



# **Inverted Metallurgical Microscope**

**Model: BS-6030**

**User Manual**



This manual is written for Inverted Metallurgical Microscope BS-6030. 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.

## Contents

### User Notice

1	Component Name.....	1
2	Assembly .....	2
	2-1 Assembly Diagram.....	2
	2-2 Assembly Step.....	3
3	Adjustment Set Diagram.....	8
4	Adjustment Procedures.....	9
	4-1 Microscope Body.....	9
	4-2 Mechanical Stage .....	10
	4-3 Viewing Tube.....	11
	4-4 Illumination Set.....	13
	4-5 Adjusting of Differential Interference .....	15
	4-6 The operation of Micrometer .....	16
5	Microscope Video and Photography .....	17
	5-1 Microscope Video.....	17
	5-2 Microscope Photography.....	18
	5-3 Digital Camera .....	18
6	Technical Specification.....	19
	6-1 Major Technical Specification.....	19
	6-2 Eyepiece Parameter.....	19
	6-3 Subjective Parameter.....	19
	6-4 Total Magnification .....	20
7	Whole Set of Instrument .....	20
8	Trouble Shooting .....	22

## User Notice



### 1. Safety Precautions

- 1.1 Microscope ought to be placed in a dry and clean place. Do not expose the Microscope in the sun directly. Avoid high temperature or humidity, dust and easy shaking environment. Make sure the stage is horizontal and firm enough. (Weight: Main Body is 12 kg)
- 1.2 When moving the instrument, grip two sides of the bottom(1 and 2 point ) of the microscope with your two hands.(see diagram ).
- 1.3 When the microscope is working, the lamp house(point 3) and nearby parts will be very hot. Please ensure there is enough cooling space for them .
- 1.4 For safety, be sure the main switch is in “O”(off) position and cut off the power supply before replacing the bulb or the fuse. If you replace the bulb during using or just after using the microscope, allow the lamp bulb and the lamp house to cool completely before touching.
  - ★ Halogen bulb: 12V/50W Halogen Lamp
- 1.5 Use the power wire correctly, Make sure the instrument is earthed, to avoid strike.
- 1.6 Use the exclusive electrical wire supplied by our company.

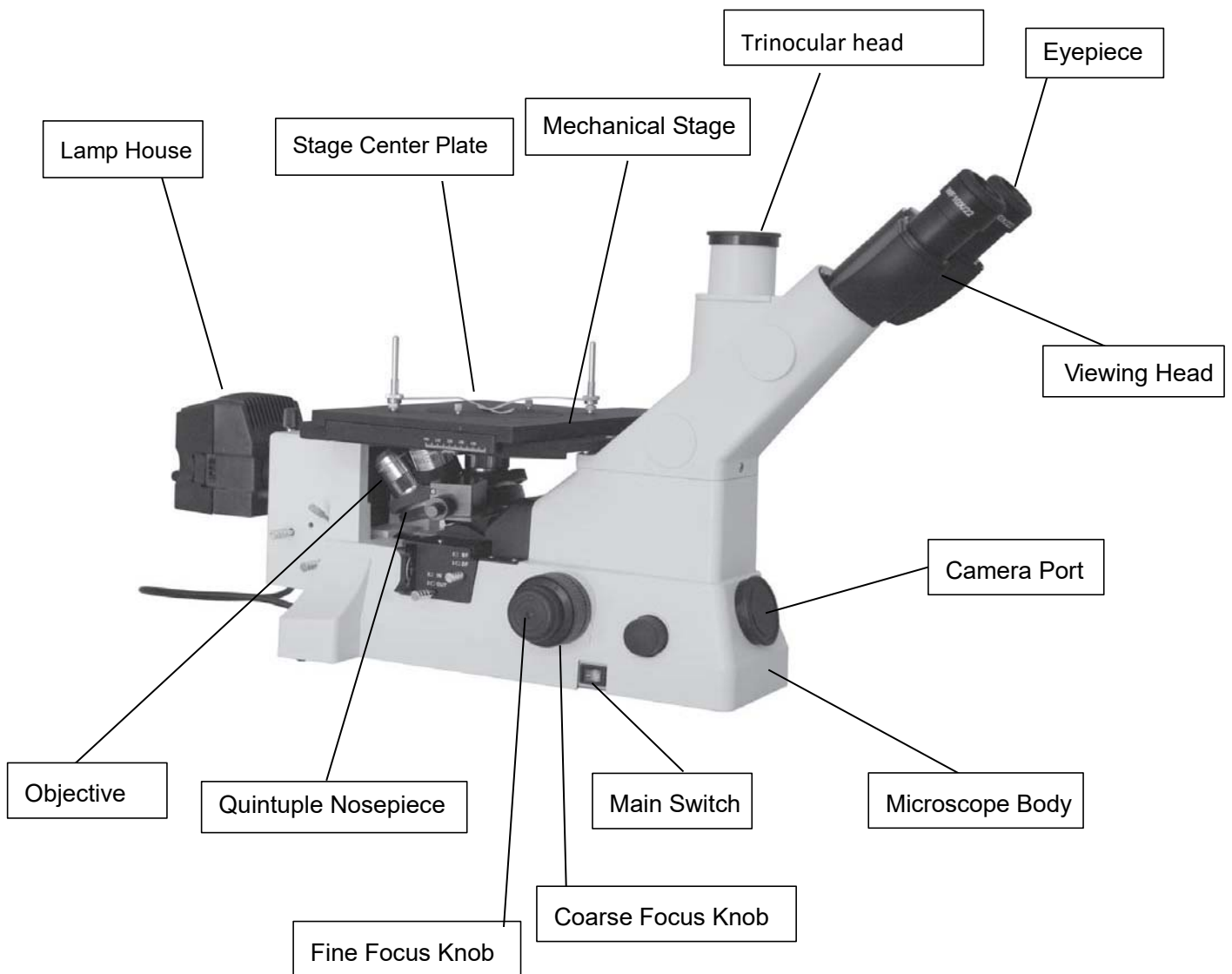
### 2. Maintenance and Care

- 2.1 The optical components should be wiped with the soft cloth gently. If cleaning the contaminations like fingerprints and oil smudges, wiped with a piece of soft cloth which moistened with a small amount of xylol or 3:7 mixture of natalite.
  - ★ (Note that the alcohol and ether are highly flammable, do keep them away from the fire or potential sources of electrical sparks, use them in a drafty room as possible as you can.)
- 2.2 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.
- 2.3 Cut off the electrical power supply immediately and wipe up the wet microscope when it was splashed by the liquid.
- 2.4 Do not disassemble any parts of the microscope, as this will affect the function or reduce the performance of the microscope.
- 2.5 After using the microscope, remember to cover it with dust cover. Do wait for the lamp house cooling completely before cover.

### 3. 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.
O	Indicates that the main switch is OFF.

# 1. Component Name



## 2. Assembly

### 2-1 Assembly Diagram

The diagram shows the sequence of the assembly, the number in the chart indicate the assembly step.

- ★ Before assembly please be sure all parts are free of dust and contamination. No scratch on any parts or the surface of the glass.
- ★ Keep the hexagonal wrench we supplied, in case it might be used in the future .

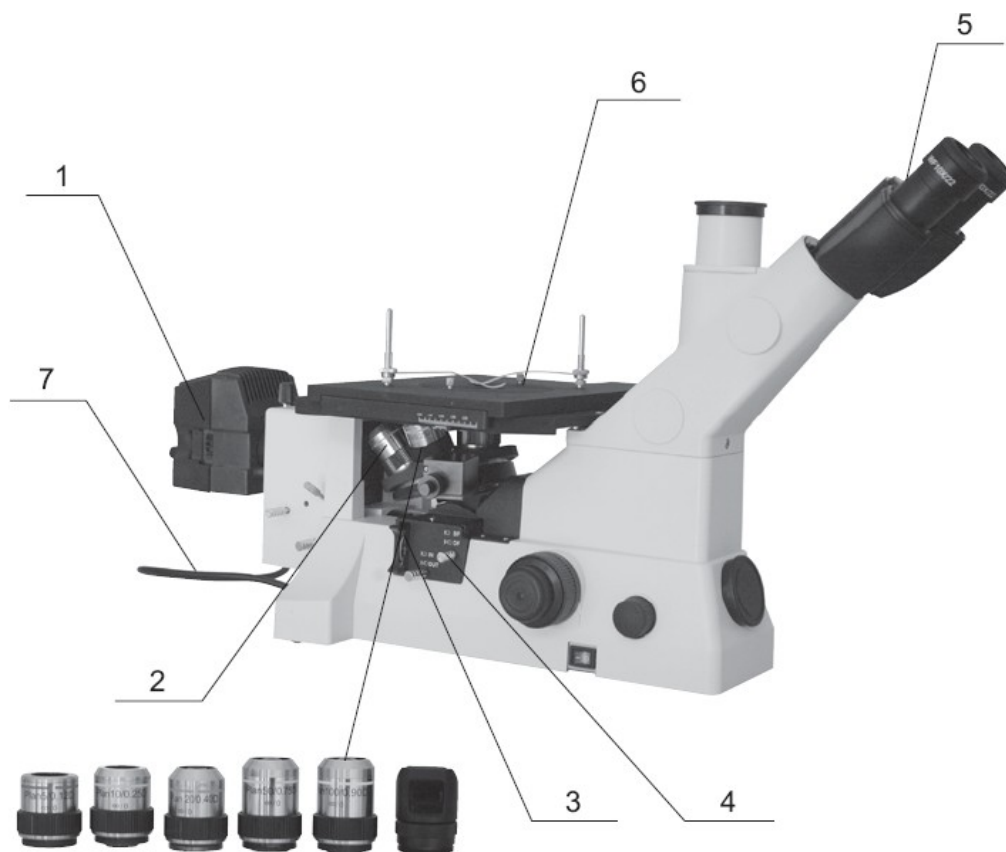


Chart 2

## 2-2 Assembly Procedure

### 2-2-1 Installing and Replacing the Bulb (Chart 3)

★ Please use the specified halogen Lamp (12V/50W) which supplied by our company.

1. Bulb replacement during use or just after use. The bulb, the lamp house and nearby parts will be very hot. Please set the main switch to “O” (off), disconnect the power plug, and make sure the bulb, the lamp house and periphery are all cool. Then, you can do your replacing.
2. Tightly hold the bulb ① with a piece of gauze or other protection materials, insert the bulb ② pins plug straight and fully into the pin holes ④ on the lamp house.

★ Please insert the bulb to the lamp house very gently, or it will be damaged by excessive extrusion.

★ Do not touch the halogen bulb with bare hands. It will shorten the service life or cause it to burst. If you leave fingerprints on the surface carelessly, clean it with a piece of dry soft cloth.

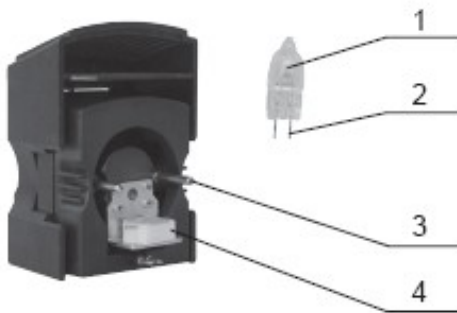


Chart 3

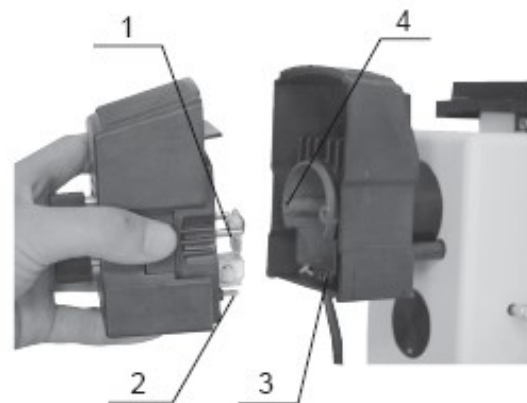


Chart 4

### 2-2-2 Install the Lamp Holder (chart 4)

Make the plug 2 and the socket 3 in alignment, same as the plug pin1 and socket 4, And then push the lamp holder into lamp unit gently until its in place.

### 2-2-3 Installing the objective(Chart 5 & 6)

1. Turning the coarse focusing knob① as the figure shows till the nosepiece gets to its lower limit.
  - ★ For ensuring the safety of the instrument during transportation, the nosepiece is located in the lowest position and the tension adjustment collar② is adjusted to an appropriate tension while leaving the factory.
2. Screw the lowest magnification objective on to the nosepiece from the nearside, then turn the nosepiece clockwise, mount other objectives according the magnification sequence from low to high. Mounting objective in this way will make it easier to change magnification.
  - ★ The objectives can also be mounted through the opening on the stage.
  - ★ Clean the objectives periodically, for the objectives used in the inverted microscope are susceptible to dust. Do not forget to use the dust cover when you do not use it.
  - ★ Do cover all the unused holes 1 on the nosepiece with dust caps, to prevent the dirt and dust from coming inside(chart 6).
  - ★ When operating, use the low magnification objective (5X or 10X) to search and focus the specimen at first, then change to the higher magnification objectives if necessary.
  - ★ When replacing the objective, turn the nosepiece slowly until you hear “clicked”, that means the objective enters into the right position-center of the light path.



Chart 5



Chart 6

### 2-2-4 Mounting Auxiliary Stage (Chart 7)

★ Attached 3 kinds of auxiliary stage for your option (chart 1)

When use the auxiliary stage 2, firstly, set the stage clips 1 aside, Gently place the auxiliary stage 2 into the movement stage 3. The both side of the water drop should be placed in the horizontal direction when choose the water drop shape auxiliary stage. No strict requirement for other optional auxiliary stage.

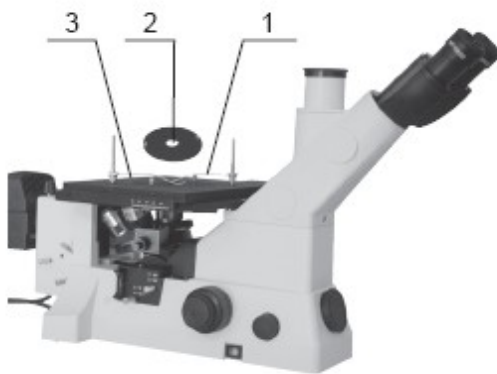


Chart7



Chart 8

### 2-2-5 Installing the Eyepiece (chart 8)

1. Remove the cap of the eyepiece tube.
2. Insert the eyepiece into eyepiece tube until they are against each other.
3. Screwing down point 3(see chart 8) with attached socket head wrench gentle to assure the eyepiece make diopter adjustment.

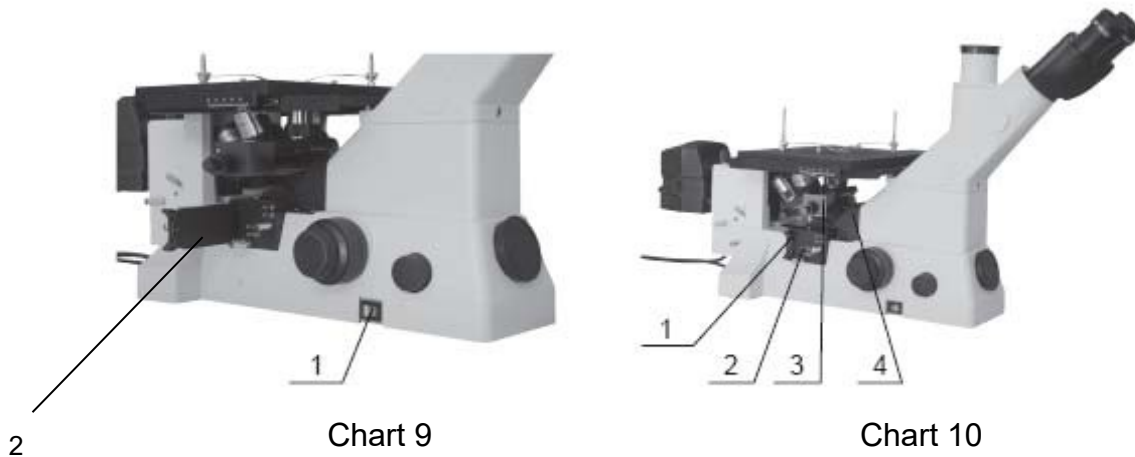
### 2-2-6 Mounting Filters and Polarizer (chart 9)

Insert the polarizer into the bottom of the vertical lighting slot 2 just as the chart shown, When fail to move on any more, indicate that the polarizer is in the right place and into the light center.



### 2-2-7 Mounting differential interference accessories (chart 9)

Insert the micrometer accessories<sup>3</sup> into dovetail groove<sup>4</sup> and push to the bottom, When fail to move on any more, indicate that the micrometer is in the right place and into the light source.



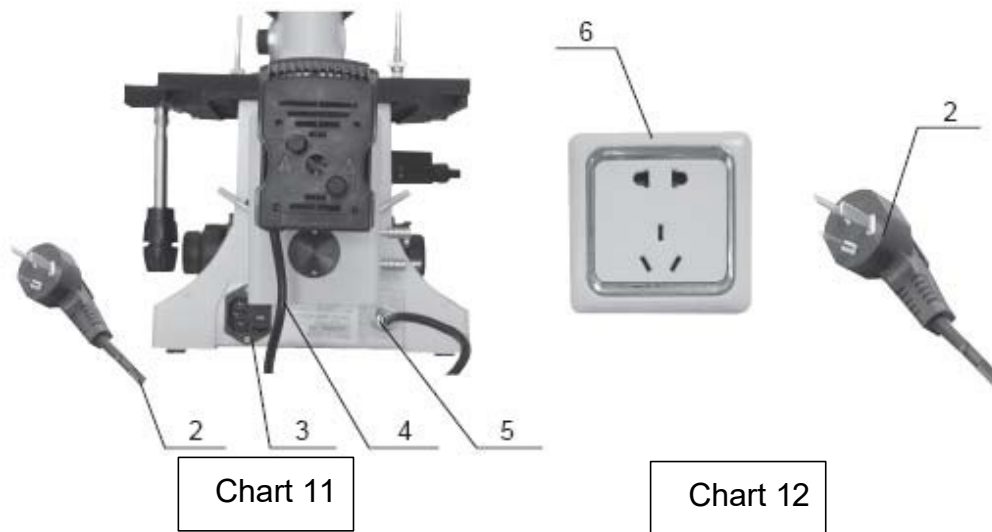
### 2-2-8 Connecting the Power Cord (chart 10,11&12)

★ **The cable and cords are vulnerable when bent or twisted, never subject the power cord to excessive force.**

1. Set the main switch<sup>1</sup> to “O” (off) position before connecting the power cord. (chart 9)
2. Insert one side of the plugs<sup>2</sup> into the power jack<sup>3</sup> of the microscope safely. (chart 11)
3. Insert the other side of Plug<sup>2</sup> into the power jack<sup>6</sup> safely. (chart 11)
4. Insert the power cord<sup>4</sup> into the power supply receptacle 5. Make sure the connection is well.

★ **Do use the supplied power cord all the time. If lost or damaged, please select the same standard cord.**

★ **Connect the power cord correctly, to ensure the instrument is grounded.**



### 2-2-9 Replacing the Fuse (chart 10,11&12)

Do remember to set the main switch① to the state of “O” (OFF) and unplug the power cord before replacing the fuse(chart 12). Rotate the fuse3 kits out of the holder with the “--”type screwdriver, replace with a new fuse, then rotate it back to the holder again.

★ Fuse rating: 250V, 2A.

### 3. Adjustment Set Diagram

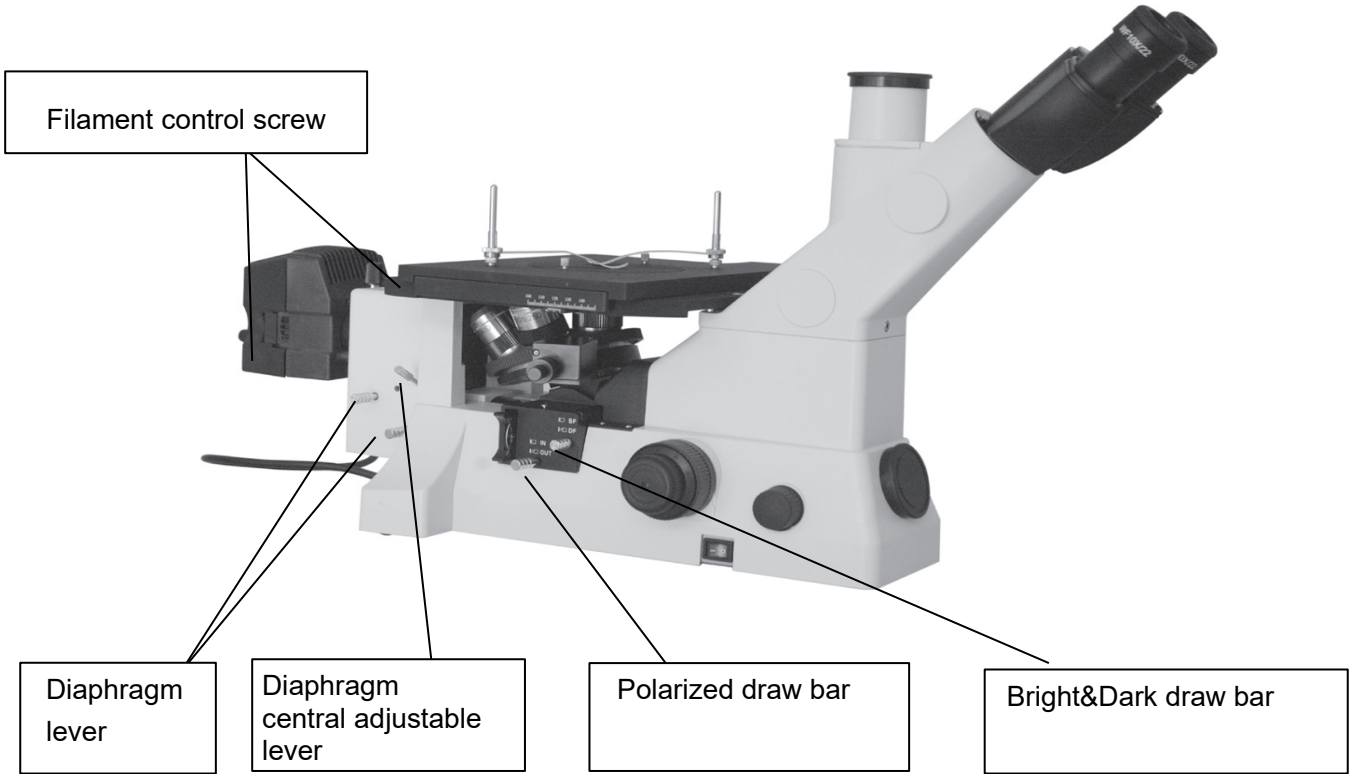


Chart13

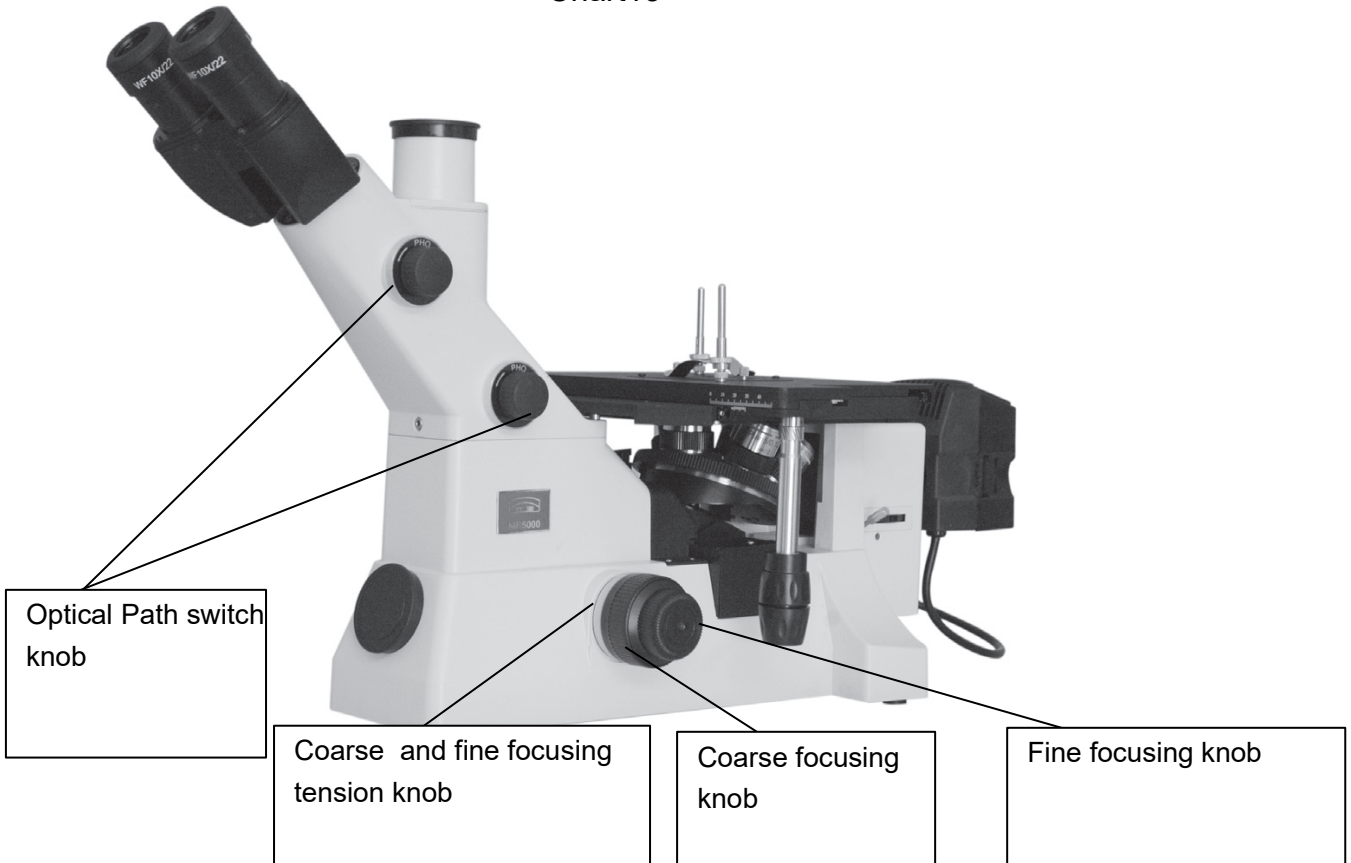


Chart 14

## 4. Adjustment

### 4-1 Microscope Base

#### 4-1-1 Turning On the Lamp (chart 15)

Connect the power supply, then set the main switch ① (shown in chart 15) on the left side of the base to “—”(on).

#### 4-1-2 Adjusting the brightness (chart 15)

Turning the brightness adjustment knob 2 clockwise, the voltage raises, and the brightness is strengthened; whereas turning at the converse direction, the voltage declines, and the brightness is weakened.

★ Using the lamp in a low voltage condition, will prolong the service life.



Chart 15

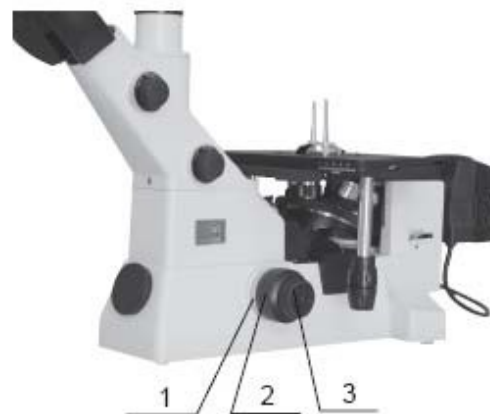


Chart 16

#### 4-1-3 Adjusting the Tension Adjustment Collar (chart 16)

★ Operating the coarse tension adjustment collar 1 can adjust the tightness of coarse focusing knob 2 effectively.

1. How to adjust the tension of the coarse focusing knob.

Turn the tension adjustment collar ①. while revolving at the direction of the counter-clockwise, the tension of the coarse focusing knob ② is increasing; and if at the contrary direction, the tension will decline.

2. If the nosepiece descends on its own, or the specimen gets out of focus soon even you focus with the fine focus knob ③, It means the coarse focusing knob is too loose. You should screw the tension adjustment collar down to increase the tension.

## 4-2 Mechanical Stage

### 4-2-1 Placing and Moving the Specimen (chart 17&18)

1. Place the specimen in the center of the auxiliary stage. (polished surface of specimen should face down on the stage)
  - ★ Before place the specimen on the stage, choose the proper stage according to the size of the specimen.
2. The specimen can be moved to desired position by turning the X-axis knob① and Y-axis knob② (movement: 40mmx40mm). The knob of rotating mechanical stage can move X-axis when adjust the knob1, and move Y-axis when adjust knob 2. Meanwhile both X and Y direction have scale value, in this case, can show the distance of the movement, and the minimum indicating accuracy is 0.1mm.

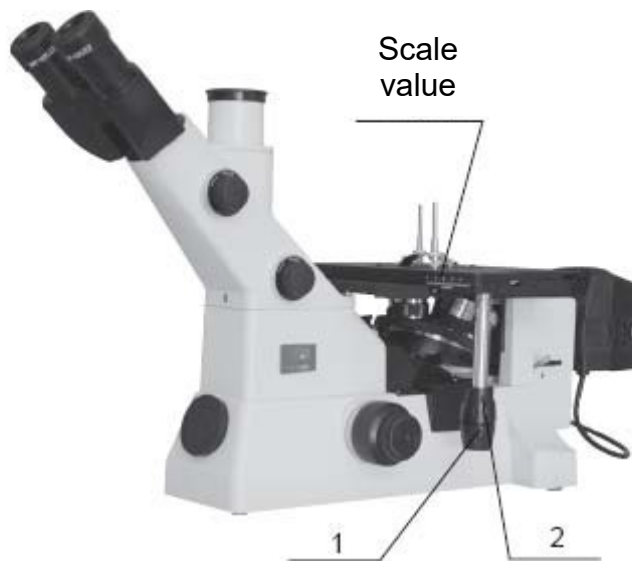


Chart 17

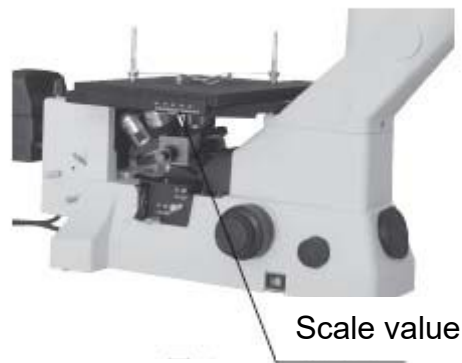


Chart 18

## 4-3 Binocular Viewing Head

### 4-3-1 Adjusting the Diopter

1. Looking through the right ocular with your right eye with the 10X objective, revolve the coarse and fine focusing adjustment knob to focus on the specimen.
2. Then turn to use the 5X objective to observe the specimen, if can not focus, then adjust the diopter of the left and right eyepiece, so that can focus successful.
3. Repeat step 1 and 2, until both eyes could see the clear image of the specimen at the same time.



#### 4-3-2 Adjusting the Interpupillary Distance (chart 10/20)

When observing with two eyes, hold on the left and right prism holders, turn them around the axis to adjust the interpupillary distance until the left and right fields of view coincide completely.

The scale on the interpupillary distance indicator, pointed by the dot “.” on the eyepiece holder, shows the interpupillary distance.

★ The range of the interpupillary distance: 55~75mm.

#### 4-3-3 Switching the Light Path (chart 21)

★ Apply to digital cameras with C-mount or DSLR digital cameras.

Slide the light path selector up and down knob with your thumb to select the light path you need.

For the binocular observation, push in the lever until you hear “clicked”. While for video or photography of up tube1, turn the up lever to PHO until it reaches the “clicked” position. While for use of video or photography down tube2, turn the down knob to PHO until it reaches the “clicked’ position.

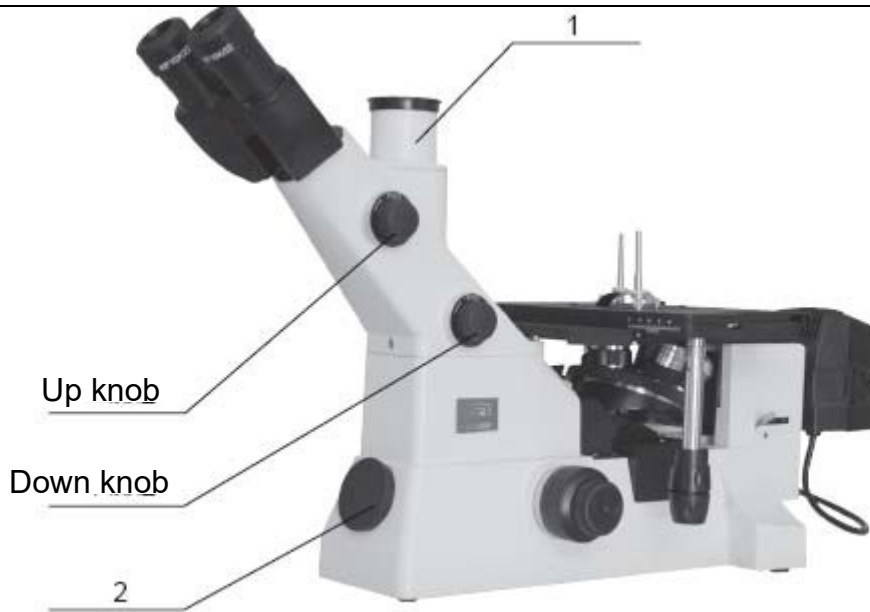


Chart 21

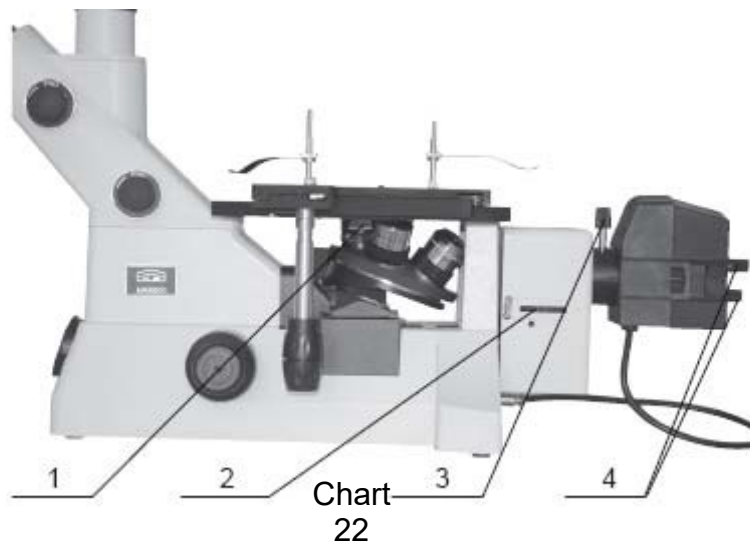
Light Path Selecting Lever	Brightness Proportion	Applicaction
Up and down knob push in	100% used for binocular observation	Dark field observation
Up knob in PHO	80% used for binocular observation, and 20% used for video or photography	Bright specimen observation and television \micrography \ video C-mount camera
Down knob in PHO	100% used for video and photography	Micrography or digital camera

## 4-4 Adjusting the Illumination Set

### 4-4-1 Filament Adjusting (chart 22)

1. Turn the objective into the nosepiece, and also switching it to the light source. Rotate the case1, and adjust the direction of the light to the visible position.
2. Open the light source, switch the screw4 of the lamp house, in this case, can see the image of the filament in the whole central diaphragm in the objective 1.
3. Switching the objective at random, and place the specimen, screw down and take off of the screw4, observe on eyepiece, until the brightness of the whole diaphragm become uniform, and then screw down the screw3.





#### 4-4-2 The usage of filter

1. Choose the proper filter according to the specimen will make the observation and picture capture more effectively.

Color Filter	Function
Green	Solid color contrast
Ground glass	Remove filament image, make brightness uniform
Blue	Solid color contrast
Gray	Weaken the light intensity when color temperature stable
Yellow	Solid color contrast

When revolving the turnplate 2, heard of the ‘clicked” that means some kind of color of the filter into the light source, and the color will show in the outside of the round turnplate. No color means no filter into the light source .

#### 4-4-3 Adjusting Aperture Diaphragm (chart 23)

The aperture diaphragm will affect the the numerical aperture of the illumination system when observe. Only if the NA of the light system match the NA of the objective, that could result in obtain the better image resolution and contrast, also extend the depth of field .

1. Push the lever1 could adjust the aperture diaphragm to the right position required.
2. Adjusting the central of aperture diaphragm, need to remove the eyepiece firstly, through the viewing head observe with 50X objective, and pull the lever1 at the same time, then could find the light flash of the filed of view. Deduce the center from the flash aperture and the edge of the diaphragm.

Then adjust the screw2 by S2 internal hexagonal wrench. Until find that the field diaphragm and aperture diaphragm become the same, match together completely. (The filed diaphragm must be adjust to the center )

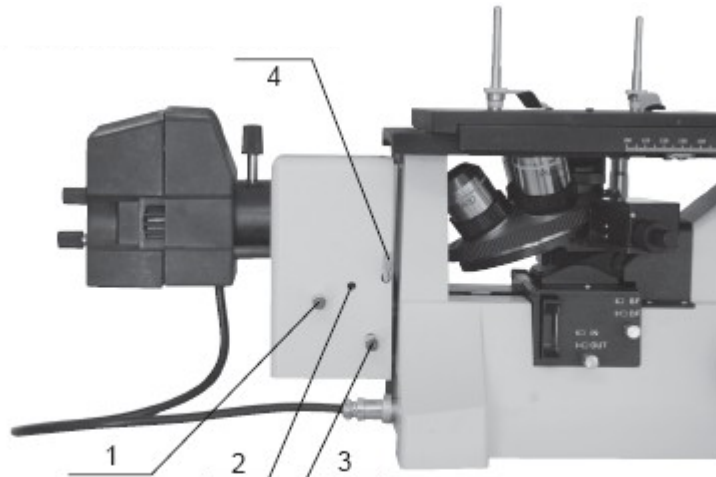


Chart 23

#### **4-4-4 Adjusting the field diaphragm (chart 23)**

1. Adjusting the field diaphragm lever(both sides), through the eyepiece observe, adjust the field diaphragm to the center. If more precise position of the center needed, firstly adjust the field diaphragm to the proper position, secondly, measure the precise position of that by 10X cross eyepiece graticule, then adjust the filed diaphragm to the center by push the lever4.
2. Push the lever 3 can result in adjusting the field diagram to the proper position required .

#### **4-4-5 Select the mode of illumination and operation(chart 24)**

1. Bright field vertical illumination
  - a. Adjust the aperture diaphragm to the optical path with the proper position (Have been well adjusted in the factory, if any change needed, please operate it as the way of 4-4-3 shows)
  - b. Adjust the vertical illumination to the bright field observation. Do operate as the chart24 shows that the lever2 placed in the OUT position while the lever1 placed in the BF position.

★ Be note that: Make the lever2 in the OUT position should be priority to adjust the lever1 in the BF position.

c. Observing the image and adjusting the aperture diaphragm to the proper position, could see the clear and plan image under the circumstance of the bright filed. Also can show the real structure and form of the specimen.



Chart 24

## 2. Dark filed vertical illumination

In order to confirm the limit of the crystal grain and the small impurities, their factor of reflections close to the factor of the major thing's, therefore, adopt to use dark field observation.

A. Open the aperture diaphragm to the maximum position

B. Open the filed diaphragm to the maximum position

C. Adjusting the vertical illumination to the dark field to observe. As the chart24 shows the lever2 placed in the OUT position, the lever1 placed in the DF position.

★ Be note that: Make the lever2 in the OUT position should be priority to adjust the lever1 in the BF position.

★ The mentioned instrument (BS-6030 microscope) could work under both dark and bright field condition, thus, no need to change the objective when observe under dark field.

## 3. Polarized Light

Put the lever1 into the BF position as chart24 shows while the lever2 in the IN position. Insert the polarizer3 into the vertical illumination slot, revolving the polarizer knob3, when the field diaphragm turn to the maximum darkness (polarizer knob scale  $0^\circ$  or  $180^\circ$ ) that means have been orthogonality already. (the polarizer3 only use under the polarize and differential interference condition) .

## 4-5 Adjusting the differential interference (chart 25)

To ensure the vertical illumination worked in the polarize orthogonal condition, insert the differential interference parts into the dove-tail slot of up and down of the main body, rotating the differential interference abeam knob1, could observe the various color change. Rotating the up and down knob2, when some kind of color is full of the whole a field, then make observation.( chart 25)



Chart 25

★ The differential interference including 3 kinds of fishplate bar, the marking fishplate bar should be used in it's own objective magnification accordingly.

#### **4-6 Usage of the 0.01 mm objective micrometer**

Be sure the right magnification of each objective before measure the specimen.

Put the micrometer of the objective on the mechanical stage with the scale ruler face down to the stage.

Put the 10X eyepiece into the right eyepiece tube of the binocular head, read the scale in the eyepiece, if the image is not clear, then rotating the diopter collar until reach to the clear scale.

Make the scale of objective micrometer focus on the plane of the eyepiece scale correctly, revolving the eyepiece make the both scale parallel, and move the stage, make one end of the scale aligning then read the other certain end scale of the eyepiece which is according to the objective scale. Make sure how many grid of the objective micrometer is occupied on the certain scale of the eyepiece.

Actual measurement formula of objective magnification :  $E=A/TL=A/0.01L=100A/L$

Definition :

E-----actual measure of objective magnification

A-----the grid of eyepiece scale

L-----the gird of objective micrometer (the grid of eyepiece scale with the reticle grid of objective micrometer accordingly)

T-----T=0.01, The reticle grid of objective micrometer.

Should better keep the obtain data in the following table.

Objective Magnification (nominal) value)	Objective Magnification (actual) mearue)
5	
10	
20	
50	
100	

The objective magnification can calculate the precise linear of the specimen.

## 5. Microscope Video and Photography

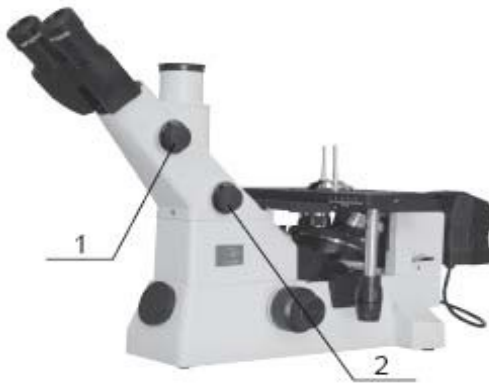


Chart 26

### 5-1 Microscope Video

#### 5-1-1 Selecting the Light Path (chart26)

★ Just used the trinocular viewing tube.

1. Switch the up lever1 to PHO position when use the up tube while switch lever2 to void space. When use the down tube, switch the lever2 to the PHO position.

2. Pull out the light path selecting lever, until you hear the “clicked”.

★ Regarding the use of down tube, firstly focusing through binocular and then selective the light path.



Chart 27

#### 5-1-2 Installing the Video Set (chart 27)

1. Take out of the dust cap1.

2. Insert the accessories ② of video set into the trinocular port and screw the shrink ring3 tightly.

3. Revolving the CCD attached parts into the trinocular port as the chart shows.

**5-1-3 Focus (chart27)**

Looking through eyepiece with 80% intensity of light, focus the specimen to get a sharp image, and then check the image on the CCTV or the CCD which is connected with the microscope video set.

**5-2 Microscope Photography**



Chart 28

**5-2-1 Selecting the Light Path**

★ **Just used in the trinocular viewing tube.**

The operation please refer to 5-1-1

**5-2-2 Installing the Photography Set (chart 28)**

1. Take out the dust cap 1
2. Be sure that the bayonet of photography accessories2 is aligning with the coupling of the camera accordingly.
3. Install the photography accessories2 into the trinocular port, and screw it clockwise tightly.

★ **Before connecting the camera set with the bayonet of photography accessories2, please remove the camera lens firstly, then use the lens connecting with the bayonet of photography accessories2, Pay attention to the camera bayonet type, please.**

★**The magnification of photograph = magnification of objective × Magnification of photography adapter.**

**5-2-3 Focus**

Looking through binocular eyepiece with 80% intensity of light and make a rough observation. When in microscope photography, do use the camera viewfinder to focus the specimen. Please refer to the user manual of the photo attachment to obtain the details.

**5.3 Digital camera**

**5-3-1 Selecting the light path**

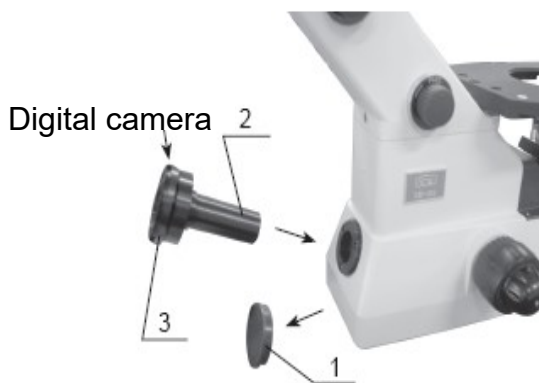


Chart 29

★ **Just used in the trinocular viewing tube.**

The operation please refer to 5-1-1

**5-3-2 Installing the Photography Set (chart 29)**

1. Take out the dust cap 1.
2. Insert the digital photography set2 into the trinocular port and screw the shrink ring3 tightly and then connect the "Canon G9" digital camera. (The coupling of other brand camera may be different, need special design )

## 6. Technical Specification

### 6-1 Main Technical Specification

Optical System	Infinite Optical System
Viewing Tube	Compensation Free Trinocular Tube Inclined at 45°; interpupillary distance: 48-75mm Division ratio: 80% for Binocular Viewing, photography with 20%, and 100% for Viewing & photograph
Eyepiece	High Point, Extra Wide Field Eyepiece EW 10X/22 Extra Wide Field Eyepiece EW 20X/12(option) Extra Wide Field Eyepiece EW 15X/16(option) 10X micrometer eyepiece
Nosepiece	Quintuple Nosepiece
Objective	Infinity Plan achromatic long working distance objective (dark and bright field both use ): 5X, 10X, 20X, 50X, 100X
Focusing System	Coaxial Coarse and Fine Focusing adjustment, Fine focusing scale value: 0.002mm, Movement(from the focus of stage) Up:1mm, down 7mm
Stage	Movement Range: 40 (Length) × 40mm (width)
Illumination	halogen tungsten lamp12V50W, Preset Center, Intensity Continuously Adjustable
Differential Interference	Adapt to objective with 5X 10X 20X 50X 100X
Operate environment	Indoor environment The temperature :5°C- 40 °C(41°F- 109°F)

### 6-2 Objectives Specification

Type	Magnification	Aperture Number(N.A)	Working Distance(mm)	Conjugate Distance(mm)	Parfocal Distance(mm)
Infinity Plan achromatic long working distance objective	5X	0.12	10	∞	45
	10X	0.25	10	∞	
	20X	0.4	5	∞	
	50X	0.75	1.3	∞	
	100X	0.90	0.7	∞	

### 6-3 Eyepiece Specification

Magnification	Field Number	Remark
10x	Ø22	Standard
10x	Ø20	With reticle 0.1mm
15x	Ø16	Optional outfit
20x	Ø12	Optional outfit

### 6-4 Total Magnification

eyepiece \ Objective	10x	15x*	20x*
5x	50x	75x*	100x*
10x	100x	150x*	200x*
20x	200x	300x*	400x*
50x	500x	750x*	1000x*
100x	1000x	1500x*	2000x*

\* Optional outfit



**7. Whole Set of Instrument ( \* optional outfit )**

No.	Content	Quantity	Remark
1	BS-6030 inverted microscope body	1	
2	WF10X22mm eyepiece	2	
3	WF15X16mm eyepiece*	2	optional outfit
4	WF20X12mm eyepiece*	2	optional outfit
5	WF10X with reticle eyepiece(0.1mm)	2	
6	Plan Achromatic objective	1	optional outfit
	2.5X*	1	
	5x	1	
	10x	1	
	20x	1	
	50x	1	
	80x*	1	
100x	1	optional outfit	
7	Stage clips	2	
8	Small stage	3	
9	S1.5 internal hexagonal wrench	1	
10	S2 internal hexagonal wrench	2	
11	Filter(green, blue, yellow, gray)	1of each	Built in turnplate
12	Power cord	1	
13	12V50W halogen lamp	3	2piece spare parts
14	Instrument Manual	1	
15	Polarizer	1	
16	DIC differential interference *	1	Attached 3 kinds fishplate bar optional
17	Micrometer (precision is 0.01mm)	1	
18	Adjusting objective for lamp house	1	
19	Instrument Certificate of inspection	1	
19	Switch lens of Digital camera *		Match digital camera

20	CCD switch lens accessories*	1	(0.5X)optional
21	135 photography objective	1	optional

## 8. Trouble Shooting

If you meet trouble during operation, please take proper measures according to the follow list. If you can't solve the trouble by the supplied methods, please contact with the sales department of our company.

Trouble	Cause	Solution
<b>A. Optical System</b>		
1. Although the illumination is on, the field of view is dark.	The poor contact exists in the lamp house and the illumination system.	Connect it securely
	The lamp bulb is burned out.	Replace it with a new one
	The brightness adjustment knob is set too dark	Adjust the knob in a proper position
	The mounted bulb is not the specified one.	use the specified halogen
2. The edge of the field of view has shadow or not evenly illuminated	The nosepiece is not located in the required	Adjust it into the right position
	The surface of the bulb becomes black	Change a new lamp bulb
	The filament shadow not clean up	move the Condenser adjust knob to eliminate the filament shadow
	The surface of the lens is moldy or has	Clean the lens
3. Find dust and stain in the field of view	There are stains on the eyepiece	Clean the eyepiece
	There are stains on the eyepiece	Clean the eyepiece

4.The image is defocused, of low-resolution	The objective damages	Mend and correct the objective (send to factory for overhauling)
	The lens of the objective and eyepiece is moldy or has contaminant	Do cleaning
	The Aperture diaphragm and field diaphragm is not adjusted properly and too much stray light.	Adjust the diaphragm properly
	The objective is not in the center of the light path	Turn the nosepiece to the located position
	Fine focus system is broken	Examine and repair the fine focus system(send to factory for overhauling)
5.The image focus surface inclines (one side is clear and the other side is faint)	The illumination light inclines seriously	Adjust the filament position, let the light distributing of the field of view become symmetrical and bright
	The specimen is not placed in required position	Put the specimen in the right position
	The nosepiece is not in the located position	Turn the nosepiece in the required position
6. The eyes are uncomfortable, the left and right fields of view is not coincided.	The interpupillary distance is not correct	Adjust the interpupillary distance correctly
	The diopter is not right	Adjust the diopter according your sight
	Can't adapt to binocular observation	When look into the objective, do not stare at the specimen but at the whole field of view, or move the eyes away to look at other things, then look into the eyepiece again.
<b>B. Mechanical System</b>		
1.The coarse focus knob is hard to turn	The tension adjustment collar is set too tight	Loose the tension properly

2.The image can't stay on the focal plane in the process of the observation	The tension adjustment collar is set too loose	Tighten the tension properly
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<b>C. Electrical system</b>		
1. The lamp can't light	No power supply	Check the power cord, and connect them
	the installation of the bulb is wrong	Install the bulb correctly
	The bulb burned out	Replace with a new bulb
2. The bulb burn out in frequently	Not use the specified lamp	Use the required lamp
3. The brightness is not enough	Not use the specified lamp	use the specified lamp
	The brightness adjustment knob is set too low	Adjust the brightness adjustment knob
4. 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

<b>D. Viewing Tube</b>		
1. The field of one eyepiece is not the same as the other ones	Interpupillary is incorrect Wrong diopter adjustment Not adopt to the microscope	Adjust the interpupillary distance, adjust the diopter When observe eyepiece should over view the whole field before focus sight on the range of the specimen.see far distance outside would help better view.

<b>E. Photomicrography</b>		
1. Image out of alignment	Wrong focusing	Adjust focusing ,make double cross and specimen could see clear
2. The window of the indoor	The light of the eyepiece and viewfinder is reflected.	Cover the viewfinder of the eyepiece and illumination system

**The performance of the microscope can not be made fully because of unfamiliar using and the change of the design by the manufacturer. This user manual will give only some advance.**