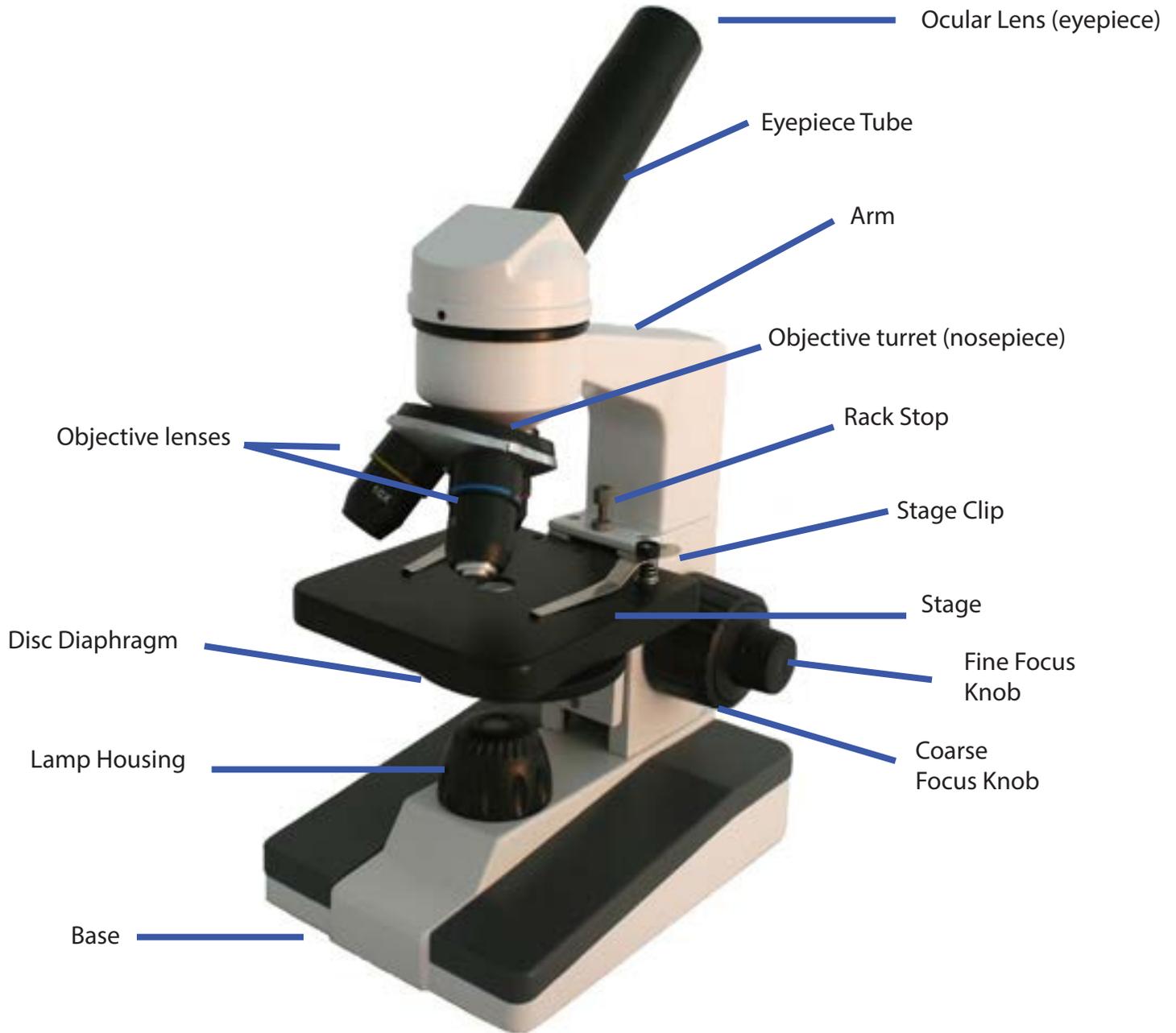




Richter Optica

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Instructions for Model
F-1
Compound Microscope



Thank you for your purchase of a Richter Optica microscope. The information in this manual is provided to answer most questions that can arise when operating your microscope and help you to avoid unnecessary maintenance expenses in the future.

Please carefully read instructions before operating microscope. Nomenclature used to describe components and controls are identified on opposite page of the manual.

UNPACKING

Do not discard styrofoam container or packing materials until you are sure shipment is complete and undamaged (retain styrofoam shipping container to store your microscope when it is not in use). Remove all tape and packing material used to protect microscope during shipment. Make certain lens surfaces do not come in contact with dirt, fingerprints or oil. Damage of lens surfaces occur when they come in contact with such contaminants, and image clarity is reduced.

DESCRIPTION OF COMPONENTS

- A. **OCULAR LENS** (eyepiece): Lens closest to the eye. Magnifies the primary image formed by the objective lens.
- B. **OBJECTIVE LENS**: Lens closest to the specimen, forms the first magnified image of the specimen.
- C. **OBJECTIVE TURRET** (nosepiece): Revolving turret designed to hold objective lenses, permits changes of magnification by rotating different powered objective lenses into the optical path.
- D. **STAGE CLIPS**: Two locked on clips hold specimen slide in place on stage.
- E. **STAGE**: Platform of the microscope where the specimen slide is placed on the stage.
- F. **DISC DIAPHRAGM**: Rotating disc located below the stage, with 6 holes of various apertures, designed to help achieve optimum resolution of the objective lens. Smaller apertures used for lower magnifications, and larger apertures used for higher magnifications.
- G. **FOCUSING KNOBS**: Focusing knobs located on each side of the arm, when turned, raise or lower stage to bring specimen into focus. The coarse focus knob is considered the rough focus knob and used to move the objective lens toward or away from the specimen. The fine focus knob is used to fine tune the focus on the specimen. It is also used to focus on various parts of the specimen. Generally one uses the coarse focus first to get close then moves the fine focus for more fine tuning.
- H. **ILLUMINATION**: Microscope is provided with a built in 4.5v LED illuminator. Features ON/OFF switch. **BATTERIES NOT INCLUDED**. You will need 3 AA batteries for operating your F-1 microscope in cordless mode. Alternatively, use the included power cord for operation.

OPERATION

- A. Always carry microscope by grasping arm with one hand and placing other hand under base.
 - B. Place microscope directly in front of you in a manner which permits you to comfortably look into the eyepiece. Position the microscope with the arm facing you so that focusing knobs are most convenient to reach.
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- C. Your microscope has LED illumination that is powered by 3 AA batteries (not included) or by the included power cord. Turn illuminator switch on the back of the base of the microscope to "ON."
 - D. Turn focus knobs to move the stage away from the objectives as far as possible.
 - E. Place specimen slide, cover slip facing up, on stage with specimen centered over hole in middle of stage.
 - F. Rotate disc diaphragm to position the smallest aperture under the hole in the center of the stage.
 - G. Turn the objective turret until the 4x (shortest) objective lens clicks into position in the optical path.
 - H. Note that each time you change from one objective lens to another you should turn the turret until you hear the click, which indicates that the lens is properly indexed in the optical path.
 - I. While looking through the eyepiece, turn focusing knobs until specimen comes into focus. If the image does not appear in the field of view, move the specimen slide slightly on the stage until the specimen comes into the field of view.
 - J. While still looking through the eyepiece, turn the disc diaphragm to observe how different apertures affect the sharpness of the image. Turn the diaphragm until the sharpest possible image is obtained. When turning the disc diaphragm, you should hear clicks as each aperture comes into proper position under the hole in the center of the stage. If aperture is not properly positioned, you will observe shadows in the field of view.
 - K. Changing Magnification:
 - 1. Note that each of the 3 objectives has a different colored ring, with each color corresponding to a different magnification. Red = 4x, Yellow = 10x, Blue = 40x.
 - 2. Total magnification obtained with each objective lens is determined by multiplying the magnification of the eyepiece times the magnification of the objective. Keep in mind that as magnification is increased, the field of view (total area that you are seeing when looking through the microscope) decreases. You will find that you will use the lower magnifications most of the time. Always use the lowest magnification (Red 4x objective) when first focusing on a new specimen slide, as this low magnification provides the biggest field of view, making it easier to locate and position your specimen properly.

 $10x \text{ eyepiece} \times 4x \text{ (red ring) objective} = 40x \text{ total magnification (will give you the biggest field of view)}$
 $10x \text{ eyepiece} \times 10x \text{ (yellow ring) objective} = 100x \text{ total magnification (smaller field of view)}$
 $10x \text{ eyepiece} \times 40x \text{ (blue ring) objective} = 400x \text{ total magnification (smallest field of view)}$
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3. To change Magnification:
 - a. Rotate revolving nosepiece with 10x objective until you hear the 10x objective click into place in the optical path. You may need to slightly adjust the focusing knob.
 - b. Rotate revolving nosepiece with 40x objective until you hear the 40x objective click into place in the optical path.
4. NOTE: Take care when rotating the 40x objective into place. This is the longest objective lens which uses a spring loaded retractable mechanism to protect the glass from scratches. This objective retracts slightly into its housing if the front of the lens comes into contact with the specimen slide while focusing the microscope. This prevents damage to both the lens and the slide.

MAINTENANCE

Store microscope in a location that is clean and dry and where there is no exposure to acid or steam. Don't let it stay exposed directly under sun light for long periods of time.

Optical:

- a. Do not attempt to disassemble any lens components. Consult our technical staff when any kind of repairs are needed that are not covered by these instructions.
- b. Prior to cleaning any lens surface, brush dirt and lint off lens surface with camel hair brush or compressed air.
- c. Do not remove eyepiece lens or objective lenses from microscope. Clean only the outer lens surface by breathing on the lens to dampen the surface, then wipe with lens paper or a cotton swab.

Mechanical:

- a. Rack Stop adjustment: Rack stop has been pre-adjusted at the factory, and should not require re-adjustment.
- b. Metal Parts: Use a clean, damp cloth to remove dust or dirt from metal followed by a dry cloth.

Electrical:

WARNING: For your own safety, please turn switch to off position and remove plug from power source before replacing bulb. Make sure that illuminator housing and lamp are cool before servicing.

- a. Unscrew and remove the top cover of the lamp housing so that the LED bulb is exposed.
- b. Carefully unscrew the bottom portion of lamp housing. It will not come completely off, but you will need to unscrew it to get a better angle when replacing the bulb.
- c. Reach into lamp housing and grasp the white part of the bulb to gently remove it.
- d. Replace with new 4.5v LED bulb and reassemble.

TROUBLE SHOOTING PROCEDURES

Problem	Reason for Problem	Solution
No Illumination	<p>Disc diaphragm has not “clicked” into it’s proper position and is blocking the light source from underneath the stage</p> <hr/> <p>Batteries need to be replaced</p> <hr/> <p>LED Bulb burned out</p>	<p>Turn disc diaphragm until it “clicks” into position</p> <hr/> <p>Replace with 3 new AA Batteries</p> <hr/> <p>Replace with new LED Bulb</p>
Image does not remain in focus	<p>Cover slip on specimen slide too thick</p> <hr/> <p>Slide upside down</p>	<p>use 0.17mm thick cover slip (No 1 cover slip)</p> <hr/> <p>Place slide on stage with cover slip facing up</p>
Poor Resolution	<p>Objective lens dirty</p> <hr/> <p>Eyepiece lens dirty</p> <hr/> <p>Too much light</p>	<p>Clean objective lens</p> <hr/> <p>Clean eyepiece lens</p> <hr/> <p>Adjust disc diaphragm</p>
Spots in field of view	<p>Eyepiece lens dirty</p> <hr/> <p>Specimen slide dirty</p>	<p>Clean eyepiece lenses</p> <hr/> <p>Clean Slide</p>