MF31 Series

Fluorescence Microscope

User Manual

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Thank you for buying our product!

This unit is a precision optical instrument. Our product has been design to provide the highest level of safety, however, improper operation or negligence in following the instructions in this manual may cause personal injuries and property losses. In order to ensure your safety, prolong the life of this unit and maintain it properly, please read this manual carefully before operating this unit.

Caution!

This manual uses the following symbols for safety reminders. Be sure to observe these warnings in order to operate this unit properly and safely.

Warning! Negligence in heeding the warning of this symbol may cause personal injury or damage to this unit!

Caution! Negligence in heeding the caution of this symbol may affect the viewing performance of this unit.

Reminder! Provide instructions and skills in operating this unit.

Pay attention to environmental protection.

Safety Reminder

1. Be sure to turn off the power switch and remove the power cord before installing this unit, replacing the bulb or fuse, plugging and unplugging the power supply.
To prevent electric shock or fire, be sure to turn off the power switch and remove the power cord before installing this unit, replacing the bulb or fuse, plugging and unplugging the power supply.

2.Do not disassemble
Except the removable parts mentioned herein, no part of this unit shall be removed, otherwise the performance of this unit may be reduced, or may cause an electric shock, injury or damage to this unit. Please contact the supplier if any fault occurs.

3.Input voltage
Check if the input voltage is consistent with your local voltage supply. If not, do not operate this unit and contact the supplier. Improper input voltage may cause a short circuit or fire thereby causes damage to this unit.

4.Use specific bulb, fuse and power cord
Use of an improper bulb, fuse or power cord may cause damage or fire to this unit. Any extended power cord used must be grounded (PE).

5. Protect this unit from high temperatures, dampness and foreign objects
To prevent short circuit or any other fault, do not expose this unit to any high temperatures or dampness environment for a prolonged period of time. A suitable operating environment is designated at a temperature of 5°C-35°C, and relative humidity of 20%-80% (at 25°C). If water splashes on this unit, turn off the power switch and remove the power cord immediately, and then wipe the water off with dry cloth. When any foreign object enters or drips onto this unit, please stop operating the unit and contact the supplier.

6.Heat of light source
The lighting bulb generates high temperatures during operation. Do not touch the collector lens or lamp box when the lamp is illuminated, and do not touch the bulb within 10 minutes after the lamp goes out due to high temperatures arising from operation. When replacing the bulb, make sure it has cooled down properly (the lamp should be off for at least 10min).
★ To prevent burn, do not touch the bulb when the lamp is illuminated or within 10min after it goes out.
★ To prevent fire, do not place any fibrous product, paper, flammable or explosive material (e.g., gasoline, petroleum ether, alcohol) near the halogen lamp housing or mercury lamp housing.

7.Coarse/fine focusing knobs
This unit employs a coarse/fine coaxial focusing mechanism. Do not turn the left/right coarse/fine focusing knob in the opposite direction. When the objectives lifting device reaches the limit of motion, do not continue to turn the coarse focusing knob, otherwise the focusing mechanism may be damaged.

8. Storage place
This unit is a precision optical instrument, and improper operation or storage may cause damage or its precision may be adversely affected. Consider the following when selecting a storage place:
※ Avoid placing the unit under direct sunlight, directly under interior lighting or any other bright place.
※ A suitable operating environment is designated at a temperature of 5°C-35°C, and relative humidity of 20%-80% (at 25°C). Do not expose this unit to high temperatures, dampness or dust for a prolonged period of time, otherwise mist or mold may develop or dust may deposit on the lens, thus cause damage to this unit and shortening its life.

Caution!

9. Installation of bulb

Do not touch the glass surface of the bulb directly with bare hands. When mounting the bulb, wear gloves or wrap it with cotton material.

※ Wipe off any dirt on the surface of the bulb with a clean cotton fabric dipped in alcohol. If the dirt is not thoroughly
※ removed, it would etch the surface of the bulb weakening its brightness and shortening its life.
※ Mount the bulb with care to avoid slipping off or injuries to your fingers.
※ When replacing the bulb, make sure its contact is intact. If its contact is damaged, the bulb may be disabled or short circuited.
※ When replacing the bulb, the feet should be inserted into the holder as deeply as possible. If the feet are not tightly inserted, the bulb may go out or short circuit.

Caution!

10. Instrument handling

This precision optical instrument is heavy and should be handled with care. Strong impact and rough handling are strictly prohibited, it may cause damage to this unit.

11. Environmental protection

Please dispose the wastes from the packaging and operation of this unit by category such as cartoon, foam, plastic, bulb and etc. Do not discard the damaged mercury lamp carelessly in order to avoid creating environmental poll

Table of Contents

I. Characteristics and applications of this unit

MF31 series fluorescence microscope is a multifunctional optical microscope with both of bright field and fluorescence, it equipped with non chromatic aberration plan achromatic fluorescence objective and wide filed eyepiece, provides excellent optical performance and the update of the system. Because of the streamline figure and pastel color, it has more beautiful appearance. It takes high brightness LED illumination with low power consume and long working life, it's safe and convenience to use. Transmission lighting LED lamp is easy to use and exchange. The microscope is widely used in the field of the biology, medicine, industry, agriculture, immunofluorescence, at the same time it is the perfect research instrument for the department of hospital, teaching and academy.

II.Structural features of this unit

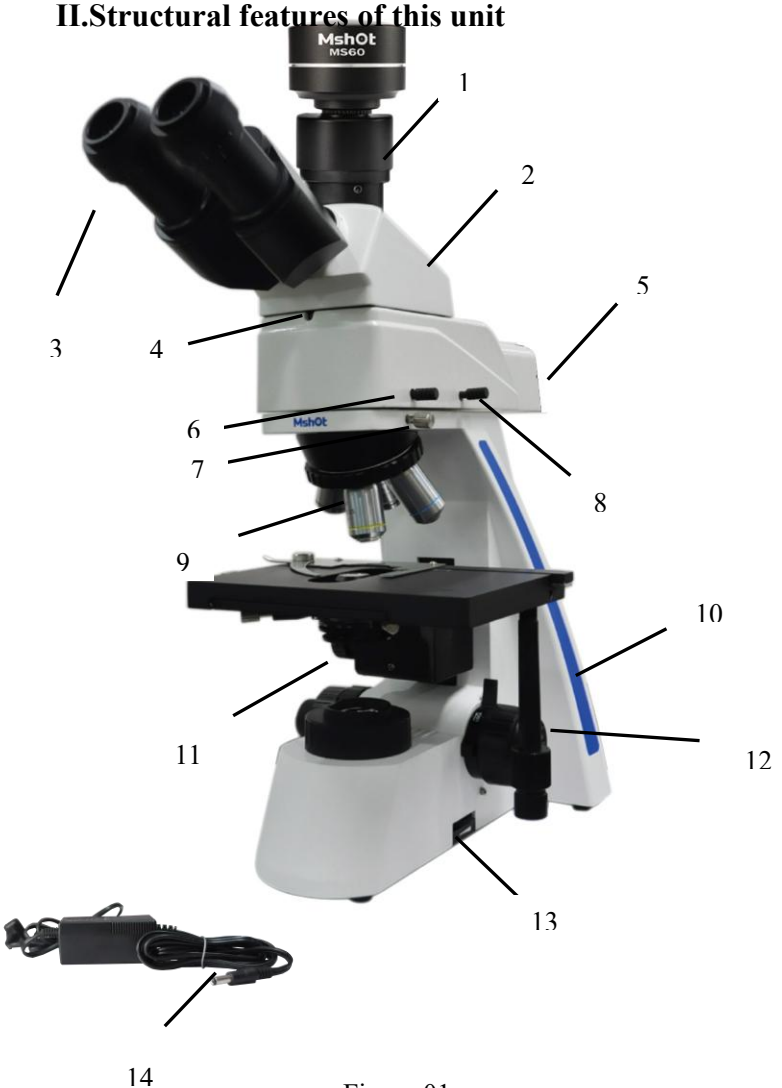


Figure 01

1. C-mount adapter seat
2. Observation head lever
3. Eyepice
4. Epi illumination fix screw
5. DC adapter port
6. Lever - bright field / fluorescence
7. Microscope body fix screw
8. Fluorescence light barrier
9. Objective
10. Transmitted light power button (on back of the body)
11. Condenser
12. Coarse and focus system
13. Transmitted light brightness controller
14. Fluorescence illuminator power adapter

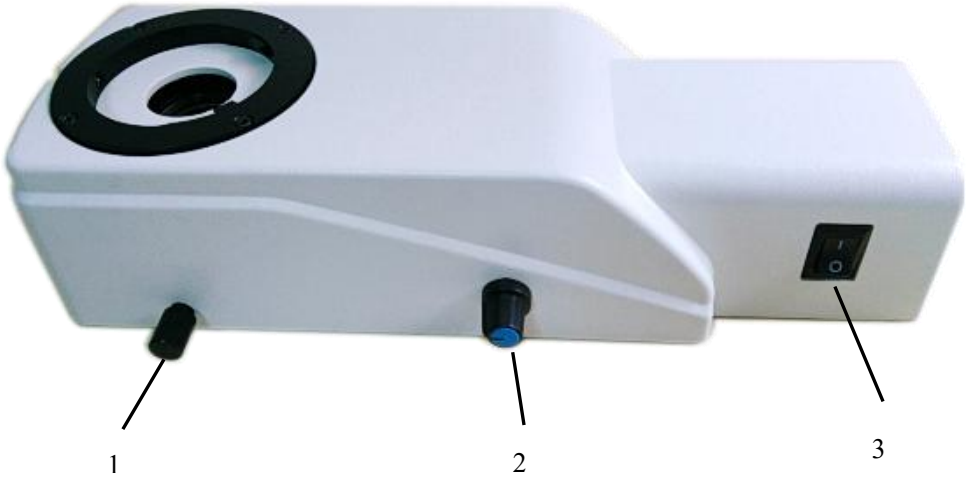


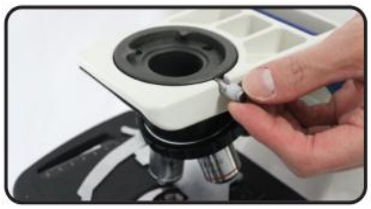
Figure 02

1.Switch lever 2. Brightness knob 3. Power

III. Installation of this unit

• Connect observation head

1.Loose screw on the top of host.



Step 1

Step 2

Step 3

• Connect eyepiece

1.Standard articulated binocular head, there is jump ring inside the eyepiece tube to fix and rotate eyepiece.

2.Insert in eyepiece

• Installation of eyepiece and condenser

Objective installation: clockwise rotate in objective from low times to high times until objective is tightly fixed.

Note: Condenser under stage has been adjusted well, there is no need to install by users again. While need to check its centering in case of shifting during shipment.

IV.Technical specifications

Main Parameter	Total Magnification	40X~1000X(standard)			
	Mechanical Tube Length	Infinity（∞）			
	Object Conjugate Distance	Infinity（∞）			
Eyepieces	Plan Objective in wide field	WF 10X	FN:Φ22mm	Objective Port: Φ30mm	Parfocalization Distance: 10mm
Trinocular	Iinterpupillary Distance: 50~75mm, light pass 0/50%/100%				
Binocular	*Optional: Articulated Binocular,30° inclination*				
Infinity Plan Achromatic Objective	4X, 10X, 40X,100X(oil)				
	Optional: Non cover slip 20X, 40X				
Condenser	Abbe Condenser (NA:1.25) can be moved freely up and down				
Stage	Double Layer Mechanical Stage, size：210 X 140mm，Moving Range：76 X 50 mm				
Epi fluorescence illumination	3W LED, 12V,2A				
	Blue LED, EF460~490nm				
	Optional: Royal blue LED, EF420~480nm				
	Optional: Green LED, EF510~550nm				
	Optional: UV LED, 330~380nm				
Transmitted light	LED light source, 3W/LED				
Power Supply	AC Voltage 85V~265V 50/60Hz，fuse parameter：250V 3.0A				
Power light	AC 100-240V 50-60HZ output 4.3V Max:0-750mA adjustable				
Digital adapter	0.5X / 1X C-mount adapter				

V． Components operation

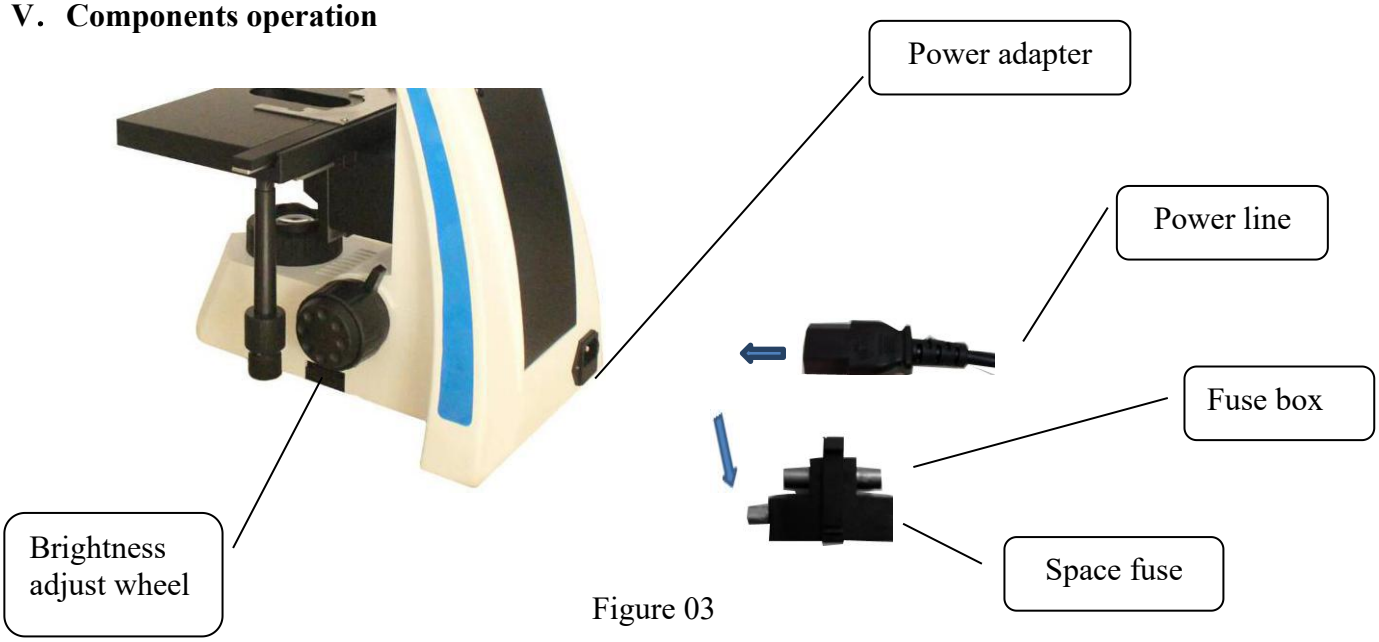


Figure 03

1. Connect power line to host back bottom side.Set illumination knob (on the left bottom side of microscope host) to lowest brightness, rotating illumination brightness by need during operation.

Exchange fuse: as figure 03, draw out fuse box and take off trouble fuse,set spare fuse to fuse box. Put box back to holder.

Attention: Before start power, please make sure voltage if meet the instrument requirement, please do not use microscope if the voltage is different, it may cause damage or fire.

2.Sample setting

Open slider holder, put on slider with upper to upside. Take notice do not damage slider. The slider should be even put on the stage, rotate stage moving wheel with X and Y to make slider into light path (as figure 04).

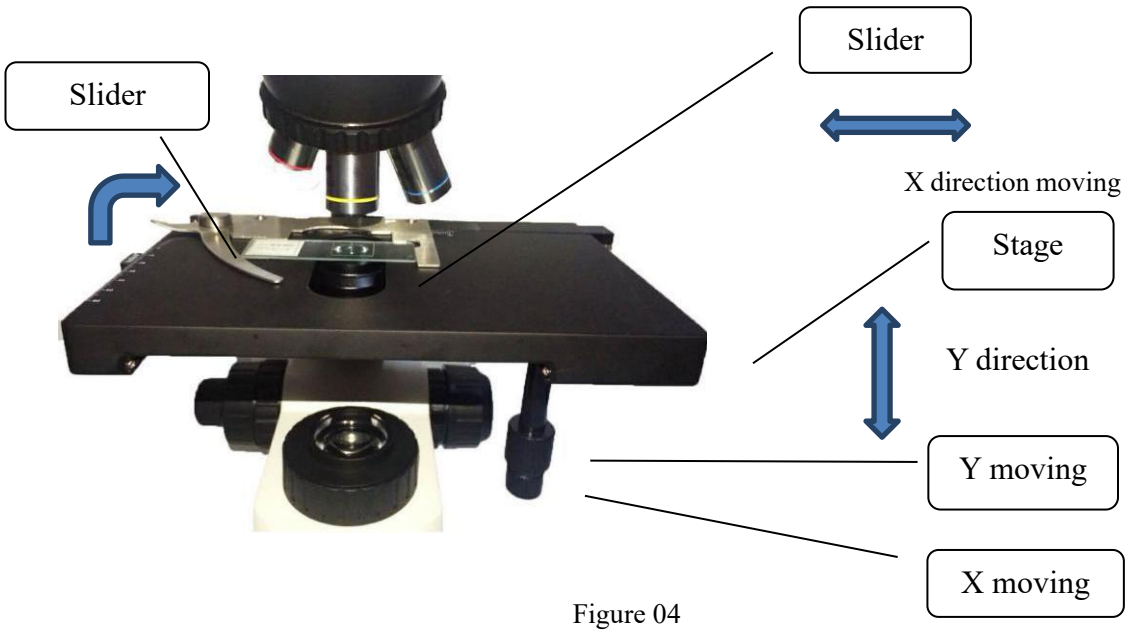


Figure 04

3.Stage sets

Figure 05

4.Condenser adjustment

4.1.1 Abbey condenser lifting wheel（Figure 05）：

Through rotate abbey condenser lifting wheel to adjust distance between condenser and slider can make brightness even to achieve best brightness and contrast.

4.1.2 Aperture adjustment（Figure 05）：

Move aperture wheel and change size of aperture to change slider contrast.In common, objective times smaller, aperture is smaller.

Attention: Aperture adjustment needs to match with objective field of numerical aperture(FN), FN is smaller, aperture size should be smaller, otherwise the same. Change field of view brightness can not achieve through change aperture size and position.

4.1.3 Binocular pupil distance adjustment and diopter

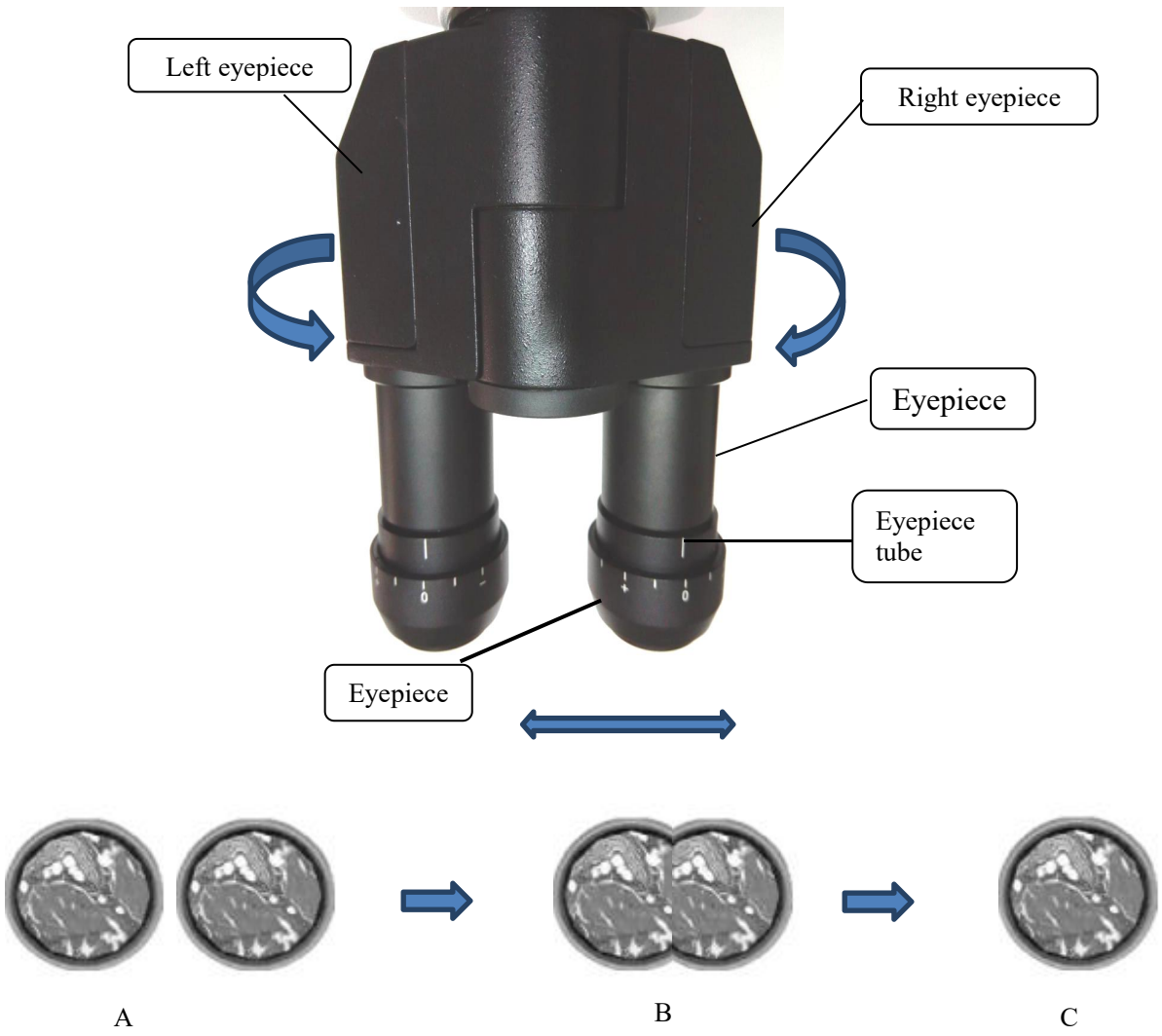


Figure 06

4.2.1 Pupil distance adjustment
The pupil distance (eye distance) varies from person to person, so before using this instrument, the pupil distance of the binocular should be readjusted.

A) transfer the eyepiece on the left and right sides to the 0 pairs of lines according to (Figure 06).
B) 10X objective is screwed into the light path, moving specimens to the light path, observing the eyepiece, adjusting the coarse and find hand wheel to make the image clear.
C) hold the binocular left mirror tube and the right mirror tube respectively, and rotate it according to (Fig.7) until the specimen is seen by both eyes. Complete coincidence (the process of A to B and then to C)

4.3.1Visual adjustment
A) transfer the left eyepiece tube and right eyepiece tube to the 0 pairs of lines according to (Figure 06). move the specimen to the light path.
B) Turn 40 X objective to light path. The right eyepiece is used to observe the specimen in the right eyesight. Adjust the coarse and find focusing hand wheel to make the specimen clearly visible.
C) Observing the specimen on the left eyepiece. If the imaging is not clear, it is necessary to adjust the eyepiece's visibility, so that a clear specimen image can be observed in left eye (adjust diopter ring, the range is: N= + 5 diopter).

4.4.1 Focus and stopper
A) Loosen the limit handle shown in Figure 07 and turn it into the 10X objective into the light path, and slowly turn the coarse moving handwheel unit the image is clear in the eyepiece.Roughly clear, then slowly rotate the micro motion handwheel to make the imaging clear. Turn to other times objective, it should be properly rotate the hand wheel to make the image clear. The minimum scale handwheel is 0.002mm.

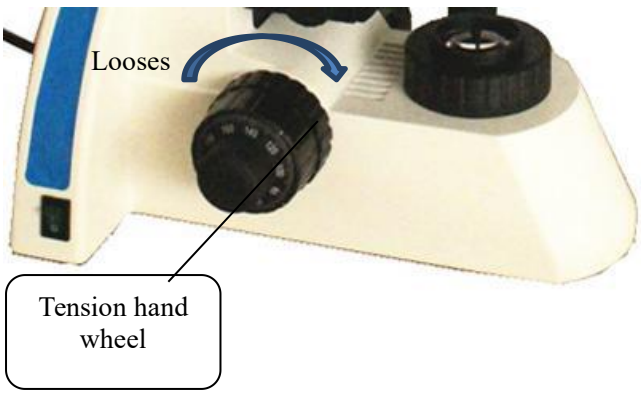


Figure 07

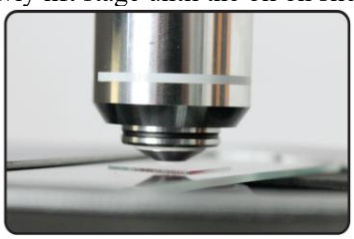
B) For convenience observation and avoid objective to touch with the slider, use stopper when focusing well (figure 07).

4.5 Oil immersion

4.5.1 Using 100X objective, you need to add oil medium. Move stage to lowest position by coarse focusing knob, drop oil on the observation area of specimen.

4.5.2 Rotate oil immersion objective(100X) to working position (the objective is marked with oil).

4.5.3 Adjust coarse focusing knob to slowly lift stage until the oil on slide touch bottom face of objective.



4.5.4 Waggle nosepiece to eliminate bubbles in oil medium, then fix oil objective to make oil full of objective and slide.

4.6 Using epi-fluorescence illumination system

4.6.1. Adjust condenser to the lowest position, diagram to the minimum size, in order to reduce interrupt lights.
4.6.2. If use bright field, pull lever of fluorescence illuminator to blank position.

VI. Using remind

1.When moving instrument, please hold the microscope by both hands.
2.Keep all optical components tiny and clear, it is very important.
3.Cover the microscope with dust cover when do not using the microscope.
4.Before wiping dust or dirt, please blow off with air blower.
5.Avoid excessive using solvent lint free cloth, please soak lens paper and cotton swab with solvent before using.
6.It is easy to overstock dirt, dust and oily material on the front side of objective lens. Please use magnifying glass to check if there is not reference substance or under dark and confused surroundings.
7. If need to take off microscope lens body, please notice do not touch lens outside face to avoid impression. On it will reduce image definition.
8.This instrument belongs to I type normal standard electrical equipment safety.
9.This instrument does not belongs to AP type or APG type equipment.
10.This instrument is equipment with protection against electromagnetic interference, surge voltage and surge current.
11.High pressure inside, non-professional people please does not open bottom base.
12.The epi fluorescence illumination is only fit to 12V, 2A power adapter.

VII.Trouble shooting

Fault	Cause	Disposition
Electric system		
No light shown in the field of view using halogen lamp	The power switch is not turned on.	Turn on the power switch.
	The halogen lamp is damaged.	Replace the halogen lamp.
	The fuse is damaged.	Replace the fuse.
	The connector of the electric chassis is in bad contact.	Check and have professional repair it.
	The halogen lamp mounted is nonconforming.	Use a conforming halogen lamp.
Optical system and imaging		
There is a black shadow on the edge of the field of view or unevenly illuminated, making it impossible to observe the whole field of view.	The nosepiece has not been turned to the fixed position.	Turn the nosepiece to the fixed position.
	The filament image deviates from the center of the collector.	Reposition the lighting bulb.
	There is dirt or oil on the surface of the objective, eyepiece or condenser	Wipe the lens surface or replace the lens.
Oil or dust is found in the field of view.	There is oil or dust on the eyepiece lens.	Wipe the eyepiece.
Defocusing or low resolution	The objective is damaged.	Repair the objective (by a professional).
	There is oil or dust on the surface of the lens of the objective or eyepiece.	Wipe the objective or the eyepiece.
	The aperture of the aperture diaphragm is too small.	Adjust the aperture of the aperture diaphragm based on the objective magnification (or numerical aperture) used.
	The objective deviates from the light path.	Turn the nosepiece to the fixed position.
The focal plane of the image is inclined (brighter on one side and darker on the other)	The lighting bulb is seriously inclined.	Reposition the lighting bulb.
	The specimen is not laid flatly.	Lay the specimen flatly on the object stage and hold it stably.
Mechanical system		
The image cannot remain clear during observation.	The focusing mechanism flows (slides down) automatically.	Adjust the coarse adjusting hand wheel.
	The fine focusing mechanism fails	Check and have professional repair it.
	The stage loosens or is inclined.	Check and have professional repair it.