



# MANUAL

## EXS-210 STEREO MICROSCOPE SERIES



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Özdeş Çağın K



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## SAFETY NOTES

1. Open the shipping carton carefully to prevent any accessory, i.e. eyepieces, from dropping and being damaged.
2. Keep the instrument out of direct sunlight, high temperature or humidity, and dusty environments.
3. 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.
4.  **LAMP REPLACEMENT -- CAUTION:** the glass housing of the lamp may be extremely hot. DO NOT attempt to change the lamp before it is completely cooled or without wearing adequate skin protection.
5. All electrical connectors (power cord) should be inserted into an electrical surge protector to prevent damage due to voltage fluctuations.
6. 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.  
NOTE: Always plug the microscope power cord into a suitable grounded electrical outlet.  
Use only the AC adapter provided with the microscope.

## CARE AND MAINTENANCE

1. Do not attempt to disassemble any component including eyepieces, objective housing or the 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 bulb. If dirt remains on the optical surface, use a soft, lint free 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.
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 servicing to maintain proper performance and to compensate for normal wear. A regular schedule of preventative maintenance by qualified service personnel is highly recommended. Your authorized ACCU-SCOPE® distributor can arrange for this service.

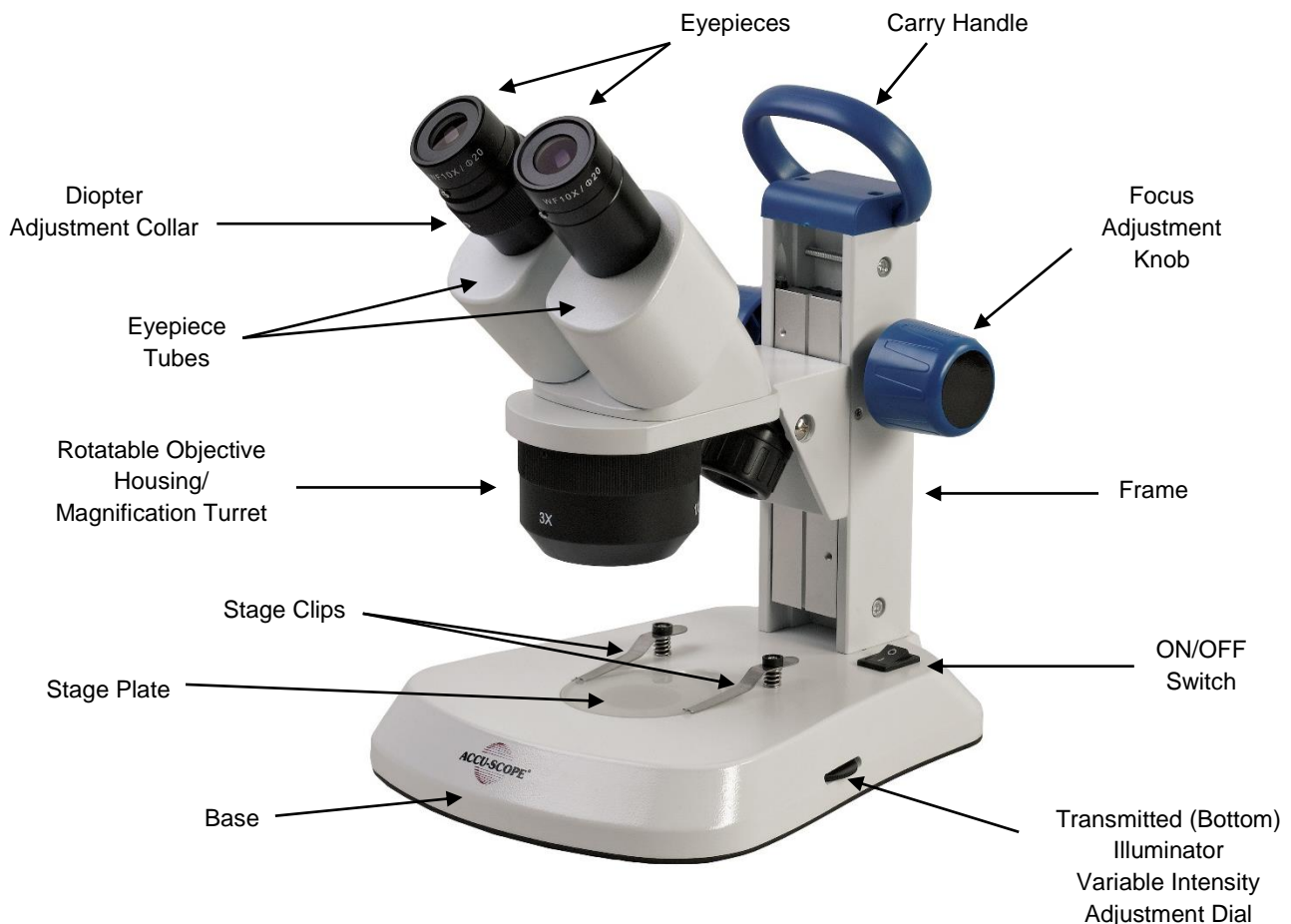
## INTRODUCTION

Congratulations on the purchase of your new ACCU-SCOPE® stereo 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.

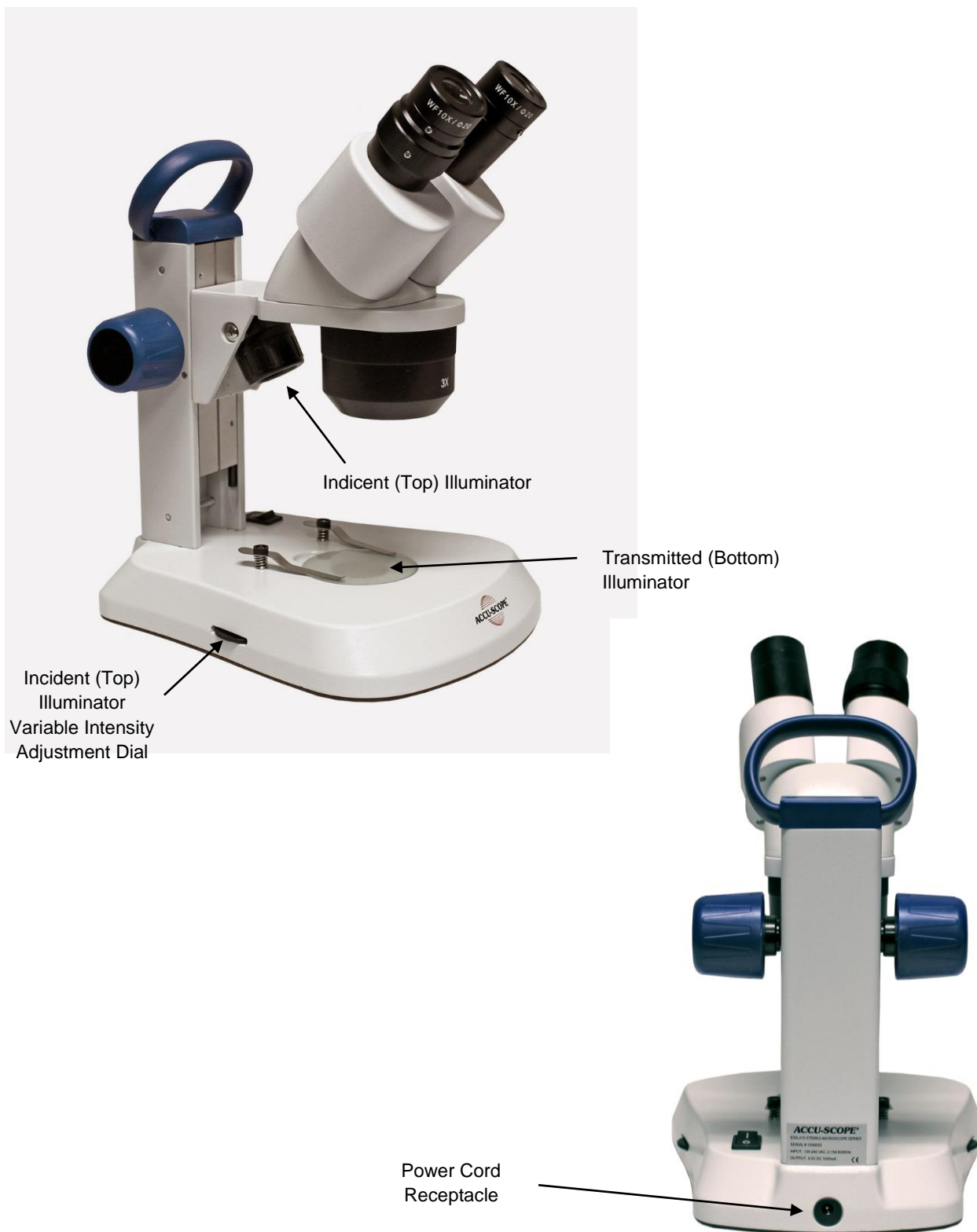
## UNPACKING AND COMPONENTS

Your microscope arrived packed in a molded shipping carton. ***Do not discard the carton:*** the shipping carton 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 can form. Carefully remove the microscope from the shipping carton and place the microscope on a flat, vibration-free surface.

## COMPONENTS DIAGRAM



COMPONENTS DIAGRAM (continued)



## ASSEMBLY

Your stereo microscope comes pre-assembled. Optional eyeguards are included with your microscope and can be installed on the eyepieces to help block out extraneous light.

## ADJUSTMENT & OPERATION

### Voltage Check

Confirm that the input voltage indicated on the rear label of the microscope corresponds to your line voltage. The use of a different input voltage than indicated will cause severe damage to your microscope.

### Connecting the Power Cord (Fig. 1)

Make sure the ON/OFF (I/O) switch ① is turned to the OFF (O) position. With the microscope facing away from you, make sure the illuminators are turned off.

To turn the illuminators off: for the bottom illuminator – the dial on the left side of the microscope ② should be turned all the way toward the front of the microscope (or away from you); for the Top illuminator – the dial on the right side ③ of the microscope should be turned all the way toward the back of the microscope (or toward you).

Insert the power cord into the power receptacle on the back of the microscope ④; make sure the connection is snug. Plug the other end of the power cord into the power supply receptacle.

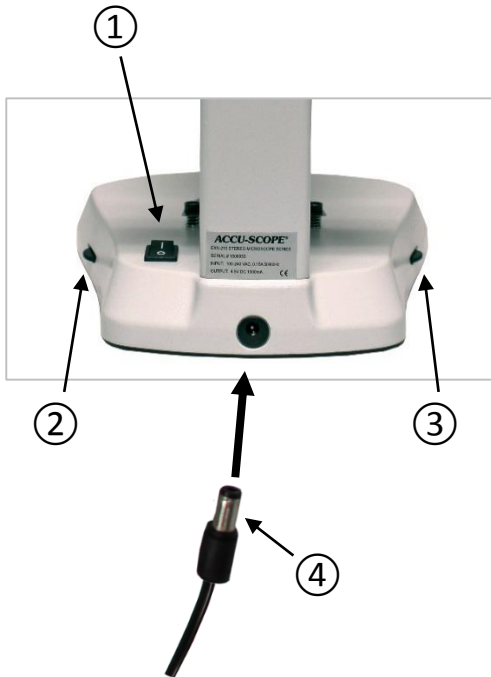


Fig. 1

Input: 100V~240V, 0.15A; 50/60Hz  
Output: 4.5V DC; 1000mA

### Adjusting Interpupillary Distance (Fig. 2)

Different users have different interpupillary distances (this distance is between the centers of pupils of each eye). When operators of the microscope change, it will be necessary to adjust interpupillary distance.

While looking through the eyepieces, hold the left and right eyepiece tubes ① of the binocular assembly and adjust the eyepiece tubes by opening or closing them until the left and right fields of view coincide completely and you are able to see a complete circle.

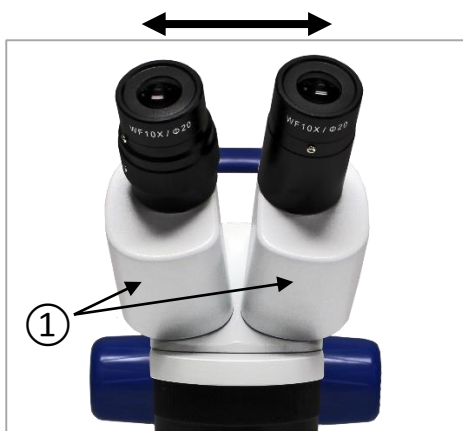


Fig. 2

## ADJUSTMENT & OPERATION *(continued)*



Fig. 3

### Adjusting Diopter Ring (Fig. 3)

Place an easy-to-observe specimen on the stage plate, i.e., a coin.

Rotate the magnification turret ① to the highest magnification, then turn the focusing knob ② to focus the specimen. Rotate the magnification turret ① to the lowest magnification, looking only into the left eyepiece, adjust the diopter ring ③ on left eyepiece to focus the specimen.

**NOTE:** The working distance of the microscope is 57mm (the distance between the microscope objective to the top of the specimen).

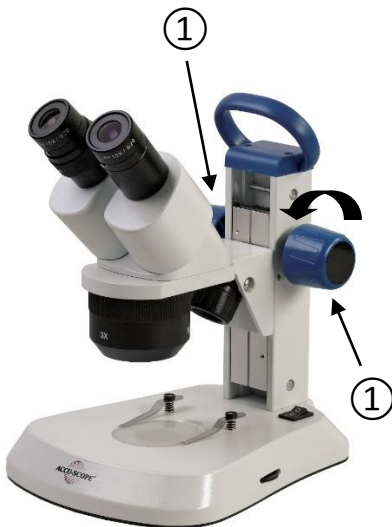


Fig. 4

### Adjusting the Focusing Tension (Fig. 4)

To adjust the tension, hold both left and right focus adjustment knobs ① with both hands, hold the left knob (to prevent it from turning), and rotate the right knob clockwise to increase (tighten) or counterclockwise to decrease (loosen) the focus knob tension.

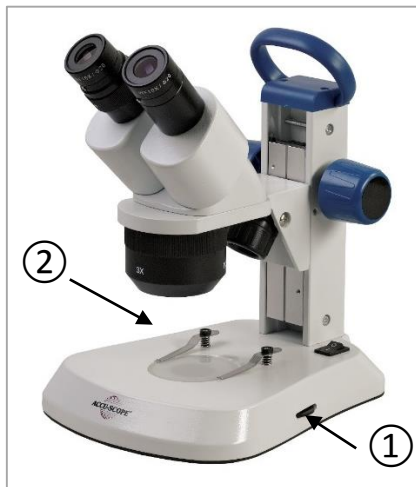
After tension adjustment has been completed, always rotate both adjustment knobs in the same direction.

**ADJUSTMENT & OPERATION** *(continued)***Changing the Magnification (Fig. 5)****Fig. 5**

Using the finger grips at the top of the turret ①, rotate the objective turret until it clicks into place. The magnification of the objective in the field of view is indicated by the number ② on the front of the objective turret (facing forward).

Additional magnification ranges can be obtained through the use of optional 5x, 15x, or 20x eyepieces.

Total Magnification = Magnification of microscope body x magnification of eyepiece  
(i.e., 3x X 10=30x)

**Adjusting Illumination (Fig. 6)****Fig. 6**

The EXS-210 is equipped with a rechargeable variable, built-in 3-way illumination system: LEDs for incident (top) and transmitted (bottom).

Brightness adjustment: the right brightness adjustment dial ① is used to adjust the bottom illumination, and the left brightness adjustment dial ② is used to adjust the top illumination.

Turn the dials to adjust the brightness as needed.

Each dial also has its own on/off so you can use either top illuminator or bottom illuminator, or both illuminators simultaneously.

For more information about the rechargeable LED illumination system and replacing the rechargeable batteries, please refer to pages 8-9.



## ADJUSTMENT & OPERATION *(continued)*



**Fig. 7**

### Observing a Specimen (Fig. 7)

Turn on the microscope.

Select the appropriate illuminator for the specimen being observed; there are three modes of illumination:

**Incident** (top) – for viewing opaque specimens

**Transmitted** (bottom) – for viewing translucent specimens

**Incident & Transmitted** – to develop contrasting conditions on a variety of specimens.

Place a specimen in the center of the stage plate area ①.

While looking through both eyepieces with both eyes, focus the microscope at the highest power by turning the focus adjustment knob(s) ② to bring the specimen into focus. This will keep the specimen in close focus at any magnification. A slight turn of the focusing knobs may be needed to sharpen focus.



**Fig. 8**

### Recharging the Microscope (Fig. 8)

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

The LED cordless microscope is powered by three 1.2v NiMH AA 1300mAh (Nickel Metal Hydride) rechargeable batteries, and when used properly can sustain approximately 2 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 would require approximately 8 hours for a full charge. The life expectancy of the rechargeable batteries is approximately 10,000 hours or equivalent to 250 recharges before needing replacement.

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

## ADJUSTMENT & OPERATION *(continued)*



**Fig. 9**

### **IMPORTANT**

**USE ONLY 1.2v NiMH AA 1300mAh (Nickel Metal Hydride) rechargeable batteries in your microscope. Using any other type of battery may damage to your microscope.**

### **Replacing the Rechargeable Batteries (Fig. 9)**

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. Open the trap door on the bottom using a small Philips head (+) screw driver.
4. Replace the three NiMH AA 1300mAh rechargeable batteries.
5. Close the trap door, and place the microscope in an upright position.
6. 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.

### **Replacing the LED Bulbs**

The reflected (top) and transmitted (bottom) lights can be used simultaneously. The lux rating for the reflected illuminator is 7000lux, and the transmitted 18,000 lux by a distance of 70mm. 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.

## SPECIFICATIONS

Objective magnification: 1x/2x, 2x/4x, 1x/3x, 1x/2x/3x, or 1x/2x/4x

Viewing head: Inclined at 45 degrees, interpupillary distance range: 54~76mm

Working distance: 57mm

Illumination system: Adjustable illumination for both LEDs (top and bottom)

## OPTICAL DATA

EYEPIECE		OBJECTIVE			
		1X	2X	3X	4X
5X/22MM	Total Magnification	5X	10X	15X	20X
	FOV (mm)	22	12	8	6
10X/20mm	Total Magnification	10X	20X	30X	40X
	FOV (mm)	20	10	6.7	5
15X/15mm	Total Magnification	15X	30X	45X	60X
	FOV (mm)	15	7.5	5	4.3
20X/10mm	Total Magnification	20X	40X	60X	80X
	FOV (mm)	10	6.5	4.3	3.2
Working Distance		57mm	57mm	57mm	57mm

## 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.

<b>PROBLEM</b>	<b>CAUSE</b>	<b>SOLUTION</b>
1. Complete circle is not visible	Interpupillary distance is not correctly adjusted	Adjust it correctly
	Diopter adjustment is incomplete	Complete diopter adjustment
2. Dirt is visible in field of view	Dirt on specimen	Clean specimen
	Dirt on eyepiece	Clean eyepiece
3. The visibility of the image is poor	Dust on objective front lens	Clean lens surface
4. Specimen image blurs when magnification is changed	Diopter ring is not correctly adjusted	Adjust it correctly
	Not in complete focus on specimen	Focus specimen correctly at a high magnification
5. Coarse focus adjustment knobs rotate with too much resistance	Tension adjustment is too tight	Loosen it properly
6. Microscope body drops or specimen goes out of focus during observation	Tension adjustment ring is too loose	Tighten it properly

## MAINTENANCE

Please remember to **never** leave the microscope with 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 service 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 two years 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 than 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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