User Manual

Monocular Polarizing Microscope

Model M813PL

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

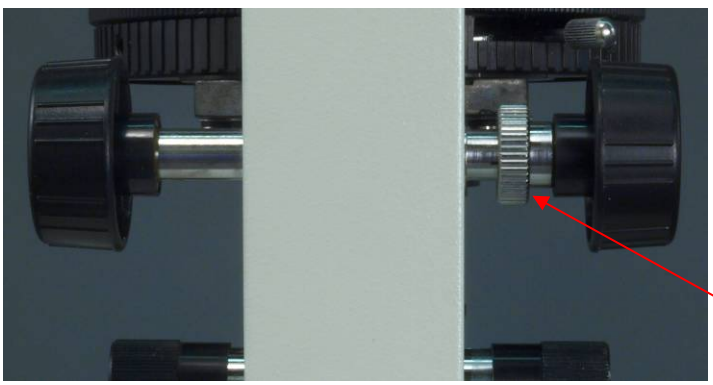
1. Do not attempt to disassemble any component including eyepieces, objectives or focusing assembly.

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. Components Illustration



2. Installation

2.1 Installation of the eyepiece

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

2.2 Installation of the objectives

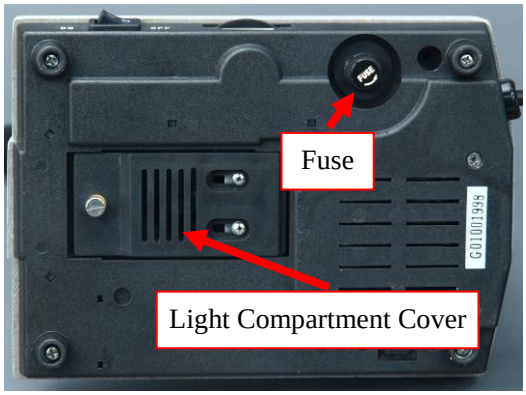
The objectives have been installed at the factory. You do not need to do anything. Please read the following note about objectives.

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.

2.3 Replacing the fuse (only when it’s dead)

1) Turn off the power and unplug the power cord.
2) Take the eyepieces off.
3) Find the fuse at the bottom of the base.
4) Turn the fuse holder counter-clockwise, take out the old fuse.
5) Insert new fuse, and then turn it on clockwise.



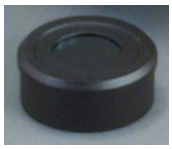
2.4 Changing halogen bulb (only when it’s dead)

1) Turn the power off and unplug the power cord. Wait for a while till the lamp and light housing cools down.
2) Take the eyepieces off. Put the microscope down on its side gently.
3) Open the light compartment cover on the bottom of the base by loosening the screw. Take out the dead bulb and insert the new bulb. Be sure the legs 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.
4) Screw the cover on.

Caution: Don’t touch the halogen bulb with your bare fingers. The fingerprints left on the bulb will shorten the bulb’s life.

2.5 Installation of the analyzer

The analyzer lens is simply put on the top of the eyepiece.



Analyzer Lens

3. Operation

3.1 Adjusting illumination

1) Connect the power cord and turn the power switch on.
2) Turn the intensity knob to increase or decrease the brightness.

3.2 Placing specimen

1) Place the slide on the mechanical stage.
2) Use the slide clips to gently secure the slide.

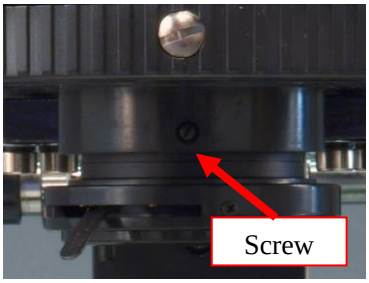
Caution: Be sure not to allow an objective to touch a specimen slide when changing objectives.

3.3 Focusing

1) With the 10x objective in position, raise the mechanical stage using the coarse focus knob until the specimen is close to the objective.
2) 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.

3.4 Adjusting condenser

The condenser is fixed on the stage by 3 screws.
The condenser can be adjusted by loosen the screws.



3.5 Adjusting aperture diaphragm

Move the 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.

3.6 Orthogonal polarized light viewing

1) Swing the polarizer into the light path.
2) Put the analyzer lens on the top of the eyepiece.
3) Turn the analyzer slowly and stop at the position of most dark in the viewing field.
4) Perform observation following the above procedures.

4. Specifications

Total Magnification	40X, 100X, 400X
Objective Tube Length	160mm
Viewing Head	Monocular, inclined 45º, swiveling 360º
Eyepieces	WF10X
Nosepiece	Triple, revolving
Objectives	Achromatic (DIN) 4X, 10X, 40X(spring)
Focus system	Separated coarse and fine adjustment
Condenser	Abbe, NA=1.25 w/ iris aperture diaphragm
Stage	Rotating stage, with 360° angle graduations and a locking screw, diameter Φ120mm
Illumination	Halogen bulb, 6V/20W, intensity adjustable
Net Weight	7 lb 16 oz (3.62 kg)

5. 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 light 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
	Condenser aperture is closed or open too much	Open or close properly
	Condenser is positioned too low	Position the condenser upward

IMAGE PROBLEMS		
Problem	**Cause**	**Solution**
Image moves while focusing	Specimen rises from stage surface	Secure the specimen in the slide clips
	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
Insufficient brightness	Aperture diaphragm closed too far	Open to the proper setting
	Condenser position 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

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