ACCU-SCOPE®

MANUAL

EXM-150

MICROSCOPE SERIES



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SAFETY NOTES

1. Open the shipping carton carefully to prevent any accessory, 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 require reshipment.
3. Keep the instrument out of direct sunlight, high temperature or humidity, and dusty environments. Ensure 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 LED bulb or fuse, be sure the main switch is off (“O”), remove the power cord, and replace the LED bulb after the bulb and the lamp house has completely cooled.
7. Confirm that the input voltage indicated on your microscope corresponds to your line voltage. The use of a different input voltage other than indicated will cause severe damage to the microscope.

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 such as cotton swabs or Q-tips, 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.
5. ACCU-SCOPE® microscopes are precision instruments which require periodic preventative maintenance to maintain proper performance and to compensate for normal wear. An annual schedule of preventative maintenance by qualified personnel is highly recommended. Your authorized ACCU-SCOPE® distributor can arrange for this service.

INTRODUCTION

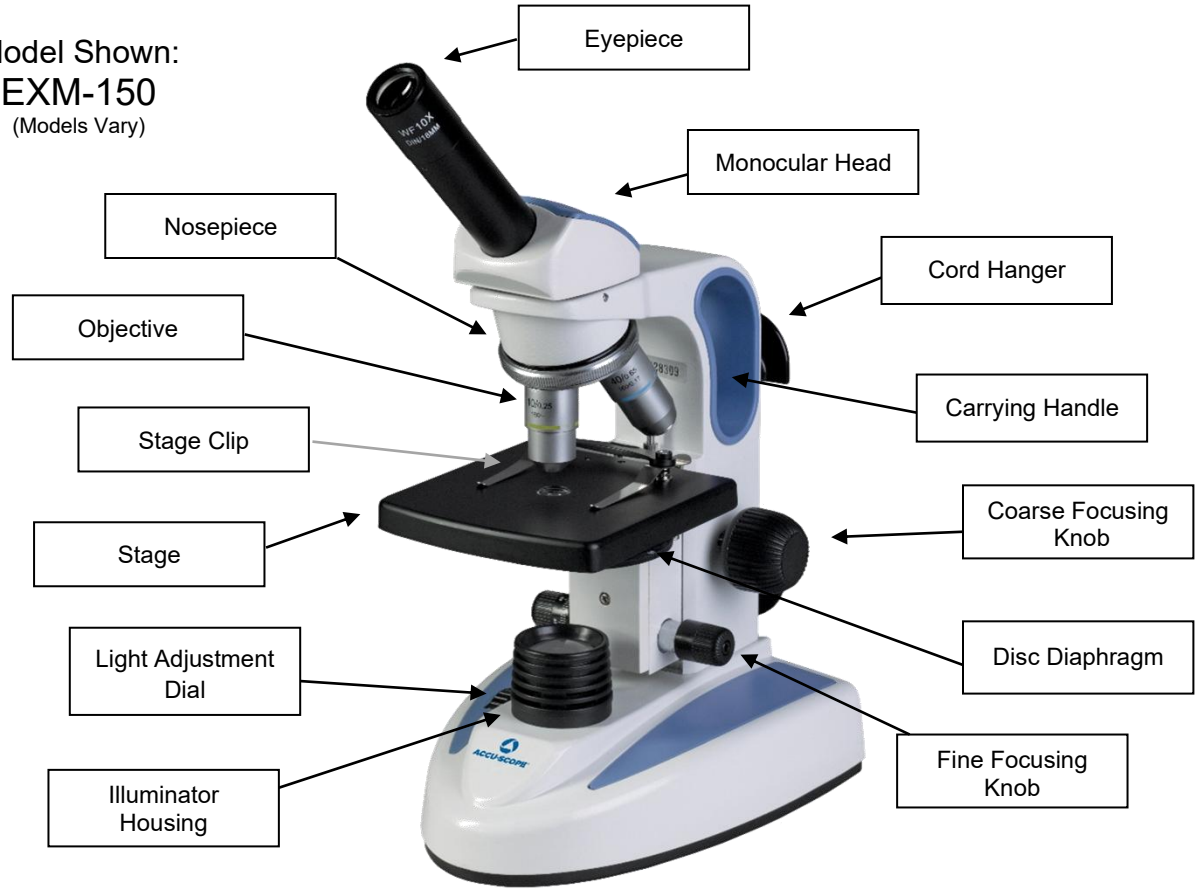
Congratulations on the purchase of your new ACCU-SCOPE ® microscope. ACCU-SCOPE ® microscopes are engineered and manufactured to the highest quality standards. Your microscope will last a lifetime if used and maintained properly. ACCU-SCOPE ® microscopes are carefully assembled, inspected and tested by our staff of trained technicians in our New York facility. Careful quality control procedures ensure each microscope is of the highest quality prior to shipment.

UNPACKING AND COMPONENTS

Your microscope arrived pre-assembled and packed in a molded container. ***Do not discard the container***: the molded container should be retained for reshipment of your microscope if needed. Avoid placing the microscope in dusty surroundings or in high temperature or humid areas as mold and mildew will form. Carefully remove the microscope from the Styrofoam container by its arm and base and place the microscope on a flat, vibration-free surface.

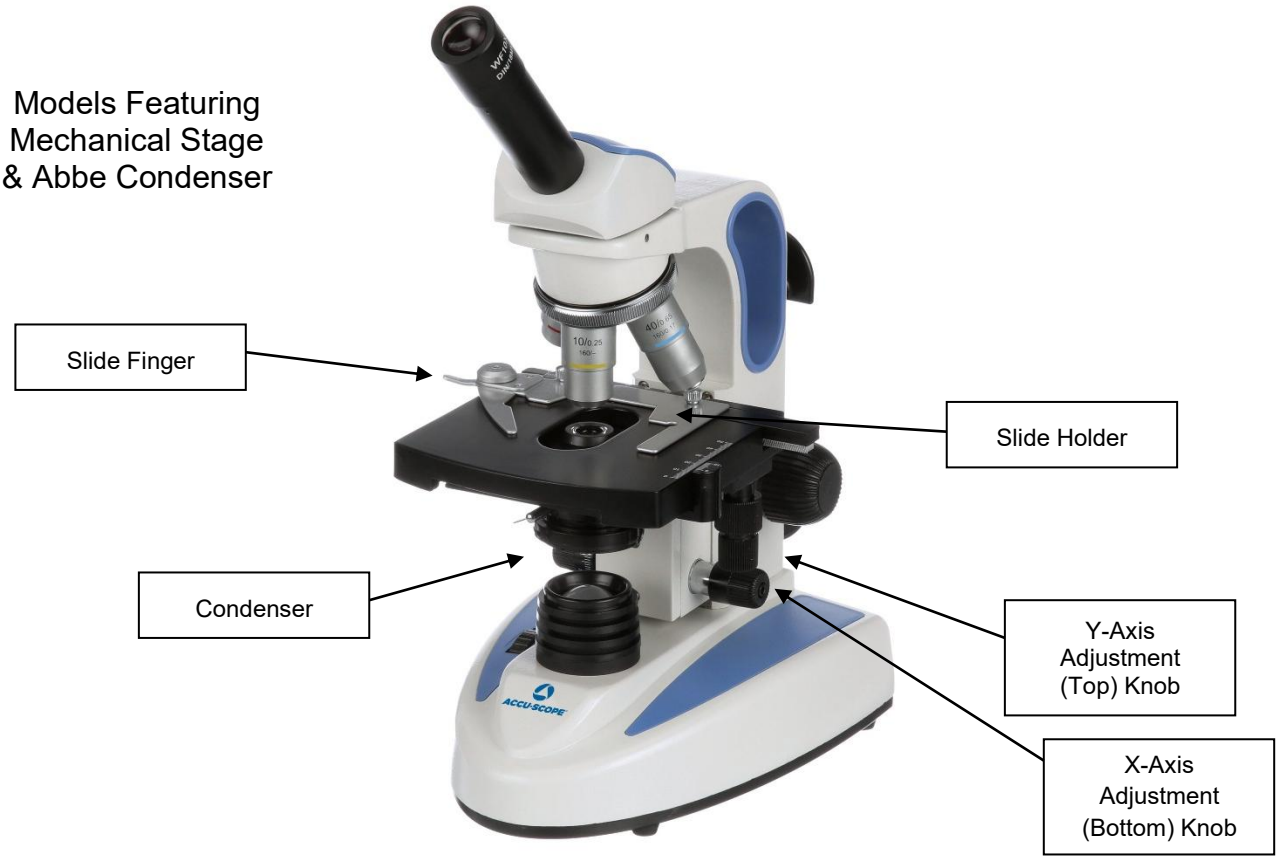
COMPONENTS DIAGRAM

Model Shown:
EXM-150
(Models Vary)



COMPONENTS DIAGRAM

Models Featuring
Mechanical Stage
& Abbe Condenser



Other Models Not Shown:

			
EXM-150-MS	EXM-151-MST	EXM-150-T	EXM-150-MS-DF

ADJUSTMENT & OPERATION



Connecting the Power Cord

Make sure the power switch is at “0”(OFF) before connecting.

Insert the connector ① of power cord securely into the power socket ②.

Insert the other connector securely into an electrical outlet.

The microscope uses a universal power supply so it may be used in any voltage range between 90 ~ 240v when used with the appropriate line cord.



IMPORTANT: Use care when storing the power cord so that it does not bend or twist – it is recommended to wrap the cord around the cord hanger for storage.

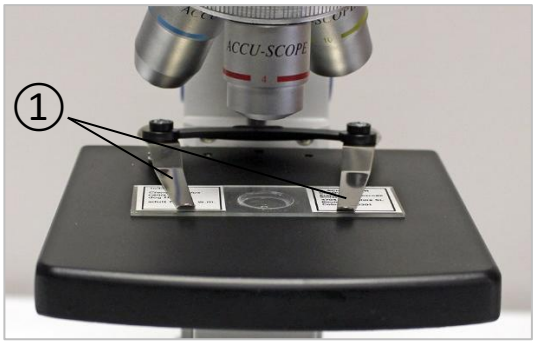


Illumination

With the microscope turned on (I), rotate the light adjustment dial ① until the illumination is comfortable for observation.

Rotate the light adjustment knob toward the back of the microscope to increase brightness; rotate toward the front to reduce brightness.

ADJUSTMENT & OPERATION *(continued)*



Placing the Specimen Slide

For Models With a Fixed Stage

Place the slide on the stage with the cover glass facing up and secure it with the stage clips ①.

For Models With a Mechanical Stage

Push the slide finger ② of the specimen holder towards the back to open it and place a specimen slide into the slide holder with the cover glass facing up. Release the slide finger so it closes and secures the slide in place.



Rotate the X and Y-axis knobs ③ to move the slide into position.

Adjusting the Focus

Turn the coarse adjustment knob ④ counterclockwise to move the stage to its lowest position.



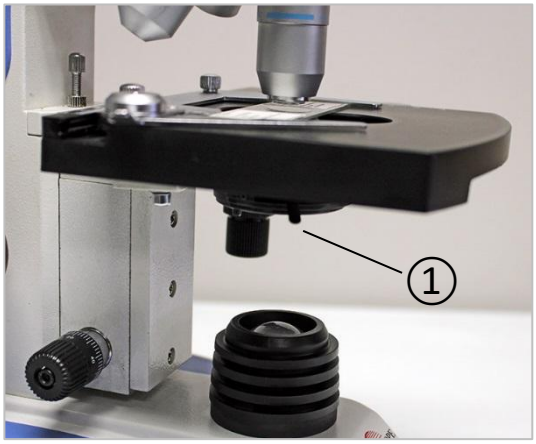
Place a specimen slide on the center of the stage.

Using the 4x objective bring the specimen into focus using the coarse ④ and fine ⑤ focusing controls.

Different objectives can be brought into view by rotating the nosepiece and using the fine adjustment knob because the objectives are parfocal.



ADJUSTMENT & OPERATION *(continued)*



Model With Iris Diaphragm

Using the Disc or Iris Diaphragm

Each EXM-150 Series Microscope is supplied with either a disc or iris diaphragm, depending on the model ordered.

The amount of light can be adjusted by opening or closing the iris diaphragm (using the lever ①) or by turning the disc diaphragm ②, located just beneath the stage).

Adjust the diaphragm to the smallest size allowable for a clear, sharp image of the specimen.



Model With Disc Diaphragm

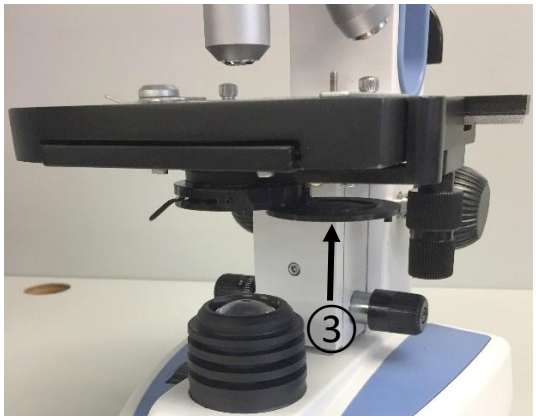
Using the Darkfield Stop (optional)

To view specimens using the Darkfield Stop, rotate the stop into the closed position.

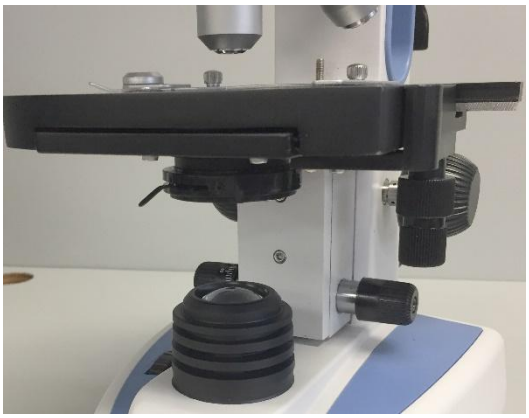
While viewing a specimen, adjust the iris diaphragm open or closed to optimize the image. The specimen should appear mostly white on a dark background.

To view the specimen in brightfield mode, rotate the darkfield stop into the open position.

NOTE: The darkfield stop is only available with the iris diaphragm.



Darkfield Stop in Open Position



Darkfield Stop in Closed Position

ADJUSTMENT & OPERATION *(continued)*



Using the 100xR Oil Objective

(EXM-151 Models ONLY)

The procedure for examining a specimen using an oil immersion objective is as follows:

Rotate the nosepiece so the low power objective is in the optical path.

Place one drop of immersion oil on the lighted area of the specimen slide ④.

Rotate the nosepiece so the 100xR oil immersion objective is in the light path. Dust or air bubbles in the oil can destroy the definition of the image. If the bubbles are trapped between the objective lens and the slide, clean off the oil and start again or try to eliminate the bubble by rotating the objective back and forth.

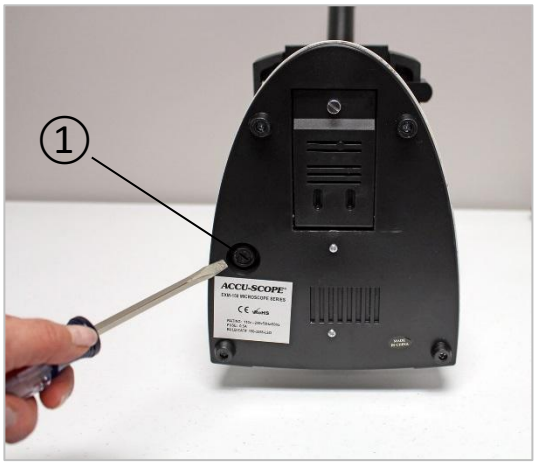
With your eye at the level of the stage, use the coarse focus knob to raise the stage with the specimen cover glass. When you see a flash of light at this location the objective lens has made contact with the immersion oil and the microscope can now be focused using the fine focus knob.

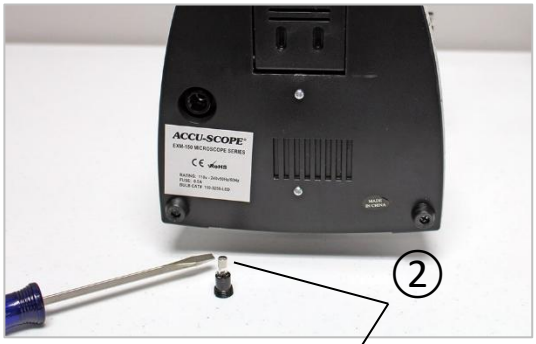
IMPORTANT NOTE

Each time you finish using the oil immersion objective wipe off all traces of oil from the objective and the specimen cover glass with a lens tissue or clean, soft cloth.

Cleaning after each use will prevent oil from contaminating the high dry objective (40xR), prevent dust and dirt from accumulating on the lens of the objective which will degrade its optical performance, and will keep the slide clean to work with.

ADJUSTMENT & OPERATION *(continued)*







Recharging the Microscope

The LED cordless, rechargeable microscope is completely portable and be used indoors or outdoors in any location where there is no electrical outlet access.

The LED cordless microscope is powered by three AA 1300mAh 1.2v NiMH (Nickel Metal Hydride) rechargeable batteries, and when used properly can sustain approximately 4 hours (depending on the light intensity/user) before a charge is required.

Each microscope is supplied with its own 4.5v/1000A line cord/charger and requires approximately 8 hours for a full charge. The life expectancy of the rechargeable batteries is approximately 20,000 hours or equivalent to 400 recharges before needing replacement.

NOTE: Your microscope can be used while recharging. Use ***ONLY*** the AC adapter/cord that came with your microscope.

Replacing the Fuse

Turn the main switch to “0” (OFF) before replacing a fuse.

Unplug the power cord from the microscope.

Carefully place the microscope on the back of its arm so the bottom of the microscope base is facing towards you.

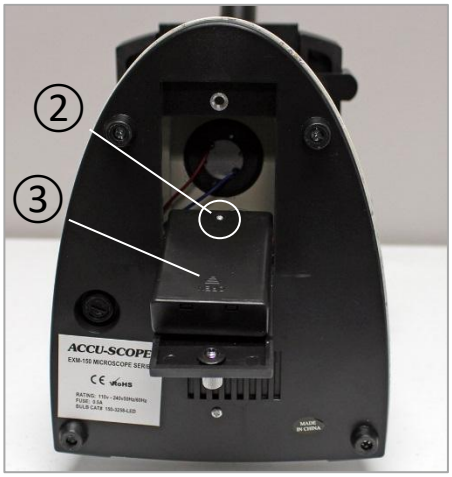
Screw off the fuse holder ① from the bottom of the microscope with a flat-head type screwdriver (—).

Gently pull out the old fuse ② and Install a new fuse into the fuse holder and screw it back into the base.

Specification of the fuse: 250V, 1.0A CAT #3277-1

ADJUSTMENT & OPERATION *(continued)*







Replacing the Rechargeable Batteries

1. Unplug the microscope from the electrical outlet (if plugged in) and unplug charger from rear of microscope (if plugged in).
2. Carefully place the microscope on the back of its arm so the bottom of the microscope base is facing towards you.
3. To expose the battery compartment, open the trap door on the bottom by unscrewing the lock screw ①.
4. Using a small hex wrench, remove the screw ② on the battery compartment and slide the cover ③ toward you to remove.
5. Replace the three NiMH AA 1300mAh rechargeable batteries ④.
6. Slide the cover back on and replace the screw.
7. Close the trap door and tighten the lock screw.
8. Carefully place the microscope in an upright position.
9. Plug the charger to the power receptacle on the back of the microscope and plug into an electrical receptacle for continued use while charging.

Allow the LED microscope to charge for 8 hours before using as cordless.

IMPORTANT

USE ONLY AA 13000mAh NiMH (Nickel Metal Hydride) rechargeable batteries in your microscope. Using any other type of battery may damage your microscope.

Replacing the LED Bulbs

The life expectancy of the LED bulbs is 20,000 hours. The LED bulbs are covered by a 1 year manufacturer's warranty.

Should your LED bulbs need replacing, please contact an authorized ACCU-SCOPE service center or call ACCU-SCOPE Inc.'s technical service department at 631-864-1000 for an authorized service center near you.

TROUBLESHOOTING

Under certain conditions, performance of this unit may be adversely affected by factors other than defects. If a problem occurs, please review the following list and take remedial action as needed. If you cannot solve the problem after checking the entire list, please contact your local dealer for assistance.

OPTICAL

Problem	Cause	Corrective Measure
Darkness at the periphery or uneven brightness of view field	Revolving nosepiece not in click stop position	Rotate the nosepiece to click stop position by swinging the objective correctly into the optical path
Dirt or dust on the view field	Dirt or dust on the lens - eyepiece, condenser, objective, collector lens or specimen	Clean the lens
Poor image quality	No cover glass attached to the slide	Attach a 0.17mm cover glass
	Cover glass is too thick or thin	Use a cover glass of the appropriate thickness (0.17mm)
	Slide maybe upside down	Turn slide over so the cover glass faces up
	Immersion oil is on a dry objective (especially the 40xR)	Check the objectives, clean if necessary
	No immersion oil used with100xR objective	Use 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	Position the condenser slightly lower than the upper limit

IMAGE PROBLEMS

Problem	Cause	Corrective Measures
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	Adjust the light intensity by rotating the intensity control dial and/or iris diaphragm
	Blue filter not used	Use daylight blue filter
Image is too bright	Lamp intensity is too high	Adjust the light intensity by rotating the intensity control dial and/or iris diaphragm
Insufficient brightness	Lamp intensity is too low	Adjust the light intensity by rotating the intensity control dial and/or iris diaphragm
	Aperture diaphragm closed too far	Open to the proper setting
	Condenser position too low	Position the condenser slightly lower than the upper limit

MECHANICAL PROBLEMS

Image will not focus with high power objectives	Slide upside down	Turn the slide over so the cover glass faces up
	Cover glass is to thick	Use a 0.17mm cover glass
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 glass is to thick	Use a 0.17mm cover glass
	Diopter adjustment is not set properly	Readjust the diopter settings as outlined in section 4.3

MECHANICAL PROBLEMS *(continued)*

Problem	Cause	Corrective Measures
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
Slippage of focus when using the coarse focusing knob	Tension adjustment is set too low	Increase the tension on the focusing knobs
Fine focus is ineffective	Tension adjustment is set too high	Loosen the tension on the focusing knobs

MAINTENANCE

Please remember to ***never*** leave the microscope with any of the objectives or eyepieces removed and always protect the microscope with the dust cover when not in use.

SERVICE

ACCU-SCOPE® microscopes are precision instruments which require periodic servicing to keep them performing properly and to compensate for normal wear. A regular schedule of preventative maintenance by qualified personnel is highly recommended. Your authorized ACCU-SCOPE® distributor can arrange for this service. Should unexpected problems be experienced with your instrument, proceed as follows:

1. Contact the ACCU-SCOPE® distributor from whom you purchased the microscope. Some problems can be resolved simply over the telephone.

2. If it is determined that the microscope should be returned to your ACCU-SCOPE® distributor or to ACCU-SCOPE® for warranty repair, pack the instrument in its original Styrofoam shipping carton. If you no longer have this carton, pack the microscope in a crush-resistant carton with a minimum of three inches of a shock absorbing material surrounding it to prevent in-transit damage. The microscope should be wrapped in a plastic bag to prevent Styrofoam dust from damaging the microscope. Always ship the microscope in an upright position; ***NEVER SHIP A MICROSCOPE ON ITS SIDE***. The microscope or component should be shipped prepaid and insured.

LIMITED MICROSCOPE WARRANTY

This microscope and its electronic components are warranted to be free from defects in material and workmanship for a period of five years from the date of invoice to the original (end user) purchaser. The LED lamp is warranted for a period of one year from the date of invoice to the original (end user) purchaser. This warranty does not cover damage caused in-transit, misuse, neglect, abuse or damage resulting from improper servicing or modification by other then ACCU-SCOPE approved service personnel. This warranty does not cover any routine maintenance work or any other work, which is reasonably expected to be performed by the purchaser. Normal wear is excluded from this warranty. No responsibility is assumed for unsatisfactory operating performance due to environmental conditions such as humidity, dust, corrosive chemicals, deposition of oil or other foreign matter, spillage or other conditions beyond the control of ACCU-SCOPE INC. This warranty expressly excludes any liability by ACCU-SCOPE INC. for consequential loss or damage on any grounds, such as (but not limited to) the non-availability to the End User of the product(s) under warranty or the need to repair work processes. Should any defect in material, workmanship or electronic component occur under this warranty contact your ACCU-SCOPE distributor or ACCU-SCOPE at (631) 864-1000. This warranty is limited to the continental United States of America. All items returned for warranty repair must be sent freight prepaid and insured to ACCU-SCOPE INC., 73 Mall Drive, Commack, NY 11725 – USA. All warranty repairs will be returned freight prepaid to any destination within the continental United States of America, for all foreign warranty repairs return freight charges are the responsibility of the individual/company who returned the merchandise for repair.

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