

User Manual

Monocular Biological Microscope

Model M814



MicroscopeNet.com

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i. Caution

1. Find the “UP” sign and place the Styrofoam container on your table or bench so that the arrow is pointing upward. Open the shipping carton carefully to prevent any accessory items (i.e. objectives or eyepieces) from dropping and being damaged.
2. Do not discard the molded Styrofoam container. The container should be retained should the microscope ever requires reshipment.
3. Keep the instrument out of direct sunlight, high temperature or humidity, and dusty environments. Ensure that the microscope is located on a smooth, level and firm surface.
4. If any specimen solutions or other liquids splash onto the stage, objective or any other component, disconnect the power cord immediately and wipe up the spillage. Otherwise, the instrument may be damaged.
5. **Important:** the lamp, lamp housing and adjacent parts will become very hot. Do not touch these parts until they have completely cooled. Never attempt to handle a hot halogen bulb.
6. All electrical connectors (power cord) should be inserted into an electrical surge suppressor to prevent damage due to voltage fluctuations.
7. For safety when replacing the halogen lamp or fuse, be sure the main switch is off, unplug the power cord, and only replace the halogen bulb after the bulb and the lamp house has completely cooled.
8. Confirm that the input voltage indicated on your microscope corresponds to your line voltage. The use of a different input voltage other than that as indicated will cause severe damage to the microscope.

ii. Care and Maintenance

1. Do not attempt to disassemble any component including eyepieces, objectives or focusing assembly.
2. Keep the instrument clean; remove dirt and debris regularly. Accumulated dirt on metal surfaces should be cleaned with a damp cloth. More persistent dirt should be removed using a mild soap solution. **Do not use organic solvents for cleansing.**
3. The outer surface of the optics should be inspected and cleaned periodically using an air stream from an air bulb. If dirt remains on the optical surface, use a soft cloth or cotton swab dampened with a lens cleaning solution (available at camera stores). All optical lenses should be swabbed using a circular motion. A small amount of absorbent cotton wound on the end of a tapered stick makes a useful tool for cleaning recessed optical surfaces. Avoid using an excessive amount of solvents as this may cause problems with optical coatings or cemented optics or the flowing solvent may pick up grease making cleaning more difficult. Oil immersion objectives should be cleaned immediately after use by removing the oil with lens tissue or a clean, soft cloth.
4. Store the instrument in a cool, dry environment. Cover the microscope with the dust cover when not in use.

1. Installation

1) Installation of the eyepiece

Remove the protective cap from the eyepiece tube. Insert the eyepiece into the eyepiece tube.

2) Installation of the objectives

The objectives have been installed at the factory. You do not need to do anything. Please read the following note about objectives.

Note:

- Inspect the objectives frequently for dirt or oil; clean if necessary.
- Use the 4x objective to initially focus the image of your specimen.
- When changing the objective magnification, rotate the objective nosepiece until you hear a “click” sound. This ensures the objective is centered in the optical light path.

3) Installation of glass filter

Swing out the filter holder under the condenser. Insert the filter into the holder, swing the holder in.

4) Replacing the fuse

The fuse is located inside the base. Turn off the power and disconnect the power cord. Before you turn over the microscope, be sure to take the eyepiece off. Lay down the microscope on one side on a piece of soft cloth. Take off the 4 screws on the corners. Take the black bottom apart from the base. You will find a black tube in the front. Screw it off and take out the dead fuse. Insert the new fuse in and screw it on. Mount the base back on and tighten the 4 screws.

5) Changing halogen bulb

Turn the power off and disconnect the power cord. Allow some time to cool down the lamp. Before you turn over the microscope, be sure to take the eyepiece off. Open the cover on the bottom of the base by loosening the thumb screw. Take the dead bulb off and insert the new bulb in. Be sure the pins on the bulb are completely inserted into the lamp socket. You may also loosen the two screws on the cover to adjust the position of the bulb to get centered and even brightness. Screw the cover on.

2. Operation

1) Adjusting illumination

Connect the power cord and turn on the main switch. Rotate the variable intensity dial on the right side beside the main power switch to increase or decrease the brightness.

2) Placing specimen

Place the slide on the mechanical stage. Use the slide holder to gently secure the slide. Turn the X and Y adjustment knobs located under the stage to position the specimen for viewing.

Caution: Be sure not to allow an objective to touch a specimen slide when changing objectives.

3) Focusing

- With the 4x objective in position, raise the mechanical stage using the coarse focus knob until the specimen is close to the objective
- Turn the coarse focus knob until the specimen is in focus. Then use the fine focus knob to obtain a sharp image. You may now switch to another magnification objective.

4) Adjusting condenser

Turn the condenser focus knob to raise or lower the condenser. The condenser is raised when using high magnification objectives and lowered when using low magnification objectives.

Note:

- The centering of the condenser and the light axis of the objective are factory adjusted. Do not attempt re-adjustment.
- The highest position of the condenser has been factory adjusted. Do not attempt re-adjustment.

5) Adjusting iris diaphragm

Move the Iris Diaphragm Lever left or right to adjust the aperture size.

Note:

The iris diaphragm is designed to adjust the aperture size, not to adjust brightness. Generally, opening the diaphragm to 70-80% of the N.A. value of the respective objective will provide an image of acceptable quality. If you want to observe the image of the iris diaphragm, remove one eyepiece and look through the tube. You will see a dark circle encroaching on the bottom of the tube.

3. Specifications

General	
Objective Tube Length	160mm
Viewing Head	Monocular, inclined 45°, swiveling 360°
Eyepieces	WF10X/18, P16X/11
Nosepiece	Quadruple
Objectives	Achromatic (DIN) 4X, 10X, 40X(spring), 100X(spring, oil)
Focus system	Coaxial coarse and fine adjustment; Focusing Range: 13mm; Fine Division (minimum fine focusing adjustment): 0.002mm
Condenser	Abbe, NA=1.25 W/Iris, Rack and Pinion Adjustment
Stage	Double layers mechanical stage 120mmx120mm; Movement Range: 60mmx30mm
Illumination	Halogen lamp 110V/6V/15W, Brightness adjustable

Eyepieces			
Designation	Magnification	Field of View	Focal Length
Wide Field	10X	18mm	24.94mm
Plan Field	16X	11mm	15.58mm

Objectives					
Magnification	Numerical Aperture	Thickness of slide cover	Focus	Working Distance	Working Mode
4X	0.10	0.17mm	31.04mm	37.5mm	Dry
10X	0.25	0.17mm	17.13mm	7.316mm	Dry
40X(S)	0.65	0.17mm	4.65mm	0.632mm	Dry
100X(S, Oil)	1.25	0.17mm	1.906mm	0.198mm	Oil

Magnifications								
Eyepiece	10X	16X	10X	16X	10X	16X	10X	16X
Objective	4X		10X		40X		100X	
Magnification	40X	64X	100X	160X	400X	640X	1000X	1600X

4. Troubleshooting Guide

OPTICAL PROBLEMS		
Problem	Cause	Solution
Darkness at the periphery or uneven brightness in the field of view	Revolving nosepiece not in click stop position	Revolve the nosepiece to click-stop position by swinging the objective correctly into the optical path
	The light source of the bulb is not at the center	Adjust the position of the bulb
Dirt or dust on the view	Dirt or dust on the lens eyepiece, condenser, objective, collector lens or specimen	Clean the lens with a camera cleaning kit
Poor image quality	No slide cover attached to the slide	Attach a 0.17mm slide cover
	Slide cover is too thick or thin	Use a slide cover of the appropriate thickness (0.17mm)
	Slide may be upside down	Turn slide over so the cover-glass faces up
	Immersion oil is on a dry objective (especially the 40x)	Check the objectives, clean if necessary
	No immersion oil used with 100x objective	Use immersion oil
	Air bubbles in immersion oil	Remove bubbles
	Condenser aperture is closed or open too much	Open or close properly
	Condenser is positioned too low	Position the condenser upward

ELECTRICAL PROBLEMS		
Problem	Cause	Solution
Lamp does not light when switched on	No electrical power	Check power cord connection
	Lamp bulb burnt out	Replace bulb
	Fuse blown out	Replace fuse

IMAGE PROBLEMS		
Problem	Cause	Solution
Image moves while focusing	Specimen rises from stage surface	Secure the specimen in the slide holder
	Revolving nosepiece is not in the click-stop position	Revolve the nosepiece to the click-stop position
Image tinged yellow	Blue filter not used	Use daylight blue filter
	Lamp intensity is too low	Adjust the light intensity by rotating the intensity control dial
Image is too bright	Lamp intensity is too high	Adjust the light intensity by rotating the intensity control dial
Insufficient brightness	Lamp intensity is too low	Adjust the light intensity by rotating the intensity control dial
	Aperture diaphragm closed too far	Open to the proper setting
	Condenser position too low	Position the condenser upward

MECHANICAL PROBLEMS		
Problem	Cause	Solution
Image will not focus with high power objectives	Slide upside down	Turn the slide over so the cover glass faces up
	Cover glass is too thick	Use a 0.17mm cover glass
High power objective contacts slide when changed from low power objective	Slide upside down	Turn the slide over so the cover glass faces up
	Cover glass is too thick	Use a 0.17mm cover glass
Slippage of focus when using the coarse focusing knob Fine focus is ineffective	Tension adjustment is not adjusted properly	Increase the tension or the machine need to be repaired