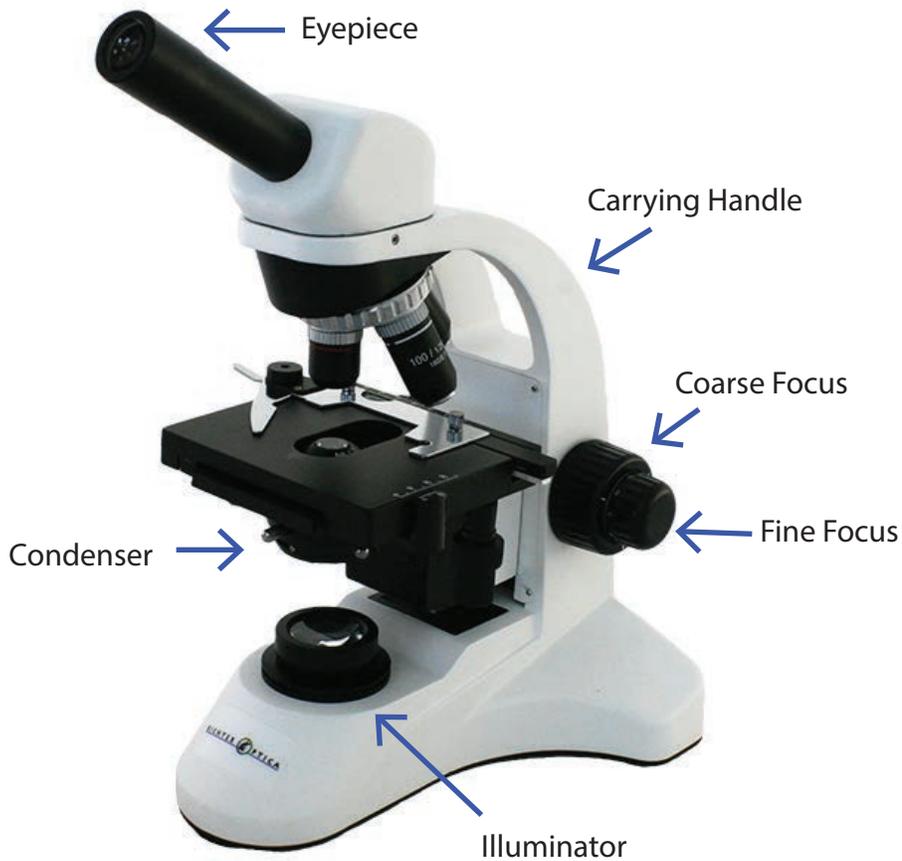




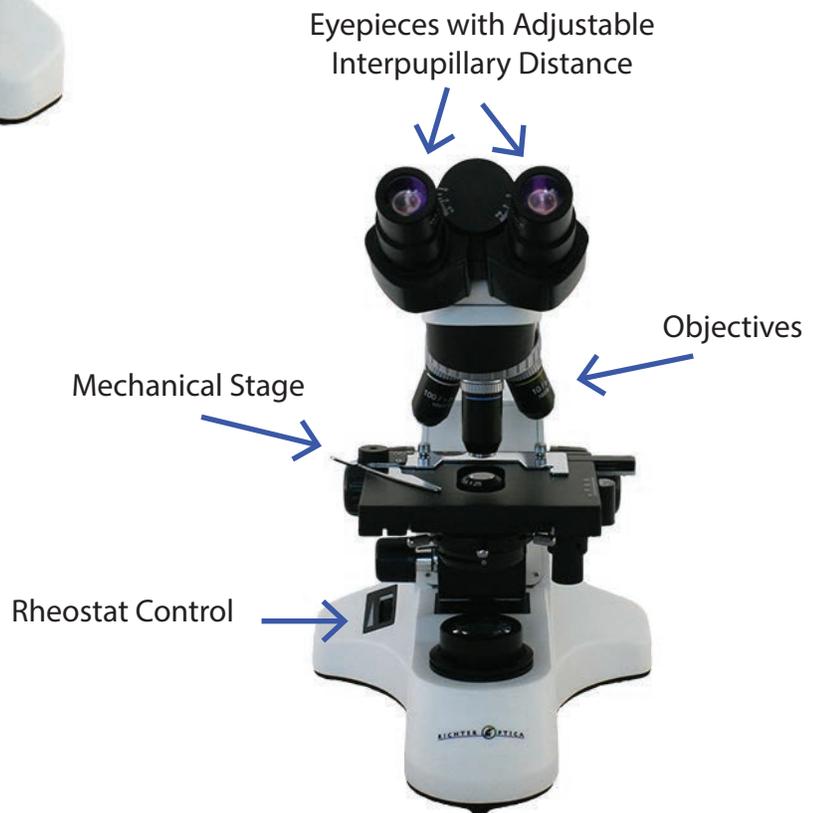
Richter Optica

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Instructions for Models:
HS-2M, HS-2B, HS-2D, HS-2WiFi
Compound Microscope



Model HS-2M
Monocular Microscope



Model HS-2B
Binocular Microscope

Condenser Height Adjustment Knob

Condenser Filter Holder

Mechanical Stage Adjustment



Digital Camera

WiFi Camera



Model HS-2D
Digital Microscope

Model HS-2WiFi
WiFi 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 to help you 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.

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. **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. **NOSEPIECE:** Revolving turret designed to hold objective lenses, permits changes of magnification by rotating different powered objective lenses into the optical path.
- D. **MECHANICAL STAGE:** Device that holds slide in place and can be moved front-to-back and left-to-right by adjusting one of two knobs on the right side of the microscope.
- E. **STAGE:** Platform of the microscope where the specimen slide is placed on the stage.
- F. **IRIS DIAPHRAGM:** Adjusted by moving lever on condenser open or closed to let more light through condenser. Adjust this lever when changing magnification.
- G. **COARSE-FOCUS KNOB:** Located on each side of the arm, raises or lowers the stage to bring the specimen stage into focus.
- H. **FINE-FOCUS KNOB:** (located in center of coarse focusing knobs) permits more precise image adjustment.
- I. **LAMP HOUSE ILLUMINATION:** Microscope is provided with a built-in LED illuminator.
- J. **SAFETY RACK STOP:** When properly adjusted, controls maximum upward travel of stage. Prevents higher power objectives from breaking slides, prevents damage to objective lenses. This stop has been pre-adjusted at the factory and will not need any further adjustment.

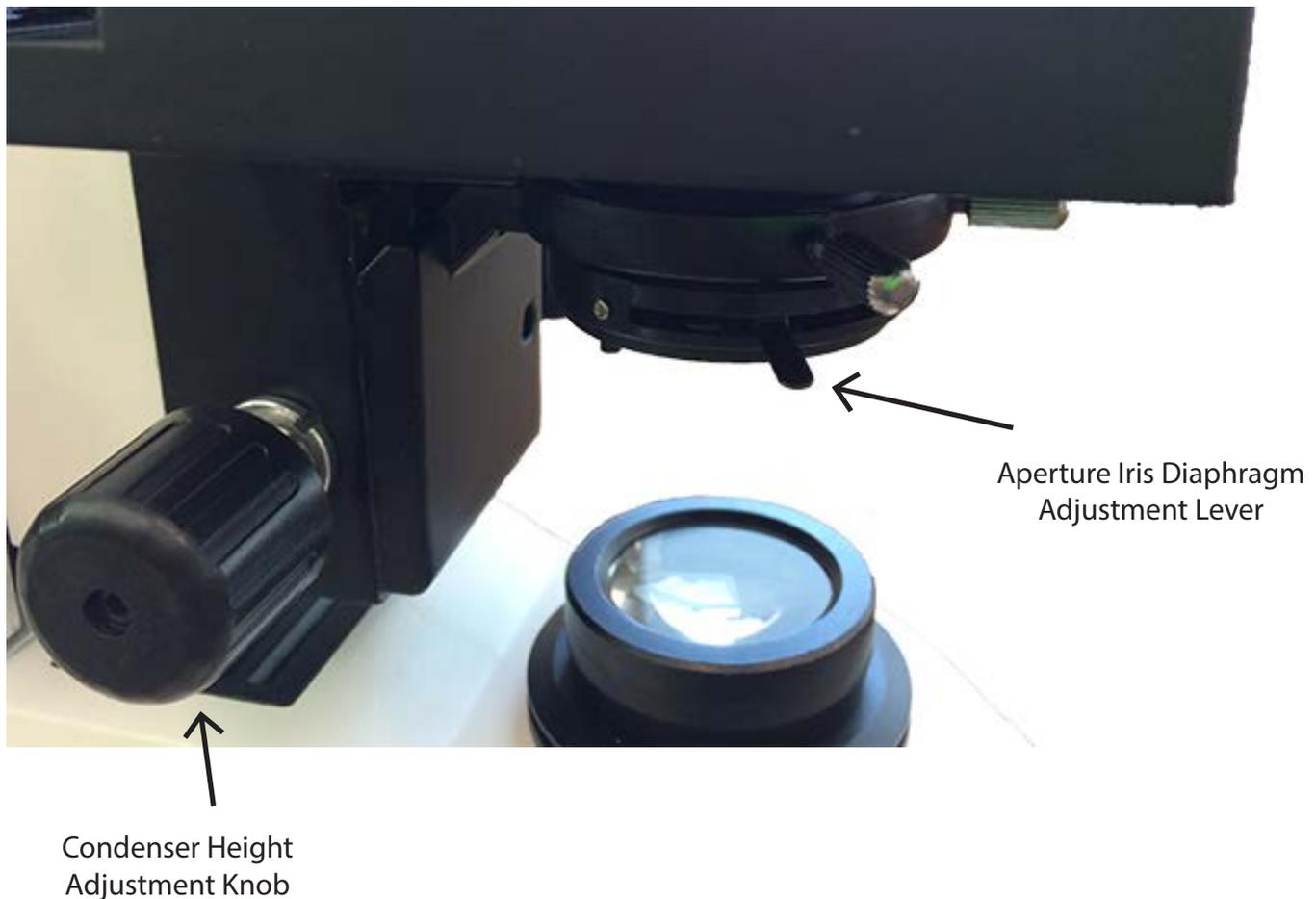
1. Changing Magnification

- a. Magnification is changed by rotating the nosepiece until a different lens is moved into the optical path. Always turn the turret until you hear it “click”. This indicates that the lens is properly positioned.
- b. The standard lenses that are provided with your microscope are a single widefield 10x eyepiece (HS-2M), or two WF10x Eyepieces (HS-2B, HS-2D, HS-2WiFi). Each microscope includes 4x, 10x and 40x objectives, while some models also include a 100x objective. The 40x and 100x objectives have a special spring retractable mechanism which retracts slightly when the front of the lens comes in contact with the specimen slide. See chart below for specifications on objectives.
- c. Also note that each objective has a color ring. This allows you to quickly change in magnification by referring to an easily observed color rather than to a number.
- d. The microscope has been parfocalled at the factory, which allows the user to easily change from one magnification to another requiring little or no adjustment of the fine focus knobs.
- e. As you increase the magnification, the field of view (area of specimen seen through the microscope) will decrease. This is why it is easier to find the specific area of interest on the specimen by starting with the lowest 4x objective lens, before increasing magnification to the 10x or 40x objective lens.
- f. *NOTE:* Care must be taken when rotating the 40x objective lens into place. This lens has a spring retractable mechanism which retracts slightly into its housing if the front of the lens strikes the specimen slide. With fine focus adjustment at mid-range, the rack stop has been adjusted at the factory to assure the 40x lens will clear the thickness of a normal specimen slide and cover slip. However, if the rack stop has been improperly adjusted, or if you are using a thicker than 0.17mm cover slip, moving the 40x lens too quickly could cause damage to the front lens element or to the slide.

Objective	Features	N.A.	Magnification with 10x Eyepieces
4x		0.10	40x
10x		0.25	100x
40x	Retractable	0.65	400x
100x	Retractable Oil Immersion	1.25	1000x

OPERATION

1. Connect the power cord.
2. Turn on the microscope with the switch at the back.
3. Adjust the rheostat control so the light is fully on.
4. Place a sample on the stage and move the 4x objective into position.
5. Focus first with the coarse focus and then the fine focus.
6. Adjust the height of the condenser so it is up snug beneath the stage.
7. Adjust the aperture iris diaphragm on the condenser. As the brightness and resolution decrease, the contrast and depth of field will increase.



CARE / MAINTENANCE

1. When using the 100x objective lens place a drop of immersion oil between the objective lens and the cover slip. When finished with observation, clean the objective lens thoroughly with lens paper.
2. When cleaning dust off of lenses it is best removed with a soft brush or a small puff of air. More persistent dirt such as oil or fingerprints can be removed with a soft cloth or lens tissue paper moistened slightly with absolute alcohol or a microscope cleaning solution.
3. Avoid using cleaning solvents to clean the metal or painted parts on the microscope. If needed, use a mild detergent on these parts.
4. When not in use cover the microscope with the provided dust cover and store in a cool, dry place.

TROUBLESHOOTING

<i>Problem</i>	<i>Reason for Problem</i>	<i>Solution</i>
Light Fails to operate.	Outlet inoperative.	Have qualified service technician repair outlet.
	AC Power cord not connected.	Plug into outlet.
	Bulb burned out, Fuse blown	Have qualified service technician replace bulb and/or fuse

<i>Problem</i>	<i>Reason for Problem</i>	<i>Solution</i>
Image will not focus	Rack stop not set at proper position	Adjust rack stop
	Slide upside down	Place slide on stage with cover slip up
	Slide cover slip too thick	Use 0.17 mm thick cover slip (No. 1 cover slip)
Poor Resolution (Image not sharp)	Objective lenses dirty	Clean objective lenses
	Eyepiece lens dirty	Clean eyepiece lenses
	Too much light	Adjust iris diaphragm
Spots in field of view	Eyepiece or condenser lens too dirty	Clean lens
	Specimen slide dirty	Clean slide
***Spots in field of view can also result from dirt on inside of eyepiece. It is recommended that you have a service technician clean inside of lens.		