



SZM SERIES MICROSCOPE

User's Manual

Madell Technology Corporation
<http://www.madelltech.com>

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This manual is for the Madell SZM series microscopes. To ensure the safety and to achieve optimum performance, please read it carefully.

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1 Before use

1-1 NOTICE

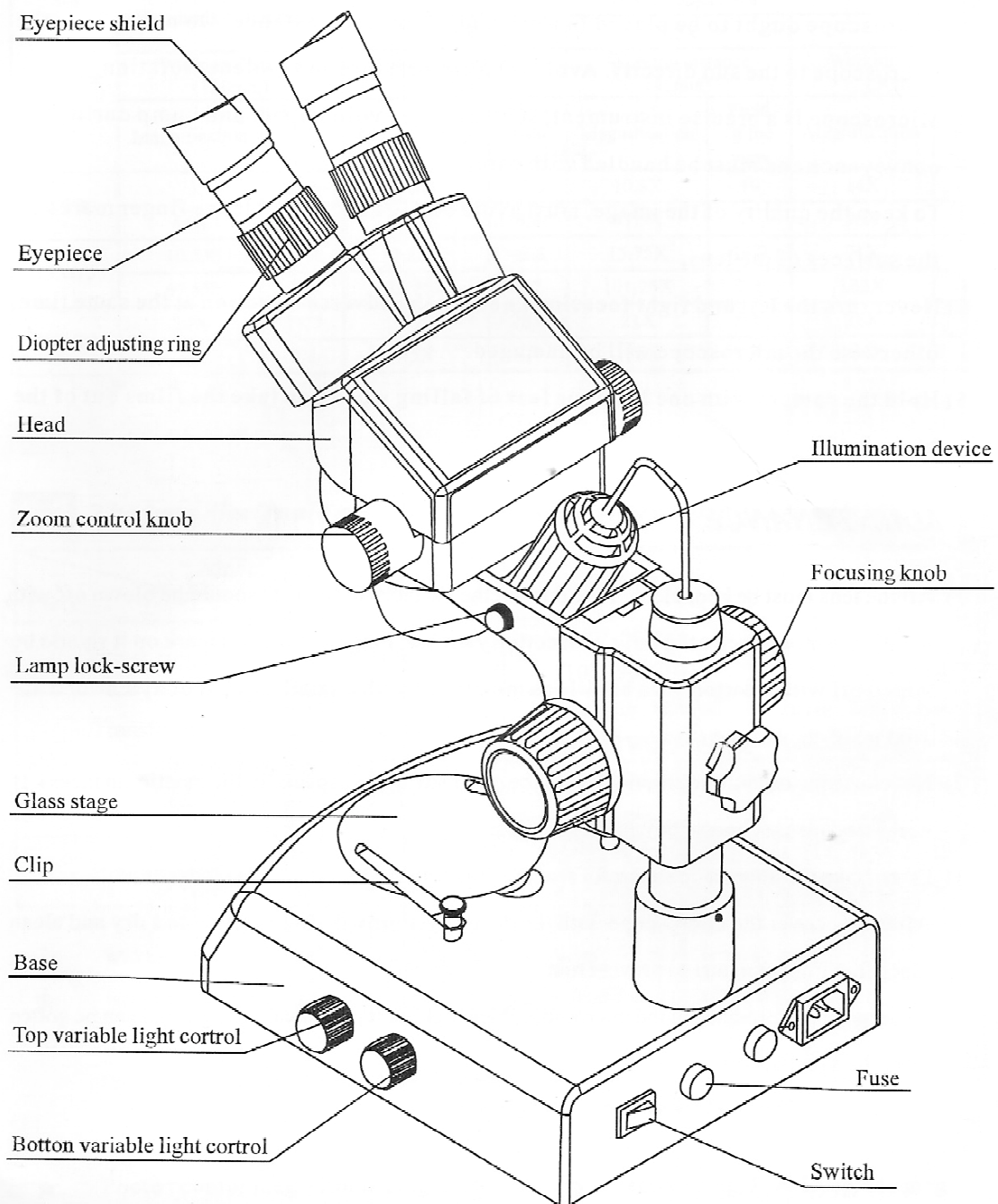
- 1) Microscope ought to be placed in a dry and clean circumstance. Do not expose the microscope to the sun directly. Avoid high temperature and violent vibration.
- 2) Microscope is a precise instrument, so it must be avoid impact and bump during the conveyance and must be handled with care.
- 3) To keep the quality of the image, must avoid the dirt and do not leave finger marks on the surfaces of the lens.
- 4) Never turn the left and right focusing knobs in the adverse direction at the same time, otherwise the microscope will be damaged.
- 5) Hold the camera with one hand for fear of falling when you take the films out of the big camera.

1-2 MAINTENANCE

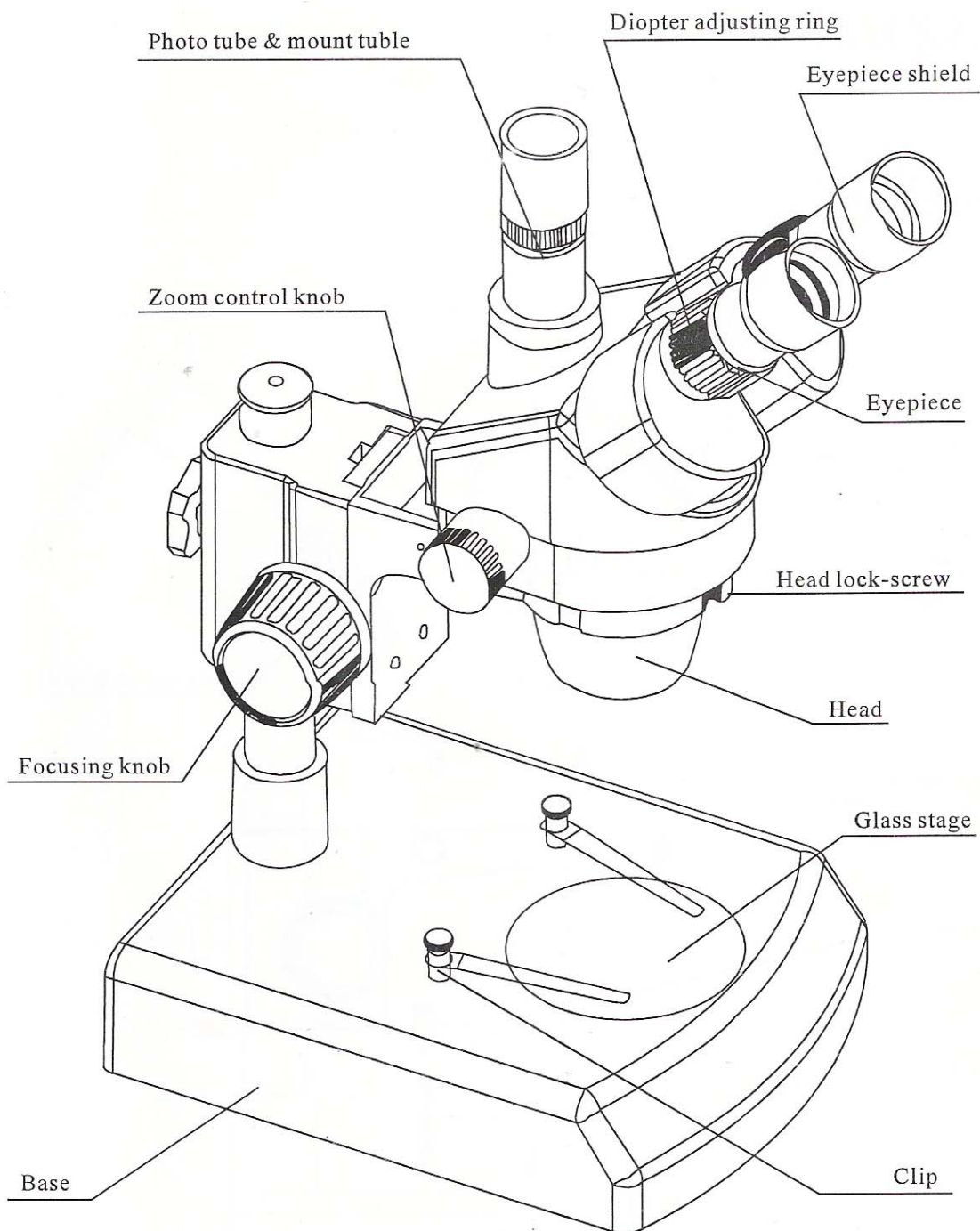
- 1) All the lens must be kept clean. Fine dust on the surfaces of the lens should be blown off with hand blower or wiped off gently with cotton yarn bar; Fingerprint or oil mark on it should be wiped off with a cotton yarn bar which moistened with a small amount of xylene or a 3:7 mixture of alcohol and ether.
- 2) Never use the organic solution to clean the other surfaces (especially the plastic surfaces). If necessary, please choose the neutral detergent.
- 3) Do not take the microscope apart for fear that it is damaged.
- 4) After use, cover the microscope with the dust-cover provided and store it in a dry and clean place free from moisture to prevent rust.
- 5) To keep the performance of the microscope, please check it periodically. The detail can be gotten from the agent nearby.

2 Nomenclature

2-1 SZMB2

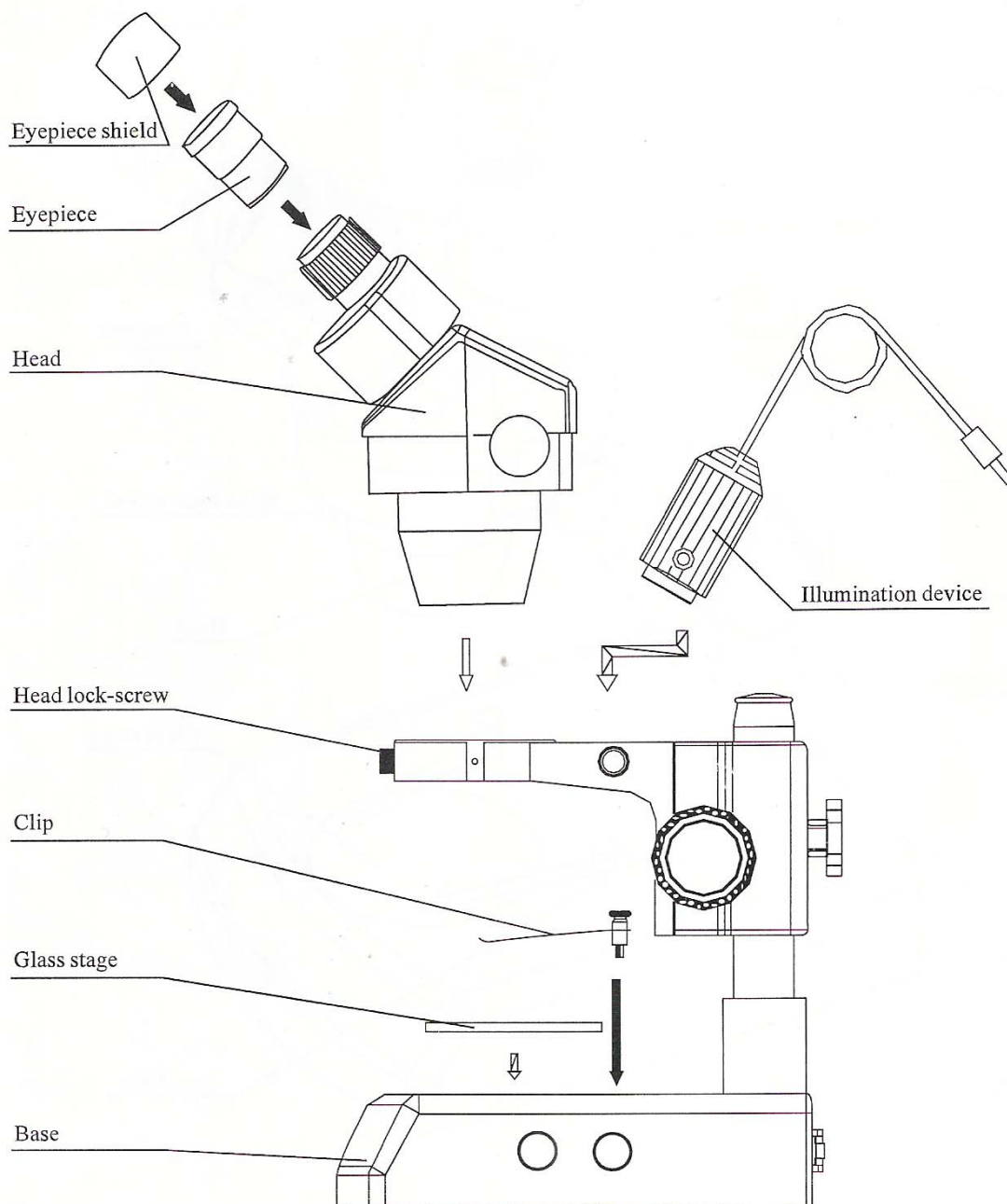


2-2 *SZMB2*

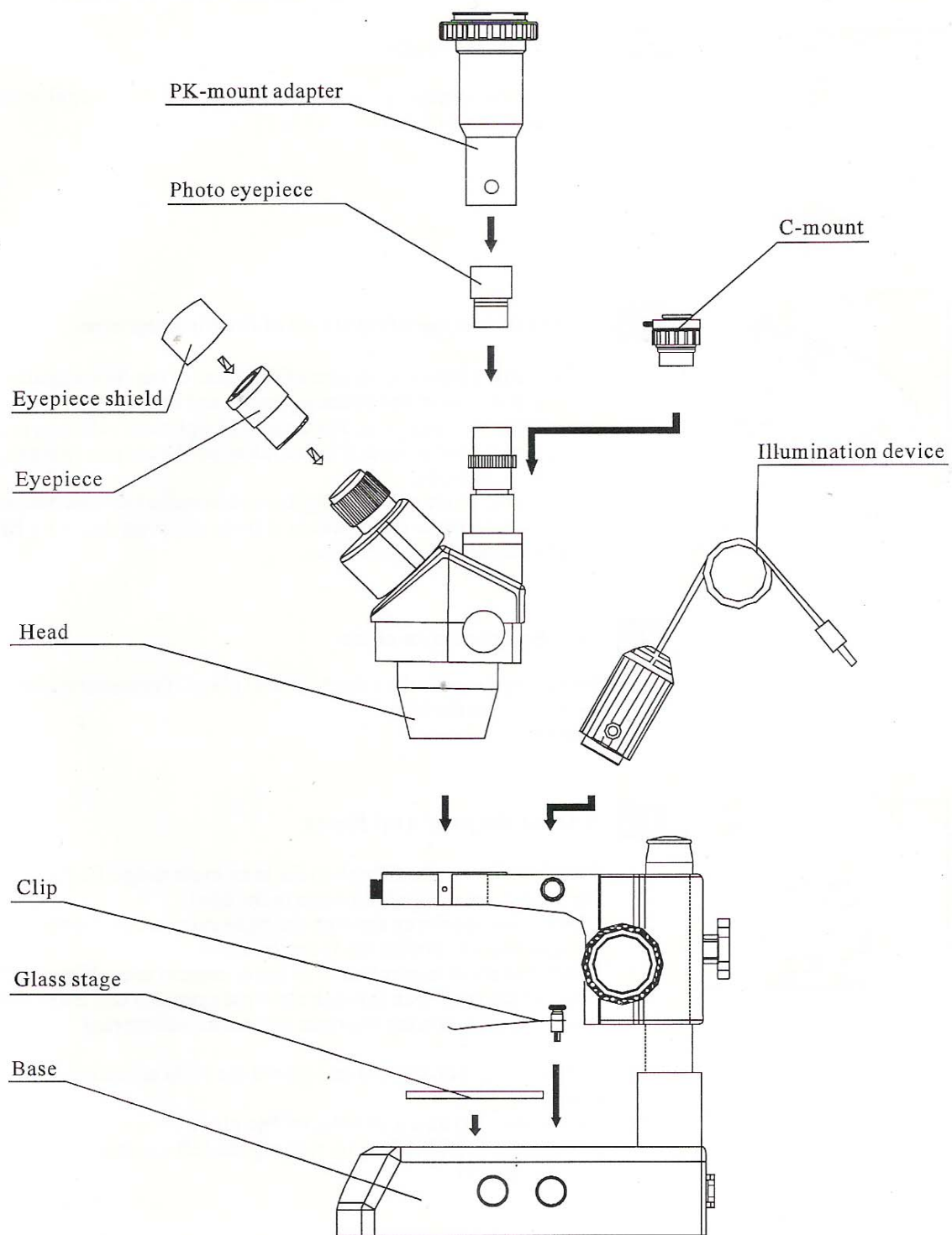


3 Assemblage

3-1 SZMB2



3-2 *SZMT2PH/CTV*



4 Operation

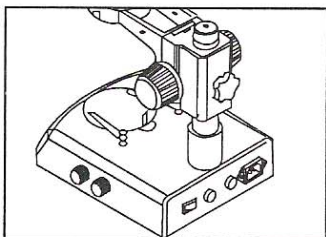


Fig. 1

4-1 Use the glass stage

- 1) Press the glass stage on the sunken place then the other side of the glass stage will be lifted. (Fig.1)

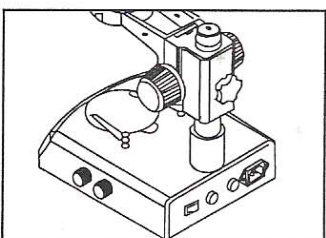


Fig.2

4-2 Adjust the degree of tightness of the focusing arm.

- 1) If you want to adjust the degree of tightness of the focusing arm, you can hold one of the focusing knobs and turn another one to attain a suitable position. The degree of tightness relies on the direction to be turned. The clockwise direction is tight, otherwise, is loose.
- 2) The suitable position of the tightness can make the adjustment more comfortable and prevent it from slipping down by its weight during the observation.

4-3 Set the specimen slide

- 1) Set the specimen in the center of stage plate. If necessary, clamp the slide with the clips.
- 2) Open the light.

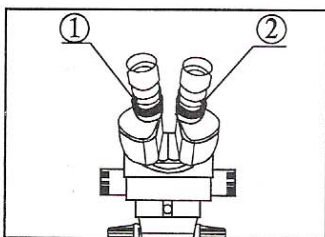


Fig.3

4-4 Adjust diopter and focus

- 1) Turn the zoom control knob to the maximum magnification.
- 2) Turn the diopter adjusting rings to the zero.
- 3) Observe the specimen through the right eyepiece and make the image clear by turning the focusing knob.
- 4) Rotate the zoom control knob to the minimum magnification.
- 5) Observe the specimen through the right eyepiece and make the image clear by turning the right diopter adjusting ring ②. (Fig.3)
- 6) Redo the step (1), (3), (4) and (5) till the right adjusting ring is more precision.
- 7) Do the step (4) and make the image clear which is observed through the left eyepiece by turning the left diopter adjusting ring ①. (Fig.3)

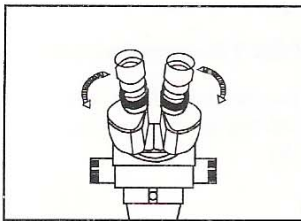


Fig. 4

4-5 Adjust the interpupillary distance

- 1) Adjust the prism housing along the direction of arrowhead of the Fig.4 till the observation is comfortable.

4-6 Use Eyepiece Shields

- 1) For user who do not wear glasses, hold the diopter adjusting rings to prevent they from rotating and turn the eyepiece till the eyepiece shields fit the observer well.
- 2) For user who wear glasses, take the eyepiece shields off before observation.

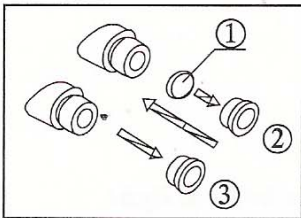


Fig. 5

4-7 Mount and Remove the Optional Eyepiece Micrometer

- 1) Turn out and remove the mounting ring from the eyepiece. (Fig.5)
- 2) Clean the eyepiece micrometer, and mount it to the mounting ring with the inscription side downward.
- 3) Gently twist the mounting ring with the eyepiece micrometer into the eyepiece till tighten ② securely.
- 4) To remove the eyepiece micrometer, twist the mounting ring. Wrap the micrometer in clean soft paper for storage.

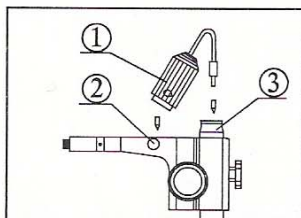


Fig. 6

4-8 Install the illumination device

- 1) Insert the illumination device ① in the bracket with the protrudent side toward the lock-screw ② and tighten the lock-screw. (Fig.6)
- 2) Put the plug in the socket of the pillar stand. ③

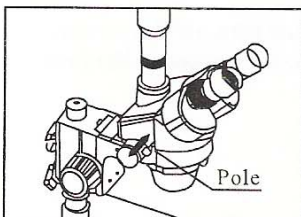


Fig. 7

4-9 Choose the optical system

- 1) You can alternate the binocular observation and video capture by pushing or drawing the pole. Push the pole you can attain binocular observation, otherwise attain video capture. No matter what optical system is chosen, must make sure the pole cannot be moved any more.

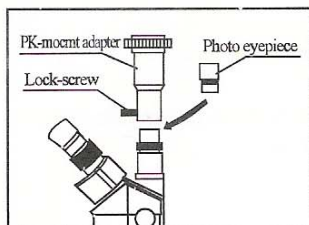


Fig. 8

4-10 Mount the photo eyepiece and the PK-mount adapter

- 1) Put the photo eyepiece in the eyepiece socket of the trinocular.
- 2) Connect the PK-mount adapter with the photo eyepiece, and then tighten the lock-screw. (Fig.8)

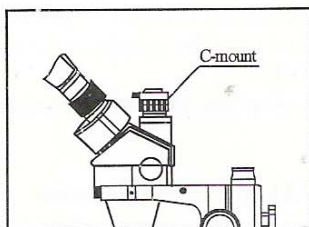


Fig. 9

4-11 Adjust the CTV

- 1) Adjust the CTV to a suitable position by rotating focusing lens.

Note: The range of the adjustment is 1~2mm in general.

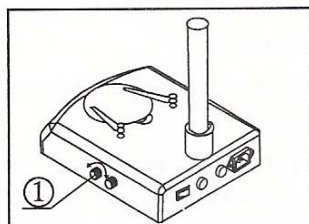


Fig. 10

4-12 Adjust the brightness of the bottom light

- 1) Turn the light regulation knob according to the sign marked on the base, along the clockwise the brightness will be added, otherwise it will be weakened. (Fig.10)

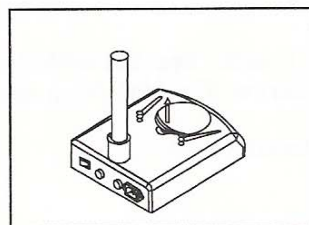


Fig. 11

4-13 Replace the lamps

- 1) Press the stage on the sunken place then the other side will be lifted. (Fig.11)
- 2) Take the lamp out of the jack.
- 3) Put a new lamp in the jack and assure it deep enough.
- 4) Recover the stage plate. (Fig.12)

Note: ① Before replacing the lamps must turn off the power.
② Avoid violence while the lamp is plugged in the jack.

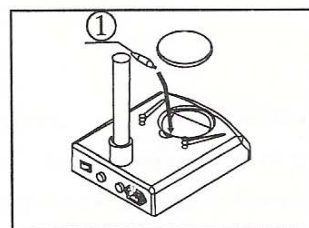


Fig. 12

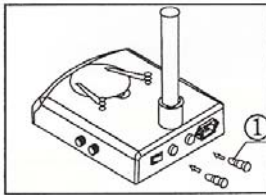


Fig. 13

4-14 *Replace the fuse*

- 1) Screw the fuse tube out with a screwdriver and then pull the fuse out of the tube ①.
- 2) Renew the fuse and mount it in an adverse way. (Fig.13)

5 Configuration chart

5-1 SZM series configuration

Configuration		Model					
Parts	Specification	SZM45B1	SZM45B2	SZM45B3	SZM45T1	SZM45T2	SZM45T3
Eyepiece	SZMEWh10 X 20	O	O	O	O	O	O
	SZMEWh15 X 15						
	SZMEHWh20 X 10						
Binocular	SZN7045	O	O	O			
Tri-ocular	DXM7045TR				O	O	O
Auxiliary objective	SZMAO0.5/165mm						
	SZMAO1.5/45mm						
	SZMAO2/30mm						
Focusing arm	SZMA1	O	O	O	O	O	O
Stand	SZMST1	O			O		
	SZMST2		O			O	
	SZMST3			O			O
	SZSTL1						
	SZSTL2						
Transformer	SZT1						
Reflect illumination	SZML1		O	O		O	O
Holder for illuminator	SZFH1						
	SZPD1						
Photo device	SZMPH						
Photo tube	SZMCTV						
Gem clamp	S/ST-GC						
Dark field condenser	ST-30-2L-HJ-01						
Ring fluorescence	SZRL						
Box	Inside foam Outside cartom	O	O	O	O	O	O

Note: The items marker "O" included and others for option.

6 Technical parameter

6-1 SZM7045/SZM7045TR

Eyepiece	Standard configuration		Auxiliary objectives					
			0.5X		1.5X		2X	
	Working distance (100mm)		Working distance (165mm)		Working distance (45mm)		Working distance (30mm)	
	Magnification	Field of the view	Magnification	Field of the view	Magnification	Field of the view	Magnification	Field of the view
10X/20	7X	28.6	3.5X	57.1	10.5X	19	14X	14.3
	45X	4.4	22.5X	8.9	67.5X	3	90X	2.2
15X/15	10.5X	21.4	5.25X	42.8	15.75X	14.3	21X	10.7
	67.5X	3.3	33.75X	6.7	101.25X	2.2	135X	1.7
20X/10	14X	14.3	7X	28.6	21X	9.5	28X	7.1
	90X	2.2	45X	4.4	135X	1.5	180X	1.1

6-2 The base electronic specification of SZM series

Parts \ Model	SZMST1	SZMST2	SZMST3
Power supply	None	220V-50Hz、 110V-50/60Hz	220V-50Hz、 110V-50/60Hz
Transformer	None	Input: 220/110VAC Output: 12VDC/45W	Input: 220/110VAC Output: 12VDC/45W
Top light	None	12V/15W halogen lamp	12V/15W halogen lamp
Bottom light		12V/15W halogen lamp	220/110V、7W fluorescent lamp

- ★ Working distance is fixed regardless of the magnification factor.
- ★ Total mag.=Zoom mag.×Eyepiece mag.× Auxiliary objective mag.

$$\text{Diameter of field of view (mm)} = \frac{\text{Field number of eyepiece}}{\text{Zoom mag.} \times \text{Auxiliary objective mag.}}$$

- ★ Photo adaptor mag.=Zoom mag. (×Auxiliary objective mag.) × Eyepiece mag.
- ★ TV adaptor mag.=Zoom mag. (× Auxiliary objective mag.) × C-mount TV adaptor middle

7 troubleshooting

The performance of the microscope can't be made full use of because of unfamiliar with the use, this table will give some advices.

Trouble	Cause	Remedy
1.Double images	Interpupillary distance is not correct	Readjust it
	Diopter adjustment is not correct	Readjust it
	Magnification of each is not the same size	Mount the same size eyepiece
2.Dirt appear in the view of the field	Dirt on the specimen	Clean the specimen
	Dirt on the surface of eyepieces	Clean the surface.
3.Image is not clear	Dirt on the surface of the objectives	Clean objectives
4.Image is not clear while the focus changing.	Diopter adjustment is not correct	Readjust the diopter
	Focus is not correct	Readjust the focus
5.The focusing knob is not smooth	The focusing knob is too tight	Loosen it to a suitable place
6.The image is obscure because of the head slipping down by itself during observation	The focusing knob is too loose	Tighten it to a suitable place
7.Incision image appear in the field of view or of the video view	The draw pole is not in correct position	Draw or push it to the correct position
8.The image on the monitor is not clear when the focusing knob is turned.	The focus of video is not correct	Readjust the focus of video to a correct position
9.Eye feel tire easily	Diopter adjustment is not correct	Adjust the diopter
	Brightness of light is not correct	Adjust the brightness
10.Bulb do not glow when the switch is on	No power in	Check the connection with the power supply
	The bulb was not inserted correctly	Inserting it correctly
	Bulb is wrong	Replace it with a correct one
11.Bulb is burned out suddenly	Use the wrong bulb	Replace it with a correct one
	The voltage is too high	Control the voltage Eg: use voltage regulator
12.Brightness is not enough	Use a wrong bulb	Replace it with a correct one
	The voltage is too low	Increase the input voltage
13.The bulb flicker or the brightness is unstable	The bulb will burn out soon	Replace it with a new one
	The bulb was not inserted correctly	Insert it correctly