
0.75X	5.03X-33.75X	45.77-6.81	7.54X- 50.63X	31.84-4.74	10.05X-67.5X	23.88-3.56	12.56X-84.38X	17.91-2.67
1X	6.7X-45X	34.33-5.11	10.05X-67.5X	23.88-3.56	13.4X-90X	17.91-2.67	16.75X-112.5X	13.43-2.00
1.5X	10.05X-67.5X	22.89-3.41	15.08X-101.25X	15.92-2.37	20.1X-135X	11.94-1.78	25.13X-168.75X	8.96-1.33
2X	13.4X-90X	17.16-2.56	20.1X-135X	11.94-1.78	26.8X-180X	8.96-1.33	33.5X-225X	6.72-1.00

8.8 Use of additional lenses 0.3X-0.5X

The additional lenses 0.3X and 0.5X have a long working distance and therefore the total stroke of the focusing column cannot compensate.
To make the additional lenses 0.3X and 0.5X work correctly, proceed as follows:

1. Screw the additional lens on the microscope body as already described in chapter 8.7.
2. Uninstall the microscope body from the head holder.
3. Install the spacer ① in the head holder and screw the fixing knob ②. (Fig. 45)
4. Re-install the microscope body onto the spacer and screw the fixing knob ③. (Fig. 46)
5. Begin working normally.

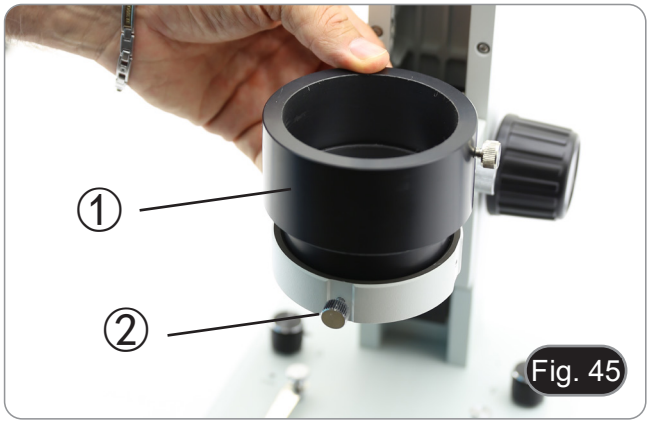


Fig. 45

Fig. 46

8.9 Black/white stage plate (SZ-ST1/2/3/7/8)

You can use a black/white contrast disc to increase the contrast of the image when working in incident light. (Fig. 47).
If you are looking at bright samples, place the disc with the black part facing up.

Fig. 47

8.10 Use of illumination (SZ-ST2/3/7/8)

1. Turn the transmitted light knob ① in order to turn ON/OFF or to change the intensity of the transmitted light LED. (Fig. 48)
2. Turn the incident light knob ② 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.

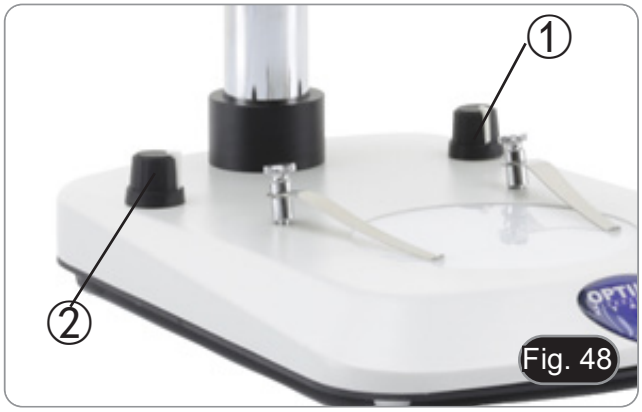


Fig. 48

Only for SZ-ST7 / SZ-ST8:

- Tilt and position the self-supporting arms of the base ③ to optimally illuminate the sample. (Fig. 49)
- The arms can be placed individually in the desired position.

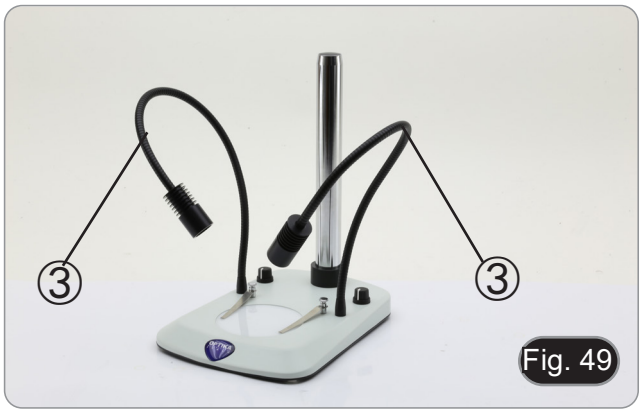


Fig. 49

8.11 Use of eye shields (SZO-B/T)

- **Use with eyeglasses**

Fold rubber eyeshields with both hands. Folded eyeshields avoid scratching the lenses of eyeglasses. (Fig. 50)


Fig. 50

- **Use without eyeglasses**

Raise eye shields and observe at the microscope placing eyes to the shields, avoiding external light to disturb the observation. (Fig. 51)


Fig. 51

8.12 Use of overhanging stand (SZ-STL1/2/X)

8.12.1 SZ-STL1

Moving the horizontal arm

1. Unlock the knob on the right side of the horizontal arm ①. (Fig. 52)

Fig. 52

2. The arm can be extended or shortened according to specific needs. (Fig. 53)


Fig. 53

Swivel the head

1. Unlock the fixing knob ① and rotate the head to the desired swivel angle (left or right), then tighten the knob again. (Fig. 54)

Fig. 54

Rotating the horizontal arm

1. Loosen the horizontal arm fixing knob ② and rotate the arm, then tighten again the fixing knob. (Fig. 55)

- **NOTE: 180° rotation of the microscope with respect to the base could cause a rollover of the entire system**.

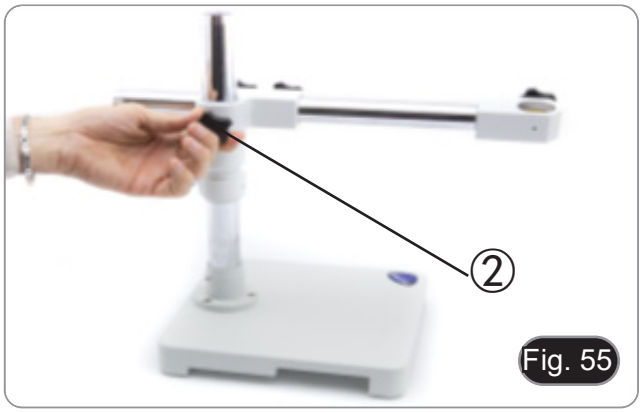


Fig. 55

8.11.2 SZ-STL2

Moving the horizontal arm

1. Unlock the knob on the left side of the horizontal arm ①. (Fig. 56)

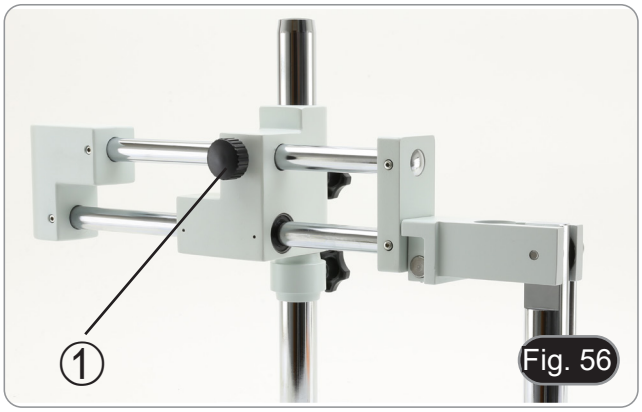


Fig. 56

2. The arm can be extended or shortened according to specific needs. (Fig. 57)

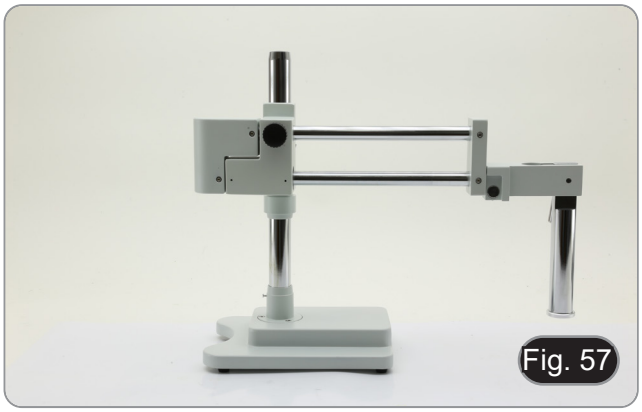


Fig. 57

Tilting the head holder

1. Loosen the knob ② (Fig. 58) on the right side of the head holder. The tilting vertical arm can be moved. Once the desired angle is achieved, tighten the knob again.

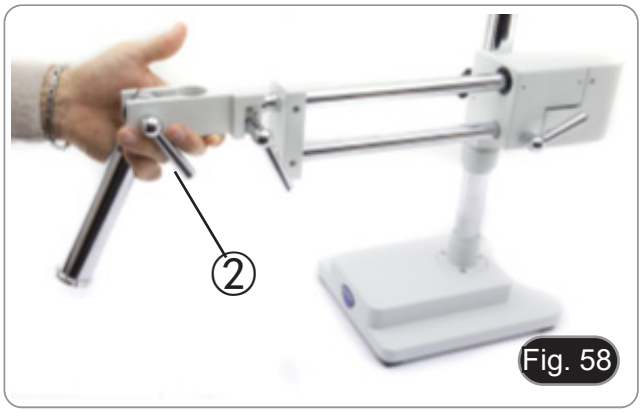


Fig. 58

Swivel the head

1. Unlock the fixing knob ③ and rotate the head to the desired swivel angle (left or right), then tighten the knob again. (Fig. 59 - 60)

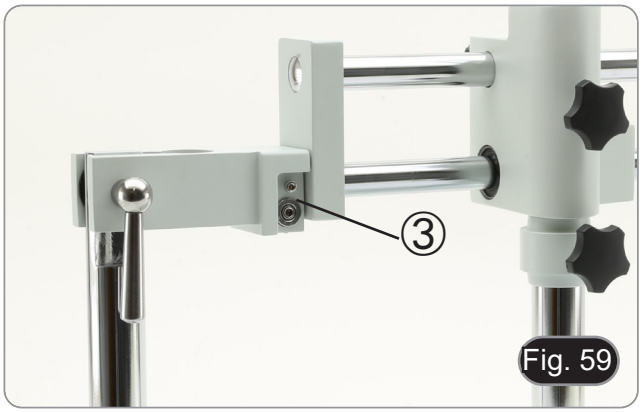


Fig. 59


Fig. 60

Rotating the horizontal arm

1. Loosen the horizontal arm fixing knob ④ and rotate the arm, then tighten again the knob. (Fig. 61)

- **NOTE: 180° rotation of the microscope with respect to the base could cause a rollover of the entire system.**

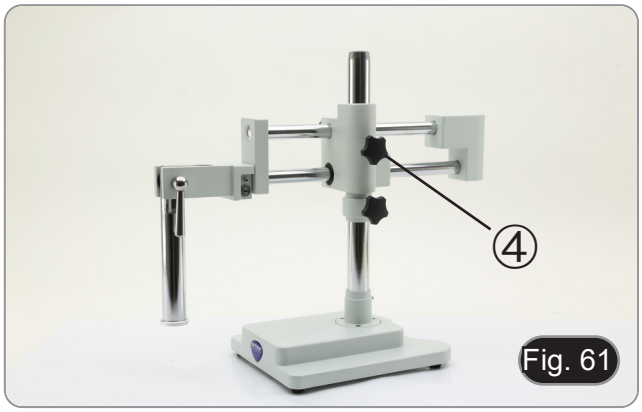


Fig. 61

8.11.3 SZ-STLX

Moving the horizontal arm

1. Unlock the knob on the right side of the horizontal arm ①. (Fig. 62)

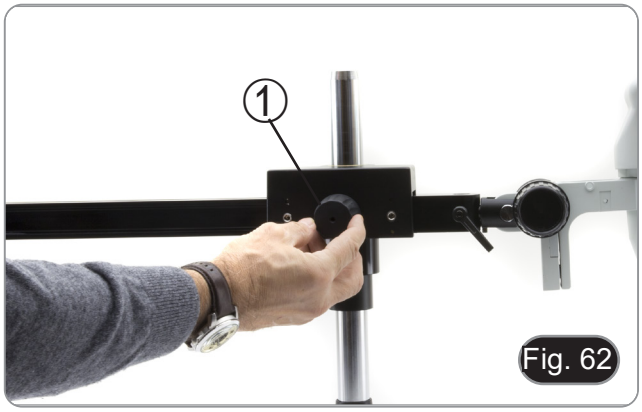


Fig. 62

2. The arm can be extended or shortened according to specific needs. (Fig. 63)

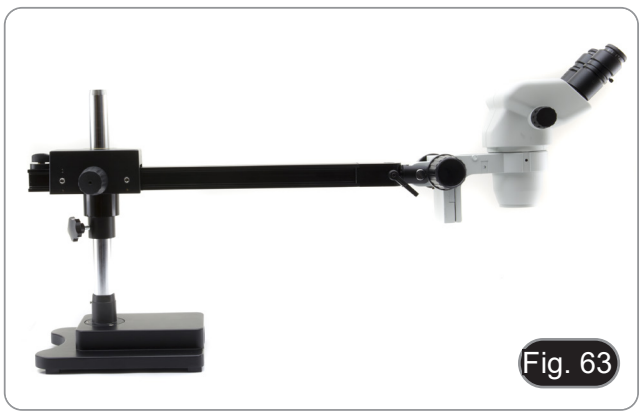


Fig. 63

Adjusting the horizontal block

1. Unlock the fixing knob of the stopper ② and move it in a position suitable to user's needs. (Fig. 64)
2. Lock the fixing knob to set the movement limit.

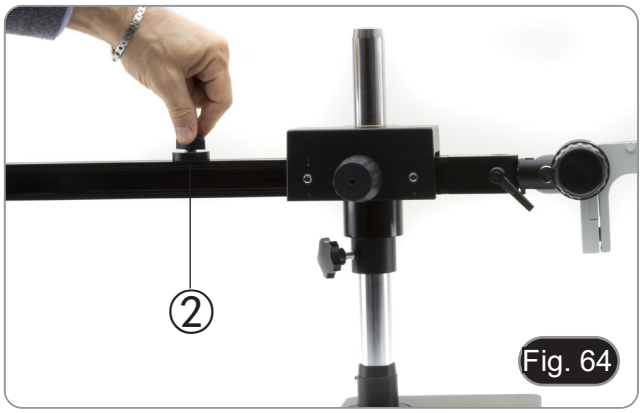


Fig. 64

Tilting the head holder

1. Loosen the Allen screw ③ (Fig. 65) on the top of the head holde.
2. The tilting black part can be moved. Once the desired angle is achieved, tighten the wrench again.

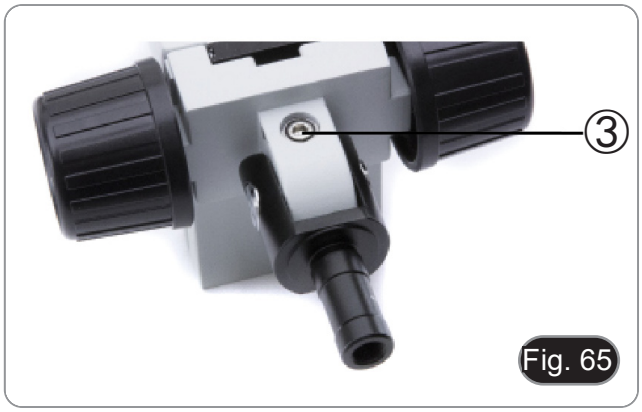


Fig. 65

Swivel the head

1. Unlock the fixing knob ④ and rotate the head to the desired swivel angle (left or right), then tighten the knob again. (Fig. 66 - 67)

Fig. 66


Fig. 67

Rotating the horizontal arm

1. Loosen the horizontal arm fixing knob ⑤ and rotate the arm, then tighten again the knob. (Fig. 68)

- **NOTE: 180° rotation of the microscope with respect to the base could cause a rollover of the entire system.**

Fig. 68

9. Microphotography

9.1 Installing the C-mount adapter

1. Loosen the clamping screw ① on the trinocular port and remove the dust cap ②. (Fig. 69)

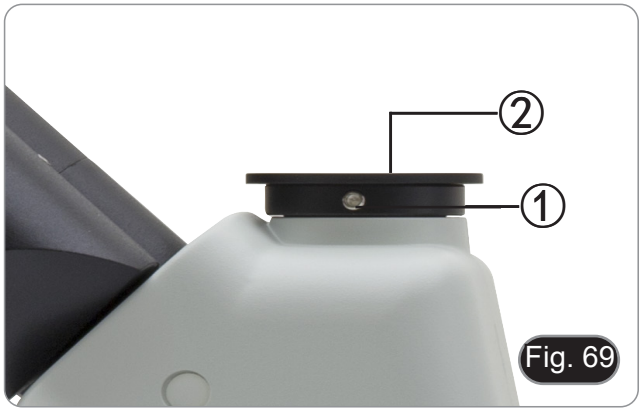


Fig. 69

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. 70), then tighten the clamping screw ①.

Fig. 70

9.2 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. 71)
4. Mount the other end of the relay tube ② into the empty hole of the trinocular port, then tighten the clamping screw. (Fig. 69)

Fig. 71

- “T2” ring is not provided along with the microscope, but is commercialy available.
- While shooting dark specimens, darken eyepieces and viewfinder with a dark cloth to miminize 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.**

10. 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.

11. Troubleshooting

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

PROBLEM	CAUSE	SOLUTION
I. Optical Section:		
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: • The image is not sharp • The contrast is not high • The details are not clear • Image glares	The lenses (additional lens, objective, eyepieces) are dirt	Throughly 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.
II. Mechanical Section:		
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
III. Electric Section:		
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
IV. Viewing tube assembly:		
The field of view of the two eyes is different	The interpupillar distance is not correct	Adjust the interpupillar distance
	The dioptric correction is not right	Adjust the dioptric 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
V. Microphotography and video:		
The image is unfocussed	Incorrect focussing	Adjusting the focus system as in the present manual
Bright patches appear on the image	Stray light is entering the microscope through the eyepieces and through the camera viewfinder	Cover the eyepieces and the viewfinder with a dark cloth

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.