



MANUAL

3002

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.

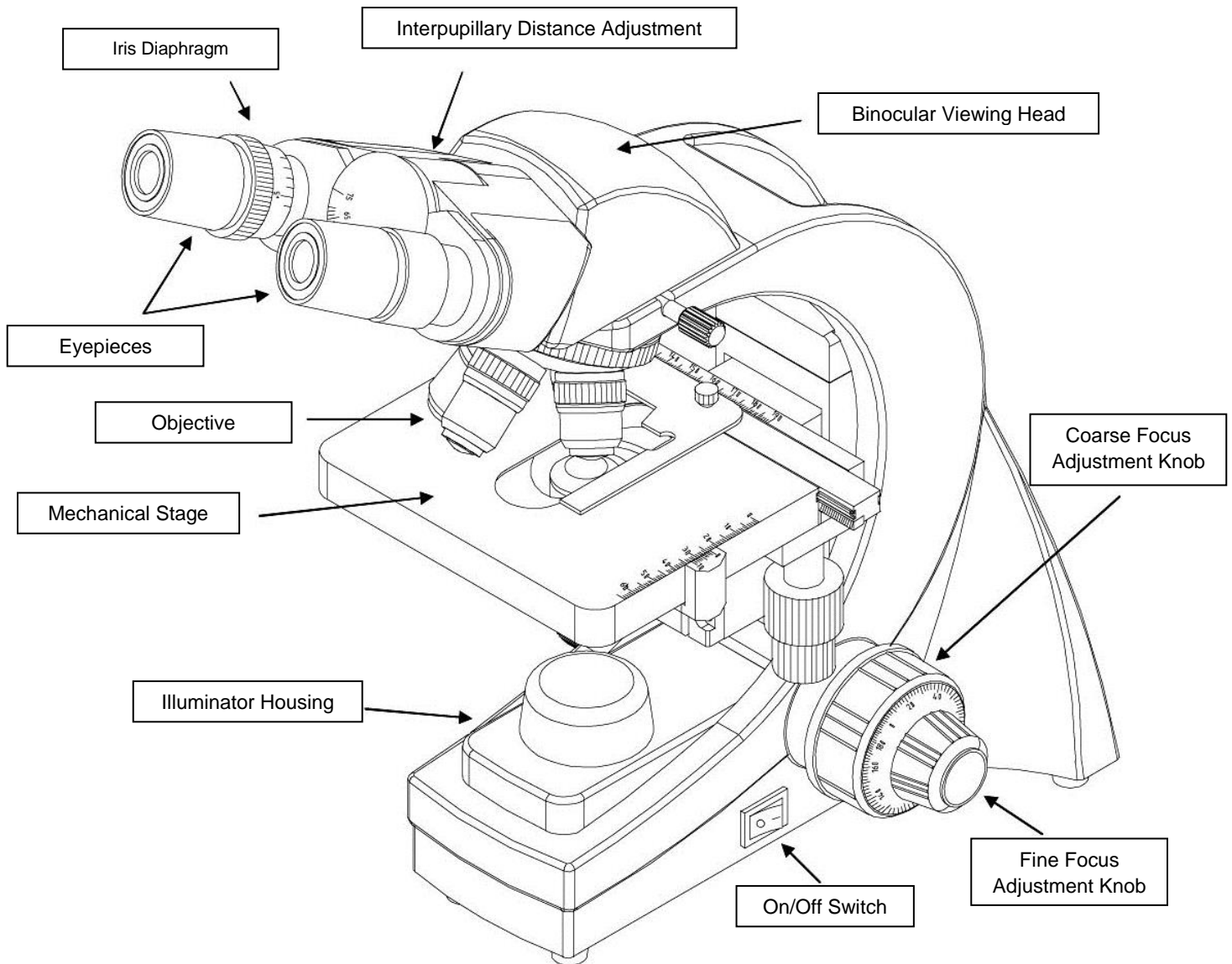
INTRODUCTION

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.

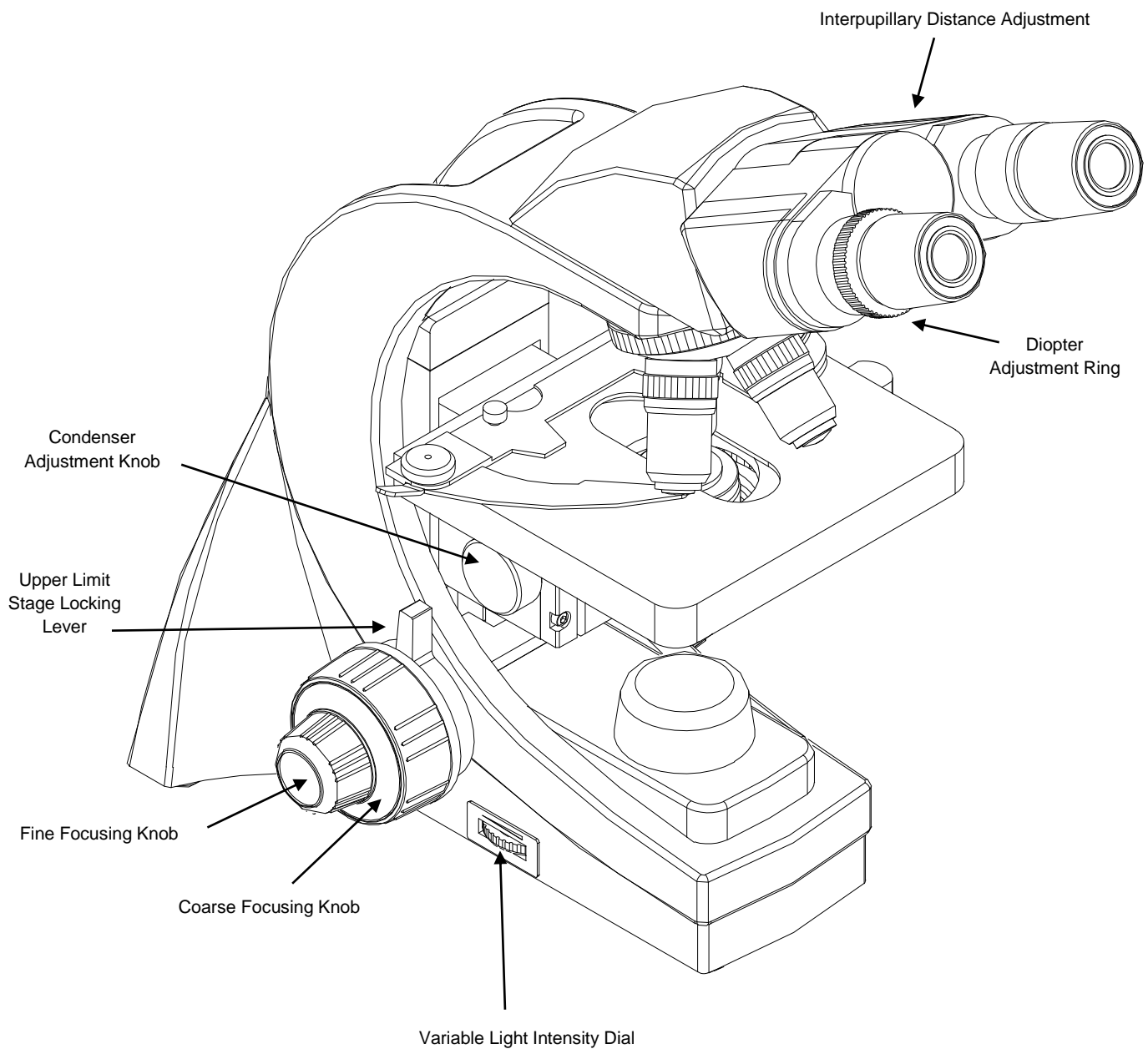
UNPACKING AND COMPONENTS

Your microscope arrived packed in a molded Styrofoam container. **Do not discard the container:** the Styrofoam 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.

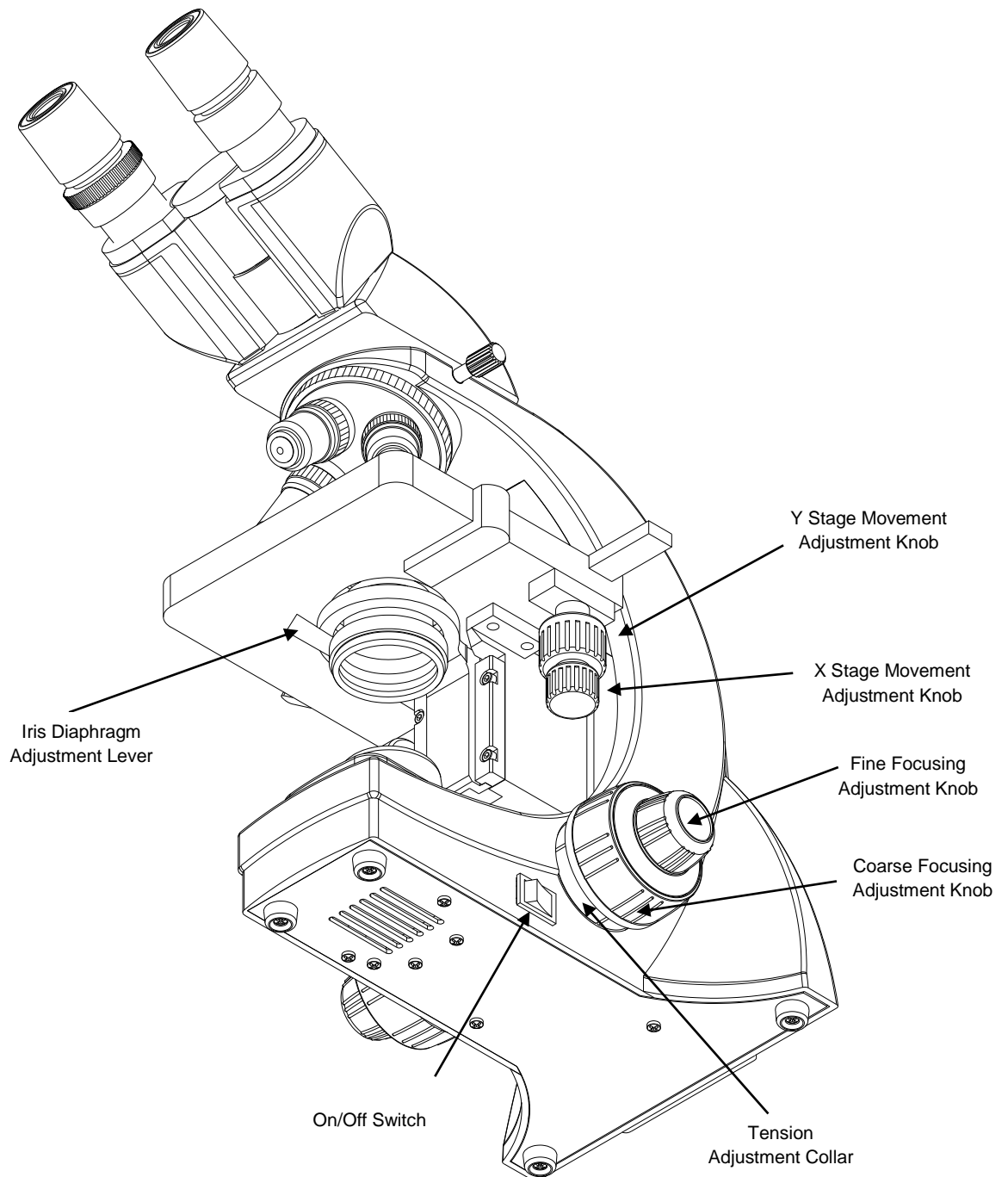
COMPONENTS DIAGRAM



CONTROLS DIAGRAMS



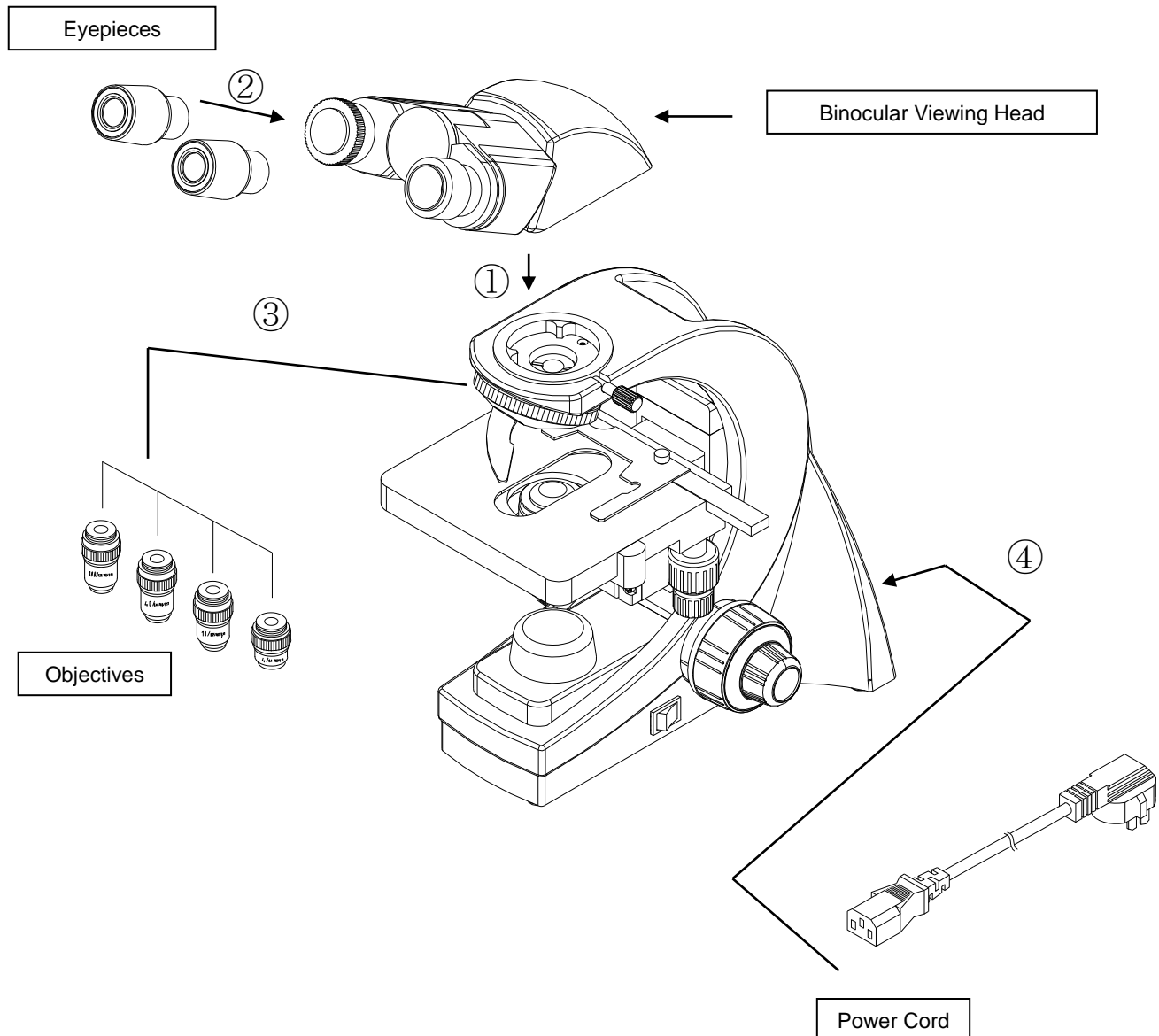
CONTROLS DIAGRAMS *(continued)*

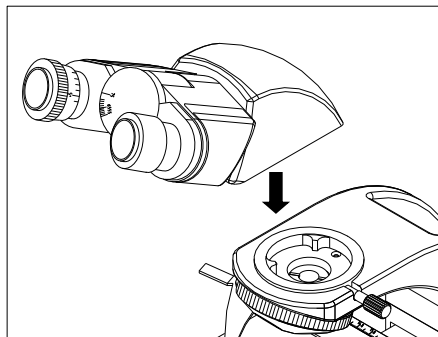
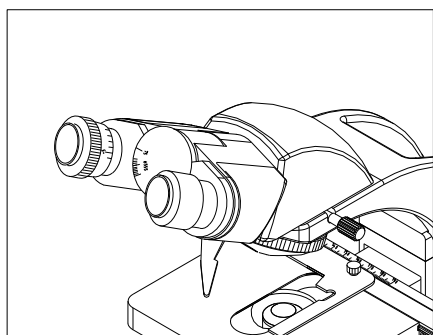
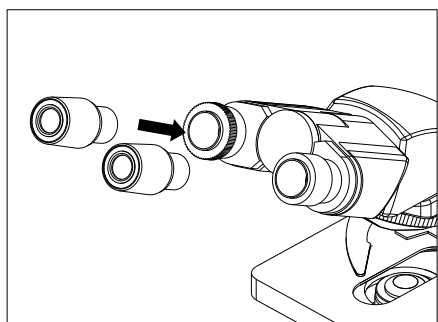
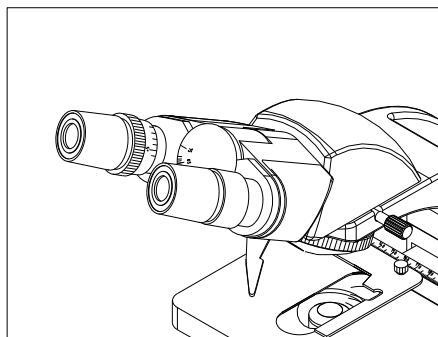


ASSEMBLY DIAGRAM

The diagram below shows how to assemble the various components. The numbers indicate the order of assembly. Your microscope was preassembled by our factory technicians at our New York facility prior to shipment. Should you need to disassemble/assemble your microscope in the future, please follow the instructions outlined below.

When assembling the microscope, make sure that all parts are free of dust and dirt, and avoid scratching any parts or touching glass surfaces.

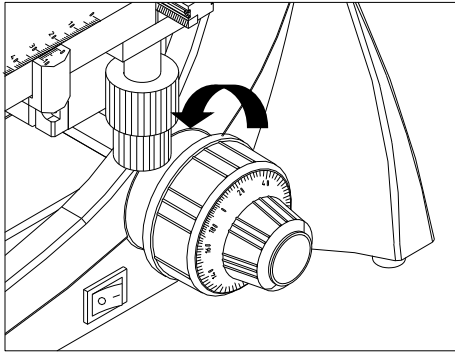
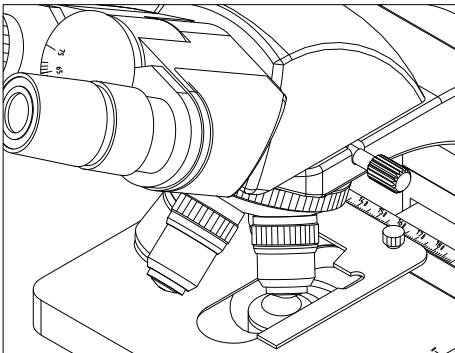
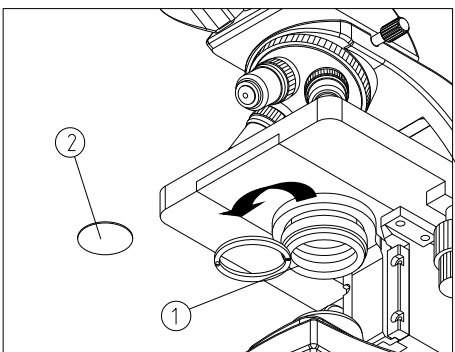


ASSEMBLY *(continued)***Fig. 1****Fig. 2****Fig. 3****Fig. 4****Installing the Binocular Viewing Head**

Loosen the lock screw and carefully insert the binocular viewing head into the main body. Rotate the head so it is facing forward, then tighten the lock screw, as shown in Fig. 1 & 2.

Installing the Eyepieces

Remove the protective caps from the eyepiece tubes. Insert the eyepieces into the eyepiece tubes as shown in Fig. 3 & 4.

ASSEMBLY *(continued)***Fig. 5****Fig. 6****Fig. 7****Installing the Objectives**

Adjust the coarse focus knob until the mechanical stage reaches its lowest limit position.

Screw the 4 \times objective into the nosepiece from the left or the right side, then rotate the nosepiece clockwise and mount other objectives by the sequence of low to high magnification as shown in Fig. 6.

Installing the Glass Filter

Swing out the condenser holder ① (Fig. 7) and insert the filter into the holder ②. Swing the holder back in place.

ASSEMBLY *(continued)*

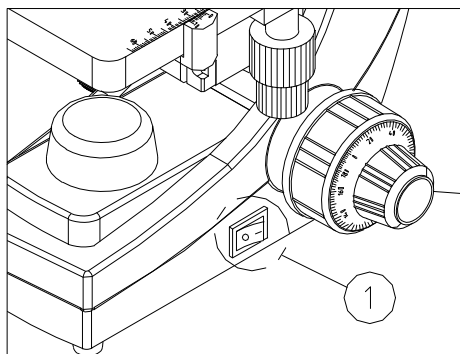


Fig. 8

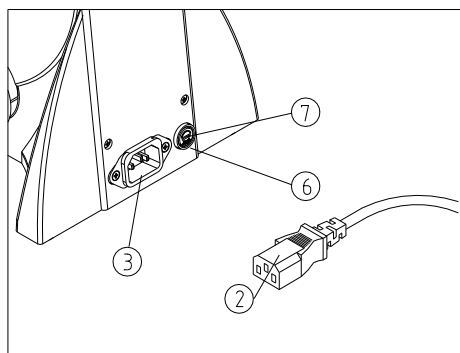


Fig. 9

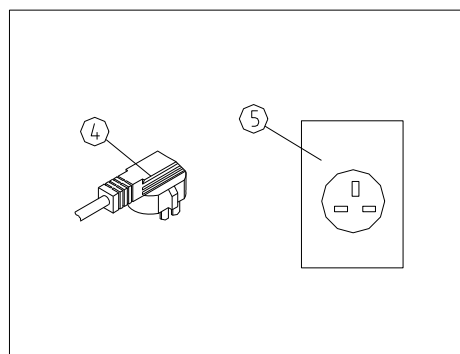


Fig. 10

Connecting the Power Cord

Do not bend or twist the power cord.

Before connecting the power cord, make sure the switch is off (O) as shown in ① (Fig 8).

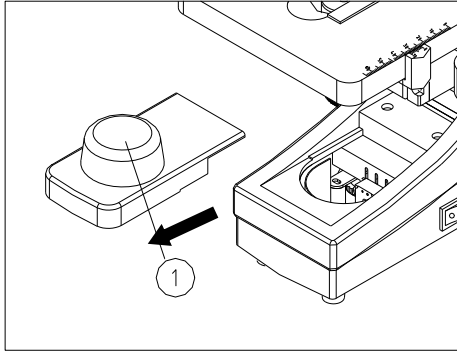
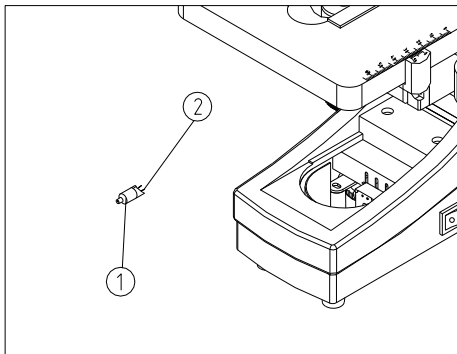
Insert the female end of the power cord plug ② securely into the power cord socket ③ on the back of the microscope (Fig. 9).

Connect the other end ④ into a 110v/220v outlet ⑤ (Fig. 10).

Replacing the Fuse

Before replacing the fuse, make sure the switch is off (O) and unplug the power cord from outlet.

Using a flat head screwdriver, remove the fuse holder ⑥ (Fig. 9), and unscrew the old fuse and insert the new fuse. Replace the fuse holder ⑦ and retighten with the screwdriver.

ASSEMBLY *(continued)***Fig. 11****Fig. 12****Installing & Replacing the Lamp**

USE ONLY the specified halogen 6 volt 20 watt lamp (CAT #3256).

DO NOT TOUCH the halogen bulb with bare hands as it may shorten the lamp life. Wrap it with gauze, a soft piece of lint-free cloth, or handle with cotton gloves.

Ensure the power switch is off and the lamp is cooled before handling.

Pull out and remove the illuminator housing ① as shown in (Fig 11), and as shown in Fig. 12, insert the pin side ② of the lamp ① completely into the lamp socket.

Reinstall the illuminator housing.

ADJUSTMENT & OPERATION

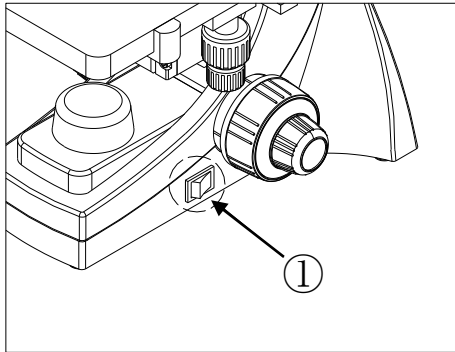


Fig. 13

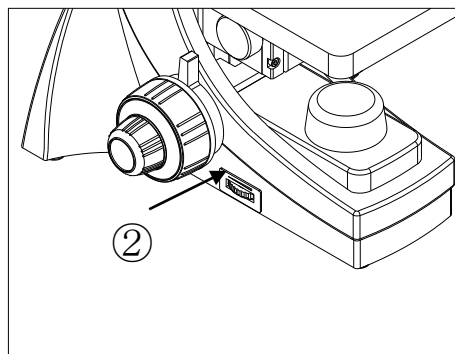


Fig. 14

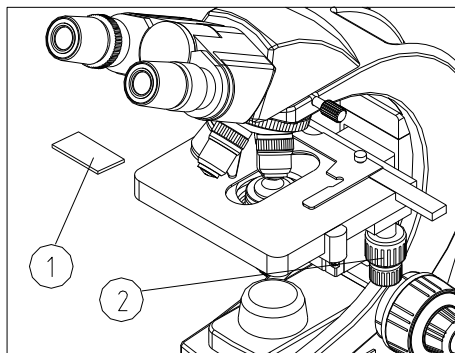


Fig. 15

Adjusting the Brightness

Connect the power supply and turn on the main switch ① (Fig. 13) .

Move the variable light intensity dial ② (Fig 14) toward the front of the microscope base to increase the brightness; turn it toward the back of the microscope base to decrease the brightness.

Placing the Specimen

Place the specimen ① on the center of the stage and use the slide holder to gently secure the slide (Fig 15).

Rotate the X and Y adjustment knobs ② of the mechanical stage to position the specimen for viewing.

Use caution when changing objectives – do not allow the objective to touch the specimen slide.

ADJUSTMENT & OPERATION *(continued)*

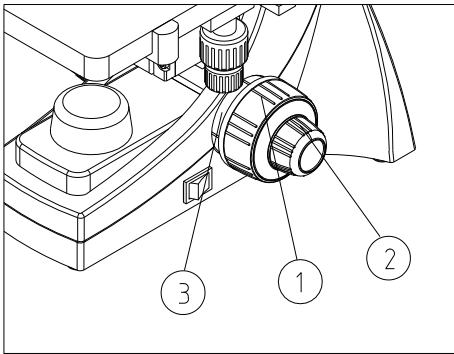


Fig. 16

Adjusting the Focusing Tension

The tension of the coarse focusing knob has already been factory adjusted. If the handle is very heavy when focusing or the specimen leaves the focus plane after focusing or the stage lowers by itself, adjust the tension adjustment collar ③ (Fig. 16).

NOTE: Rotate the tension adjustment collar toward the front of the microscope base and will tighten the coarse focusing knob.

Adjusting the Focus

To ensure that you obtain sharp images with both eyes (since individual eyes vary, especially for those wearing glasses) any eyesight variation can be corrected in the following manner: set both diopter collars to "0".

Using your left eye only and the 10X objective, focus your specimen by adjusting the coarse adjustment knob ① (Fig. 16). When the image is in view, refine the image to its sharpest focus by turning the fine adjustment knob ② (Fig. 16). Rotate the diopter collar to obtain the sharpest focus.

To obtain the same sharp image using your right eye, do not touch the coarse or fine adjustments. Instead, rotate the right diopter collar until the sharpest image appears. Repeat several times to check.

NOTE: do not counter rotate the focusing knob as this will cause damage to the focusing system.

ADJUSTMENT & OPERATION *(continued)*

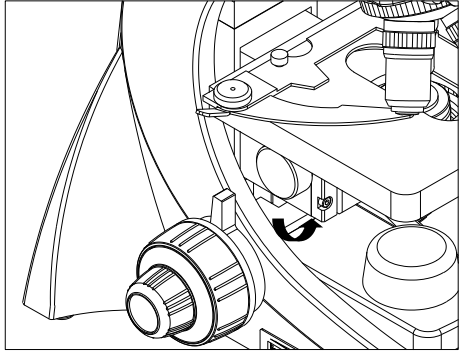


Fig. 17

Adjusting the Condenser

Turn the condenser focus knob (Fig. 17) to raise or lower the condenser. The condenser is raised when using high magnification objectives and may be lowered when using the low magnification objectives.

NOTE: the centering of the condenser and the light axes of the objective are factory adjusted – DO NOT attempt to re-adjust.

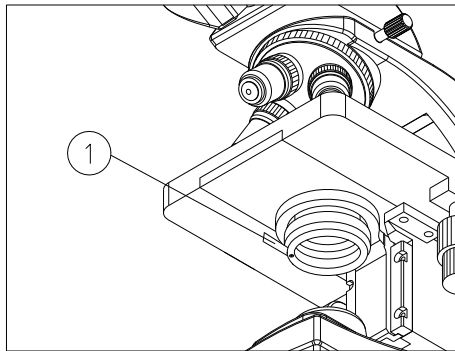


Fig. 18

Adjusting the Iris Diaphragm

Move the iris diaphragm lever (Fig. 18) left or right to adjust the aperture size.

The iris diaphragm is designed to adjust the aperture size, not to adjust brightness.

Generally, reducing the diaphragm opening to 70-80% of the N.A. value of the respective objective will provide an image of acceptable quality. If you want to observe the image of the iris diaphragm, remove one eyepiece and look through the tube. You will see a dark circle encroaching on the bottom of the tube.

ADJUSTMENT & OPERATION *(continued)*

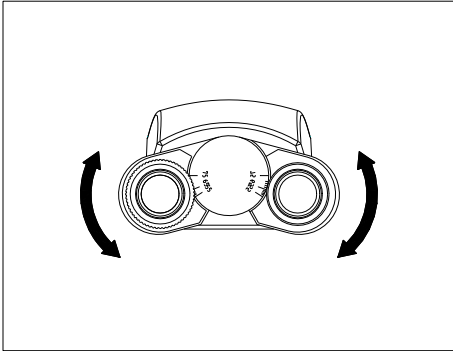


Fig. 19

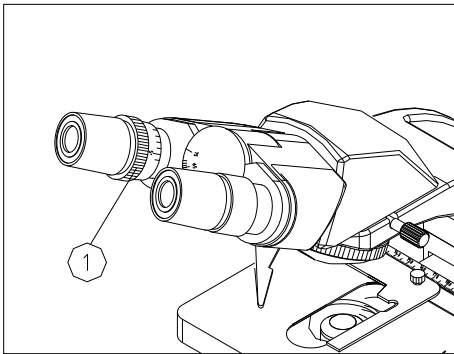


Fig. 20

Adjusting the Interpupillary Distance

To adjust the interpupillary distance, hold the left and right eyetubes (Fig. 19) while observing a specimen. Rotate the eyetubes around the central axis until the fields of view of both eyetubes coincide completely. A complete circle should be seen in the viewing field when viewing the specimen slide. An improper adjustment will cause operator fatigue and will disrupt the objective parfocality.

Where “.” on the eyepiece tube lines up, then that is the number for the interpupillary distance (IPD). Range: 52~75mm. (Fig. 19).

Remember your interpupillary for future operation.

Adjusting the Eyepiece Diopter

Using the 10x objective and your right eye only, observe your specimen through the right eyepiece and bring it into focus.

Observe the specimen with your left eye only through the left eyepiece. If the specimen is not in focus, rotate the diopter ring ① (Fig. 20) until a sharp image is viewed.

NOTE: the diopter adjustment ring is on the LEFT eyetube. The right eyetube is fixed – DO NOT attempt to rotate the right eyetube.

The diopter range is ± 5 .

LED Lamp Specifications

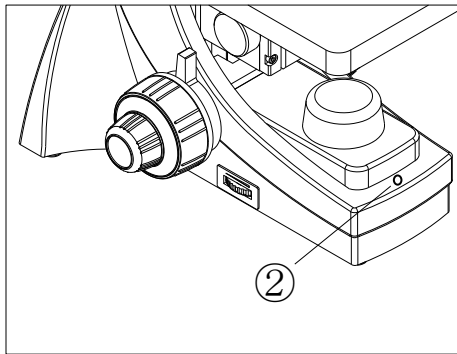
The 3002-LED-R microscope is equipped with a variable 1 watt rechargeable LED lamp. The LED lamp can last up to 5 hours on a single charge depending on the brightness level used, and is rated for 10,000 hours. The battery should come fully charged from the factory. To recharge the battery, follow the instructions below.

NOTE: The microscope can be used while recharging the battery with the power cord, and it can still operate with the power cord when the battery can no longer hold a charge and needs to be replaced.

If the LED lamp or battery needs to be replaced, contact your local authorized ACCU-SCOPE dealer or call ACCU-SCOPE at 631-864-1000 for a dealer near you.

LED Lamp Assembly **CAT# 02-3259**; Battery Pack **CAT# 02-1060** -- available only through authorized ACCU-SCOPE dealers.

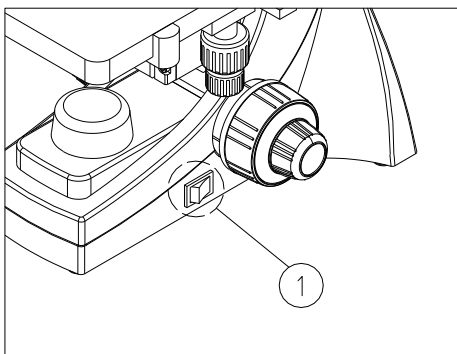
LED Illumination (For Corded or Cordless Operation)



Cordless Operation

To use the microscope for cordless operation (battery only), unplug the power cord from the wall and from the base of the microscope. Turn the power switch to the on "I" position.

The battery light indicator ② on the front of the microscope base will be green when the battery is charged, and turns red when the battery is running low.



Corded Operation

(While Recharging the Battery)

You can recharge the battery **while continuing to use the microscope**. Turn the main switch ① on the base of the microscope to the off "O" (middle) position, connect the power cord to the base of the microscope and plug the cord into a power supply outlet. Turn the main switch ① to the on "I" position.

It takes about 5-6 hours to fully recharge the battery.

NOTE: The battery light indicator ② will remain red while the power cord is plugged in and charging while using the microscope. Once the power cord is removed, the light will turn green to indicate the battery is fully charged.

NOTE: When your microscope is not in use, turn the main switch ① on the base of the microscope to the off "O" (middle) position to cut off all power (battery and AC).

Recharging the Battery

To recharge the battery **without using the microscope**, turn the main switch ① on the base of the microscope to the off "O" (middle) position, connect the power cord to the base of the microscope and plug the cord into a power supply outlet. Turn the main switch ① to the "recharge" position "II". It takes about 5-6 hours to fully recharge the battery. The battery light indicator ② will be green when charged.

ELECTRICAL SPECIFICATIONS

MODEL	ELECTRICAL	BULB TYPE	FUSE
Halogen	120v/60Hz	6v/20w	0.5A
LED	100-240v/60Hz	LED	0.5A

Troubleshooting the LED Lamp

PROBLEM	CAUSE	SOLUTION
LED lamp does not light	No power supply	Check the power cord or recharge the battery
	The LED wire is disconnected	Reconnect the LED wire <i>OR</i> call your local authorized ACCU-SCOPE dealer for service
	The LED lamp is damaged	Change the LED lamp assembly – CAT# 02-3259 <i>OR</i> call your local authorized ACCU-SCOPE dealer for service
The brightness of the LED lamp is not adequate	The rechargeable battery is aging	Replace the battery pack – CAT# 02-1060 <i>OR</i> call your local authorized ACCU-SCOPE dealer for service
	The charging circuit is not working	Replace the charging circuit board <i>OR</i> call your local authorized ACCU-SCOPE dealer for service

TECHNICAL SPECIFICATIONS

Objective Tube Length	160mm
Viewing Head	Monocular, Binocular or Trinocular Head, 30°Inclined; Interpupillary Distance 52-75 mm
Eyepiece	WF 10x; 18mm Field of View
Nosepiece	Forward Facing Quadruple Nosepiece
Objective	Achromatic objectives 4X, 10X, SP40XR, 100XR oil
Focusing	Coaxial coarse and fine focusing system; the minimum division of fine focusing: 0.002mm; focus adjustment range: 23mm
Condenser	Abbe Condenser NA=1.25 with Iris Diaphragm & Filter Holder
Stage	Double Plate Mechanical Stage 140mmx140mm, Movement Range 75x50mm
Illumination	Halogen Lamp 6V 20W or 1 watt LED

Objectives

Magnification	Numerical Aperture (NA)	Thickness of cover slip (mm)	Working Distance (mm)	Type
4X	0.10	0.17	37.5	Dry
10X	0.25	0.17	7.316	Dry
40X	0.65	0.17	0.632	Dry
100X	1.25	0.17	0.198	Oil

Eyepieces

Category	Magnification	Field of view (mm)
Wide Field	10x	Φ18

Total Magnification

Eyepiece	10x	10x	10x	10x
Objective	4x	10x	40x	100x
Total Magnification	40x	100x	400x	1000x

Electrical

MODEL	ELECTRICAL	BULB TYPE	FUSE
Halogen	120v/60Hz	6v/20w	0.5A
LED	100-240v/60Hz	LED	0.5A

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 PROBLEMS

Problem	Cause	Solution
Darkness at the periphery or uneven brightness in the field of view	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 coverglass attached to the slide	Attach a 0.17mm coverglass
	Coverglass is too thick or thin	Use a coverglass of the appropriate thickness -- 0.17mm
	Slide may be upside down	Turn slide over so the coverglass faces up
	Immersion oil is on a dry objective (especially the 40xR)	Check the objectives; clean if needed
	No immersion oil used with 100xR 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 position too low	Position the condenser at the upper limit

TROUBLESHOOTING *(continued)*

IMAGE PROBLEMS

Problem	Cause	Solution
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	Rotate the nosepiece in the click-stop position
Image tinged yellow	Blue filter not used	Use daylight blue filter
	Lamp intensity is too low	Adjust the light intensity by rotating the intensity control dial
Image is too bright	Lamp intensity is too high	Adjust the light intensity by rotating the intensity control dial
	Aperture diaphragm closed too far	Open to the proper setting
	Condenser position too low	Position the condenser at the upper limit
Insufficient Brightness	Lamp intensity is too low	Adjust the light intensity by rotating the intensity control dial
	Aperture diaphragm closed too much	Open to the proper setting
	Condenser position is too low	Position the condenser at the upper limit

TROUBLESHOOTING *(continued)*

MECHANICAL PROBLEMS

Problem	Cause	Solution
Image will not focus with high power objective	Slide upside down	Turn the slide over so the coverglass faces up
	Cover glass is too thick	Use a 0.17mm coverglass
High power objective contacts slide when changed from low power objective	Slide upside down	Turn the slide over so the coverglass faces up
	Cover glass is too thick	Use a 0.17mm coverglass
	Diopter adjustment is not set properly	Readjust the diopter settings
Lamp does not light when switched on	No electrical power	Check power cord connection
	Lamp burnt out	Replace lamp
	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 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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