User Manual

Trinocular
Compound Microscope

Model M9332

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. For safety when replacing fuse, be sure the power switch is off, unplug the power cord, and then replace fuse.

7. 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.

8. **Important:** Security devices are installed to prevent the focusing mechanism and mechanical stage from damage during the shipping. You have to remove them using the Allen key provided before starting installation and operation. (see **2.1**)

ii. Care and Maintenance

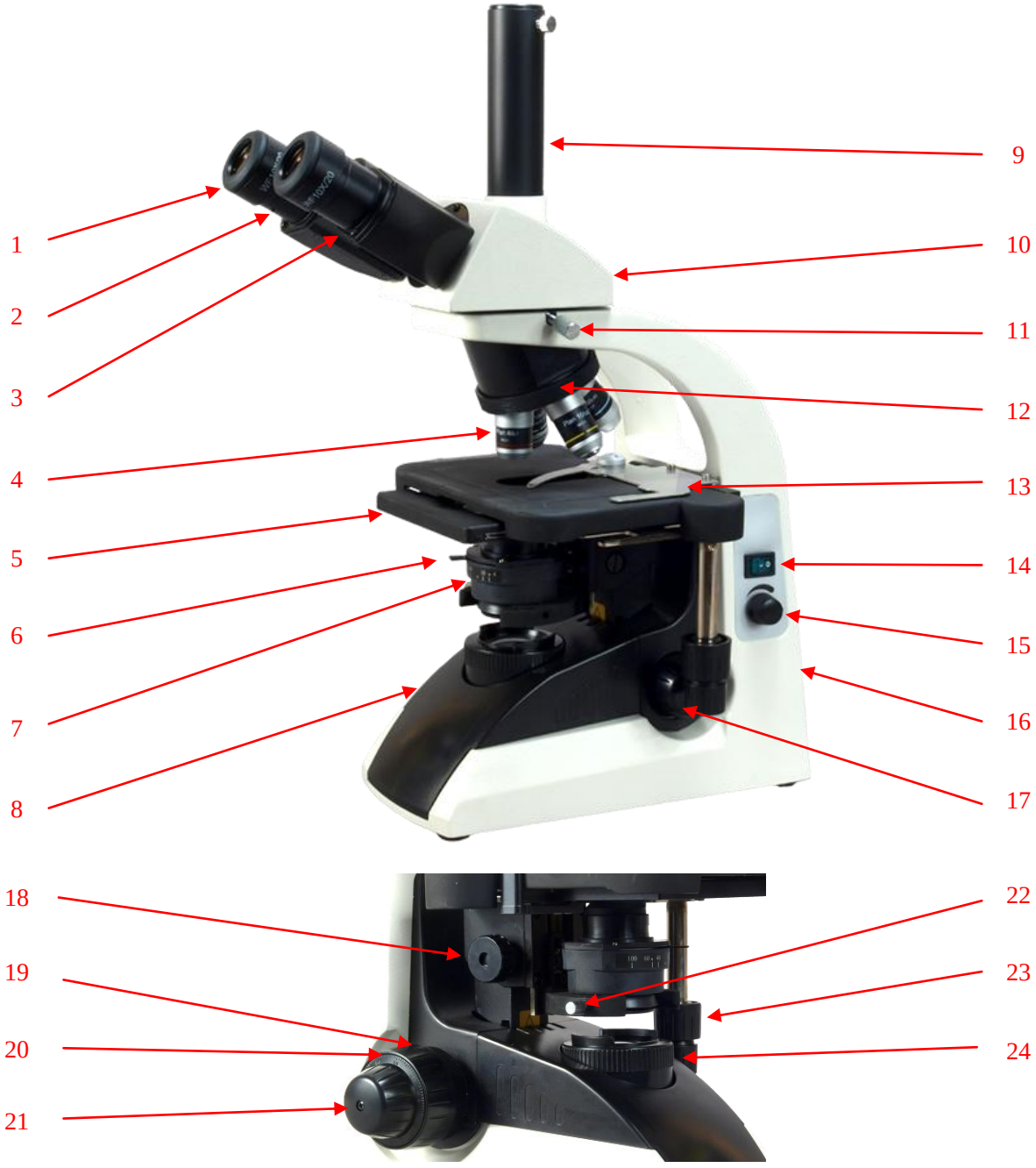
1. Do not attempt to disassemble any component including eyepieces, objectives or focusing assembly.

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



1. Diopter Adjustment
2. Eyepiece
3. Eyepiece Tube
4. Objective
5. Stage
6. Iris Diaphragm Lever
7. Condenser
8. Lamp Housing
9. Photo Tube
10. Viewing Head
11. Head Secure Screw
12. Nosepiece
13. Slide Holder
14. Power Switch
15. Intensity Knob
16. Microscope Body
17. Fine Focus Knob
18. Condenser Focus Knob
19. Tension Ring
20. Coarse Focus Knob
21. Fine Focus Knob
22. Condenser Secure Screw
23. Stage Control Knobs
24. Collector Lens

2. Installation

2.1 Remove the security devices

1) Take off the lamp housing (8) by sliding it out at the arrow direction as shown in Fig 2.
2) The security device for the focusing mechanism is shown in Fig.3. Unscrew the three screws by the Allen key provided.
3) The security device for the mechanical stage is shown in Fig.4. Unscrew the two screws by the Allen key provided.

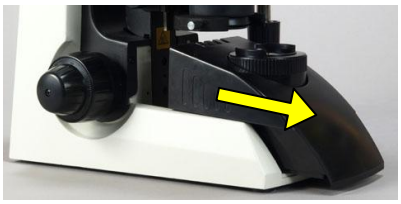


Fig. 2

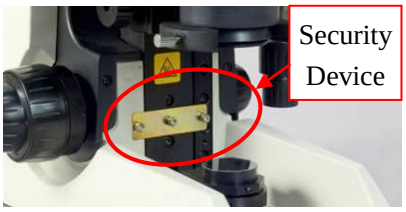


Fig. 3

Fig. 4

2.2 Installation of the trinocular viewing head

1) Loosen the head secure screw (11) on the top of the microscope body (16) and remove the plastic cover on the top.
2) Remove the cap on the dovetail of the trinocular viewing head (10).
3) Insert the dovetail of trinocular viewing head (10) into the socket on the top of the body (16); ensure that the dovetail is completely seated into the socket; tighten the secure screw (11).

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

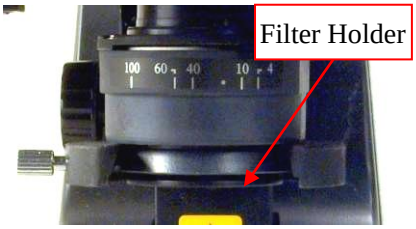


Fig. 5

2.3 Installation of the eyepieces

1) Remove the protective caps from the eyepiece tubes (3).
2) Insert the eyepieces (2) into the eyepiece tubes (3).

2.4 Installation of the objectives

4) Adjust the coarse focus knob (20) until the mechanical stage (5) is at its lowest position.
5) Install the 4X objective into the nosepiece (12). Then in a clock-wise direction, rotate the nosepiece and install each succeeding higher magnification objective.

2.5 Installation of the color Filter

1) Take off the filter holder located at the bottom of condenser (7) as shown in Fig.5.
2) Put the filter into the holder.
3) Put the holder back on the condenser.

2.6 Replacing the fuse

1) Turn off the power and disconnect the power cord.
2) Find the fuse holder at the back of microscope body (16), just beneath the power socket, as shown in Fig.6.
3) Gently pry the fuse holder by a screw driver to take it out.
4) Replace the fuse, and then push the fuse holder back in.

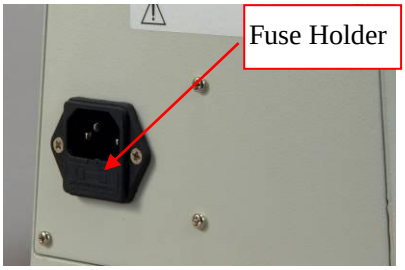


Fig. 6

3. Operation

3.1 Adjusting illumination

1) Connect the power cord to the power outlet and the microscope.
2) Turn on the power switch (14).
3) Turn the intensity knob (15) to increase or decrease the brightness.

Caution: It may hurt your eyes if you remove the lamp housing (8) and look directly or through the eyepieces at the LED light while the light is brightest.

3.2 Placing specimen

1) Place a slide on the mechanical stage (5). Use the slide holder (13) to gently secure the slide.
2) Turn the stage X and Y control knobs (23) to position the specimen for viewing.

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 (5) using the coarse focus knob (20) until the specimen is very close to the objective.
2) Turn the coarse focus knob (20) until the specimen is in focus. Then use the fine focus knob (21) or (17) to obtain a sharp image. You may now switch to another 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.

3.4 Adjusting condenser

1) Turn the condenser focus control knob (18) to raise or lower the condenser (7).
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.*

3.5 Adjusting iris diaphragm

Move the Iris Diaphragm Lever (6) left or right to adjust the aperture size.

Note: The iris diaphragm is designed to adjust the aperture size, not to adjust brightness. 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 Adjusting interpupillary distance

While observing with both eyes, hold the left and right eyepiece tubes (3) then slowly swing the tubes in and out. The interpupillary distance is correct when the left and right fields of view converge completely into one image.

3.7 Adjusting eyepiece diopter

1) 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.
2) Then observe the specimen with your left eye only through the left eyepiece. If the specimen is not in focus, rotate the top portion of eyepiece (shown in Fig.7) until a sharp image is obtained.
3) Since diopter on both eyepieces is adjustable, you may also do the above in the opposite way, in other words, left eye first and right eye second.

Fig. 7

3.8 Adjusting tension

The tightness of the tension adjustment ring has been pre-set at the factory. If the mechanical stage drops by itself, turn the tension adjustment ring (19) until the tension is in maintained.

4. Specifications

Model	M9332
Total Magnification	40X, 60X, 100X, 150X, 400X, 600X, 1000X, 1500X
Eyepieces	A pair of widefield 10X/20 (diopter adjustable) A pair of widefield 15X/16 (diopter adjustable)
Objectives	Infinity-corrected, plan, chromatic objectives 4X/0.1 (∞/-), 10X/0.25 (∞/-), 40X/0.65 (∞/-, spring), 100X/1.25 (∞/-, spring, oil)
Viewing Head	Trinocular, inclined 30º, swiveling 360º Interpupillary distance 1-31/32" – 2-15/16" (50mm - 75mm)
Nosepiece	Reverse, revolving quadruple
Stage	Double layer mechanical stage Dimension: 7-3/8" x 5-5/16" (188 mm x 135 mm) Movement range: 3" x 2-1/16" (78 mm X 53 mm)
Condenser	Abbe NA=1.25, w/ iris diaphragm and filter holder Rack & pinion adjustment, range 25mm
Aperture Diaphragm	Iris diaphragm, attached on the condenser
Focusing Mechanism	Coaxial coarse and fine focusing knobs on left side Fine focusing knob on right side Minimum fine focusing adjustment at 0.002mm, range 25mm Tool-free tension adjustment
Illumination	Transmitted, 12V/20W halogen light Light center adjustable Variable intensity
Power Supply	AC 100V-240V, 50/60HZ
Dimension	13-3/4" x 9" x 18-3/4" (35 cm x 23 cm x 47.7 cm)
Net weight	15 lb 15 oz (7.25 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 optical path
Dirt or dust on the view	Dirt or dust on the lens of eyepiece, condenser, objective, 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	Apply 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 or too high	Raise or lower the condenser

ELECTRICAL PROBLEMS

Problem	Cause	Solution
Lamp does not light when switched on	No electrical power	Check power cord connection
	LED bulb burnt out	Replace LED light
	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	Increase the light intensity by turning the intensity control knob
Image is too bright	Lamp intensity is too high	Reduce the light intensity by turning the intensity control knob
Insufficient brightness	Lamp intensity is too low	Increase the light intensity by turning the intensity control knob
	Aperture diaphragm too closed	Open to the proper setting
	Condenser position too low	Raise the condenser

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 slip
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 slip is too thick	Use a 0.17mm cover slip
	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	Tighten the tension
	Tension adjustment is set too high	Loosen the tension