



# Biological Microscope

Model: BS-2025M/B/T

## Instruction Manual



To ensure the safety and obtain satisfactory performance, please study this operation instruction thoroughly before your operation.

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## 1. Purpose

BS-2025 series biological microscopes are designed for teaching, clinical verify. This series microscopes with original style, steady structure, convenient operation and clear image is suitable for observing various biological specimens, and mostly applied in school, college, hospital and family.

## 2. Name of Components

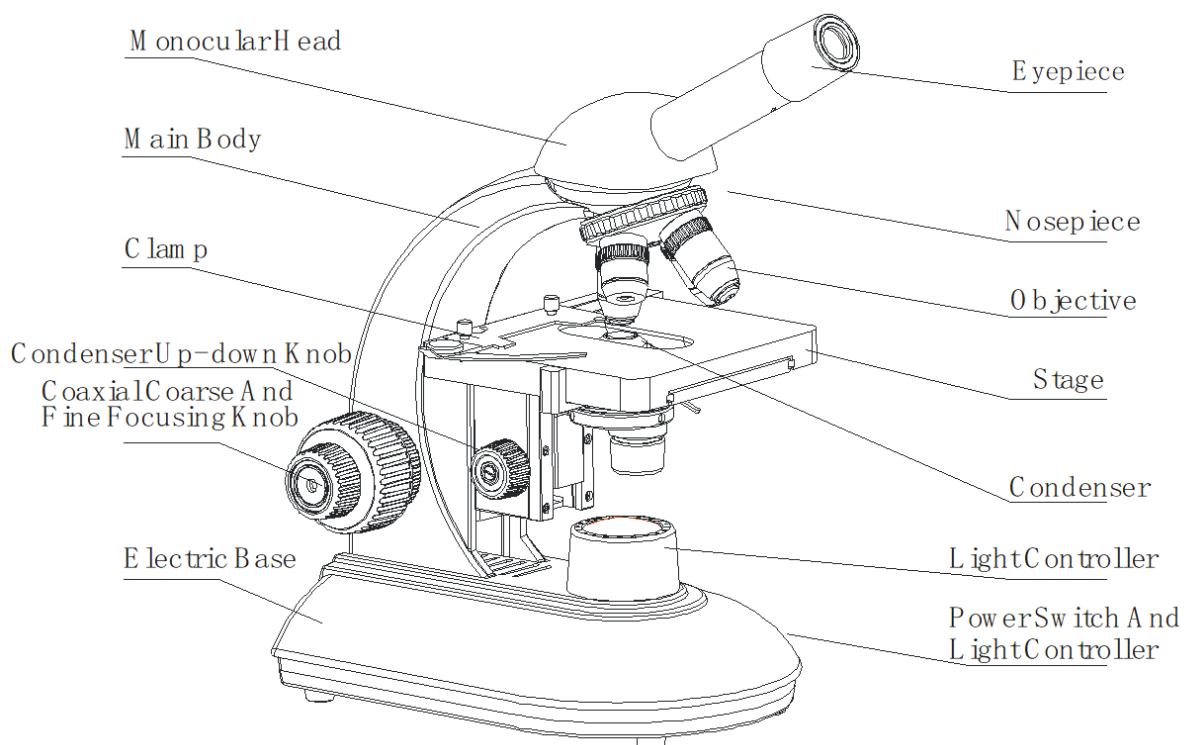


Fig. 1 BS-2025M Monocular Microscope

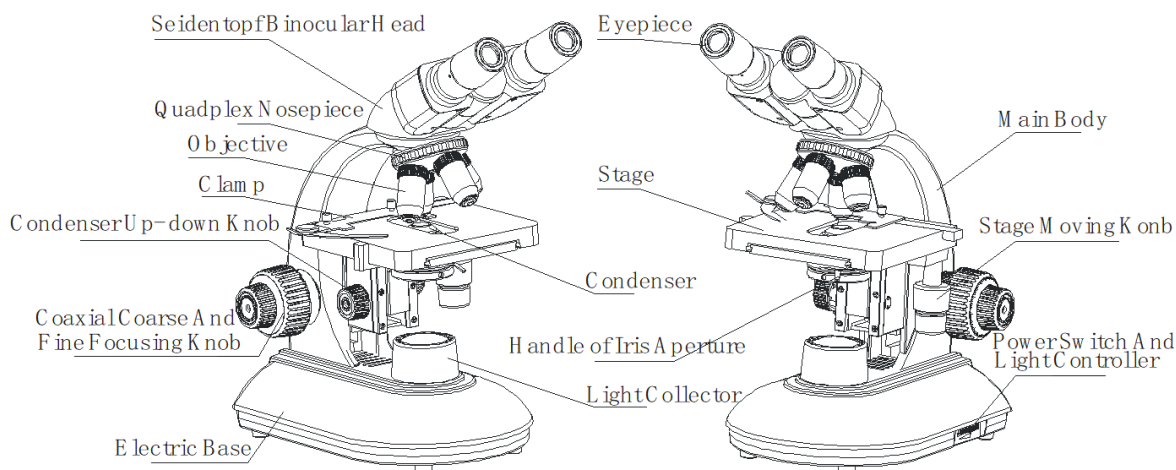


Fig. 2 BS-2025B Binocular Microscope

### 3. Specifications

#### 3.1 Total magnifications

Total Magnifications	Objective	4X	10X	40X	100X
	Eyepiece	40X	100X	400X	1000X
	10X/18mm	40X	100X	400X	1000X
	16X/11mm	64X	160X	640X	1600X

#### 3.2 Objectives

Objective	Numerical Aperture (N.A.)	Objective Field (Field Number $\phi 18$ )	Resolving Power	Working Distance Objective	
				Achromatic	Plan
4X	0.10	4.5mm	2.8 $\mu$ m	13mm	16mm
10X	0.25	1.8mm	1.1 $\mu$ m	6.3mm	2mm
40X (S)	0.65	0.45mm	0.42 $\mu$ m	0.44mm	0.66mm
100X (Oil) (S)	1.25	0.18mm	0.22 $\mu$ m	0.3mm	0.42mm

#### 3.3 The other specification

3.3.1 Mechanical tube length: 160mm

3.3.2 Conjugate distance: 195mm

3.3.3 Head: Monocular, Inclined 30°, Rotable 360°, Eyepiece can be fixed,

Anti-fungal systems.

Seidentopf binocular head 30°, Rotable 360°,

Interpupillary adjustable distance is 55-75mm,

Diopter adjustable range $\pm 5$ , Anti-fungal systems.

3.3.4 Nosepiece: Quadplex nosepiece

3.3.5 Mechanical stage: Size 142mm $\times$ 134mm

X-Y travel 50mm $\times$ 70mm

3.3.6 Focusing systems: Coaxial coarse and fine focusing knobs, Coarse stroke

22mm, Fine division 2 $\mu$ m, Condenser up-down range

25mm

3.3.7 Condenser: Abbe condenser, N.A. 1.25, Adjustable aperture,

Aperture center is adjustable.

3.3.8 Mirror: Mirror diameter $\phi$ 52mm (optional)

3.3.9 Filter: Built in blue filter,  $\phi$ 38.5mm

3.3.10 Anti-fungal systems: Eyepiece and objective is anti-fungal, anti-fungal

system built in head.

3.3.11 Electric components: Input voltage AC85-265V, 50/60Hz

Output voltage DC1.2-6V

6V/20W halogen lamp

Rotation potentiometer with power switch

Fuse 2A  $\phi$ 5 $\times$ 20

## 4. Installation

BS-2025 series microscopes are packed as integrate, and it is convenient for installation.

Open the package carton, and insert eyepiece into the eyepiece tube of the head (eyepiece for monocular microscope has been inserted before packing). If objectives don't be fixed, please take objectives out from objectives packing box, and drive them into the holes of nosepiece orderly and tightly according to the magnification.

Take out the oil bottle and dust cover, and place it properly for convenient use.

## 5. Operation

### 5.1 Electric components

Make sure the supply voltage meets the instrument's requirement, then plug in it. Rotation potentiometer with power switch used by the instrument is for protecting lamp.

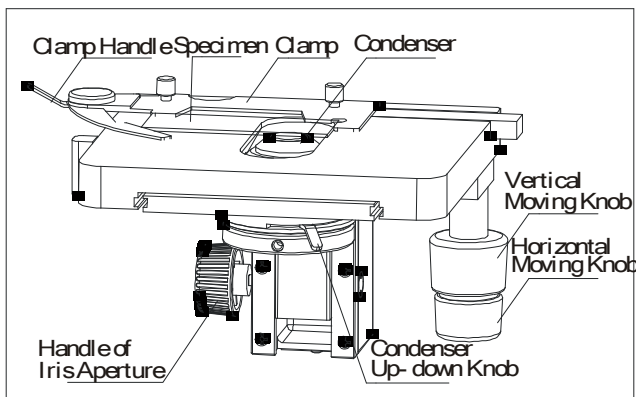


Fig.3 Stage And Condenser

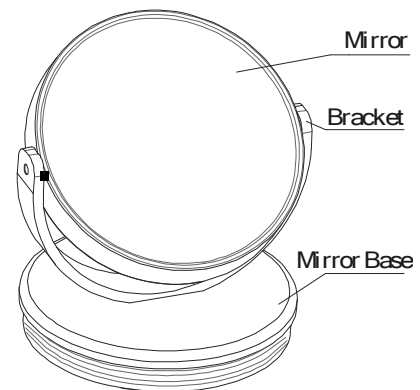


Fig.4 Mirror

### 5.2 Placing specimen (Shown in Fig.3)

Please place specimen on the stage, and the face with cover glass should be up, then clip it with clamp. Clipping specimen should be careful in order to avoid spoiling glass. Place specimen on the stage levelly, and make it into optical path by adjusting vertical moving knob and horizontal moving knob.

### 5.3 Condenser (Shown in Fig.3)

#### 5.3.1 Condenser up-down

Turn the condenser up-down knob to adjust the distance between condenser front and the specimen, and change the equal

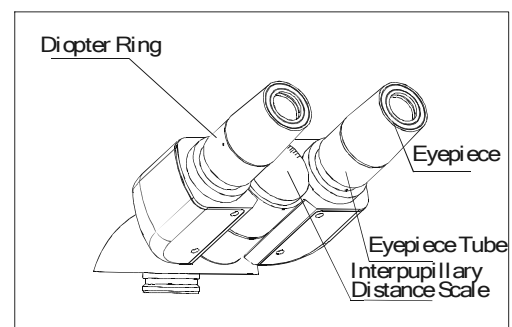


Fig.5 Interpupillary Distance Adjustment And Diopter Ring

illumination to obtain the best brightness.

### 5.3.2 Iris aperture adjustment

Stir the handle of iris aperture of condenser to adjust size of iris aperture for adjusting the contrast of the specimen.

## 5.4 Interpupillary distance and diopter adjustment (Shown in Fig.5)

5.4.1 Interpupillary distance is different for everyone, so interpupillary distance should be adjusted before using binocular microscope. Please take the two eyepiece tubes to turn until the bright rings observed by two eyes are in superposition entirely.

▲ BS-2025M monocular microscope don't need to be adjusted.

### 5.4.2 Diopter adjustment

As focusing for binocular, user should observe right eyepiece with right eye, and make the right eyepiece clear by focusing adjustment, then observe the left eyepiece, at the same time, adjust the diopter ring of the left eyepiece tube to make the image of left eyepiece clear as same as the right eyepiece.

## 5.5 Focusing adjustment

Usually 10X objective should be used for focusing adjustment first. Take 10X objective into bright path, then observe the specimen with right eyepiece by right eye and turn coarse focusing knob to find the image, then turn slowly fine focusing knob to make the image clear.

All objectives of our microscope are precisely adjusted, and approximate clear image should be found with the other objectives after getting the clear image with 10X objective. If the image isn't enough clear with the other objectives,



please turn fine focusing knob slightly to find the satisfactory image.

▲ Don't turn left and right coarse and fine focusing knobs with different direction with power at the same time, if so, the focusing system will be damaged.

▲ Don't directly pull objective to turn nosepiece when user changes the different objectives, if so, optical quality of microscope possibly be affected. The right way is to take the tooth-like part of the nosepiece to turn it, and make the objective into correct position and into the bright path.

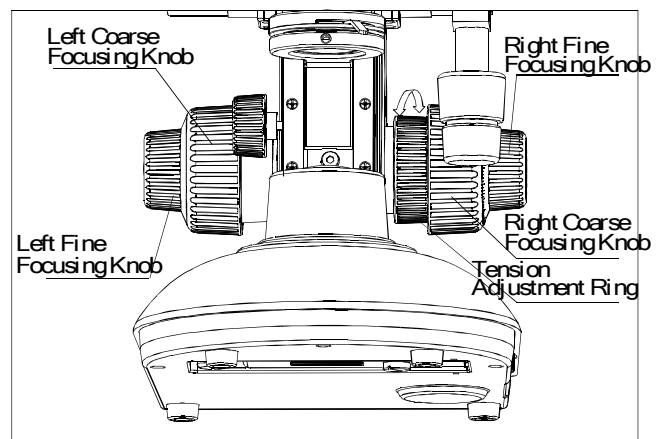


Fig.6 Coarse And Fine Focusing Knobs And Tension Adjustment Ring

#### 5.6 Usage of the tension adjustment ring (Shown in Fig.6)

The tension adjustment ring can adjust the tension of the coarse and fine focusing unit to prevent the stage from sliding down automatically and to improve the comfort of operation. Rotation clockwise makes tension decrease, and by contraries, rotation counterclockwise makes tension increase.

#### 5.7 Usage of immersion oil objective

The 100X objective of BS-2025 series microscopes can be used for observation even if without immersion oil. However, adding moderate immersion oil between the front lens of 100X objective and the cover glass of specimen can make the image clearer. Please pay attention that air bubble and impurity can't be in the immersion oil, otherwise, the image would be affected.

First of all, take 40X objective which has been focused well out from bright path, then take 100X objective into bright path. At this time, nosepiece or stage moving knob should be turned slightly, and also slightly turn fine focusing knob to clear away the air bubble of immersion oil, otherwise, the air bubble would affect the image badly.

▲ After immersion oil used, the oil of specimen and the microscope surface should be soon cleaned by absorbent cotton, lens paper, gauze or soft cotton cloth with moderate mixture of pure industrial alcohol and ether (proportion 1:4)

▲ Standard thickness 0.17mm cover glass should be chosen when high times objective used, and thickness error should be within 0.01mm, otherwise, image definition would be affected.

#### 5.8 Mirror (Shown in Fig.4)

Mirror of BS-2025 series microscopes is optional, and it is used when electrical power isn't supplied.

Mirror doesn't be suggested as illumination source when 100X objective used. Take light collector down from base, then take mirror on base. Turn mirror to make reflecting face to the light source, and make reflecting face and horizontal face as 45° approximately to make the light to specimen as possible. The mirror has two sides, one is a plane mirror, and the other one is a concave one. Concave mirror is suitable for large-area outside light source, such as bright sky.

#### 5.9 Points of attention after using

5.9.1 Power of microscope should be turned off after using, and the plug

should be pulled down. If immersion oil used, please clean objective and specimen soon. Finally, cover microscope with dust cover.

5.9.2 Please take eyepiece and objectives out from microscope if user will stop using it for a long time, and place eyepiece and objectives into drier with drying agent. Cover microscope with dust cover.

## 6. Maintenance

### 6.1 Clean microscope

6.1.1 Don't touch the lens with hand, Dust on lens should be cleaned by soft brush or absorbent cotton or cleaned by absorbent cotton, lens paper with the mixture of alcohol and ether (proportion 1:4).

6.1.2 Alcohol and ether all are burnt easily, please take them away from fire. Be careful for turn on and off power.

6.1.3 Don't clean painted metal and galvanizing metal with organic solvent such as alcohol, ether or the mixture of the both. Silicon cloth or soft cleaning preparation is suggested to clean it.

6.1.4 Plastic should be cleaned by soft cloth with clear water.

### 6.2 Environment of using and placing

6.2.1 Microscope should be used and placed in a cool, dry, non-dust, non-shake and non-corrosive gases environment.

6.2.2 Microscope should be used in environment of indoor temperature 0°-40°C and maximum relative humidity 85%.

6.2.3 Removing humidity equipment is suggested to be installed when microscope used in heavy humidity area to avoid fungus and mist damage instrument.

6.2.4 Please pay attention to prevent microscope from violent shake and vibration in application and in carrying. Don't drag it on the surface of worktable to avoid damage microscope and worktable.

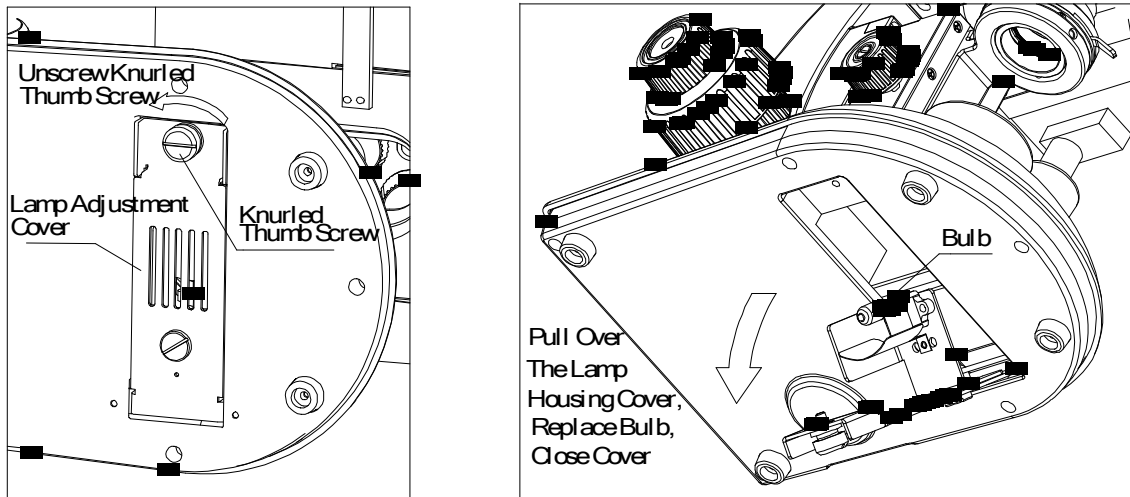


Fig.7 Replacement of Bulb

### 6.3 Replacement of bulb (Shown in Fig.7)

6.3.1 Turn off power, and pull out plug.

6.3.2 Wait the bulb become cool.

▲ Please be sure that the bulb is cool, then follow by the operations.

6.3.3 Lay aside the microscope reliably, unscrew the knurled thumb screw of the lamp housing cover on the underside of base.

6.3.4 Pull over the lamp housing cover.

6.3.5 Pull out the bulb should be replaced, hold a new bulb with silk cloth to avoid fingerprint and dust affect bulb brightness and service life, and insert fully the contact pins into the bulb socket.

6.3.6 Close the lamp housing cover, and screw the knurled thumb screw.

▲ After working for above 10

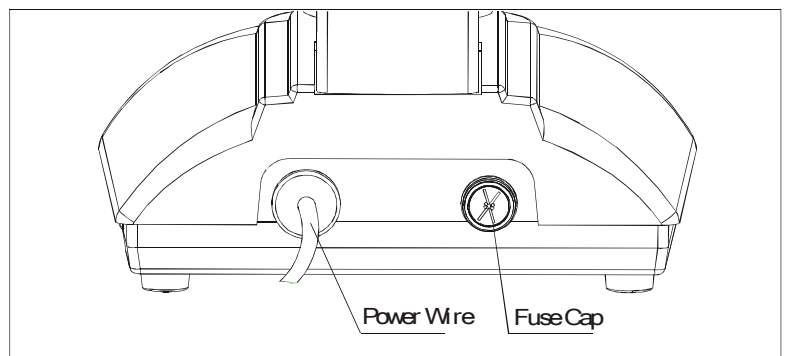


Fig.8 Replacement of Fuse

hours continuously, better cut off the microscope about 30 minutes.

#### 6.4 Replacement of fuse (Shown in Fig.8)

6.4.1 Cut off power of microscope, and pull out the plug.

6.4.2 Unscrew fuse cap in the back of base, take out old fuse.

6.4.3 Replace a new fuse, then screw the fuse cap.

6.5 Stop to use microscope, please cut off power, cover the dust cover, and place it in a cool and dry environment.

#### 6.6 B-LED biological microscope

##### 6.6.1 LED illumination specification:

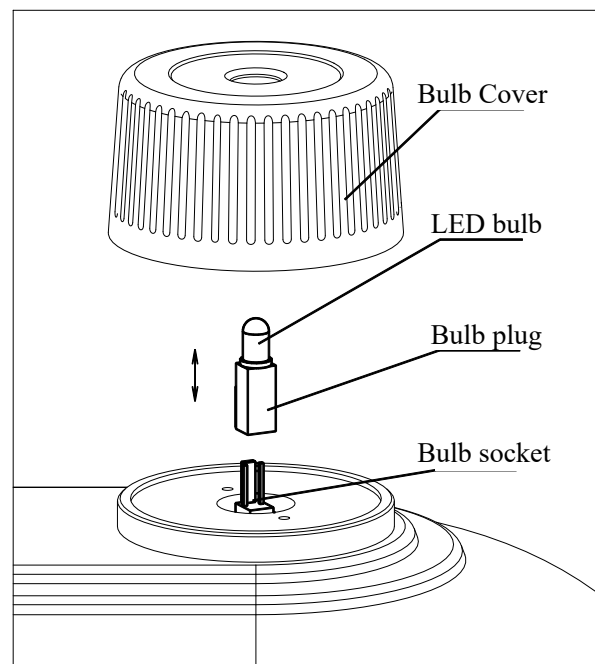
Available LED using time: Above 10,000 hours

Working Voltage: 3.1V

Maximal working electrical current: 30mA

Maximal power dissipation: 120mW

Luminous intensity: Above 6cd



##### 6.6.2 LED bulb replacement:

Cut off power: Pull out the power plug off socket, and confirm power cut off

Put out bulb cover: Put out the bulb cover off the up-cover of the base LED

bulb replacement: Pull up the LED bulb with plug and out off the bulb socket, then insert the replacing bulb with its plug into the bulb socket

## 7. Troubleshooting

In the period of using BS-2025 series microscopes, if there is any trouble occurs, please referring to the following sheet listing some common troubleshooting, and resolve them.

Trouble	Causation	Remedy
Switch on but bulb dark	Plug is unreliable	Plug in again
	Bulb is broken	Change bulb
	Fuse is broken	Change fuse
Bulb is flickering or brightness is unsteady.	Bulb is unstable	Insert it again
	Bulb is broken	Replacing bulb
Brightness of view field isn't enough or is uneven.	Bulb specification doesn't meet the requirement.	Replacing bulb
	Brightness isn't adjusted correctly	Adjust rotation potentiometer
	Objective isn't in correct position	Make the objective in correct position.
	The size of iris aperture is too small.	Adjust the size of iris aperture.
	Lens (objective, eyepiece, condenser, light collector) has dust.	Clean it
	Position of condenser is too low	Higher condenser
Image isn't clear (contrast or definition isn't enough).	Cover glass of specimen doesn't meet the requirement	Use required thickness cover glass (0.17mm)
	Cover glass of specimen isn't in up direction	Place specimen correctly
	Surface of objective lens is dirty (especially it is easy for the front lens of 40X objective to dip in immersion oil)	Clean it
	Immersion oil isn't used for 100X objective (oil)	Use immersion oil
	Immersion oil doesn't meet the requirement	Use immersion oil supplied by us
	There is bubble in immersion oil	Clear the bubble way
	Size of iris aperture isn't proper	Adjust the size of iris aperture
	Position of condenser is too low	Readjust the position of condenser

One side of image is dark or image is moving as focusing.	Objective isn't in correct position.	Make the objective in correct position.
	Specimen isn't placed correctly	Place specimen levelly on stage and clip it with clamp.
Objective touches specimen as changing low times objective to high times objective.	Cover glass of specimen isn't in up direction.	Place specimen correctly
	Cover glass doesn't meet the Requirement.	Use required thickness cover glass (0.17mm)
Image observed by two eyes aren't in superposition entirely.	Interpupillary distance isn't adjusted correctly.	Adjust interpupillary distance according to two eyes.
It is easy for eyes to be tired during observing.	Diopter isn't adjusted correctly	Readjust diopter



## 8. Outfits

Items	Specification	BS-2025M	BS-2025B	BS-2025T
Eyepiece	WF 10X-18 mm	●	●●	●●
	WF 10X-18 mm(With Pointer)	○	○	○
	WF 16X-13 mm	○	○○	○○
	WF 10X-18 mm(Reticule 0.1 mm)	○	○	○
Achromatic Objective	4X	●	●	●
	10X	●	●	●
	40X(S)	●	●	●
	100X/1.25 (Oil) (S)	●	●	●
	20X	○	○	○
	60X (S)	○	○	○
Plan Objective	4X	○	○	○
	10X	○	○	○
	40X/0.65 (S)	○	○	○
	100X/1.25 (Oil) (S)	○	○	○
	20X	○	○	○
	60X(S)	○	○	○
Monocular Head	Inclined 30°, Rotatable 360°	●		
Seidentopf Binocular Head	Inclined 30°,Rotatable 360°, Interpupillary Distance 50-75mm		●	
Seidentopf Trinocular Head	Inclined 30°,Rotatable 360°, Interpupillary Distance 50-75mm, Light Distribution: 20:80			●
Nosepiece	Quadplex	●	●	●
Focusing Knobs	Coaxial Coarse and Fine Focusing Knobs	●	●	●
Mechanical Stage	Stage Size: 120mmX115mm, Travel: 50mmX70mm	●	●	●
Condenser	Abbe N.A. 1.25(Iris Diaphragm)	●	●	●
Dark Field Ring	Available For 4X-40X Objective	○	○	○
Polarizing Attachment	Analyzer /Polarizer	○	○	○
Mirror	Plano-concave mirror	○	○	○
C-mount	1X/ 0.5X (Focus Adjustable)			○
Base	LED Illumination Systems (non-rechargeable)	●	●	●
	LED Illumination Systems (rechargeable)	○	○	○
	6V 20W Halogen Lamp, Wide Voltage: 100V-240V	○	○	○

Note: "●"In Table Is Standard outfits, "○" Is Optional Accessories.

Packing Size: 337mm×242mm×417mm

Gross Weight: 7 kgs

Net Weight: 5.5 kgs