

User Manual

Binocular Biological
Microscope

Model M826



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 binocular viewing head

Loosen the thumb screw on the head of the body; remove the cap on the dovetail of the binocular viewing head; insert the binocular viewing head into the head of the body; ensure that the dovetail is completely seated into the body; tighten the thumb screw. Do not release the head from your hand grip until you are sure the head is installed securely.

2) Installation of the eyepieces

Remove the protective caps from the eyepiece tubes. Insert the eyepieces into the eyepiece tubes.

3) 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 10x 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.

4) Installation of glass filter

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

5) Changing the 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 eyepieces off and the head is securely locked by the thumb screw. Open the cover on the bottom of the base by loosening the thumb screw. Take out the dead bulb and insert the new bulb. 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.

6) Installing the mirror (optional, your model may not have one)

The mirror is only used when there is a power failure or you are outdoor without power. To mount the mirror, you need to first screw off the light cover on the base. Remember, the power should be off and the power cord should be unplugged when you are doing the change. Screw the black disc onto the base and then insert the mirror into the hole at the center of the black disc. You may try to get reflected ambient light on either side of the mirror with different angles for best result.

2. Operation

1) Adjusting Illumination

Connect the power cord and turn on the main switch. Rotate the variable intensity dial 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 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 10x 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.

6) Adjusting Interpupillary Distance

While observing with both eyes, hold the left and right prism eye tubes. Rotate the eye tubes around the central axis. The interpupillary distance is correct when the left and right fields of view converge completely into one image.

7) Adjusting Eyepiece Diopter

- Using the 10x objective and your right eye only, observe your specimen through the eyepiece and bring it into focus by adjusting the focus knobs.
- Then observe the specimen with your left eye only through the left eyepiece. If the specimen is not in focus, rotate the diopter ring until a sharp image is obtained.

3. Specifications

General	
Objective Tube Length	160mm
Viewing Head	Binocular, inclined 30°, swiveling 360°, interpupillary distance 55-75mm, adjustable diopter
Eyepieces	WF10X, P16X
Nosepiece	Quadruple
Objectives	Achromatic 4X, 10X, 40X(spring), 100X(spring, oil)
Focus system	Coaxial coarse and fine focusing, minimum fine focusing adjustment at 0.002mm, range 12mm
Condenser	Abbe, NA=1.25
Stage	Double layer mechanical stage, area 120mmx130mm, movement range 60mmx30mm
Illumination	Halogen lamp 6V/15W

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	2.906mm	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
	Brightness at the lowest position	Turn the brightness adjustment dial

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
	Diopter adjustment is not set properly	Readjust the diopter settings