Premiere®

PROFESSIONAL MICROSCOPE

MRP-3000 - Binocular

MRP-3000D- Dual View

MRP-3000T- Trinocular

Operation Manual

This operation manual is for the **Models MRP-3000, MRP-3000D**, and **MRP-3000T microscopes**. We recommend that you carefully review this manual prior to operating this device in order to optimize safety and performance, and to become fully familiar with its use. Keep this operation manual in an easily accessible place for future reference.

WARNING: To prevent fire and electrical shock, do not expose unit to rain or moisture.

CAUTION: No user-serviceable parts inside. Refer servicing to qualified service personnel.

Contents *MRP-3000*

1-1. Operation

(1) As the microscope is a precision instrument, always use it with care. Avoid dropping or shaking during operation. Make sure the microscope is placed on a flat surface.

(2) Do not put the microscope in direct contact with the sun. Do not expose the microscope to high temperature, damp, or dusty environment.

(3) When moving the microscope, you should use both hands, typically one hand under the base and one hand on the arm (stand) of the microscope and set it down carefully.

CAUTION: It will damage the microscope if you hold the microscope either by the stage, focusing knob or head.

(4) Be sure the microscope is unplugged before replacing the bulb or fuse and wait until the bulb has cooled down. **NOTE: Only use a 6V/20W Halogen Bulb**

(5) This microscope has a built in dual voltage transformer and can be used with wide voltage range from 90 to 240V.

(6) Only use the power cord supplied with the microscope.

1-2 Maintenance

(1) Wipe the lens gently with a soft lens tissue. After every use with oil or fingerprints clean the lens surfaces with lens paper or lens paper moistened with a little rubbing alcohol. If you do not have lens paper make sure to use a lint free towel or cloth.

CAUTION: Alcohol is flammable. Do not place this chemical near fire or fire causing source. You should use this chemical in a ventilated place.

(2) Don't use organic solution to wipe the surfaces of the other components.

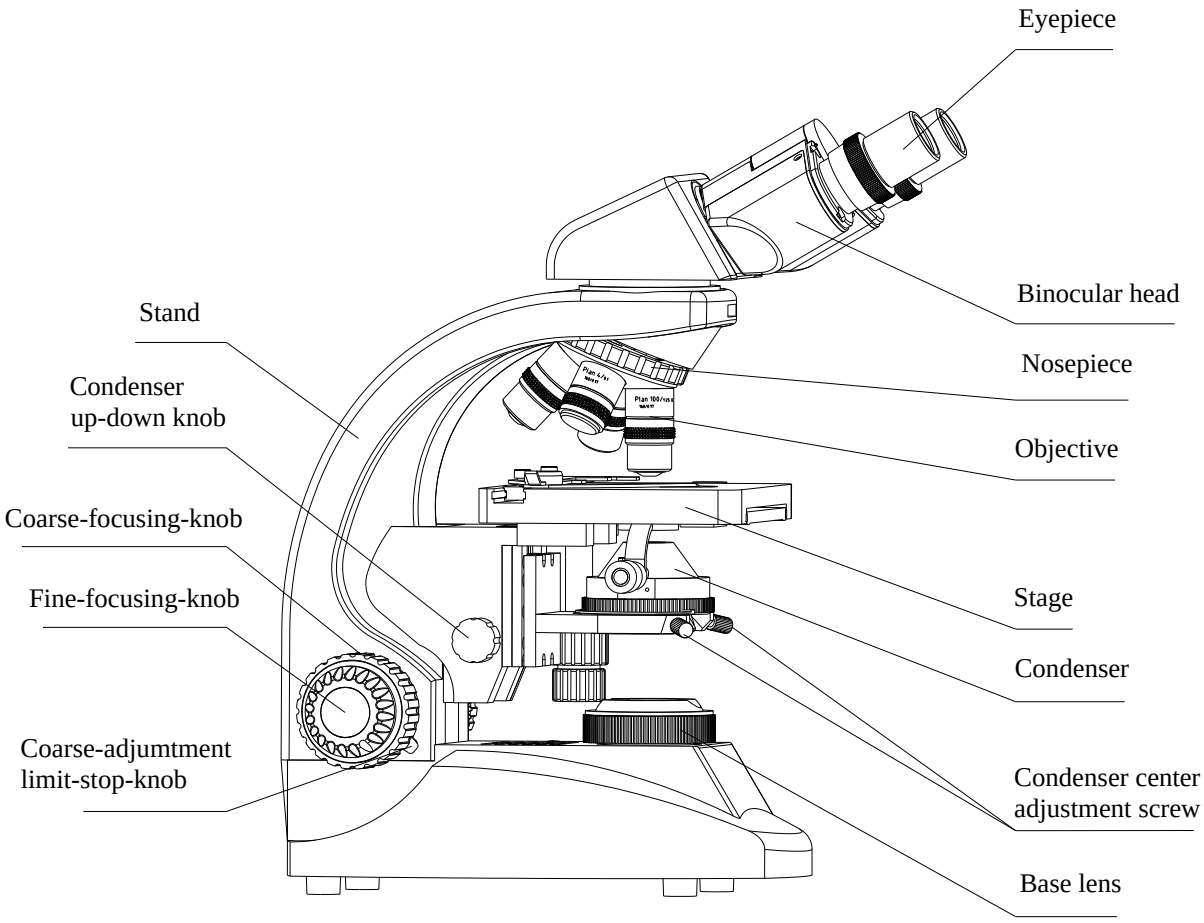
(3) If the microscope comes in contact with a liquid, then you should turn off the power immediately and wipe it dry.

(4) Never disassemble or service the microscope yourself.

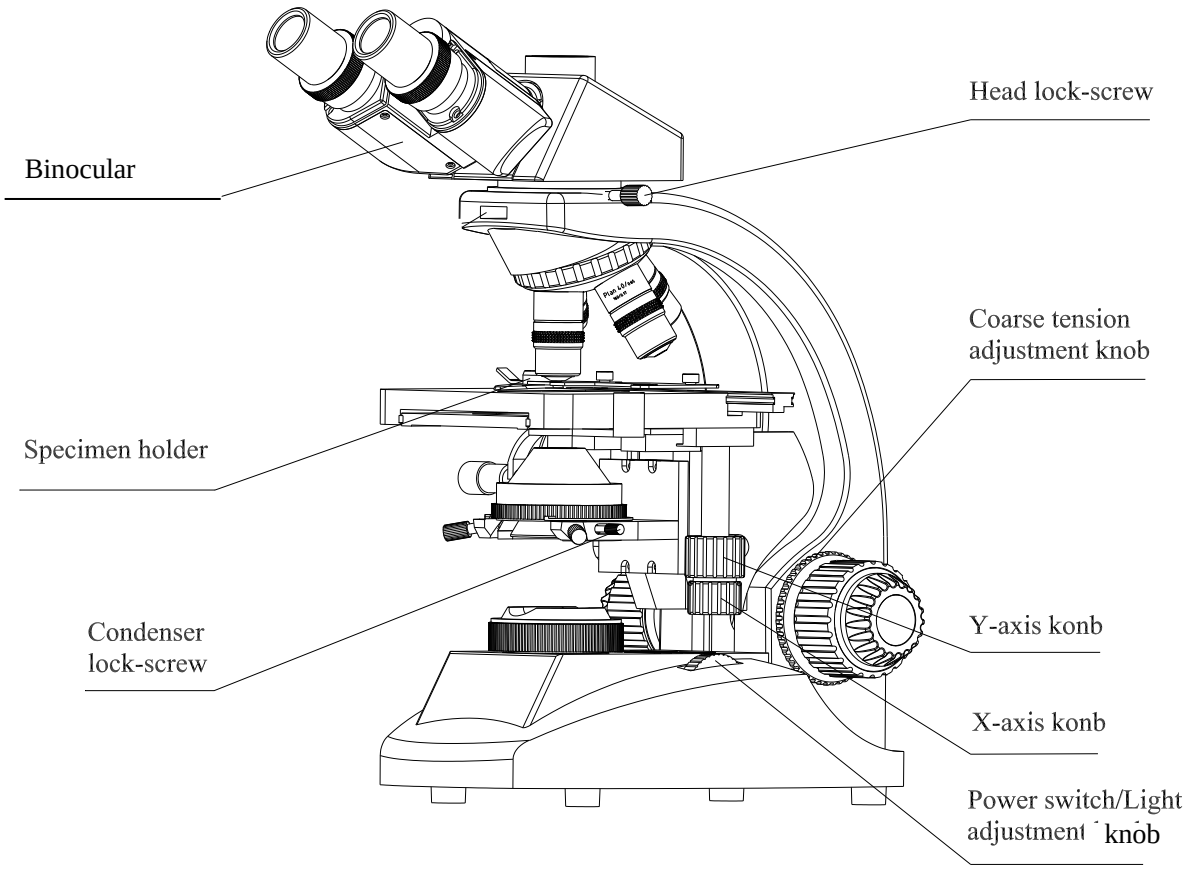
(5) After using, cover the microscope with a dust cover.

2. Diagram *MRP-3000*

MRP-3000 Intermediate Biological Microscope Diagram



MRP-3000 Biological Microscope Diagram



3. Assembly MRP-3000

3-1 *Install the Objectives*

Install the objective into the microscope nosepiece from the lowest magnification to the highest, in a clockwise direction.

3-2 *Insert the Eyepieces*

(1) Remove the eyepiece tube covers.

(2) Insert the eyepiece into the tube completely.

3-3 *Install plug*

Insert one side of the plug into the back socket of the microscope.

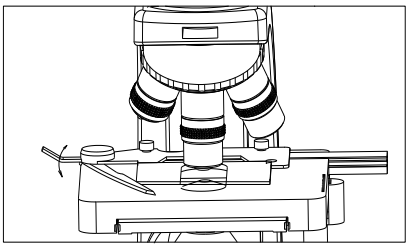
4. Operation MRP-3000

Fig.1

4-1 *Turn on*

(1) Insert the plug into an outlet and turn on.

(2) Adjust the light adjustment knob until you get the suitable brightness. **(See fig.1)**



4-2 *Set the specimen slide*

(1**)** Push the arm of the specimen holder back.

(2) Insert the slide with the cover glass facing up and allow the arm of the specimen holder forward. **(See fig.2)**

(3) Rotate the X and Y-axis knobs on the mechanical stage to move the specimen to the center (the center of the objective).

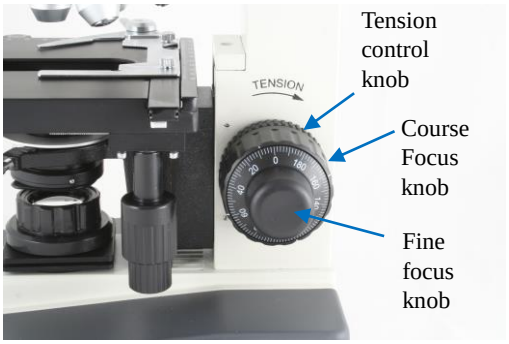


Fig.3

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4-3 *Adjust focus*

(1) Move the objective 4X into the light path.

(2) Rotate the coarse-focusing-knob until the image appears.

(3) Turn the fine-focusing-knob to make the specimen clearer. **(See fig.3)**

- **When using the 4X and 10X objective, open the aperture diaphragm and field diaphragm to the widest position.**

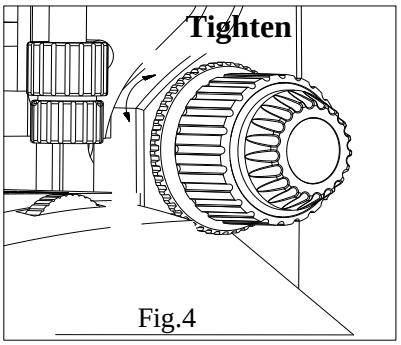


Fig.4

4-4 *Adjust tension of the focus*

If the course focus knob is difficult to turn when focusing or the stage drifts downwards by itself, you can solve the problem by adjusting the tension adjustment ring. Turn clockwise to tighten the controls or counterclockwise to loosen the controls **(See fig.4)**

Fig.5

4-5 *Adjust the interpupillary distance*

When observing with both eyes hold the bases of the base of the eyepieces and rotate them around the axis until there is only one field of view. **(See fig.5).** On the left and right eyepiece base should point to the same number. The number is the interpupillary distance.

Fig.6

4-6 *Adjust diopters*

Rotate one eyepiece to the "0" position using the white thread. This should be done to your dominate eye, then using that same (one side only) eyepiece focus on an specimen clearly. Now observe the other eyepiece and rotate its diopter adjusting ring until the image is clear in that eyepiece. **(See fig.6)**

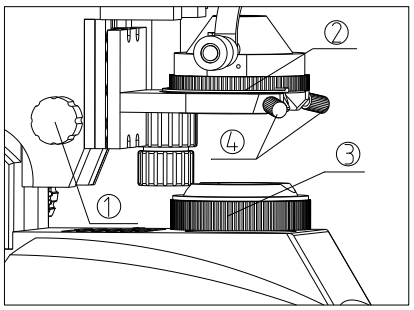


Fig.7

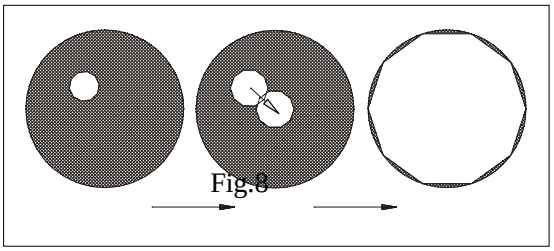


Fig.8

Image of aperture diaphragm (inside)

Fig 8

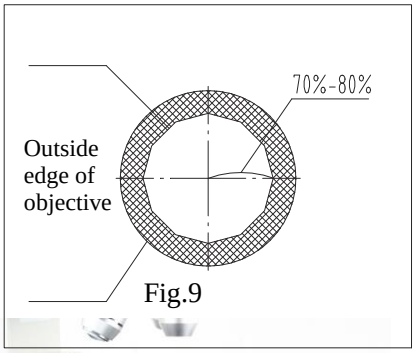


Fig.9

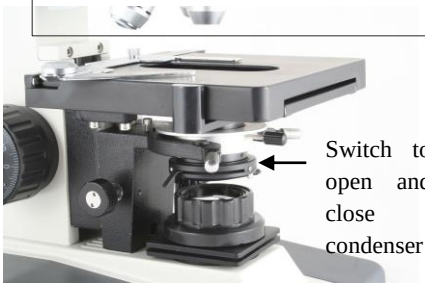


Fig.10

4-7 *Center the condenser*

(1) Rotate the condenser up-down knob ① to raise it to the highest position. **(See fig.7)**

(2) Rotate the 4X objective into the light path.

(3) Rotate the upper diaphragm ring ② in a counterclockwise direction and move to the smallest setting. Rotate the Kohler diaphragm ring counterclockwise ③ and you will see the image of field diaphragm from the eyepieces.

(4) You want to see the circle of light closest to the center. If it is centered go to section 4-8, if not go to the next step.

(5) Adjust the center adjustment screw ④ and put the light to the center of the field of view [Make sure the aperture of the field diaphragm is smaller than the field of view of the eyepiece **(See fig.8)**. When the shadow around the field of view of the eyepiece is symmetrical, it shows the condenser has been centered correctly. **(See fig.8)**

(6) Now, you can enlarge the Kohler diaphragm ③ and remove the shadow.

4-8 *Adjust Kohler diaphragm* ③

The Kohler diaphragm can prevent other light from entering and strengthen the image by limiting the beam of light entering the condenser. When the image of the diaphragm is just on the edge of the field of view, you can obtain the clearest image.

4-9 *Adjust aperture diaphragm* ②

The aperture diaphragm decides the numerical aperture of the illumination. If the N.A. of illumination is matching with N.A. of the objective②, you can obtain better resolution and the contrast.

If the contrast is low, you can adjust the N.A. of the condenser to 70%-80% of the N.A. of the objective when using. Adjust the upper diaphragm ring until you see the image like above **(See fig.9).** Use of diaphragm and put the N.A. of condenser ② to 80% of the objective. e.g.: objective 40X (N.A. =0.65), put the aperture diaphragm to about 0.65X0.8=0.52. **(See fig.10)**

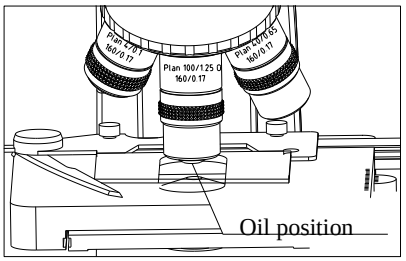


Fig.11

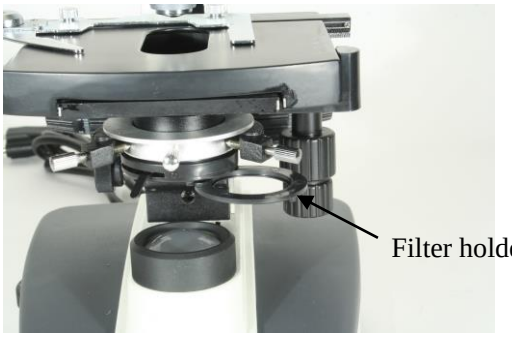


Fig.12

(See fig.13)

4-10 *Use the oil objective*

(1) Use the objective 40X to focus the specimen.

(2) Put a drop of oil on the specimen. **(See fig.11)**

(3) Rotate the nosepiece to place the 100X objective (oil) into the light path. Then use the fine focusing knob to focus.

★Make sure there is no air bubble in the oil.

A. Take out the eyepieces to examine the air bubble. Open the aperture diaphragm and field diaphragm fully and observe the edge of the objective from the tube without the eyepiece.

B. You can rotate nosepiece slightly and swing the oil objective some times to remove the air bubble.

(4) After using oil, clean the 100X lens with clean lens paper using rubbing alcohol if the oil does not come off easily.

4-11 *Use the filter*

Filter can make the background softer. **(fig.12)**

There is a filters: blue.

(You also place the Polarizer in this position when using the optional simple polarizing set)

4-12 *Replace the halogen bulb*

(1) Turn off the power supply before replacing the bulb.

(2) Loosen the screw of the lamp holder base, and open the door to the lamp holder.

(3) Wait until the bulb cools down, and then insert the new bulb into the bulb holder on the lamp base.

(4) Close the door of the lamp holder and retighten the screw

Fig.14

4-13 *Replace the fuse*

Turn off the power supply before replacing the fuse. On the bottom screw off the fuse holder from the base with a “flat head” screwdriver. Remove the damaged fuse and install the new fuse. Finally screw the fuse base back to the base. **(See fig.14)**

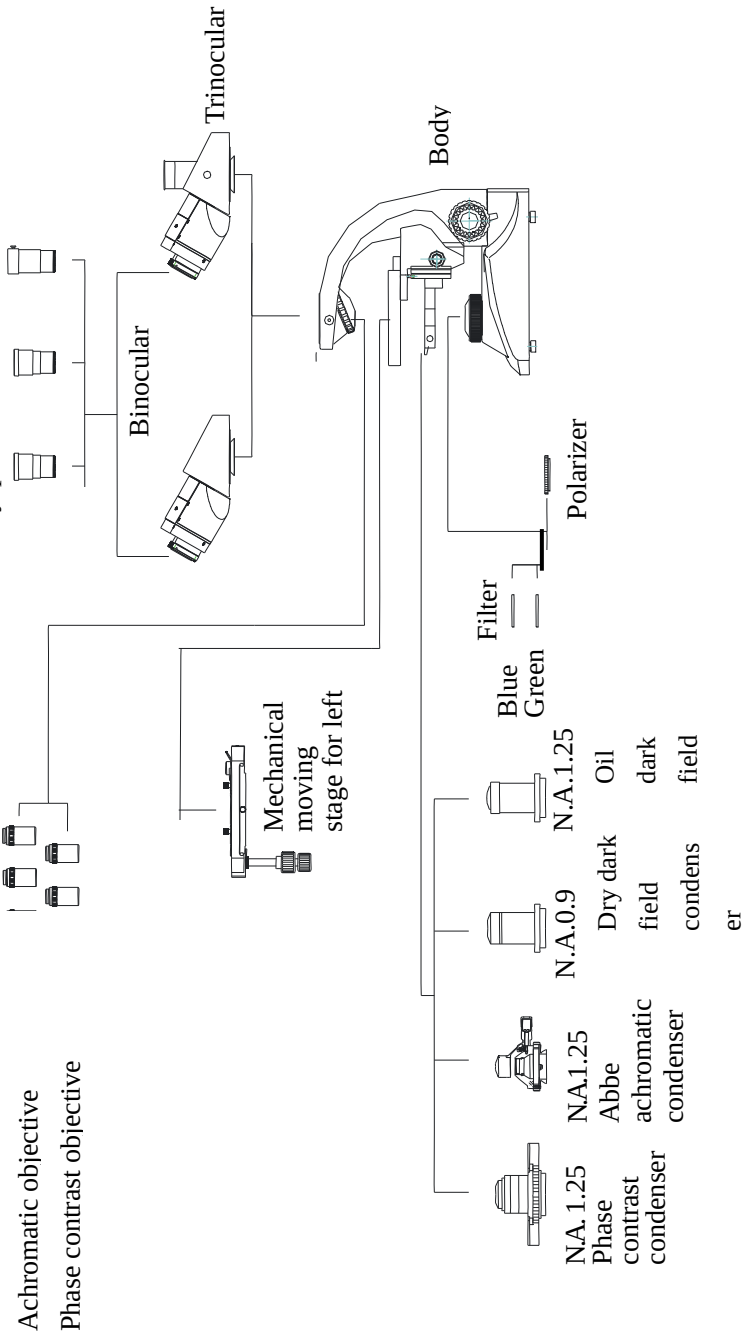
Replacement Fuse - Rating: 250V，3.15A.

5.General specification *MRP-3000*

MRP-3000 Biological Microscope general specifications (For optional upgrade please call your authorized dealer)

Install		Model		
Parts	Specifications	MRP-3000	MRP-3000T	MRP-3000D
Eyepiece (pair)	10X/18mm eyepiece	•	•	2 pair
	PL16X plan eyepiece			
	Center eyepiece			
Objective	Achromatic objective 4X	•	•	•
	Achromatic objective 10X	•	•	•
	Achromatic objective 40X	•	•	•
	Achromatic objective 100X	•	•	•
	Plan achromatic objective 4X			
	Plan achromatic objective 10X			
	Plan achromatic objective 40X			
	Plan achromatic objective 100X			
Head	30° Binocular head	•		
	30° Trinocular head		•	
	30° Dual Binocular head			•
Nosepiece	Reversed quadruple nosepiece	•	•	•
Stand	Coaxial coarse & fine	•	•	•
Stage	140 x 135mm mechanical stage	•	•	•
Condenser	N.A.1.25 abbe condenser	•	•	•
	N.A.1.25 five position phase			
	Single special phase contrast			
	Single special phase contrast			
	Single special phase contrast			
Power	90V-240Vwide voltage 6V/20W halogen bulb (built in) Variable control adjustment	•	•	•
Accessory	Blue filter(ϕ 32	•	•	•
	Spare bulb	•	•	•
	Replacement fuse	•	•	•
Dark field condenser	Dry dark filed condenser N.A.0.9			
	Oil dark field condenser N.A.1.25			
Polarizing set	Polarizer(ϕ 32)			
	Analyzer			
	Rotating stage (center)			

***MRP-3000* Biological Microscope Configuration drawing**



7-1 *MRP-3000* Biological Microscope general specifications

Optical	Achromatic Optical system
Head	Binocular, 30°inclined. Trinocular, 30°inclined. 45° Dual Binocular head
Eyepiece	10X eyepiece, line field of view 18mm
Nosepiece	Reversed quadruple nosepiece
Objective	Achromatic objective(4X、10X、40X、100X) Plan objective(4X, 10X, 40X, 100X) (not included)
Focus	Coaxial coarse & fine focusing system with limit-stopper and tension adjustment. Travel range: 20mm. Fine focusing precision：0.002mm
Stage	Mechanical stage 140x135mm; moving range 75mmx50mm; built in low position coaxial adjustment, left and right hand for option.
Condenser	N.A.1.25 achromatic condenser N.A.1.25 five position phase contrast condenser (not included) N.A. 0.9 dry dark field condenser (not included) N.A. 1.25 oil dark field condenser (not included)
Illumination	90～240V wide voltage. Built-in Koehler illuminator system. 6V/20W halogen bulb. Pre-centered, a continuous adjustment of brightness.

7-2 *Parameter of objective*

Type	Magnification	Numerical aperture （N.A.）	Working distance （mm）	Conjugate distance （mm）	Parfocal distance （mm）	Thickness of the cover glass
Plan objective	4x	0.1	17.912	195	45	0.17
	10x	0.25	2.043	195	45	0.17
	40x	0.65	0.65	195	45	0.17
	100x	1.25	0.16	195	45	0.17
Plan objective	4x	0.1	17.912	195	45	0.17
	10x	0.25	2.043	195	45	0.17
	40x	0.65	0.65	195	45	0.17
	100x	1.25	0.16	195	45	0.17

Symptom	Cause	Remedy
Optics		
(1)The lamp is bright, but the light in the field of view is not bright enough.	Field diaphragm is not large enough.	Enlarge the field diaphragm.
	Condenser is too low.	Adjust the condenser.
	Condenser is not centered.	Center the condenser.
(2)The side of the field of view is dark or not even.	The nosepiece is not in the right position.	Turn the nosepiece into the right position.
	Stain or dust has accumulated on the condenser, objective, eyepieces, and base lens.	Clean the lens.
	Condenser adjustment needed (see step 3-7)	Center the condenser.
(3)Stain or dust is observed in the field of view.	Stains have accumulated on the specimen.	Clean the specimen.
	Stains have accumulated on the lens.	Clean the lens.
(4)Unclear image	No cover glass on the specimen slide.	Add the cover glass.
	The cover glass is not standard.	Use a standard cover glass with thickness 0.17mm.
	The cover glass faces down.	Put the cover glass to face up.
	The immersion oil has accumulated on the dry objective.	Clean thoroughly.
	The immersion oil is not used for oil objective 100XR.	Use immersion oil.
	Air bubble in the immersion.	Get rid of the air bubble.
	Use wrong immersion oil.	Use correct one.
	The aperture is not opened correctly.	Adjust the iris diaphragm.
	Stain or dust has accumulated on the lens in the inlet of the head.	Clean the lens.
	The condenser is not in the right position.	Adjust the condenser.
(5)One side of the field of view is dark or the image moves while focusing.	The specimen slide is not fixed.	Fix with clips.
	The nosepiece is not in the right position.	Turn the nosepiece into the right position.
	Condenser is centered incorrectly.	Center the condenser.
(6) The eyes feel tired easily. The right field of view doesn't superpose with the left.	Interpupillary distance is wrong.	Adjust the interpupillary distance
	Diopter adjustment is wrong.	Adjust the diopter.
	The eyepiece for the right is different from the left.	Use the same eyepieces.

Symptom	Cause	Remedy
Mechanics		
(1)Can not get the objective focused.	The cover glass faces down.	Put the cover glass to face up.
	The cover glass is not standard.	Use a standard cover glass with thickness 0.17mm.
(2) The objective touches the cover glass while turning the nosepiece.	The cover glass faces down.	Put the cover glass to face up.
	The cover glass is not standard.	Use a standard cover glass with thickness 0.17mm.
(3)Coarse focusing knob is too tight.	Tension knob is too tight.	Loosen a little.
(4)Stage declines itself and can't stay in the focus plane.	Tension knob is too loose.	Tighten a little.
(5)Coarse focusing knob can't rise.	The limit stop knob is locked.	Loosen the knob.
(6)Coarse focusing knob can't decline.	The base of the condenser is too low.	Raise the base.
(7)Can not move the slide smoothly.	The slide is not fixed correctly.	Adjust it correctly.
	The movable specimen holder is not fixed properly.	Adjust it correctly.
(8)The image moves obviously when touching the stage.	The stage is fastened incorrectly.	Fasten the stage correctly.
Electrical		
(1)The bulb does not work.	No power supply.	Check the connection of the power cable.
	The bulb is not inserted correctly.	Insert it correctly.
	The bulb burnt out.	Replace it.
(2)The bulb burnt out usually.	Use a wrong bulb.	Replace with a correct one.
(3)The field of view is not bright enough.	Use a wrong bulb.	Replace with a correct one.
	The use of light adjustment knob is wrong.	Adjust correctly.
(4)The bulb flickers or the brightness is not stable.	The bulb will burn out soon.	Replace with a new one.
	The wire doesn't connect all right.	Connect correctly.

TRINOCULAR / DUAL VIEW MICROSCOPE

MRP-3000 Microscopes may be adapted to function as a Trinocular microscope. The Trinocular head fits on the base in place of binocular head, third 10X eyepiece (**not included**) may be used or camera eyepiece (**sold separately**) can be inserted in the vertical tube for digital images with your computer. (Ask for **MA88** or **MA89**).

Also MRP-3000 microscopes may be adapted to function as a Dual View microscope with front and back viewing.

MRP-3000T **MRP-3000D**

Warranty

The manufacturer warrants this instrument to be free from defects in material and workmanship under normal use for five years from the date of purchase (one year for electrical components). It does not cover damage resulting from abuse or misuse, repairs or alterations performed by other than authorized repair technicians, or damage occurring in transit. If you have questions concerning this product or warranty, contact the dealer from whom it was purchased. For warranty service, microscope should be well packed to avoid damage in transit, preferably in original box and packing. Include your complete return address and telephone number as well as a description of the difficulty, date and place of purchase, and ship to the address below. It will be repaired or replaced at no charge and returned. If misuse, alterations, accident or abnormal conditions of operation caused failure, an estimate for repairs will be provided for your approval prior to work being performed.

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C & A Scientific Co., Inc.

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