



[www.insize.com](http://www.insize.com)



## **OPERATION MANUAL**

**Model ISM-M600  
Metallurgical Microscope**



The model ISM-M600 reflected & transmitted light microscope is equipped with reflected & transmitted light systems, plan achromatic objectives and wide field eyepieces. The observers can get the clear image in the wide field. It's suitable for knowing something about the internal construction of materials and condition monitoring of different mechanical apparatus in the colleges and factory.

### I. Specification

#### 1. Eyepieces

Type	Magnification	Focus (mm)	Field (mm)	Remark
Plan eyepiece	10X	25	Φ18	Standard
	16X	15.6	Φ11	Option

#### 2. Objectives

Type	Magnification	N.A.	W.D(mm)
Plan achromatic (No cover glass)	5X	0.12	18.3
	10X	0.25	8.9
	40X	0.65	0.69
	60X	0.85	0.26

#### 3. Total Magnification

Total Magnification	Objectives				
	5X	10X	40X	60X	
Eyepieces	10X	50X	100X	400X	600X
	16X	80X	160X	640X	960X

4. Illumination: using a 6V20W halogen lamp, brightness adjustable.

- The filters of reflected system are included red, blue, green and burnish glass. The filters of transmitted system are included blue, green and burnish glass.
- Stage movement range: 50mm X 75mm.
- The minimum division of fine focusing 0.002mm
- Interpupillary distance adjustment range: from 53 mm to 75 mm.
- Anti-fungus: Yes.

### II. Components

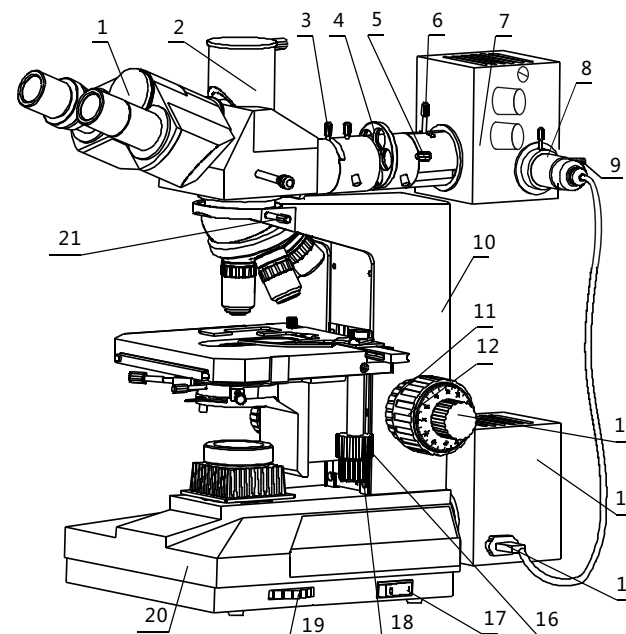


Fig.1

- Eyepiece
- Trinocular
- Polarizer
- Filters turn-plate
- Lamp housing holding screw
- Condenser adjusting pole
- Lamp housing
- Lamp stand holding screw
- Adjusting tension knob
- Coarse focusing knob
- Fine focusing knob
- Power supply box
- Power plug
- Lengthwise moving knob
- Reflected light power switch
- Crossing moving knob
- Reflected light control knob
- Base
- Tube holding screw

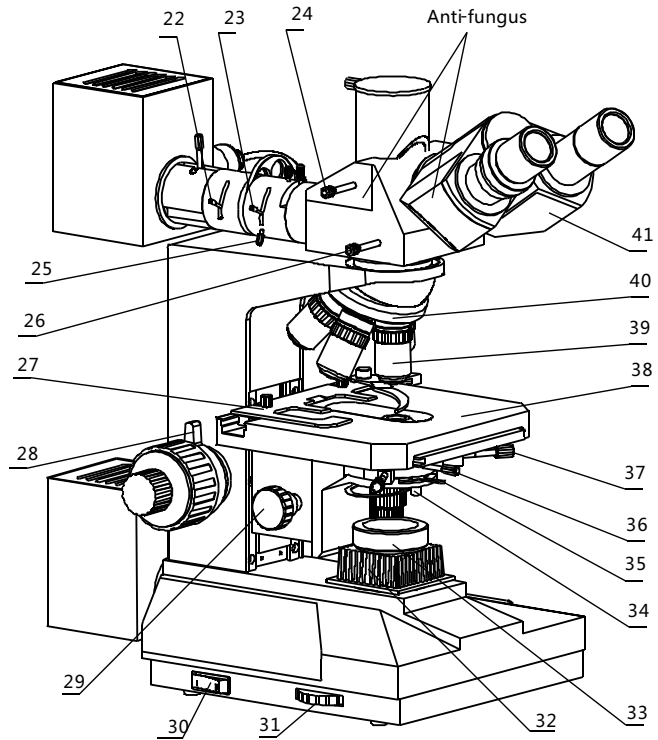


Fig.2

22. Aperture diaphragm adjusting pole 23. Field diaphragm adjusting pole 24. Observe/photo control lever 25. Field diaphragm adjusting screw 26. Analyzer lever 27. Specimen holder 28. Limited knob 29. Condenser up-down knob 30. Transmitted light power switch 31. Transmitted light control knob 32. Collector 33. Polarizer 34. Filter base 35. Aperture diaphragm adjusting pole 36. Condenser holding screw 37. Condenser adjusting screw 38. Stage 39. Objective 40. Nosepiece 41. Binocular

### III. Installation

#### 1. Reflected illumination

Take off the shade ④ of auxiliary lens under the reflected illumination, installation the reflected illumination on the socket ③ of body ①, tighten up the tube holding screw ②. (Fig.3)

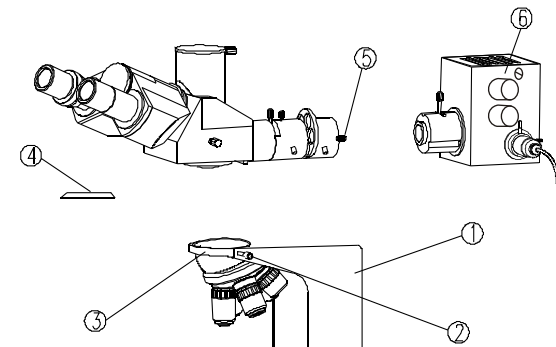


Fig.3

#### 2. Lamphouse

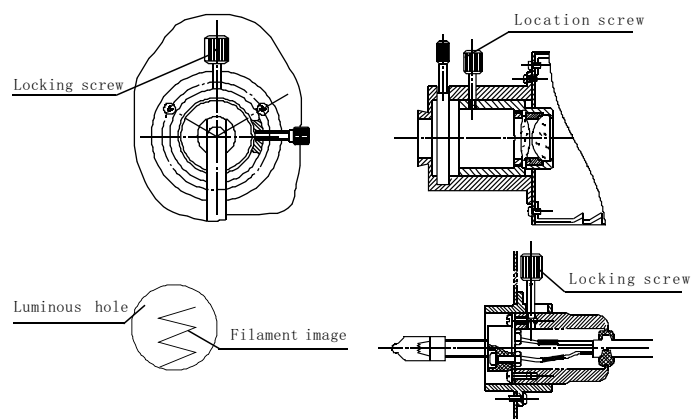
Loose the lamphouse holding screw ⑤ and installation lamphouse ⑥ into the end of reflected illumination, then tighten the lamphouse holding screw ⑤ again.

### IV. Observing Operation

#### 1. Reflected illumination

- (1) Plug the power plug 15 into power supply box 14. (Fig.1)
- (2) Push the Reflected light power switch 17 to "I", then the Reflected light power is turned on.
- (3) Take away the 10X objective, turn the nosepiece to its anchor point.
- (4) Put a piece of white paper on the stage.

- (5) Loosen the locking screw and move the location screw forward or backward to make the image of filament be in the center of paper.
- (6) If the image of filament not clear, you should adjust the condenser adjusting pole 6 to make the image clear.
- (7) If the image of filament offset the center of stage too far, you should take down the location screw and draw out the lamp, push it to side a little, then install the lamp and location screw again.
- (8) Install the 10X objective and put a piece of specimen on the stage again.
- (9) Adjust the coarse/fine focusing knob 12,13 to make the image of specimen clearly.
- (10) If brightness of field not equality, you can move the location screw of condenser screw slightly to make the brightness of field equality, then tighten the locking screw again to avoid the lamp moving.
- (11) Turn the field diaphragm to minimum, adjust the field diaphragm adjusting screw 25 to make the center of field diaphragm and field be superposition, then turn the field diaphragm until you can not see the image of field diaphragm in the field.
- (12) When use other magnification objective, you can adjust the aperture diaphragm and the brightness of illumination to obtain satisfactory contrast.
- (13) In order to obtain an image of good quality, you can use a piece of brush glass or filters according to your need.



## 2. Transmitted illumination (Fig.2)

- (1) Push the transmitted light power switch 30 to "I", then the transmitted light power is turned on.
  - (2) Adjust the transmitted light control knob 31 and the aperture diaphragm adjusting pole 35. turn the condenser up-down knob 29 to move condenser.
3. Push the observe / photo control lever ① of trinocular to observing position and push aside the analyzer ② by analyzer lever.( Fig.4)

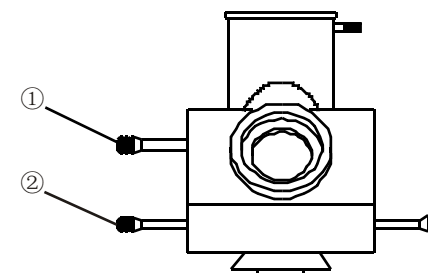


Fig.4

## 4. Adjust interpupillary distance

Put a piece of specimen on the stage and focus to obtain the image of it. Adjust the interpupillary distance of binocular until the right-left field of view can be composed one. (Fig.5)

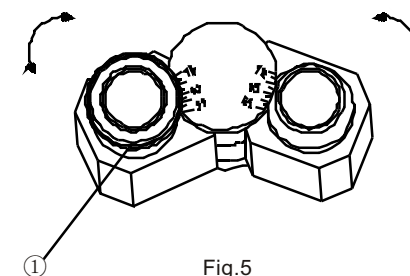


Fig.5

## 5. Adjust diopter

Turn the 40× objective to observation position. Firstly, observe the right tube with right eye, adjust coarse-fine focusing knob to image clearly. Secondly, observe the left tube with left eye, adjust the diopter control ① to image clearly.( Fig.5)

### 6. Coarse/Fine focusing (Fig.6)

The instrument used coaxial coarse/fine focusing mechanism. The adjustable tensional knob ④ used for adjusting the tension of the coarse focusing knob ③ to prevent the stage from naturally sliding down and adjusting the knob to comfortable. The limit knob ① prevents accidental specimen/objective contact. ② is fine focusing knob.

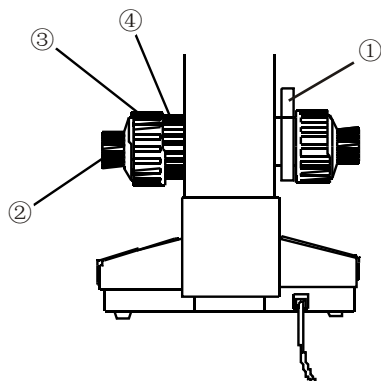


Fig.6

### 7. Reflected observation system

Put a piece of specimen on stage 38, select 10X objective and observe with it, turn coarse / fine focusing knob 12, 13 to make the image of specimen clear. Turn the field diaphragm down by turning the field diaphragm adjusting pole 23, then adjust the field diaphragm adjusting screw 25 to make the field diaphragm center coinciding with optics axis, then you can turn the field diaphragm adjusting pole 23 to make the field diaphragm bigger than field eyepiece. Turn the filters turn-plate 4 to select filter. (Fig.1,2)

### 8. Transmitted observation system

Put a piece of specimen on stage 38, select 10X objective and observe with it, turn coarse / fine focusing knob 12,13 to make the image of specimen clear. When observe with different magnification objective, you should focus by the fine focusing knob 13, then put the filter in the filter base 34.(Fig.1,2)

### 9. Polarized light device

Push the analyzer lever 26 to make the analyzer being on the observation position. When observe with reflected mirror, put the polarizer 3 into collector 32 and turn polarizer 3, you can observe the variant contrast light of field. When the polarized light is quadrature, you can observe the specimen on stage with polarized light. When observe with reflex, you should put the polarizer 33 on the collect 32 and turn the polarizer 33 to observe the variant contrast of field until the polarized light being quadrature. (Fig.1,2)

### 10.Exchange the lamp

#### A. Reflected illumination (Fig.7)

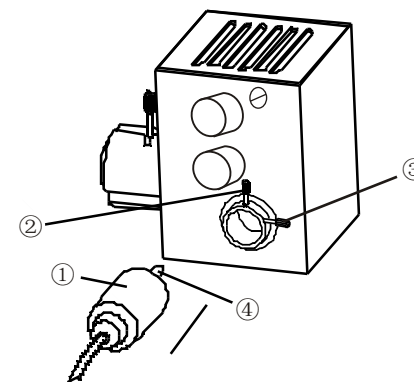


Fig.7

- (1) Put out the plug and turn off power supply.
- (2) Loose the lamp stand holding screw ③ and the lamp adjusting screw ②, put out the lamp stand ①.
- (3) Pull out the old lamp ④ from lamp stand and install a new lamp again.
- (4) Install the lamp stand ① and turn on power supply again, then according "VI. OBSERVING OPERATION 1" to adjust.

#### B. Transillumination (Fig.8)

- (1) Put out plug and turn off power supply.
- (2) Incline the microscope, loose the screw ② on the lamp stand Board ③ and turn away the lamp stand board ③.

- (3) Put out old lamp ⑤ from the lamp stand board ③ and install a new lamp ⑤.
- (4) Tighten the screw ② to hold the lamp stand board ③ on the base ① turn on the power supply and observe, if the illumination is not even, you can loose the screw ⑥ and adjust the lamp stand ④.

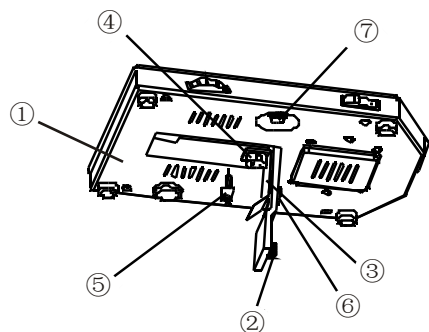


Fig.8

### 11. Exchange fuse

Incline the microscope, Loose the screw of fuse ⑦, put out the bad fuse, then mount the new fuse and tighten the screw of fuse ⑦ again.

**The specification of fuse :  $\Phi 5$ , 0.5A**

## V. Maintenance

### 1. Sweep the lens

Sweep the lens by lens tissue or soft fabric immersed with mixed liquid of alcohol/ether or diethyl benzene.

### 2. Clean the painted parts

The dust on the painted parts can be removed by gauze, for the grease spots, the gauze immersed slightly with aviation gasoline is recommended. Do not use organic solvents such as alcohol,

ether or other thinner etc, for cleaning the pointed parts or plastic components.

### 3. Avoid disassembling the microscope

Being a precise instrument, do not disassemble the microscope casually that may cause serious damage to its performance.

### 4. Being not used

Cover the microscope with polymethyl methacrylate or polyethylene and places where there is dry and mouldless. Suggest that storage all objectives and eyepieces in closed container with drying agent.