

# User Manual

## Trinocular Metallurgical Microscope

Model V83M



[MicroscopeNet.com](http://MicroscopeNet.com)

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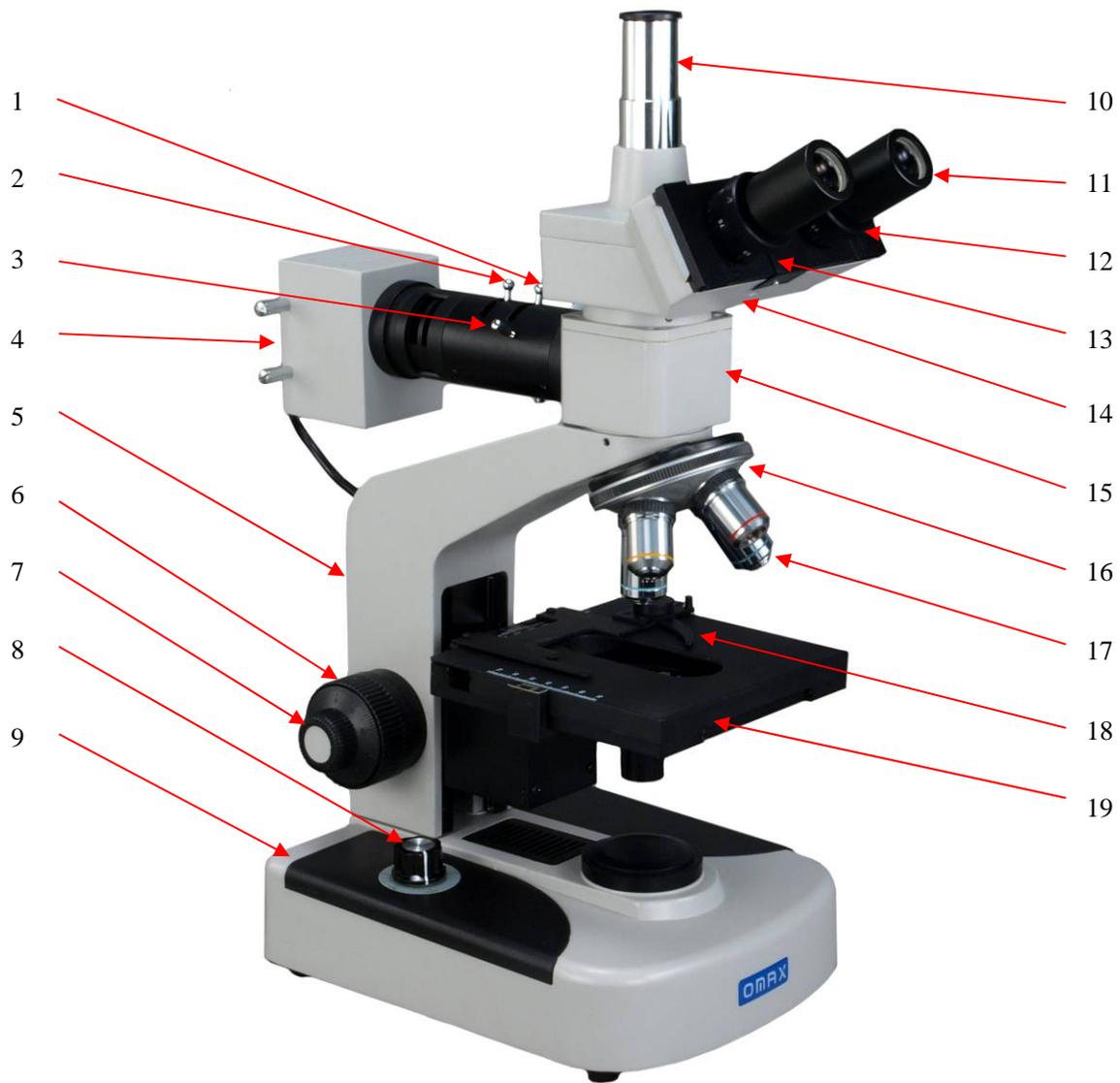
## i. Caution

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

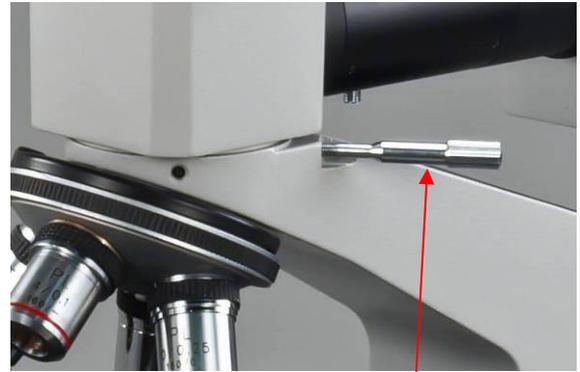


- |                                    |                           |
|------------------------------------|---------------------------|
| 1. Field Diaphragm                 | 11. Eyepiece              |
| 2. Aperture Diaphragm              | 12. Diopter Ring          |
| 3. Field Diaphragm Centering Screw | 13. Eyepiece Tube         |
| 4. Light Housing                   | 14. Viewing Head          |
| 5. Microscope Frame                | 15. EPI Illumination Unit |
| 6. Coarse Focus Knob               | 16. Nosepiece             |
| 7. Fine Focus Knob                 | 17. Objective             |
| 8. Power Switch/Intensity Knob     | 18. Slide Holder          |
| 9. Microscope Base                 | 19. Mechanical Stage      |
| 10. Photo Tube                     |                           |

## 2 Installation

### 2.1 Installation of the EPI illumination unit

- 1) Find the thumb screw in the packaging, and screw it in into the threaded hole as shown in the figure.
- 2) Seat the dovetail of EPI unit into the socket on the top of the stand securely, and then tighten the thumb screw.
- 3) Connect the electrical cord to the DC power port at the back of the stand.
- 4) The halogen bulb has been installed in the light housing already. Don't try to disassemble it.



Thumb Screw

### 2.2 Installation of the trinocular viewing head

- 1) Turn the head secure screw on EPI light unit backward.
- 2) Seat the dovetail of viewing head into the socket, and then tighten the head secure thumb screw.



Head Secure Screw

### 2.3 Installation of the eyepieces

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

### 2.4 Installation of the objectives

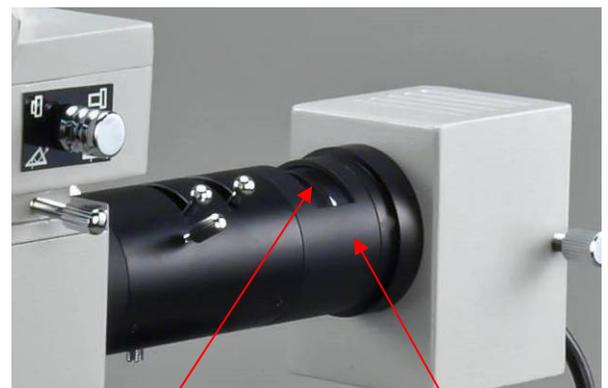
- 1) Adjust the coarse focus knob until the mechanical stage is at its lowest position.
- 2) Install the lowest magnification objective into the nosepiece. Then in a clock-wise direction, rotate the nosepiece and install each succeeding higher magnification objective.

#### Note:

- 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.

### 2.5 Installation of the color filters

- 1) Turn the slot cover around to reveal the slots
- 2) Insert the selected color filter into the filter slot on the EPI light unit.



Color Filter Slots

Slot Cover

3) Cover the slots with the slot cover to prevent the foreign matter from dropping in.

**2.6 Fuse replacement**

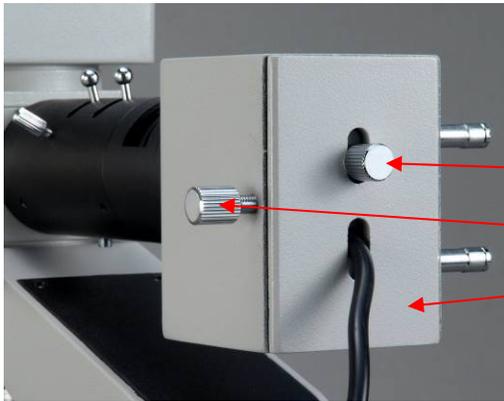
- 1) With a flat-head screwdriver, pry the fuse holder out.
- 2) Replace the fuse with a new one.
- 3) Put the fuse holder back.



Fuse Holder

**2.7 Light bulb replacement**

- 1) Turn the power switch off.
- 2) Unplug the power cord from the wall outlet.
- 3) Turn the light horizontal adjusting screw counter-clock wise until the light housing back cover can be taken off.
- 4) Take off back cover.
- 5) Replace the halogen bulb with a new one. (Make sure the bulb is cooled down before pulling out the bulb)
- 6) Put the back cover back and tighten the horizontal centering screw.
- 7) Turn the horizontal and vertical centering screw to adjust the position of the light bulb. (see 3.1)



Light Vertical Centering Screw

Light Horizontal Centering Screw

Back Cover

## 3 Operation

### 3.1 Adjusting illumination

- 1) Connect the power cord of microscope to a wall outlet, and turn on the power switch.
- 2) Rotate the intensity dial to increase or decrease the brightness.
- 3) To center the light bulb, turn the light horizontal centering screw to move the light bulb left or right first, and then loosen the vertical centering screw and move the back cover up or down, until the light in the field of view is even and bright. Tighten the vertical centering screw once the light bulb is in the right position.

### 3.2 Placing specimen

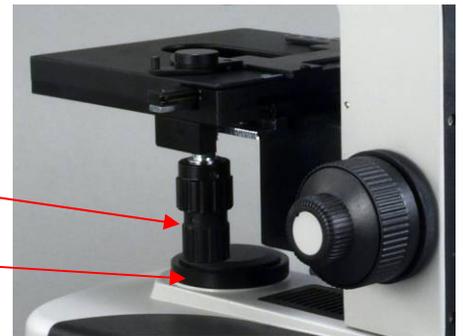
- 1) Place the stage plate on the mechanical stage.
- 2) Secure the stage plate with the holders.
- 3) Place the specimen on the plate.
- 4) Turn the X and Y translational knobs to position the specimen for viewing.



Stage Plate

Y-Translational Knob

X-Translational Knob



#### Caution:

- Be sure not to allow an objective to touch a specimen or slide when changing objectives.
- The height of the specimen should be less than 45mm.

### 3.3 Adjusting interpupillary distance

While observing with both eyes, hold the left and right eyepiece tubes then 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 the diopter ring on left eyepiece tube only. Do not 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

### 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. Then use the fine focus knob to obtain a sharp image. You may now switch to another magnification objective.

### 3.6 Diaphragm adjustment

There are two diaphragms: aperture diaphragm and field diaphragm. You can get the perfect image only when the two diaphragms are at suitable size. Please adjust them when observing.

- 1) Aperture diaphragm: It controls the aperture angle of incident light. The aperture diaphragm should be adjusted according to different objectives.
- 2) Field diaphragm: It controls the size of field of view and reduces the inner incident light to make the high contrast. Normally the field diaphragm is set at the same size of the viewing field of the observing eyepiece.

### 3.7 Adjusting tension

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 inside of the coarse focus knob on the right hand side until the tension is in maintained.



Tension Adjusting Collar

### 3.8 Photo/video observing, capturing and recording

- 1) Pull the photo/ocular switch bar to the photo position.
- 2) Mount microscope camera (electronic eyepiece) onto the photo tube and connect the USB cable from camera to computer.
- 3) Open image observing software to examine. You also can capture images or record live videos through the software, depending on the functions provided by the software.
- 4) If a conventional camera used, you may need an adapter to connect your camera to the photo tube.



Switch Bar

**Note:** Camera is not included. Electronic eyepieces are sold separately.

## 4 Specifications

Model	V83M
Total Magnification	40X, 64X, 100X, 160X, 400X, 630X, 640X, 1000X, 1008X, 1600X
Eyepiece	WF10X/18, WF16X/11
Objective	Plan field achromatic, DIN 4X, 10X, 40X(Spring), 63X(Spring), 100X(Spring, Oil)
Viewing Head	45° inclined, 360° swiveling , Sliding interpupillary distance adjustment, adjustable diopter on both ocular tube
Nosepiece	Revolving, quadruple
Illumination	EPI illuminator, 6V/30W halogen, intensity adjustable, with built-in condenser, iris aperture diaphragm, iris field diaphragm, 2 color filter slots
Condenser	Built-in
Stage	Double layer mechanical stage with slide holder, size 14cm X14cm (5-1/2" x 5-1/2"), translation range 70mm X 50mm (2-3/4" x 2")
Focus system	Coaxial coarse and fine focus knobs on both side Tension adjustable
Power supply	AC 110V – 240V, 50/60Hz
Dimension	30.5cm x 20.3cm x 48cm (12" x 8" x 19")
Net weight	8kg (17lb 10 oz)

## 5 Troubleshooting Guide

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
	The light bulb is not at the center	Adjust the position of the bulb
	Field diaphragm is not in the center	Adjust the field diaphragm to the center
	The photo/ocular switch bar is not in the right position	Push the bar all the way to the end for eye observation or pull all the way for camera
Dirt or dust on the view	Dirt or dust on the lens of eyepiece, objective, or specimen	Clean the lens with a camera cleaning kit
	Dirt or dust on the specimen	Clean the specimen
Poor image quality	Immersion oil is on a dry objective (especially the 40X and 60X)	Check the objectives, clean if necessary
	Aperture diaphragm is closed or open too much	Open or close properly
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
	The power cord of the light housing is not connected to the base	Connect the power cord
Image moves while focusing	Specimen is not secured	Secure the specimen
	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
Image is too bright	Lamp intensity is too high	Adjust the light intensity
Insufficient brightness	Lamp intensity is too low	Adjust the light intensity
	Aperture diaphragm closed too far	Open to the proper setting
	The light bulb is not in the center	Adjust the position of the bulb
High power objective contacts specimen when changed from low power objective	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