



BS-6023 Series

Instruction Manual







This manual is written for BS-6023 metallographic measurement device. To ensure the safety, obtain optimum performance and to familiarize yourself fully with the microscope, it is strongly recommended that you read this manual carefully before operating the microscope.

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1. Safety Symbols

symbol	explanation
	Indicates that the surface becomes hot, and should not be touched with bare hands.
	Before use, carefully read the user manual .Improper use could result in personal injury to the user and/or damage to the equipment.
	Indicates that the main switch is ON.
	Indicates that the main switch is OFF.

2. Safety Precautions

1. Be careful when opening box to keep objectives from dropping and damage, avoid objectives from sweat and fingerprints.
2. Do keep the metallographic device out of direct sunlight, high temperature or humidity, dusty and easy shaking environment. Make sure the stage is smooth, horizontal and firm enough.
3. When moving the instrument, grip two sides of the bottom of the microscope with your two hands.

★DO NOT hold the coarse-fine movement hand wheel or the lamp house or the microscope may be damaged.

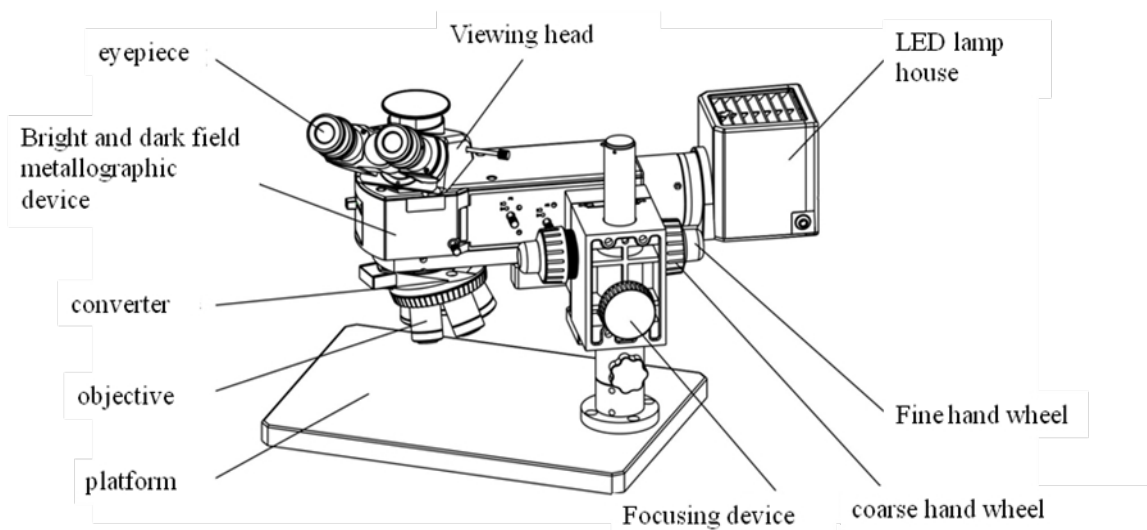
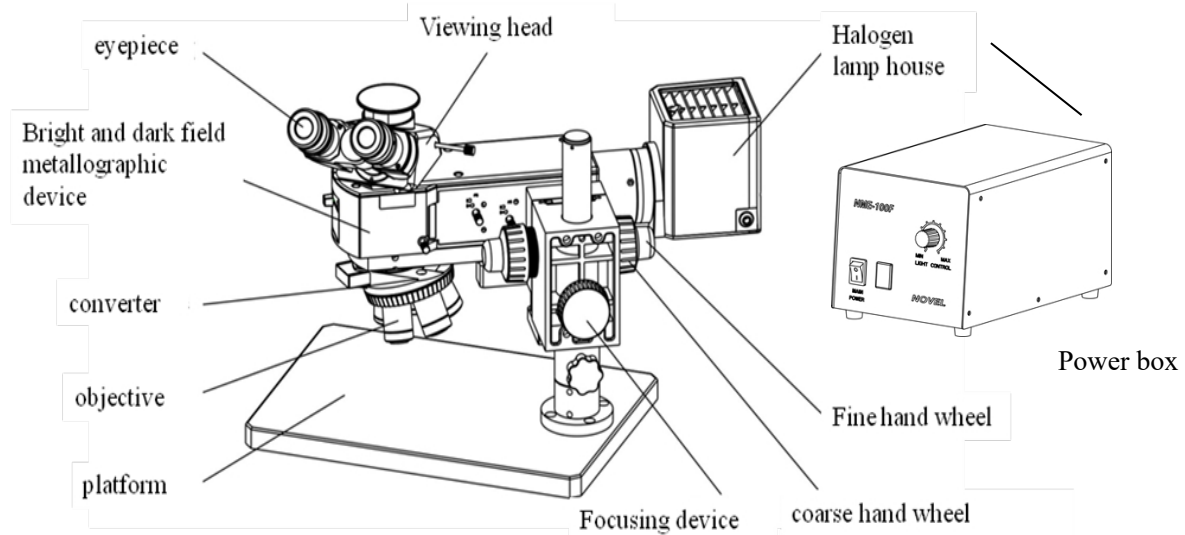
4. Please ensure enough cooling room for power box and keep away from power wires.
5. When running, the lamp house and nearby parts will be very hot. Please ensure 10cm cooling room for them.
6. Make sure the instrument is earthed, to avoid lightning strike
7.  For safety, be sure the main switch is in “O”(off) state and cut off the power supply before replacing the bulb or the fuse. If you replace the bulb during use or right after use, allow the lamp bulb and the lamp house to cool completely before touching.
8. Use the dedicate power wires.
9. When camera or TV lens is needed, make sure the adding weight is less than 2.8kg.

3. Maintenance and Care

1. All the lenses have been adjusted properly; do not dismount them by yourself please.
2. The nosepiece and coarse and fine focusing parts are so delicate that it is forbidden to disassemble them carelessly by yourself.
3. Keep the instrument clean ,and do not pollute the optical element when wiping away the dust on the instrument.
4. The contaminations on the prism, like fingerprints and oil smudges, could be gently wiped with a piece of soft cloth or tissue paper, gauze which has been immersed in pure alcohol or ether. **(Note that the alcohol and ether are highly flammable, do keep them away from the fire or potential sources of electrical sparks, and use them in a drafty room as possible as you can.)**
5. Do not attempt to use organic solvents to clean the microscope components other than the glass components. To clean them, use a lint-free, soft cloth slightly moistened with a diluted neutral detergent.
6. When using, if the microscope is splashed by liquid, cut off the power at once, and wipe away the splash.
7. Do not disassemble any parts of the microscope, as this will affect the function or reduce the performance of the microscope.
8. Place the instrument in a cool, dry position. After using the microscope, remember to cover it

1.Component Names

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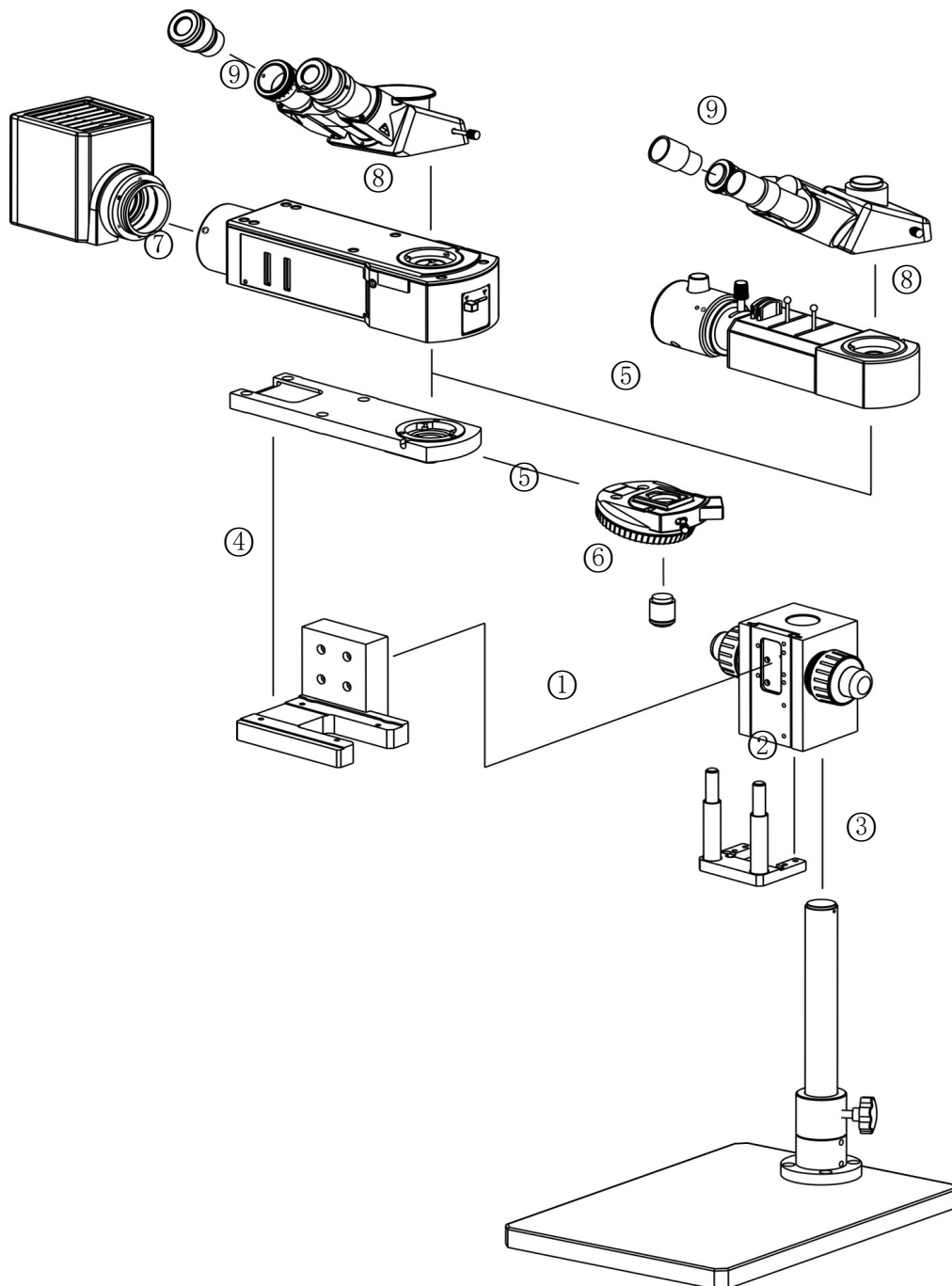
2.Assembly

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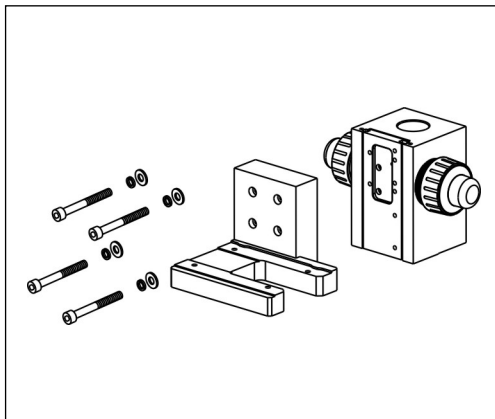
2-1 Assembly Diagram

The following picture shows the sequence of the modules in which the number stand for the steps of assemble.

- ★ Before assembling, make sure that every module is free of dusts and dirt. Do not scratch any modules or glass surfaces.
- ★ Keep the provided hexagon screwdriver as you may need it when changing modules.



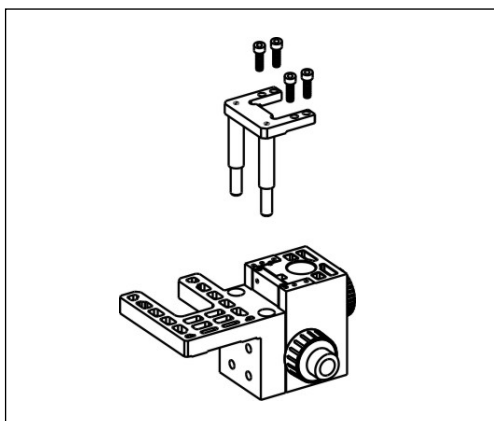
2-2 Assembly Steps



Pic.1

2-2-1 Install L-plate (pic.1)

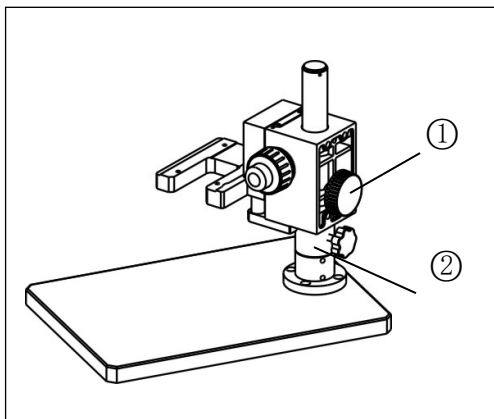
- ★ Fix the L-plate and the fine-coarse movement component together by 4 matched bolts and washers.



Pic.2

2-2-2 Install supporting component (pic.2)

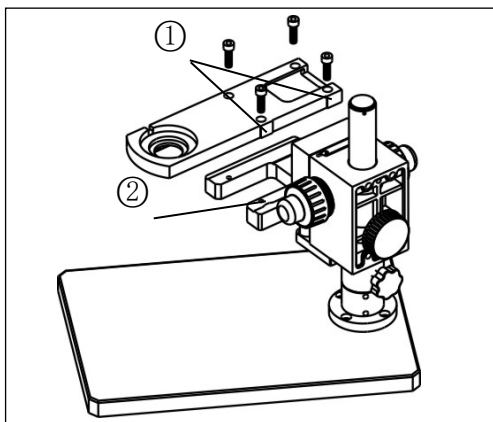
- ★ Insert the supporting component to the corresponding holes on the L-plate and fix it on the fine-coarse movement component by 4 matched bolts and washers.



Pic.3

2-2-3 Install fine-coarse movement component (pic.3)

- ★ Stack the fine-coarse movement component on the column of the platform and screw the fixing bolt ①.
- ★ If the specimen is too high, we can stack the locking collar ② on the column before the install of fine-coarse movement component.



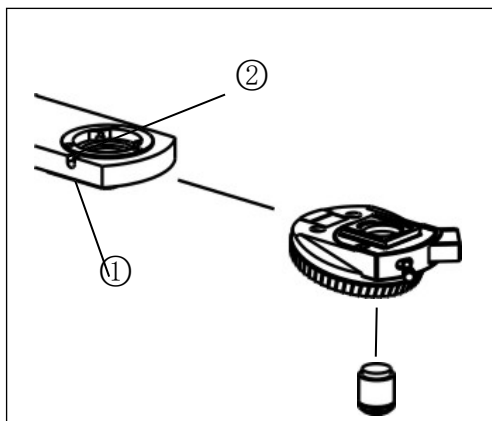
Pic.4

2-2-4 Install connecting plate (pic.4)

★ Put the connecting plate on the L-plate and fix it by 4 matched bolts. Make sure the locating surface ① is adjacent with the surface ② of the L-plate

2-2-5 Install converter and objective (pic.5)

1. Insert the converter to the socket on the connecting plate by path shown in pic.5 and tighten the bolt ① by a hexagon screwdriver to fix it.
2. Screw the objectives to the holes on the converter in sequences.

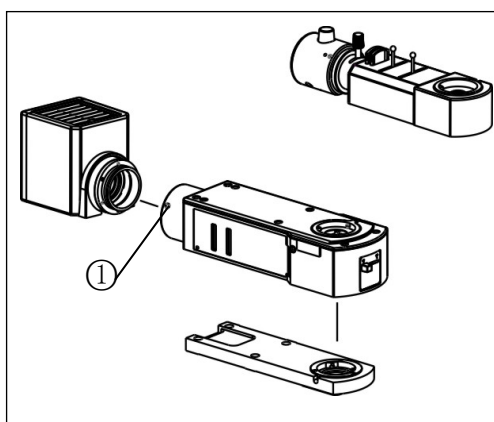


Pic.5

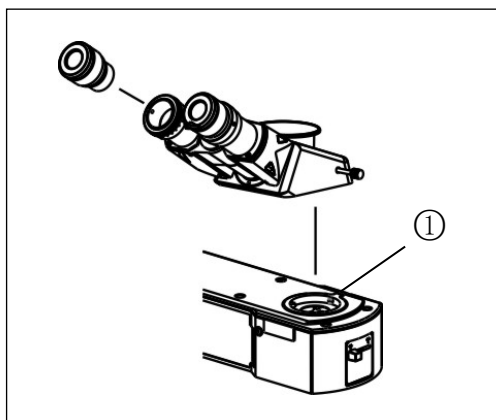
2-2-6 Install metallographic device (pic.6)

★put the swallow tail of the metallographic device in the corresponding holes on the connecting plate and tighten the bolt ② in pic.5.

★If it is a bright and dark field metallographic, we should insert the lamp house into the back of the metallographic device and tighten bolt ① to fix it.




Pic.6



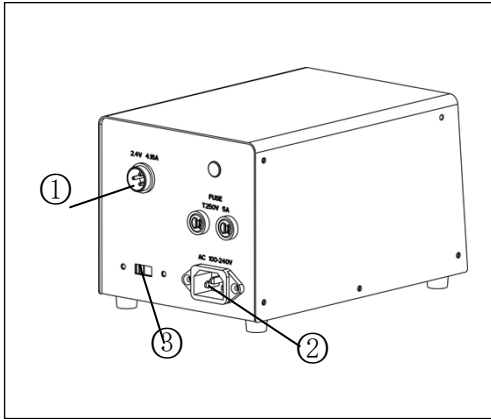
Pic.7

2-2-7 Install viewing head (pic.7)

1. Put trinocular viewing head onto the swallow-tail of the connecting-plate and screw bolt  to fix the viewing head.
2. Insert the eyepiece to the lens cone of the viewing head.

3. Adjustment and Operation

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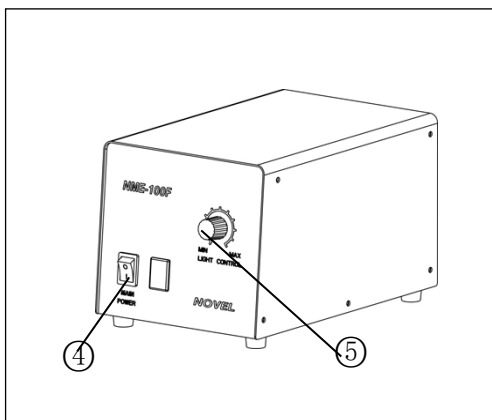
Pic.1

3-1 Connect power source and regulate light (pic.1, pic.2)

1. Connect the air plug of halogen lamp house with the aerial socket of the power box, plug one head of power line to socket and the other head to the power supply. Toggle the converter switch to proper position according the power demand of location.

2. Make sure the light adjust knob in a minimum position and toggle the main switch in the front of power box to the “ — ” position. (It only needs to plug the adapter to the socket when using LED house)

3. Turn the knob to the MAX position to increase the voltage and the brightness of lamp house.



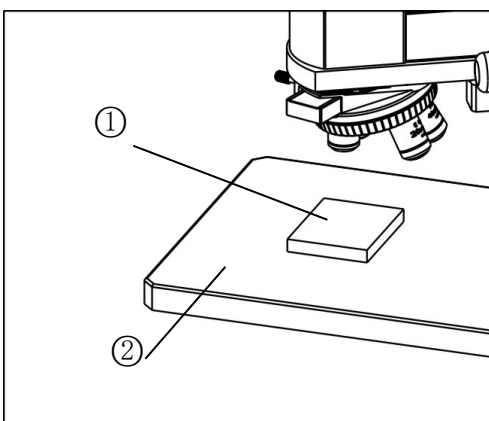
Pic.2

3-2 Sample placement (pic.3)

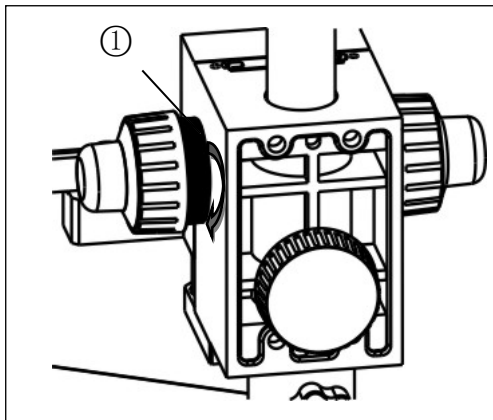
Place the sample on platform.

sample should be flat or parallel. Besides, reflected light should not entrance the objective otherwise the observation will fail.

★ Be careful when convert objectives. The objective may touch the sample when converting objective after using a short working distance objective.



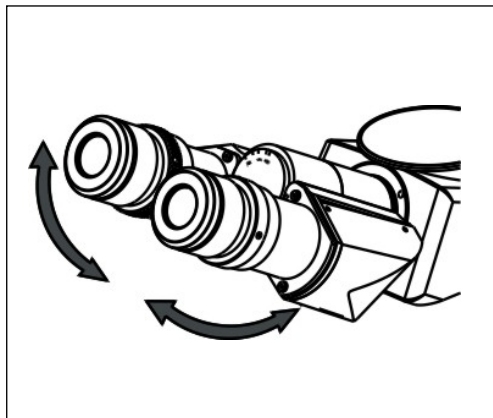
Pic.3



Pic.4

3-3 Adjustment of coarse focus hand wheel (pic.4)

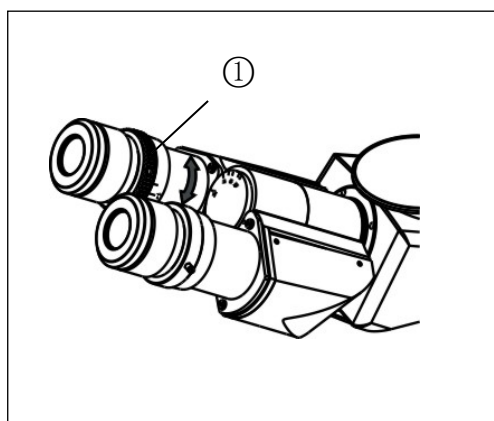
- ★ The loose condition of coarse focus hand wheel can be adjusted by turning the adjusting ring①.
- ★ The coarse focus hand wheel is in a loose state when delivered, a heavy force is needed to rotate the hand wheel.



Pic.5

3-4 Adjustment of pupil distance (pic.5)

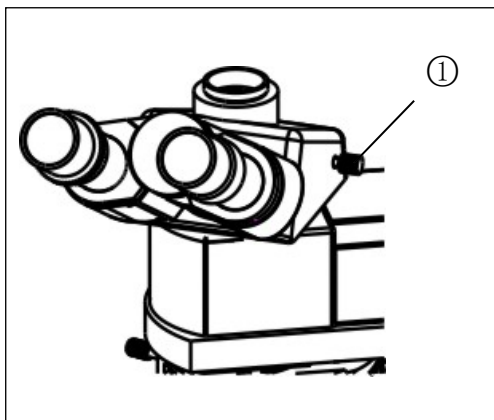
The range of pupil distance is 47mm~78mm. when observing with both eyes, hold and rotate the prism table to adjust the pupil distance until the left and right field of view coincided.



Pic.6

3-5 Visibility adjustment (pic.6)




1. Observing with right eye, rotate the focus hand wheel until the sample is imaged clearly within the eyepiece.
2. Use left eye to observe, adjust the visibility ring① until the sample is imaged clearly within the left eyepiece.

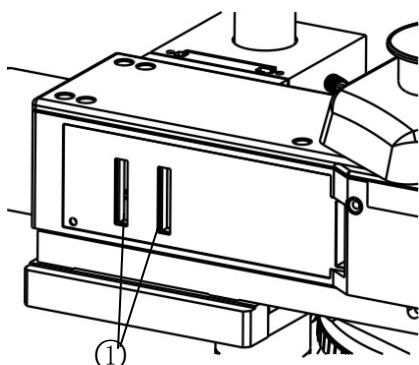


Pic.7

3-6 3-gear light path switch (pic.7)

1. When not using cameras, totally push in the light path switch rod and observing by eyepiece. Use the 10× objective to focus, first descend the focusing component and find the image in the 10× eyepiece, then turn the fine focusing hand wheel until getting clear image. Convert the objective will not touch and damage the sample because of the parfocal.
2. When using cameras, totally push in the light path switch rod and pull it out after getting a clear image. Observing through videos.

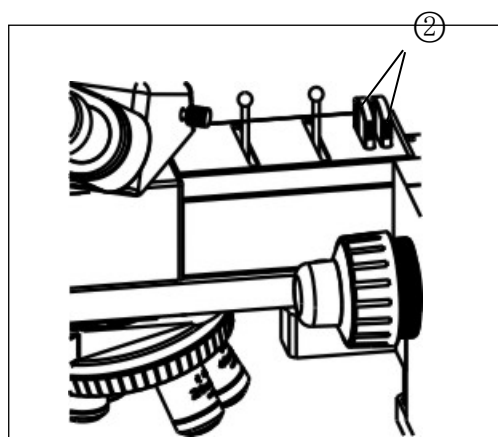
Icons	Operation (switch rod)	Brightness ratio of eyepiece and camera
	Totally pushed in	100:0
	middle	20:80
	Totally pulled out	0:100



Pic.8

3-7 Usage of color filter (pic.8, pic.9)

Plug needed color filter in position1 (position 2 when use LED), make sure the filter is well settled.

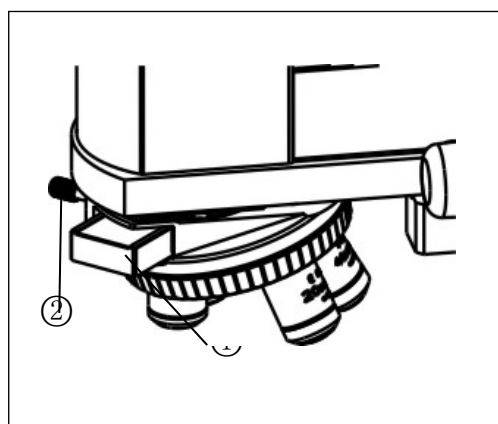


Pic.9

Color filters	Function
Ground glass	Adjust the brightness of the light
Green filter	Increase the contrast when single color observing
Yellow filter	Increase the contrast when observing semiconductors
Blue filter	Used in normal observe and camera observe
Matte filter	Smooth light

3-8 Usage of extension function board (pic.10)

A socket to settle an extension function board is preserved and it's occupied by a normal bright and dark field board when the microscope is delivered. If you want to use other function board, just loosen bolt ② and pull out the bright and dark field board and then tighten bolt ② after plug the extension board in.

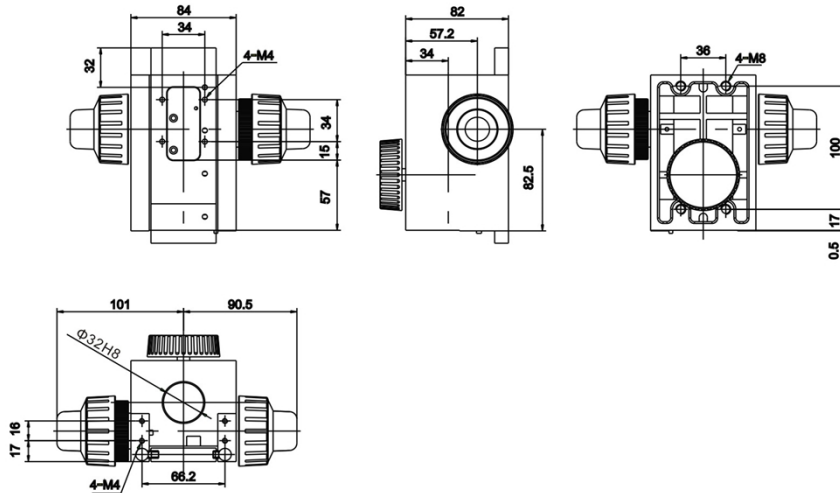


Pic.10

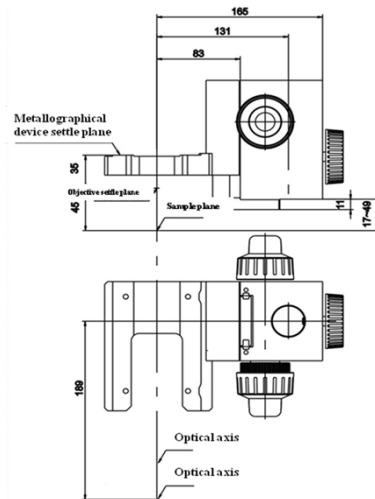
4.Main Component Size

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4-1. Size of the focusing components



4-2. Focusing component and L-plate



5. Technical specification

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5- 1. Main technical specification

Optical systems	infinite optical system	BS-6023BD	BS-6023B
Viewing head	Siedentopf trinocular viewing head, inclined at 30°, rotate 360°, interpupillary distance 48mm-75mm, light distribution: 80:20	●	●
eyepiece	Extra wide field eyepiece EW10×/22mm, eyepiece tube Φ30mm	●	●
Objective Nosepiece	5-hole nosepiece (W26*1/36')	●	
	5-hole nosepiece (4/5'*1/36')		●
Objective	Infinite Plan bright and dark field objective 5×,10×,20×,50×,100×	●	
	Infinite Plan bright field objective 5×,10×,20×,50×,100×		●
Focusing	Coaxial coarse and fine adjustment, Fine Division 0.001mm, Moving Range 32mm	●	●
Metallographic device	Bright and dark field metallographic device	●	
	Bright field metallographic device		●
Illumination	24V/100W Halogen light, Brightness adjustable	●	●

5-2. Electrical parameters

A. halogen lamp parameters:

- 1) Input voltage: AC100-240V, 50/60 Hz
- 2) Fuse: T500mAL250V
- 3) Illumination: 24V 100W

B.S-LED parameters:

- 1) Input voltage: AC100-240V, 50/60 Hz
- 2) Fuse: T500mAL250V
- 3) Illumination: S-LED 3W

6. Trouble Shooting

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6.1 Optical system

Problem	Cause	Solution
The edge of the field of view has shadow or not evenly illuminated	The nosepiece is not located in the required position	Adjust it into the right position
	The filament is not in center	Make it in center
	There are stains on the lens	Clean it
Find dust and stain in the field of view	There are stains on the lens	Clean it
	There are stains on the glass	Clean it
	There are stains on the lens	Clean it
	Aperture diaphragm is too big	Narrow it properly
	There are stains on the lens cone glass	Clean it
	Aperture diaphragm is too small	wide it properly
	The converter is not located in the required position	Adjust it into the right position
The sample is in float state	Reliably solidify it	
The image moves when focusing	Sample is floated in the surface of platform	Place it stable
	The converter is not located in the required position	Adjust it into the right position
Brightness is not enough	Aperture diaphragm is too small	Re-adjust it
	Kohler illumination is not in the center of view field	Adjust it into the center by Kohler illumination center bolt

6.2 Mechanical System

Problem	Cause	Solution
The sample moves not smoothly	Slide is not tighten reliable	Tighten it reliable
The left and right fields of view is not coincided	The interpupillary distance is not correct	Adjust the interpupillary distance correctly
The eyes are uncomfortable and tired	The diopter is not right	Adjust the diopter according your sight
	Brightness is not suitable	Adjust the voltage of the bulb

6.3 Electrical System

Problem	Cause	Solution
The lamp can't light	No power supply	Check the power cord, and connect them exactly
	the installation of the bulb is wrong	Install the bulb correctly
	The bulb burned out	Replace with a new bulb
The bulb burn out in frequently	Not use the specified lamp	Use the required lamp. If it's still not working ,contact the repair department
The brightness is not enough	Not use the specified lamp	Use the required lamp
	Voltage is too low	Increase the voltage
The light glimpses	The bulb is going to spoil	Change the bulb
	The power cord has a poor contact	Check the power cord, and connect them exactly