User Manual

Trinocular Compound Microscope

Model M837L1

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. All electrical connectors (power cord) should be inserted into an electrical surge suppressor to prevent damage due to voltage fluctuations.

6. 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

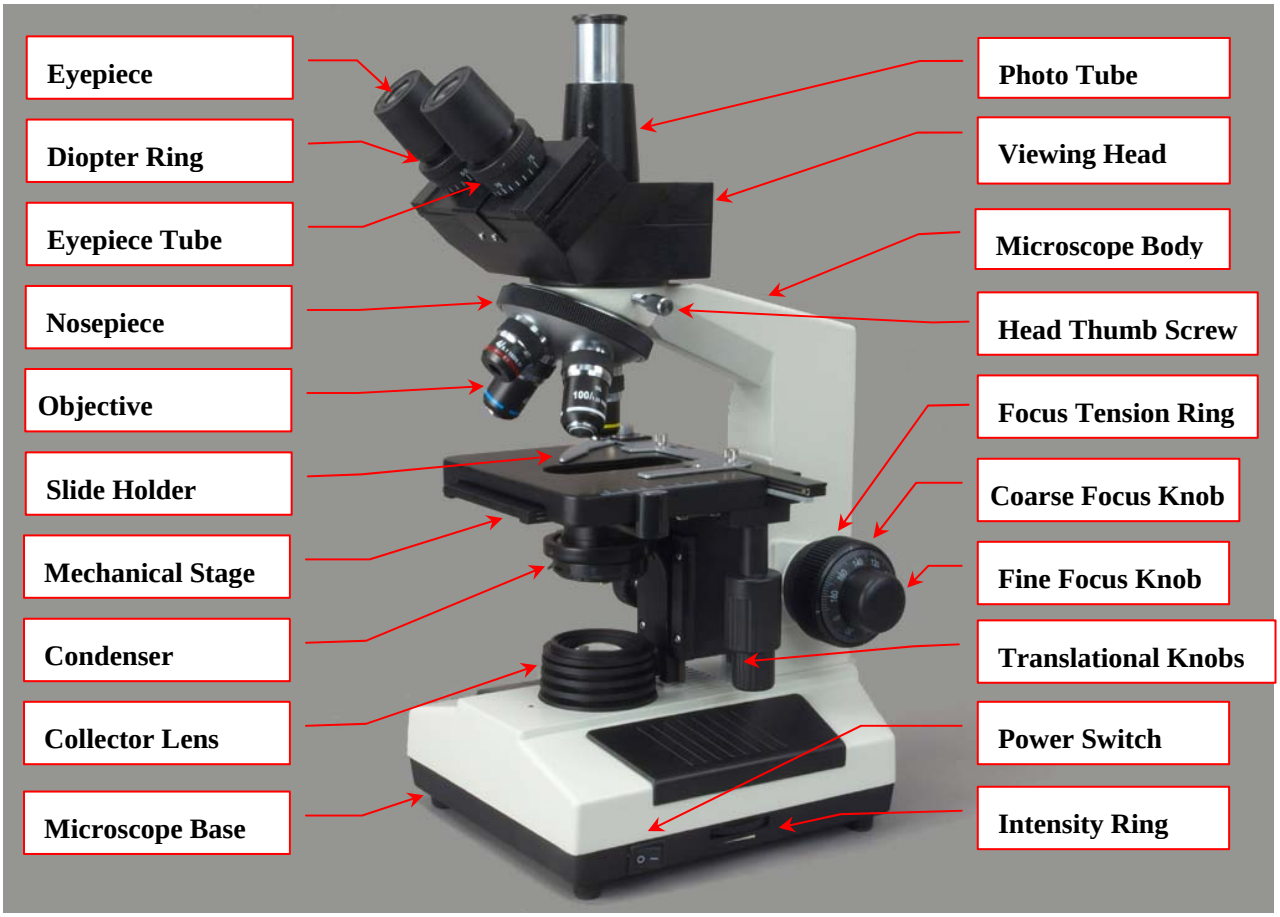
1. Do not attempt to disassemble any component including eyepieces, objectives or focusing assembly.

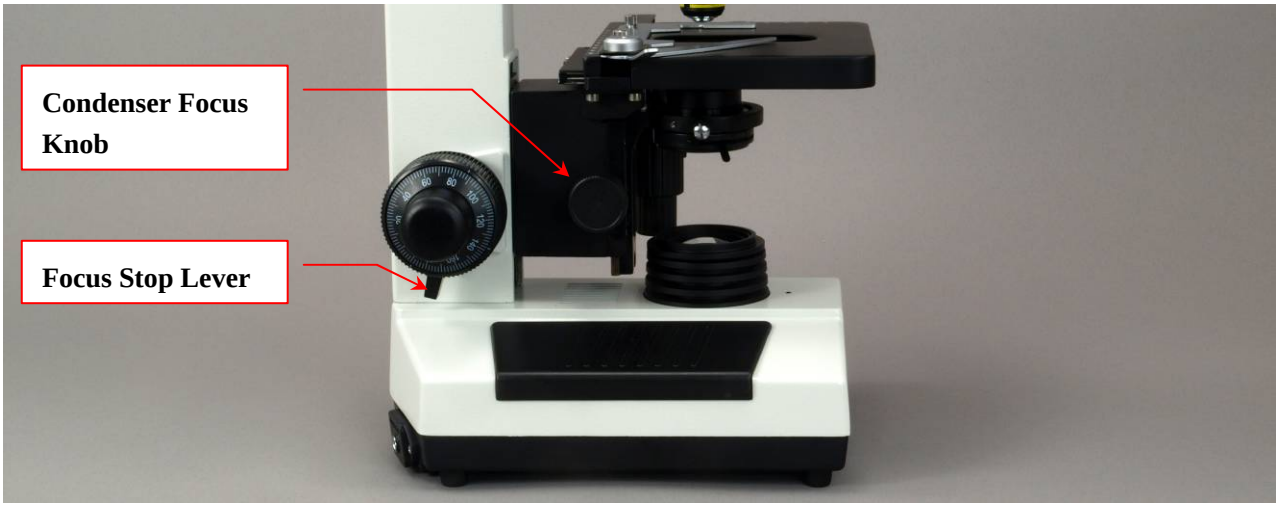
2. Keep the instrument clean; remove dirt and debris regularly. Accumulated dirt on metal surfaces should be cleaned with a damp cloth. More persistent dirt should be removed using a mild soap solution. **Do not use organic solvents for cleansing**.

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 trinocular viewing head

1) Loosen the thumb screw on the top of the body and remove the plastic cover on the top.
2) Remove the cap on the dovetail of the Trinocular viewing head.
3) Insert the Trinocular viewing head into the head of the body; ensure that the dovetail is completely seated into the body; tighten the thumb screw.

Caution: Do not release the head from your hand grip until you are sure the head is installed securely.

2.2 Installation of the eyepieces

1) Remove the protective caps from the eyepiece tubes.
2) Insert the eyepieces into the eyepiece tubes.

2.3 Installation of the objectives

1) Turn the coarse focus knob until the mechanical stage is at its lowest position.
2) Install the 4X objective into the nosepiece. Then in a clock-wise direction, rotate the nosepiece and install each succeeding higher magnification objective.

Note: 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.

2.4 Installing (or changing) the batteries

1) Turn the power off and disconnect AC adapter.
2) Turn over the microscope on its side; find the battery housing at the bottom.
3) Open the cover of the battery housing by loosening the thumb screw. Take out the dead batteries and insert the new batteries.
4) Put the cover on.

Caution: Before you turn over the microscope, be sure to take the eyepieces off and be certain that the head is securely locked by the thumb screw.

2.5 Replacing the fuse

1) Turn off the power and disconnect the AC adapter.
2) Turn over the microscope on its side; find the fuse holder at the bottom of the base.
3) Turn the fuse holder counter-clockwise to take it off, insert new fuse, and then turn it on clockwise.

Caution: Before you turn over the microscope, be sure to take the eyepieces off and be certain that the head is securely locked by the thumb screw.

3. Operation

3.1 Adjusting illumination

1) Connect the AC adapter to the power outlet and the microscope (or install 3 AA batteries into the battery housing).
2) Turn on the main power switch.
3) Rotate the variable intensity dial to increase or decrease the brightness.

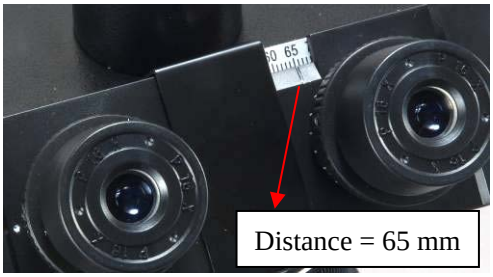
3.2 Placing specimen

1) Place the slide on the mechanical stage. Use the slide holder to gently secure the slide.
2) Turn the X and Y translational knobs to position the specimen for viewing.

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

3.3 Adjusting interpupillary distance

While observing with both eyes, hold the left and right eyepiece tubes then slowly slide the tubes in and out. The interpupillary distance is correct when the left and right fields of view converge completely into one image.



3.4 Adjusting eyepiece diopter

1) Rotate the 10x objective into position.
2) Rotate the diopter ring on the right eyepiece tube until its numerical value is the same as your interpupillary distance, for example, 65 in the right figure.
3) Close your left eye and bring the specimen into focus following the focusing procedures in 3.5.
4) Close your right eye and bring the same specimen into clear sharp focus by adjusting only the diopter ring on left eyepiece tube. Don't use focus knobs at this step.
5) Since both sides are adjustable, you may also do the above in the opposite way, in other words, left eye first and right eye second.

3.5 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.
3) Use the fine focus knob to obtain a sharp image.
4) 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 100x objective, then tighten the focus stop lever.

3.6 Adjusting condenser

1) Turn the condenser focus knob to raise or lower the condenser.

2) 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.

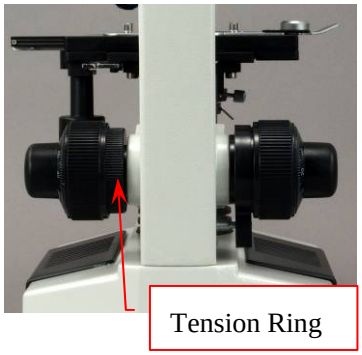
3.7 Adjusting aperture iris diaphragm

Move the aperture 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.

3.8 Adjusting focus tension

The focus tension has been pre-set at the factory. If the mechanical stage drops by itself, rotate the tension adjustment ring situated between the coarse focus knob and microscope body on the power switch side until the tension is in maintained.



3.9 Photo/video observing, capturing and recording

1) Remove the plastic photo tube port cover on the top of the viewing head.
2) Thread the photo tube on to the trinocular viewing head.
3) Turn on the computer and launch the observing software to examine.
4) If necessary, adjust the height by loosening the 2 set screws on the photo tube and turn the upper part in order to make the camera parfocal with the eyepieces.
5) You also can capture images or record live videos through the software.

Note: Camera and digital camera sold separately.

4. Specifications

General

Objective Tube Length	160mm
Viewing Head	Trinocular, inclined 45º, swiveling 360º, 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 28mm
Condenser	Abbe, NA=1.25
Stage	Double layer mechanical stage, area 140mmx140mm, movement range 75mm X 50mm
Illumination	LED light
Power	AC adapter: 100-240VAC, 50/60HZ, output DC7.5V DC Battery: 3 AA batteries

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

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 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	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
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