saxon

high quality optics

Biological Microscope Operation Instruction

This instruction manual is to ensure the safety and obtain satisfactory performance and familiarize yourself with the use of this microscope. Please study the manual thoroughly before the operation

Contents

1. Introduction

H6000 Series Biological Microscopes

Stands out among the same types due to its modern multifunctional and serializing designs and perfect manufacture.

Ergonomic principle is fully applied to the design of H6000 series biological microscope, this makes each operation parts rational arranged. Coaxial coarse and fine focussing knobs provide you comfortable feeling and can be rotated flexibly. Both hands can be placed on the plastic armrests of the base in a relaxed, natural posture. The result: less operator fatigue allowing for longer periods of observation. Coarse focusing travel is 20mm. X-Y travel of the stage is 50×76mm.

Each supplied objective conforms to standard DIN. Its resolution and aberration have been calibrated to the best.

Another attractive feature is that H6000 series biological microscope can provide multi-function by choosing corresponding accessories such as phase contrast, photomicrography, dark-field, polarizing, TV and video, fluorescence, etc. This model can meet your various needs and will be your ideal tool in your work.

H6000 series biological microscopes is an ideal instrument in research and test in many fields such as biology, bacteriology, histology, immunology, pharmacology, chemistry, agriculture and stockbreeding.

2. Specifications

2.1 Total magnifications

Objective / Total mag. / Eyepiece	10X	25X	40X	100X
10x eyepiece	100X	250X	400X	1000X
16x eyepiece	160X	400X	640X	1600X
2.5x photo eyepiece	25X	62.5X	100X	250X
4x photo eyepiece	40X	100X	160X	400X
6.3x photo eyepiece	63X	157.5X	252X	630X

2.2 Eyepieces

Item	Category	Field number (mm)	Focal length (mm)	Remarks
P10	Plan eyepiece	18	24.95	
P16	Plan eyepiece	10	15.6	
10X	Pointer eyepiece	17.2	24.77	
10X	Reticule eyepiece	18	24.95	0.1mm per division
DZ8	Centering eyepiece			
S2.5X	Photo eyepiece	42	82.46	
S4X	Photo eyepiece	42	31.88	
S6.3X	Photo eyepiece	42	-6.77	

2.3 Objectives

Item	Category	N.A	System	W.D.	Remark
S-PLAN4/0.10	Plan achromatic	0.10	Dry	15.5	
S-PLAN10/0.25		0.25		1.89	
S-PLAN40/0.65		0.65		0.5	Objective (spring)
S-PLAN100/1.25oil		1.25	Oil	0.4	
Plan10/.025	Plan achromatic	0.25	Dry	1.65	Objective (spring)
Plan25/40		0.40		1.05	
Plan40/0.65		0.65		0.5	
Plan100/1.25oil		1.25	Oil	0.18	
S-Plan Ph10/0.25	Plan positive phase contrast	0.25	Dry	1.89	Red mark
S-Plan Ph40/0.65		0.65		0.5	Objective (spring)
S-Plan Ph100/1.25oil		1.25	Oil	0.4	Red mark
Plan Ph10/0.25	Plan positive phase contrast	0.25	Dry	1.89	Green mark
Plan Ph40/0.65		0.65		0.5	Objective(spring)
Plan Ph100/1.25oil		1.25	Oil	0.4	Green mark
Plan Ph10/0.25	Plan positive phase contrast	0.25	Dry	1.65	Objective (spring) Red mark
Plan Ph40/0.65		0.65		0.5	
Plan Ph100/1.25oil		1.25	Oil	0.18	
Plan Ph10/0.25	Plan positive phase contrast	0.25	Dry	1.65	Objective(spring) Green mark
Plan Ph40/0.65		0.65		0.5	
Plan Ph100/1.25oil		1.25	Oil	0.18	
Plan10/0.25	Fluorescence	0.25	Dry	1.65	Objective (spring)
25/0.65		0.65	Dry	0.5	
40/1		1	Glycerin	0.14	
100/1.25		1.25		0.1	

2.4 Power supply

Input: 220V/50Hz or 110V/60Hz

Output: 6V 20w

Fuse: 0.75A Φ5×20

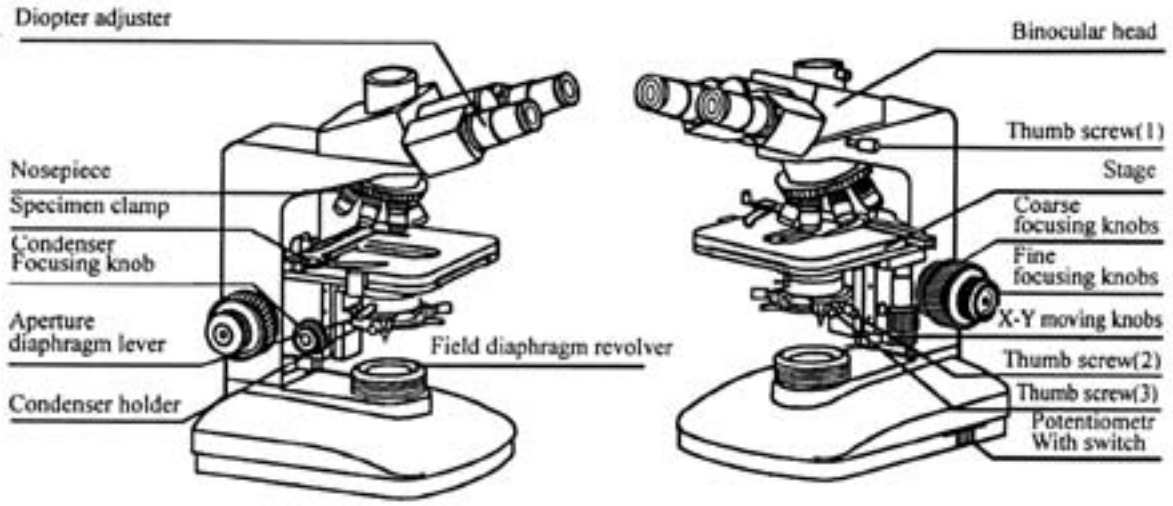

Fig 1

3. Installation(Fig.1,2)

3.1 As shown in Fig.2. Lift the stage by rotating the coarse focusing knob and lower the condenser by moving the condenser focusing knob.Align the fixed pin of the condenser with the condenser holder , push the condenser to its position and fix it with the thumb screw(2).

3.2 As shown in Fig.2.Lower the stage, screw the objectives into the nosepiece in the sequence of their magnifications.

3.3 As shown in Fig.2 and Fig.8. When binocular head or fluorescence attachment is required, fix it on the body with the thumb screw (1) When fluorescence attachment is required , fix the epi-fluorescence device on the body with thumb screw (1) and thumb screw(10),then fix the lamp house on the epi-fluorescence device with the thumb screw (11).Finally, fix the binocular head or trinocular head on the epi-fluorescence device with thumb screw(9).

3.4 As shown in Fig.2. Installation of the photographic attachment:

Take down the camera lens,attach the camera back to the camera adapter on the photo adapter(2) with the red mark on them aligend and turn them to the fixed location ,Then mount the photo adapter(2) on the photo adapter(1) with a photo eyepiece installed,and sequentially mount photo adapter(1) on the trinocular head .

There are two ways to set the video device:

1)After connecting the video adapter , C-mount adapter and video head together , then set them on the trinocular head .

2)Take down the camera adapter and the camera back of the photographic device,replace with the C-mount adapter and the video head , but this narrows the area of the image.

4. Operations

4.1 Adjustment of the microscope(Fig.1)

4.1.1 Insert one end of the plug into the socket of the rear end of the instrument underpan, insert another end of it into the power socket(make sure the input is coincided with the rated voltage before operating).

4.1.2 Turn on the power , then move the adjusting lever to the luminance achieve to a proper

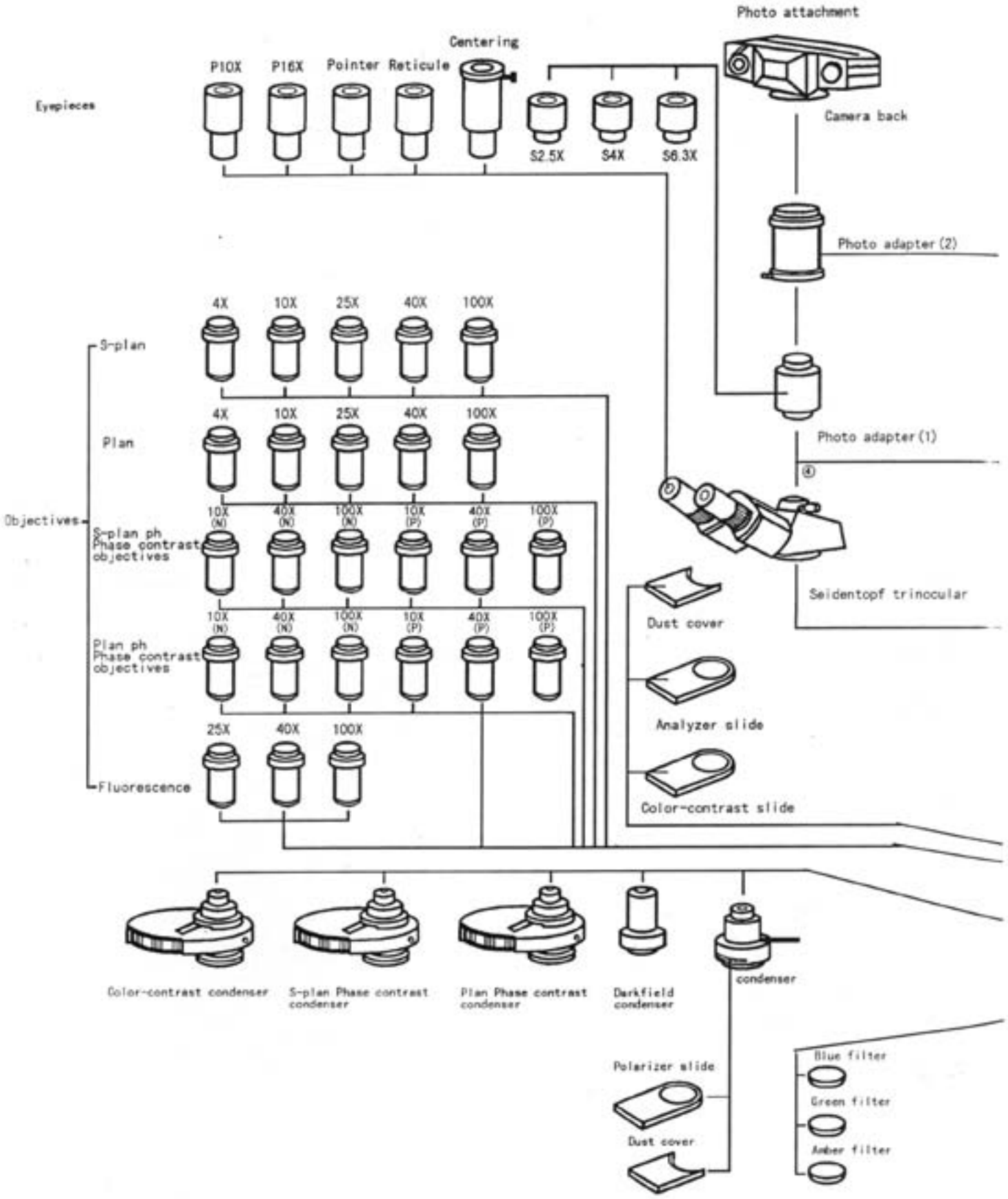
Photo attachment
Centering
P10X
P16X
Pointer
Reticule
Eyepieces
S2.5X
S4X
S6.3X
Camera back
Photo adapter (2)
4X
10X
25X
40X
100X
S-plan
Plan
Photo adapter (1)
Objectives
10X (N)
40X (N)
100X (N)
10X (P)
40X (P)
100X (P)
S-plan ph Phase contrast objectives
Plan ph Phase contrast objectives
Seidentopf trinocular
Dust cover
Analyzer slide
Color-contrast slide
Fluorescence
Color-contrast condenser
S-plan Phase contrast condenser
Plan Phase contrast condenser
Darkfield condenser
condenser
Polarizer slide
Dust cover
Blue filter
Green filter
Amber filter

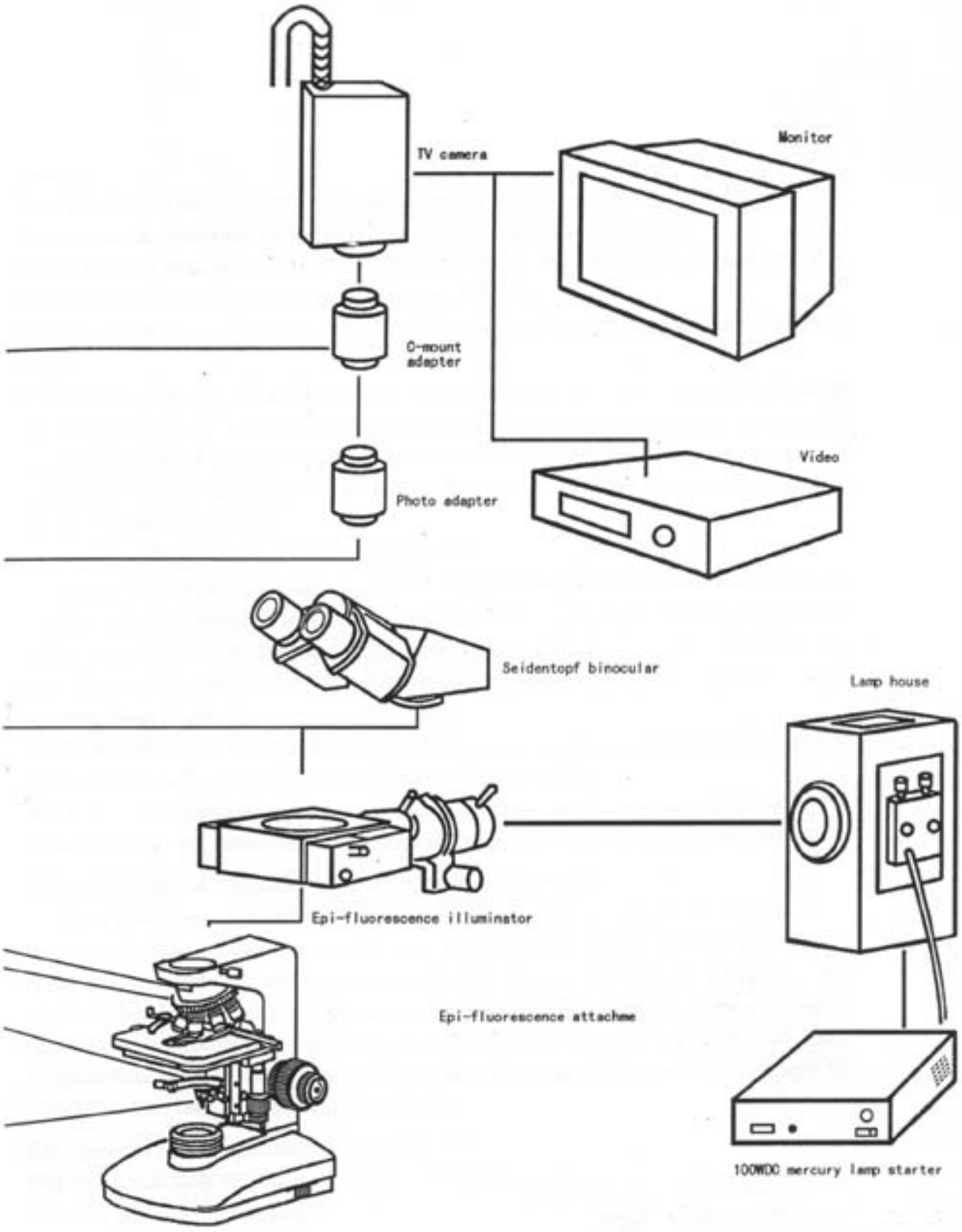

Fig.2 Installation

position.

4.1.3 Revolve the nosepiece to put 10x objective into the optical path.

4.1.4 Rotate the condenser focusing knob to lift the condenser to its location.

4.1.5 Place the specimen on the stage and fix it with the specimen clamp.Regulate the X-Y moving knob to make the sample into the illuminating area.

4.1.6 Open the aperture diaphragm to the midst position by pulling the aperture diaphragm lever.

4.1.7 Observe through the right eyepiece , focus until getting a sharp image(lift the stage slowly until an image outline is seen by rotaing the coarse focusing knob,then turn the fine focusing knob until getting a sharp image).Adjust the thumb screws(3)to bring the field diaphragm image to the center of the view field(field diaphragm can be changed by rotating the field diaphragm revolver).

4.1.8 Interpupillary distance and diopter adjustment .

Observe through the left eyepiece , turn the diopter adjuster in the left eyepiece tube to get a sharp image , By rotating the binocular tubes with both hands,make the exit pupil distance of the two eyepieces corresponds to your interpupillary distance,so the two images in your eyes overlap.Now, the interpupillary distance and the diopter can be reached after the two adjusting items above.

★When employ 100x oil objective , The space between objective and specimen ,glass slide and the condenser front lens should be filled with the immersion oil.

★When employ high magnification objectives ,the thickness of the cover-glasses should be within designed requirement:0.17±0.01mm,otherwise the image defintion will be affected.

4.2 Image contrast adjustment in the bright field observation

Usually, the image contrast of the object in the view field has close relation with the object itself. Good image contrast can be obtained by regulating the brightness of the light, the size of the aperture diaphragm and choosing proper filter. But you can't change the brightness in the view field by minishing the aperture diaphragm. Take down the eyepieces and observe through the eyepiece tube, the aperture diaphragm image can be seen. Usually a good image of appropriate contrast will be obtained by making the image of the aperture diaphragm fill 70%-80% of the back diaphragm of the objective.

4.3 Operation of the tension adjustable ring and focus stop devices(see Fig.3)

4.3.1 The stage may slide down automatically after a long time usage. Revolve the tension adjustable ring on the left to the arrowed direction as shown in Fig.3. This can tighten the coarse focusing knob to prevent the stage from sliding down automatically.

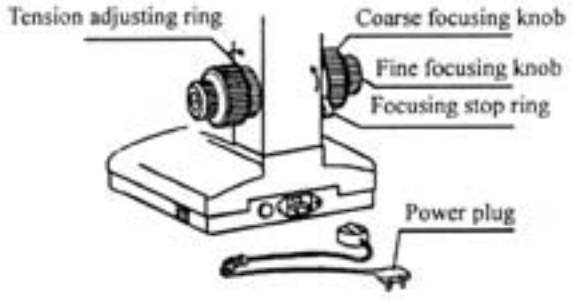

Fig 3 Coarse and fine focusing adjustment

4.3.2 The instrument is equipped with a focusing stop device, after the image is in focus through 10x objective,tighten the focus stop ring on the right , then the rising height of the stage is limited.Later ,lift the stage to this position with the coarse focusing knob,the image outline of the sample is visible.

★The coarse and fine focusing knobs on both sides must be turned in the same direction. Turning in reversed direction forcedly is absolutely forbidden, otherwise , the focusing mechanism will be damaged.

4.4 Bulb replacement

★The bulb should not be replaced until it cools down entirely.

★The filament center should be adjusted if it diverges the optical axis after bulb replacement.

4.4.1 Turn off the power switch and pull out the plug.

4.4.2 Screw out the thumb screw and turn over the lampstand plate (Fig.5).

4.4.3 Draw out the burnt-out bulb in arrowed direction as shown in Fig.5 and replace it with a new one. Be sure not to leave any fingerprint or stains on the bulb to avoid reducing the bulb brightness and lifetime.

4.4.4 Screw in the thumb screw to fix the lamp stand plate.

4.4.5 Switch on the power.

4.4.6 Take off the eyepieces and observe through the eyepiece tube directly.Adjust if the filament image diverges the optical axis(Fig.6).

4.4.7 Make the filament image center coincide with the optical axis by moving the thumb screw after loosening it(Fig.4),then screw in this screw.

4.5 Replacement of the fuse(Fig.4)

Screw off the fuse cap,then replace the fuse.

★The power supply should be shut off before replacing(pull out the plug).

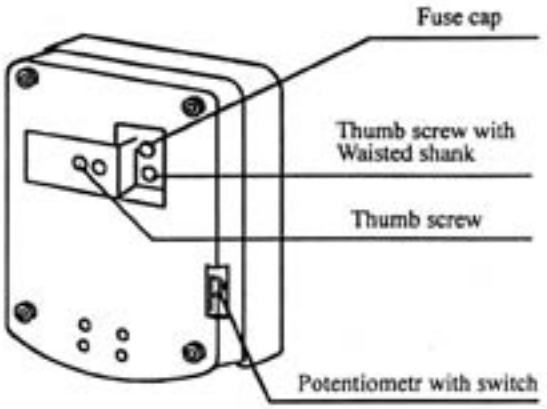

Fig 4

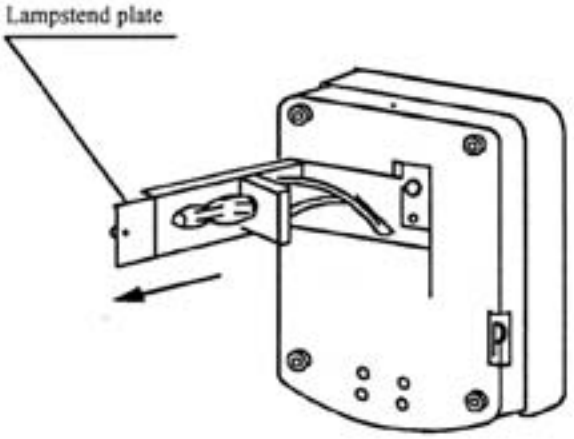

Fig 5

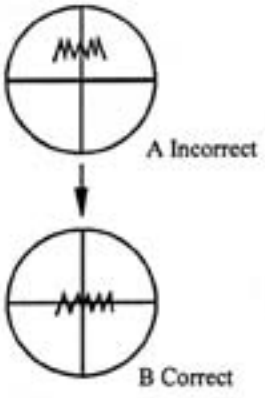

Fig 6 The place of the filament adjustment

5. Trouble-shooting table

If you encounter any disorder or hitches in the operation, find out the cause and solve it refer to the following table. Contact with the service station of our company nearby in case the hitch can be removed . It is not allowed to disassemble the microscope arbitrarily.

Trouble	Cause	Solution
No illumination	1.Power cord not properly connected 2.The fuse burn-out 3.Bulb burnt	1.Reconnent it properly 2.Replace the fuse 3.Repalce the used bulb
Flashed light	1.Bulb is about to burnt. 2.Bulb pin not inserted well	1.Replace the used bulb 2.Reinsert it
Insufficient brightness in view field	1.Incorrect bulb specification 2.Bulb not centered 3.Aperture diaphragm too samll 4.Luminance adjusting lever not adjusted to position 5.Condenser too low 6.Stains on lens surface	1.Replace the bulb 2.Readjust it 3.Readjust it 4.Push the luminance adjusting lever forward 5.Readjust it 6.Clean it with soft cloth or lens tissue lightly moistened with a few mixture of alcohol and ether
Uneven brightness in view field	1.Nosepiece not positively click-stops 2.Field diaphragm not centered 3.Field diaphragm too small 4.Stains on the lens surface or the specimen surface	1.Turn it to proper position 2.Centering again 3.Open it to the same size as the view field 4.Clean it
Unclear image	1.Specification of cover glass unqualified 2.Slide glass in reversed direction 3.Dirty lens (especially for 40x front lens) 4.Immersion objectives not oiled or oil unqualified 5.Bleb in oil 6.Aperture diaphragm not suitable	1.Use glass with standard thickness 2.Turn it over 3.Clean it 4.Use oil provided by us 5.Turn the nosepiece repeatedly or refill the oil 6.Readjust
Sample touched by high magnification objectives when focusing	1.Slide glass in reversed direction 2.Cover glass too thick	1.Turn it over 2.Use glass with standard thickness
Images of both eyepieces not overlapped	Interpupillary distance incorrect	Readjust
Easy to get tired when observing	Diopter not appropriate	Readjust according to 4.1.7 and 4.1.8

6. Maintenance

All microscopes have been checked according to the products standard before leaving the factory.In order to maintain the stability of the performance of the microscope and prolong its lifetime,repair and maintenance should be performed regularly.

6.1 Microscope should be placed in a dry , cool place without any dust or corrosive gases. The microscope with the fluorescence attachment should be stored in a dullish room.

6.2 All objectives are revised accurately and shouldn't be disassembled arbitrarily.
6.3 When employing 100x immersion objective, the space between the objective and the specimen,between the specimen and the conderser should be filled with the oil. When employing 40x、100x glycerine-immersion fluorescence objective , glycerine should be filled into the space between the objective and the specimen.Bleb and impurity , which can affect the observation,are not allowed in the immersion oil and glycerine.Before observing (if employ glycerine, wait for the glycerine infiltrating for a little while),bleb should be removed by totaing the nosepiece back and forth lightly.Each time after using ,the oil or glycerine must be cleaned with the absorbent tissue moistened with a few mixture(4:6)of alcohol and ether.

Don't use watered glycerine or the one exposed in the air for a long time,otherwise it will affect the image definition..

6.4 Don't load heavy object on the stage to prevent it from disorder.
6.5 When eyepiece, objectives and condensers not in use for a long time,they should be kept in the desiccator to prevent from fungus and moisture.
6.6 The microscope must be disconnect with the power supply and covered with dust cover when not in use.
6.7 The power supply must have grounded wire.

7. Optional attachments

7.1 S-Plan ph10x, 40x, 100x plan achromatic negative and positive phase-contrast device
7.2 Plan ph10x.40x.100x plan achromatic negative and positive phase-contrast device
7.3 S-Plan 25x and plan 25x plan achromatic objectives
7.4 Photographic attachment
7.5 Dark-field attachment
7.6 Polariaing attachment
7.7 TV and video attachment
7.8 Color-contrast attachment
7.9 Fluorescence attachment

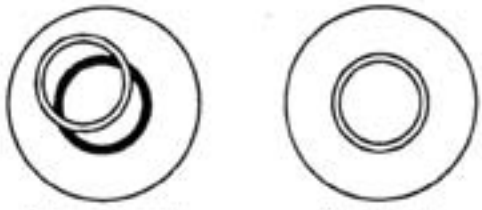

Fig 7

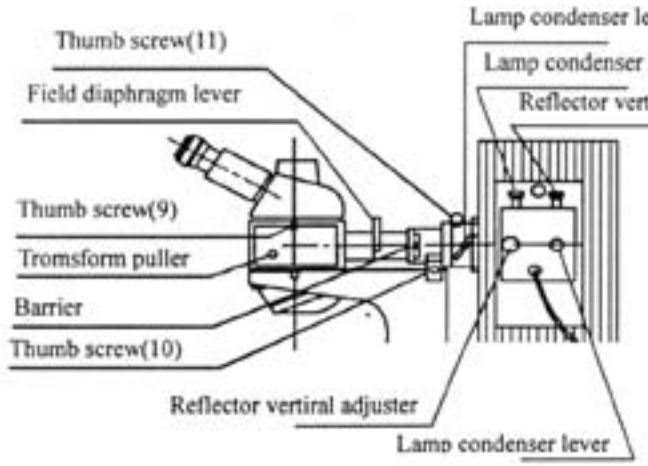

Fig 8

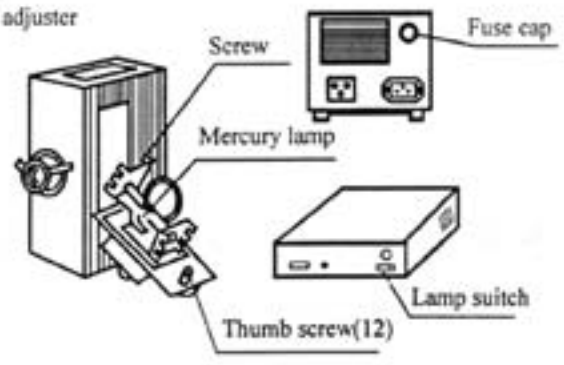

Fig 9

H6000 Series Outfits

Items	Parameter	Model					Order number
		H6202	H6203	H6302	H6303	H6500	
Eyepiece	Plan eyepiece (WF10X-18mm)	●●	●●	●●	●●	●●	EP10a
Plan achromatic objective	SPLAN10/0.25	●		●			B-OSPr10
	SPLAN25/0.40	●		●			B-OSPr25
	SPLAN40/0.65	●		●			B-OSPr40a
	SPLAN 100/1.25(OIL)	●		●			B-OSPor100
	PLAN10/0.25		●		●		B-OPr10
	PLAN25/0.40		●		●		B-OPr25
	PLAN40/0.65		●		●		B-OPr40
	PLAN 100/1.25(OIL)		●		●		B-OPor100
Fluorescence objective	PLAN10/0.25					●	B-OFr10
	25/0.65					●	B-OFr25
	40/1.00					●	B-Ofor40
	100/1.25					●	B-Ofor100
Power supply	220V20W/ 110V20W	●	●	●	●	●	
Head	Binocular head (30° inclined seidentopf)	●	●				TBR06
	Trinocular head (30° inclined seidentopf)			●	●	●	TTR02
Condenser	N.A.1.25	●		●			C05
	N.A.1.25		●		●	●	C23
Fluorescence attachment	Fluorescence Main Body (B、G)					●	FD07
	100W direct current mercury lamp house					●	LH08
	100W direct current mercury power source house					●	LS14
	Glycerine					●	
Cedar oil		●	●	●	●	●	
Filter	Φ32(blue)	●	●	●	●		Cu02-1

H6000i Series Outfits

Component	Item	Model				Order number
		H6201i	H6203i	H6301i	H6303i	
Eyepiece	Plan eyepiece(WF10X-18mm)	●●	●●	●●	●●	EP10a
IOS achromatic objective	4X/0.10	●		●		B-0Ai4a
	10X/0.25	●		●		B-OAi10a
	40X/0.66	●		●		B-OAi40a
	100X/1.25(OIL)	●		●		B-OAi100a
IOS achromatic objective	PLAN10X/0.25		●		●	B-OPi10a
	PLAN20X/0.40		●		●	B-OPi25a
	PLAN40X/0.66		●		●	B-OPi40a
	PLAN100X/1.25(OIL)		●		●	B-OPoi100a
Power supply	220V20W/110V20W	●	●	●	●	
Head	Binocular head(30° inclinnd seidentopf)	●	●			TBR06
	Trinocular group(30° inclinnd seidentopf)			●	●	TTR02
Condenser	N.A.1.25	●		●		C05
	N.A.1.25		●		●	C23
Cedar oil		●	●	●	●	
Filter	Φ32(blue)	●	●	●	●	Cu02-1

H6000 Series Microscope Optional Accessories

Items	Parameter		Order number
Eyepiece	WF10X-20		EW10
	WF10X-18(pointer)		EPg10
	WF10X-18(reticule)		Epr10b
	WF16X-10		EP16
	WF16X-14		EW16
Plan achromatie objective	SPLAN4/0.10		B-OSPr4
	PLAN4/0.10		B-OPr4
Head	Binocular head (45° inclined,seidentopf)		TBR07
	Trinocular head (45° inclined,seidentopf)		TTR03
	Binocular head (30° inclined,sliding)		TB07
	Trinocular head (30° inclined,sliding)		TT06
	Binocular head (45° inclined,sliding)		TB08
	Trinocular head (45° inclined,sliding)		TT07
Phase contrast attachment	Plan achromatic positive objective	Splan Ph 10/0.25	B-OSPr10
		Splan Ph 40/0.65	B-OSPr40a
		Splan Ph 100/1.25(OIL)	B-OSPopr100
		Plan Ph 10/0.25	B-OPpr10
		Plan Ph 40/0.65	B-OPpr40a
		Plan Ph 100/1.25(OIL)	B-OPopr100
	Plan achromatic negative objective	Splan Ph 10/0.25	B-OSPnr10
		Splan Ph 40/0.65	B-OSPnr40
		Splan Ph 100/1.25(OIL)	B-OSPonr100
		Plan Ph 10/0.25	B-OPnr10
		Plan Ph 40/0.65	B-OPnr40a
		Plan Ph 100/1.25(OIL)	B-OPonr100
	Phase contrast condenser(used to Splan phase contrast Objective)		C06a
	Phase contrast condenser(used to Plan phase contrast Objective)		C06
	Centering Objective		EC8
Dark field attachment	Dark field condenser		C07
Polarized light attachment	Polarizer slide		PO01
	Analyzer slide		PA01
Fluorescence attachment	Fluorescence main body(B.G.V.U)		FD08
	200W mercury lamp source house		31x.3
	200W mercury lamp house		31x2.2
Photo attachment	10X reticule eyepiece		Epr10b
	2.5X photo eyepiece		EPHn2.5
	4X photo eyepiece		EPHn4
	6.3X photo eyepiece		EPHn6.3
	135 photo device(with 4x photo eyepiece)		MP03
Image attachment	Pick-up camera.monitor, C-monut		TV02
Dual-viewing attachment	Distance of two viewing field is 600mm		TB06
Epi-illumination attachment	6V20W halogen-tungsten lamp(with reflector)		II09
Filter	Φ32(green,yellow)		Cu02-2.3

H6000i Series Microscope Optional Accessories

Items	Parameter		Order number
Eyepiece	WF10X-20		EW10
	WF10X-18(pointer)		EPg10
	WF10X-18(reticule)		EPr10b
	WF16X-10		EP16
	WF16X-14		EW16
IOS plan achromatic objective	PLAN4X/0.10		B-OPi4a
IOS Phase contrast attachment	Plan achromatic positive objective	Plan Ph 10/0.25	B-OPi10a
		Plan Ph 20/0.40	B-OPip20a
		Plan Ph 40/0.66	B-OPip40a
		Plan Ph 100/1.25(OIL)	B-OPoip100a
	Plan achromatic negative objective	Plan Ph 10/0.25	B-OPin10
		Plan Ph 20/0.40	B-OPin20
		Plan Ph 40/0.66	B-OPin40
		Plan Ph 100/1.25(OIL)	B-OPoin100
	IOS phase contrast condenser		C22
	Centering eyepiece		Eci
Dark field attachment	Dark field condenser		C07
Polarizing attachment	Polarizer slide		PO01
	Analyzer slide		PA01
Photo attachment	10X reticule eyepiece		EPr10b
	2.5X photo eyepiece		EPHn2.5
	4Xphoto eyepiece		EPHn4
	6.3X photo eyepiece		EPHn6.3
	135Photo device(with 4X photo eyepiece)		MP05
Image attachment	Pick-up camera,monitor, C-mount		TV05
Dual-viewing attachment	Distance of two viewing field is 600mm		TB11
Filter	Φ32(green, yellow)		Cu02-2、3