

User Manual

Monocular Compound Microscope

Model: M614



MicroscopeNet.com

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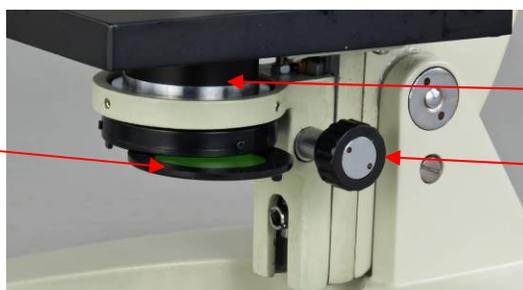
i. Caution:

1. Open the carton carefully with a knife or paper cutter. Find the “UP” sign and place the Styrofoam container on the side that makes the arrow upward. If the “UP” sign is missing, please open the Styrofoam container gently to prevent any accessory, 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 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 illumination and adjacent parts will become hot. Do not touch these parts until they completely cool down. Do not let little kids use the illumination, but use the mirror instead.
6. **Important:** when move the microscope to another place, hold the microscope arm with hand firmly to move it. **DO NOT** hold the ocular tube on viewing head when you need to move the microscope.
7. All electrical connectors (power cord) should be inserted into an electrical surge suppressor to prevent damage due to voltage fluctuations.

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. Observe the specimen with the 10X and 40X objectives in order; then observe the specimen with the 100X objective. Apply the immersion oil on the slide cover with the 100X objective. Do not let the immersion oil to contact with the dry objectives lens (especially the 40X). Clean the dry objective lens using the camera cleaning kit if the immersion oil is on the dry objectives lens. Clean the 100X objective lens first using the camera cleaning kit after observing the specimen with the 100X objective, then clean the specimen. More persistent dirt should be removed using a little bit alcohol. **Do not use organic solvents for cleansing.**
5. Store the instrument in a cool, dry environment. Cover the microscope with the dust cover and put the microscope into the wood storage case when not in use.

1 Components Illustration



- | | | | | | |
|---|-------------------------------|----|----------------------|----|----------------------|
| 1 | Eyepiece WF5X | 10 | Eyepiece WF16X | 19 | Illuminator |
| 2 | Eyepiece Tube | 11 | Eyepiece WF10X | 20 | Power Cord |
| 3 | Coarse Focus Knob | 12 | Immersion Oil | 21 | Extra Bulb |
| 4 | Fine Focus Knob | 13 | Viewing Head | 22 | Color Filters |
| 5 | Microscope Arm | 14 | Nosepiece | 23 | Mirror |
| 6 | Slide Holder Lock Thumb Screw | 15 | Objective | 24 | Color Filter Holder |
| 7 | X-Y stage Moving Knobs | 16 | Slide Holder | 25 | Abbe Condenser |
| 8 | Condenser Lock Thumb Screw | 17 | Mechanical Stage | 26 | Condenser Focus Knob |
| 9 | Microscope Base | 18 | Iris Diaphragm Lever | | |

2 Installation

2.1 Installation of the eyepiece

- 1) Remove the protective cap from the eyepiece tube.
- 2) Turn the cap counter-clockwise of the plastic storage case to open it.
- 3) Turn the eyepiece counter-clockwise to take it out from the plastic storage case.
- 4) Insert the eyepiece into the eyepiece tube.

2.2 Installation of the mechanical stage attachment

- 1) Rotate the coarse focus knob to raise the viewing head to the highest position.
- 2) Insert the two pins into the holes.
- 3) Tighten the slide holder lock thumb screw (See **Fig. 1**).

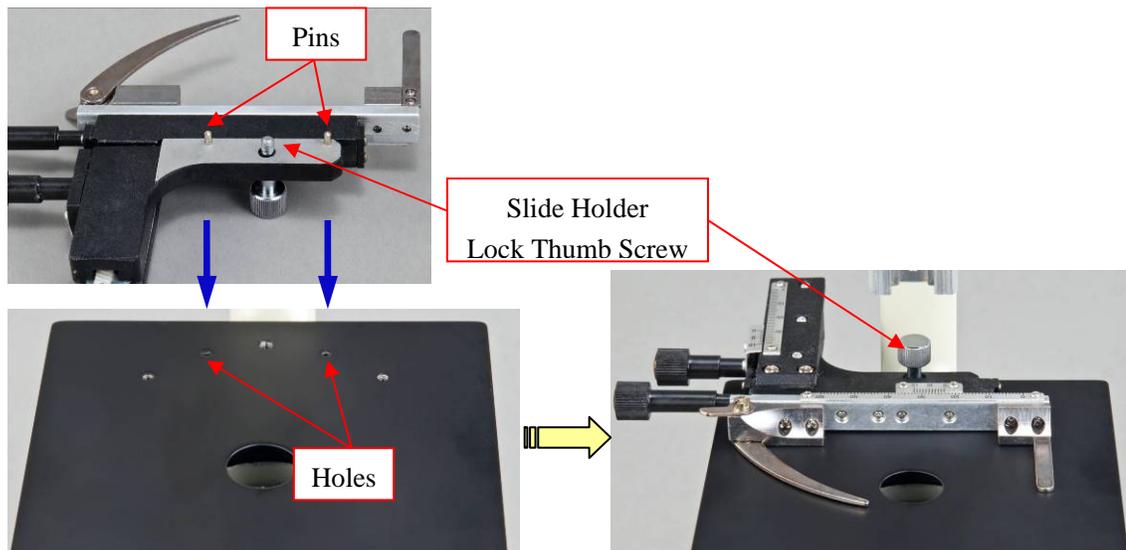


Fig. 1

2.3 Installation of the objectives

After installing the movable specimen holder, then installing the objectives.

- 1) Turn the caps counter-clockwise to remove them from the nosepiece.
- 2) Take the objectives out from the plastic storage cases and turn each one clockwise into the holes on the nosepiece. Install the 10X objective into the nosepiece first. Then in a counter-clockwise direction, rotate the nosepiece and install each succeeding higher magnification objective as shown in **Fig. 2**.

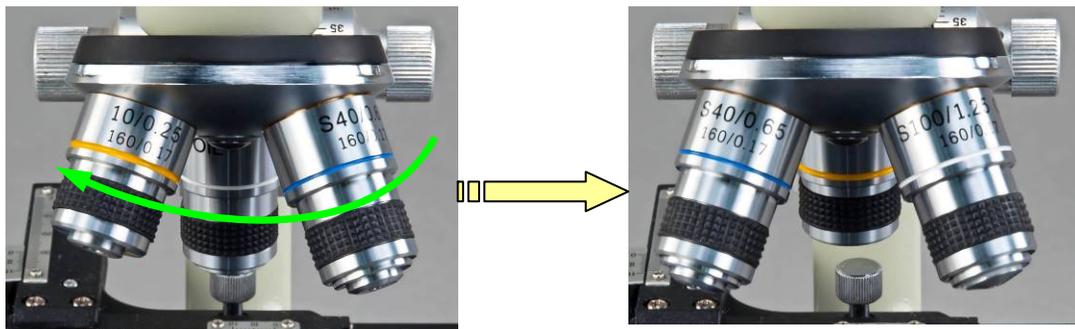


Fig. 2

- 3) Rotate the coarse focus knob to lower the viewing head to normal position.

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 or have a clear “in position” feeling. This ensures the objective is centered in the optical light path.

2.4 Installation of the glass filter

- 1) Swing out the color filter holder under the condenser.
- 2) Place the filter into the holder as shown in **Fig. 3**, swing the holder in.

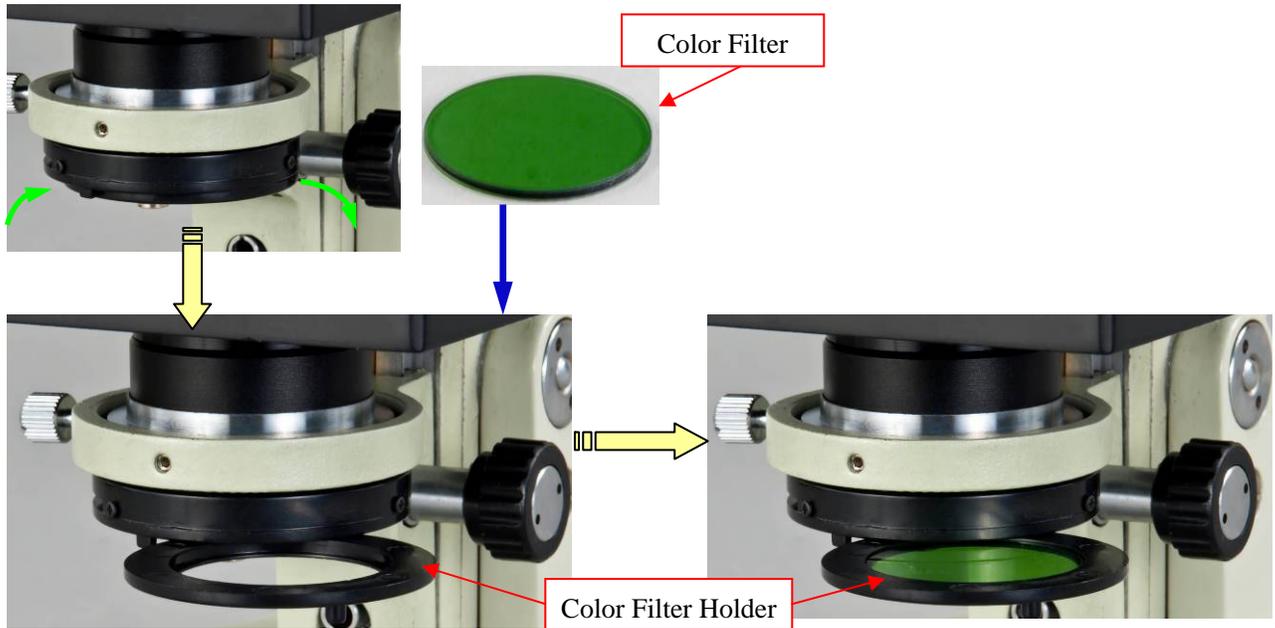


Fig. 3

2.5 Installing (or changing) the halogen bulb

- 1) Turn off the power switch of the power socket and disconnect the power cord.
- 2) Allow some time to cool down the lamp.

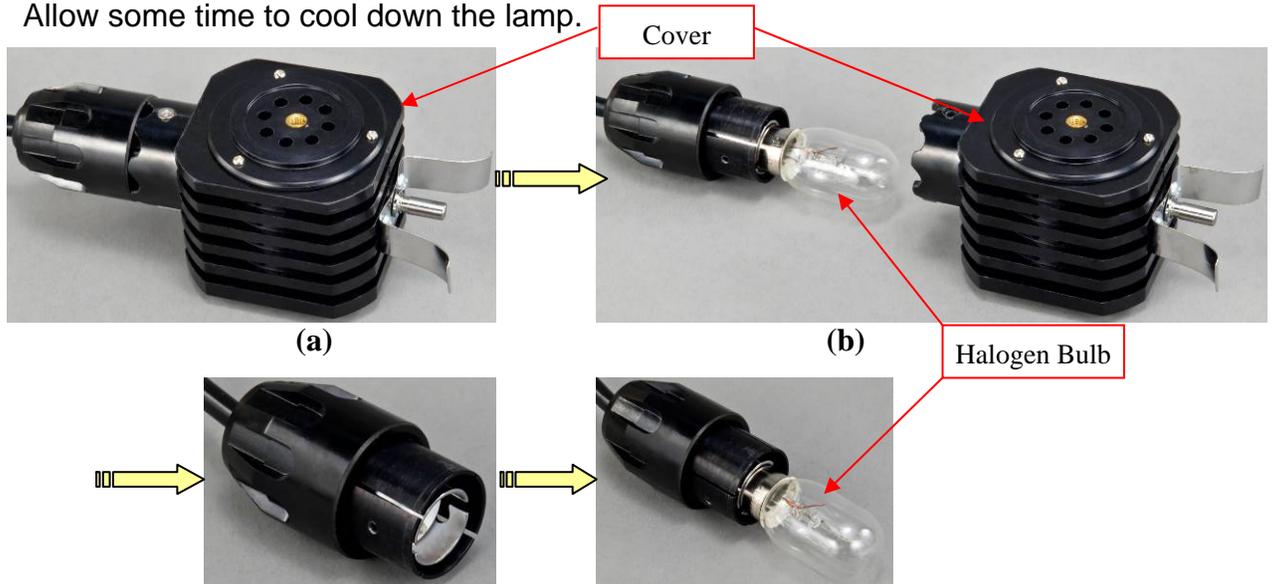


Fig. 4

- 3) Take the illumination out from the microscope base.
- 4) Turn over the illumination and loosen the screw (**Fig. 4 (a)**).
- 5) Open the cover of the illumination (**Fig. 4 (b)**).
- 6) Take out the dead halogen bulb (**Fig. 4 (c)**).
- 7) Insert the new halogen bulb (**Fig. 4 (d)**).
 - Be sure the pins on the bulb are completely inserted into the lamp socket.
- 8) Screw the cover on.

2.6 Installing the mirror

- 1) Turn off the power switch of the power socket.
- 2) Take the illumination from the microscope base.
- 3) Insert the mirror into the hole on the microscope base. See **Fig. 5**.
You may try to get reflected ambient light on either side of the mirror with different angles for best result.

Note:

- The mirror is used when there is a power failure or you are in the field and no power is available.
- The illumination will become hot. Let little kids use the mirror instead of the illumination.

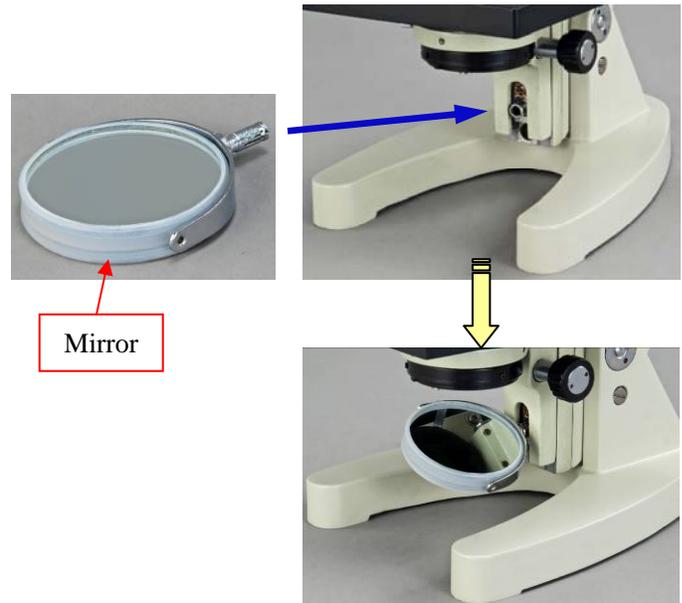


Fig. 5

3 Operation

3.1 Connecting illumination

- 1) Insert the illumination into the hole on the microscope base and plug the power cord to the power outlet (**Fig. 6**).
- 2) Turn on the power switch of the power socket.

Caution:

- The illumination will become hot. Do not let little kids use the illumination, but use the mirror instead.
- A diffusion filter is attached beneath the condenser to get uniform light and protect your eyes from strong LED light when a low power objective applies. The diffusion filter can be swung out to make the view field brighter when observing with a high power

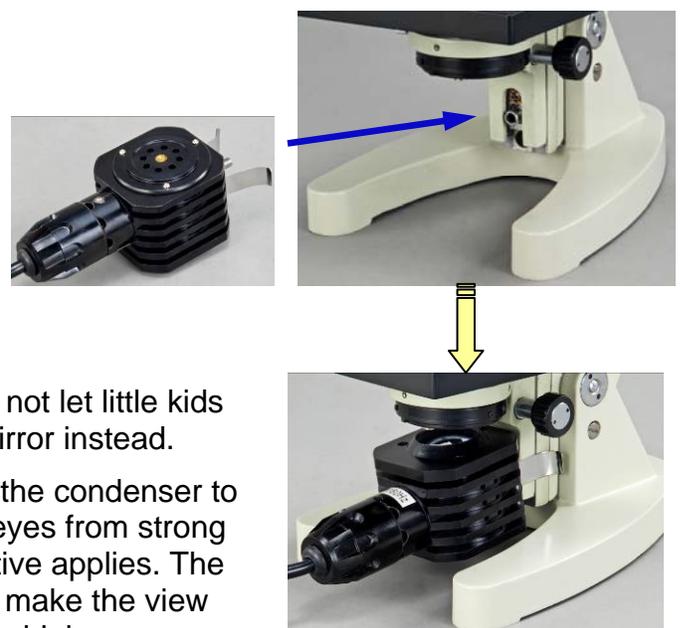


Fig. 6

objective, such as 100X objective.

3.2 Placing specimen

- 1) Place the slide on the mechanical stage.
- 2) Use the slide holder to gently secure the slide.
- 3) Turn the X and Y stage moving levers to position the specimen in the center of viewing field.

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, lower the viewing head 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. Use the fine focus knob to obtain a sharp image. You may now switch to another magnification objective.

Caution:

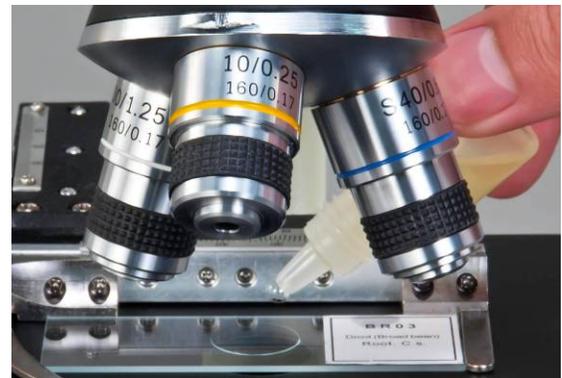
Be sure not to allow an objective to touch a specimen slide when changing objectives.

3.4 Applying the immersion oil

- 1) Rotate the objective nosepiece to seat the observing position between the 40X and 100X objectives as shown in **Fig. 7 (a)**.
- 2) Place a drop of immersion oil on the slide cover as shown in **Fig. 7 (b)**.
- 3) Rotate the objective nosepiece to seat the 100X objective to the observing position until you hear a “click” sound.
- 4) After observing the specimen, use the camera cleaning kit to clean the 100X objective lens gently and the specimen in time.
- 5) If it is hard to clean, you need a little bit alcohol to clean the 100X objective lens and the specimen.



(a)



(b)

Fig. 7

Caution (important):

- When you use the 100X objective to observe the specimen, you have to finish observing the specimen with the 10X, 40X objectives.
- When you use the 100X objective to observe the specimen, you have to apply the immersion oil on the top of the slide cover.
- When you apply the immersion oil with the 100X objective, do not let the

immersion oil to contact with the dry objective lenses (especially the 40x). If the immersion oil is on the dry objectives lens, please use the camera cleaning kit to clean the objectives lens in time. The oil will damage the dry objective lenses.

- After observing the specimen with the 100X objective, clean the 100X objective lens first.

3.5 Adjusting condenser

- 1) Turn the condenser focus knob to raise or lower the condenser.
- 2) Raise the condenser when using high power objectives and lower it when using low power 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.

3.6 Adjusting iris aperture diaphragm

Swing the iris diaphragm lever (**Fig. 8**) left or right to adjust the aperture size.

Note:

The iris diaphragm is designed to adjust the aperture size, not to adjust the brightness although the brightness will be changed when it's adjusted. When aperture is adjusted to smaller size, the contrast will be increased and the depth of field will be increased as well. Turn up the intensity of the light if the image is too dim.



Fig. 8

4 Specifications

General	
Model	M614
Total Magnification	50X, 100X, 160X, 200X, 400X, 500X, 640X, 1000X, 1600X
Viewing Head	Monocular
Microscope Arm	0° ~ 60° adjustment
Eyepieces	One wild field WF5X One wild field WF10X One wild field WF16X
Nosepiece	Revolving quadruple
Objectives	Achromatic DIN 10X/0.25 160/0.17 40X/0.65 160/0.17(spring), 100X/1.25 160/0.17(spring, oil)
Condenser	Abbe, NA=1.25, w/ iris diaphragm and diffusion filter Rack and pinion adjustment
Focus Mechanism	Separate coarse and fine focusing knobs on both sides
Mechanical Stage	Dimension: 5-1/8" x 4-3/8" (13 cm x 12 cm) X-Y translational range: 2-1/4" x 1-1/8" (60 mm x 30 mm)
Illumination	Transmitted, halogen
Power Supply	110V/60Hz (US and Canada)
Dimension of microscope	7-1/4" x 6-1/4" x 14-1/2" (18.5 cm x 16 cm x 37 cm)
Dimension of wood storage case	11" x 9-1/4" x 15-3/4" (28 cm x 23.5 cm x 40 cm)
Net weight of microscope	5 lbs 8 oz (2.5 kg)
Net weight of wood storage case	5 lbs 1 oz (2.3 kg)
Total shipping package	13 lbs (6 kg)

5 Troubleshooting Guide

Problem	Cause	Solution
Lamp does not light when switched on	No electrical power	Check power cord connection
	Lamp bulb burnt out	Replace bulb
Darkness at the periphery	Revolving nosepiece not in click stop position	Revolve the nosepiece to click-stop position by swinging the objective correctly into the optical path
Uneven brightness in the field of view	The diffusion filter is not in the light path	Check the diffusion filter and make sure it's in the light path
Insufficient brightness	Diffusion filter used when using 100X objective	Swing out the diffusion filter when using 100X objective
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
	Dirt or dust on the specimen	Clean the specimen
Poor image quality or not able to get focused image	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 (specimen at the bottom)	Turn slide over so the cover-glass faces up
	Diopter adjustment is not set properly	Readjust the diopter settings
	Immersion oil is on a dry objective (especially the 40x)	Check the objectives, clean if necessary
	No immersion oil used with 100x	Use immersion oil
	Air bubbles in immersion oil	Remove bubbles
	Specimen rises from stage surface	Secure the specimen in the slide holder
	Blue filter not used	Use daylight blue filter
	Condenser aperture is closed or open too much	Open or close properly
	Condenser is positioned too low or too high	Move condenser upper or lower