

User Manual

Monocular Biological Microscope

Model M613



MicroscopeNet.com

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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.

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.
4. Store the instrument in a cool, dry environment. Cover the microscope with the dust cover when not in use.

Installation

1) Installation of the eyepieces

Remove the protective caps from the eyepiece tubes. Insert the eyepieces into the eyepiece tubes and secure it by the small screw.

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 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.

3) Installation of the glass filter

You may touch a small handle from the bottom of the condenser and swing the filter holder out. Insert the filter into the holder, swing the holder in.

5) Replacing the fuse

Turn off the power and disconnect the power cord. The fuse is located beside the power plug connector on the back of the base. Turn the fuse holder counter-clockwise and take it off, insert new fuse, then turn it on clockwise firmly.

6) Changing the 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 four screws on the corners. Take out the dead bulb and insert the new bulb. Screw the cover on.

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 stage and move the slide to your desired position when it's focused (see next step). You may use the two clamps to secure the slide. It's easy to lift the clamp by pressing on the other end (short end).

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 (the larger one) 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 (the small one) to obtain a sharp image. You may now switch to another magnification objective.

Tips:

To prevent your specimen slide from making contact with an objective, raise the stage to its highest position without contacting the 40x objective, adjust the upper screw to the appropriate position (loosen the nut first if necessary) and tighten it with the nut.

4) Adjusting condenser

Turn the condenser focus ring located below the stage and on the top of the filter holder. Turn it clockwise to raise and turn it counter-clockwise to lower it. 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 axes 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 tension knob

The tightness of the tension adjustment collar has been pre-set at the factory. If the mechanical stage drops by itself, rotate the tension adjustment collar located between the coarse focus knob and the arm until the tension is in maintained.

Specifications

General	
Objective Tube Length	160mm
Viewing Head	Monocular, inclined 45°, swiveling 360°
Eyepieces	WF10X, WF20X (optional)
Nosepiece	Triple
Objectives	Achromatic 4X, 10X, 40X(spring)
Focus system	Separate coarse and fine focusing, minimum fine focusing adjustment at 0.002mm
Condenser	Abbe, NA=1.25
Stage	Simple plain stage, area 120mmx130mm
Illumination	Incandescent lamp 110V/20W

Eyepieces			
Designation	Magnification	Field of View	Focal Length
Wide Field	10X	18mm	24.94mm
Wide Field	20X	9mm	12.58mm

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

Magnifications						
Eyepiece	10X	20X	10X	20X	10X	20X
Objective	4X		10X		40X	
Magnification	40X	80X	100X	200X	400X	800X

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
	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 under 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 set too low	Increase the tension on the focusing knobs
	Tension adjustment is set too high	Loosen the tension on the focusing knobs