User Manual

Trinocular Compound LED PLAN Microscope

Model M834ALPLAN

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 the lamps or fuses, be sure the main switch is off, unplug the power cord, and only replace the bulb after the bulb and the lamphouse has completely cooled.
7. **Important:** 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

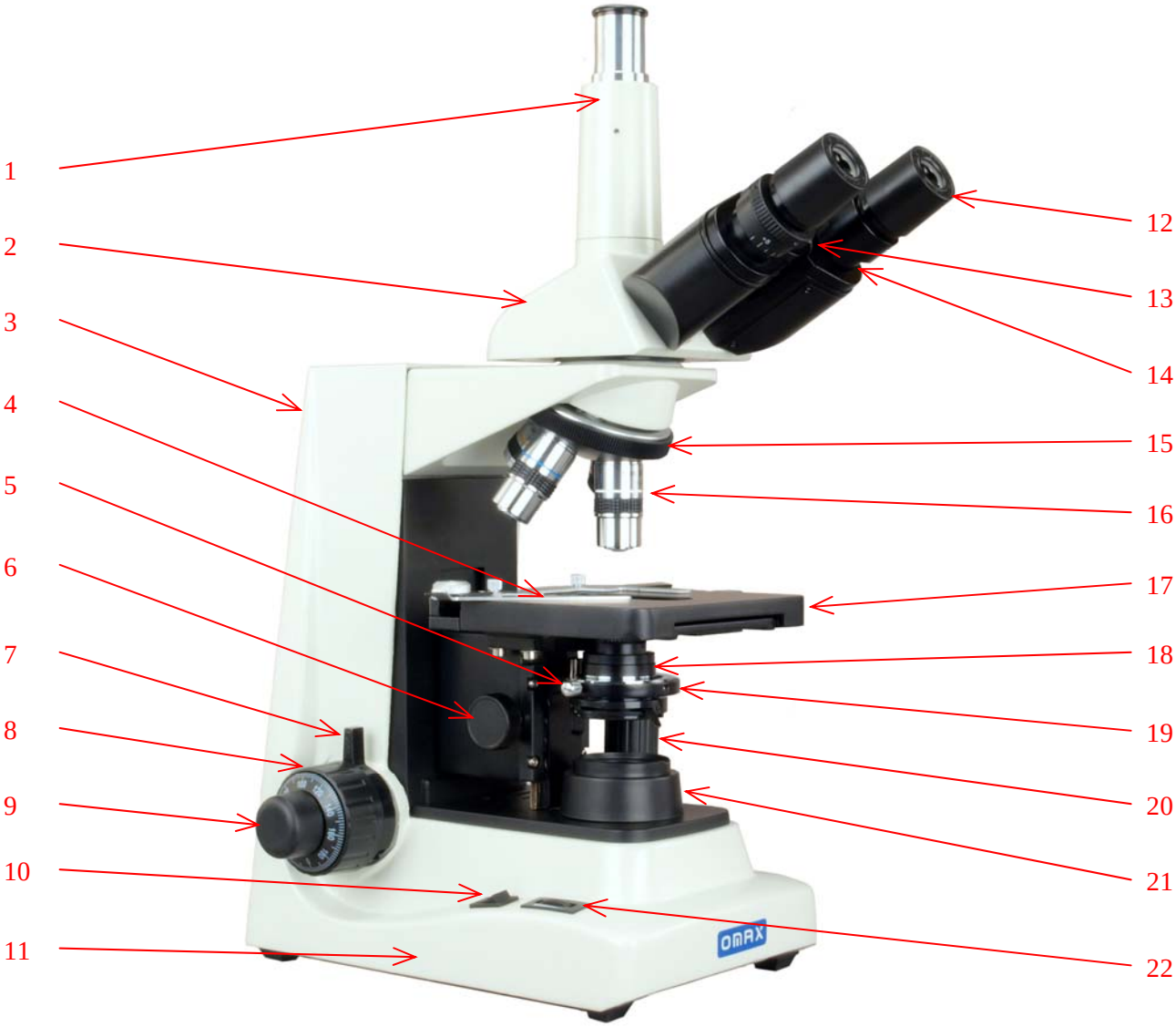
1. Do not attempt to disassemble any component including eyepieces, objectives or focusing assembly.

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. Observe the specimen with the 4X, 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 lens cleaning paper if the immersion oil is on the dry objectives lens. Clean the 100X objective lens first using the lens cleaning paper 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 when not in use.

1. Components Illustration



1	Photo Tube	9	Fine Focus Knob	17	Mechanical Stage
2	Viewing Head	10	Power Switch	18	Condenser
3	Microscope Body	11	Microscope Base	19	Condenser Holder
4	Slide Holder	12	Eyepiece	20	X-Y Stage Moving Knobs
5	Condenser Lock Thumb Screw	13	Diopter Adjusting Ring	21	Light Collector
6	Condenser Focus Knob	14	Eyepiece Tube	22	Intensity Dial
7	Stage Upward Stopper	15	Nosepiece		
8	Coarse Focus Knob	16	Objectives		

2. Installation

2.1 Installation of the trinocular viewing head

1) Loosen the set screw on the top of the microscope body and remove the plastic cover.
2) Remove the cap on the dovetail of the trinocular viewing head.
3) Seat the dovetail of trinocular viewing head into the socket on the top of microscope body completely and tighten the set screw.

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

2.2 Installation of the photo tube

1) Remove the cap on the top of the viewing head.
2) Thread the photo tube onto the top of the viewing head.

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

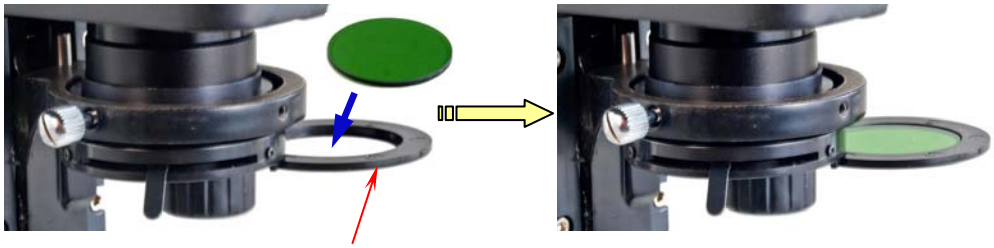
1) Adjust the coarse focus knob until the mechanical stage is at its lowest position.
2) Turn the caps counter-clockwise to remove them from the nosepiece.
3) Take the objectives out from the plastic cases and turn each one clock-wise into the hole on the nosepiece. Install the 4X objective into the nosepiece first. Then in a clockwise direction, rotate the nosepiece and install each succeeding higher magnification objective.

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.

2.5 Installation of the glass color filter

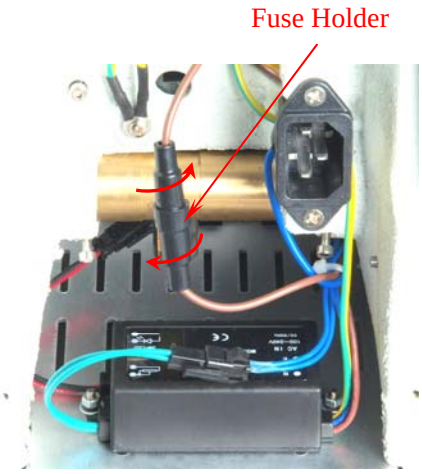
1) Swing out the filter holder under the condenser.
2) Insert the filter into the holder and swing the holder back in.



Color Filter Holder

2.6 Replacing the fuse

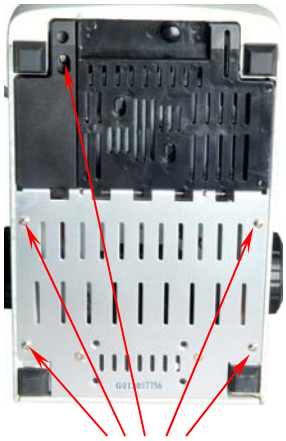
1) Turn off the power and disconnect the power cord.
2) Loosen the 5 screws on the back board and open the board.
3) Turn the fuse holder (small black container) and take the fuse out.
4) Insert the new fuse into the holder and screw it back.
5) Put the board back to its place and tighten the 5 screws.



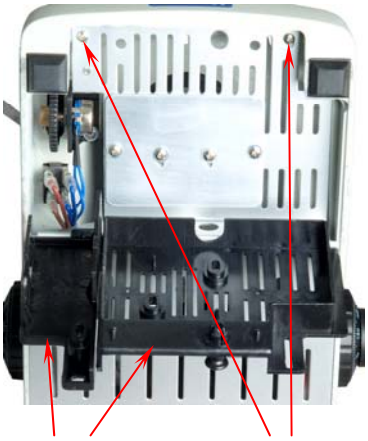
Fuse Holder

2.7 Replacing the LED light

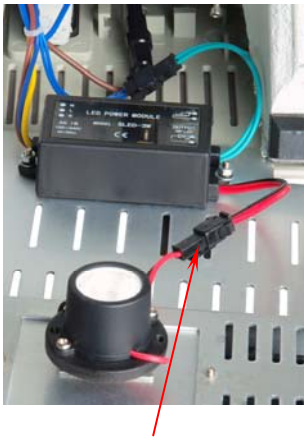
1) Turn off the power and disconnect the power cord.
2) Remove 5 screws at the base.
3) Remove the 2 covers. Find 2 other screws and remove them.
4) Open the cover of base, disconnect the LED light.
5) Remove the 2 screws that hold the LED bracket on the base.
6) Remove the 2 screws that hold the LED on the bracket.



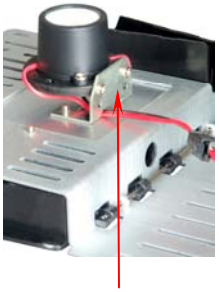
5 Screws



2 Covers 2 Screws



Disconnect from here



Bracket

3. Operation

3.1 Adjusting illumination

1) Plug the power cord into the power socket on the microscope and connect it to the power outlet.
2) Turn on the power switch.
3) Rotate the intensity dial to increase or decrease the brightness.

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-Y stage moving knobs 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, raise the mechanical stage using the coarse focus knob until the specimen is close to the objective.
2) Turn the coarse focus knob slowly until the specimen is in focus.
3) Use the fine focus knob to obtain a sharp image.
4) To get a good focused image, you may need to combine the focus knob adjustment and interpupillary distance adjustment, along with eyepiece diopter adjustment stated in **3.6** and **3.7**.
5) 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 stage upper stopper. Give the stage a tiny extra moving space to ensure the objective can be focused every time.

3.4 Observing with 100X oil objective

1) When observing with the 100X oil objective, a drop of immersion oil must be applied on the slide.

2) Turn the 100X objective to the observing position.
3) Adjust the focus knob till the slide very close to the 100X objective and the immersion oil on the slide contact with the lens of objective.
4) Adjust the fine focus knob to focus.
5) After observing the specimen, use the lens cleaning paper to clean the 100X objective lens gently and the slide immediately.
6) If it is hard to clean, you need a little bit alcohol to clean the 100X objective lens and the slide.

Caution (important):

- When you use the 100X objective to observe the specimen, you have to finish observing the specimen with the 4X, 10X, 40X objectives.
- 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 lens cleaning paper to clean the objectives lens immediately or 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) 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.

3.6 Adjusting interpupillary distance

While observing with both eyes, hold the left and right eye tubes, swing inwards and outwards. 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 diopter ring until a sharp image is obtained.

3.8 Adjusting Iris diaphragm

Swing the 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 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.

3.9 Adjusting focus tension

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

4. Specifications

Model	M834ALPLAN
Total Magnification	40X, 100X, 400X, 1000X
Viewing Head	Trinocular, Siedentopf, inclined 30º, swiveling 360º Swing interpupillary adjustment, 55 ~ 75mm (2-3/16" ~ 2-15/16") Adjustable diopter on left eyepiece tube
Photo Tube	Height adjustable
Eyepieces	1 pair of WF10X/18
Optical Tube Length	160mm
Nosepiece	Reversed revolving quadruple
Objectives	PLAN 4X, 10X, 40X (spring), 100X (spring, oil)
Condenser	Abbe, NA=1.25, w/ iris diaphragm and filter holder Rack and pinion adjustment
Focus Mechanism	Coaxial coarse and fine focusing knobs on both sides w/ stage upward stopper Minimum fine focusing adjustment at 0.002mm, range 30mm
Mechanical Stage	Large double layer mechanical stage Dimension: 140mmx110mm (5-1/2” x 4-1/4”) Movement range: 78mm X 52mm (3” x 2”)
Illumination	Transmitted, 5W LED, variable intensity
Power Supply	AC 100 – 240V, 50/60HZ (US and Canada plug)
Dimension	36cm x 23cm x 48cm (14-1/8” x 9-1/8” x 19”)
Net weight	7.35 kg (16 lbs 3 oz)

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
	Fuse blown out	Replace fuse
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 is not at the center	Adjust the position of the bulb
Dirt or dust on the view	Dirt or dust on the eyepiece, condenser, objective or collector lens or specimen	Clean the lens with a lens cleaning paper
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
	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 opened too much	Open or close properly
	Condenser is positioned too low	Position the condenser upward
	Specimen rises from stage surface	Secure the specimen in the slide holder
	Blue filter not used	Use daylight blue filter
	Lamp intensity is too high or low	Adjust the light intensity by rotating the intensity control dial
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