



MANUAL

3000-LED **MICROSCOPE SERIES**



CONTENTS

SAFETY NOTES 3

CARE AND MAINTENANCE 3

INTRODUCTION 4

UNPACKING AND COMPONENTS DIAGRAMS 4-5

ASSEMBLY DIAGRAM & PROCEDURE 6-8

ADJUSTMENT & OPERATION

 ILLUMINATION 9

 MIRROR 9

 SPECIMEN SLIDE 9

 FOCUSING 10

 INTERPUPILLARY DISTANCE 10

 FIELD DIAPHRAGM 11

 APERTURE DIAPHRAGM 11

 OIL OBJECTIVE 12

 FILTER 13

 FUSE REPLACEMENT 13

 LED BULB REPLACEMENT 14

TECHNICAL SPECIFICATIONS 16

TROUBLESHOOTING 17-19

MAINTENANCE 20

SERVICE 20

WARRANTY 20

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.

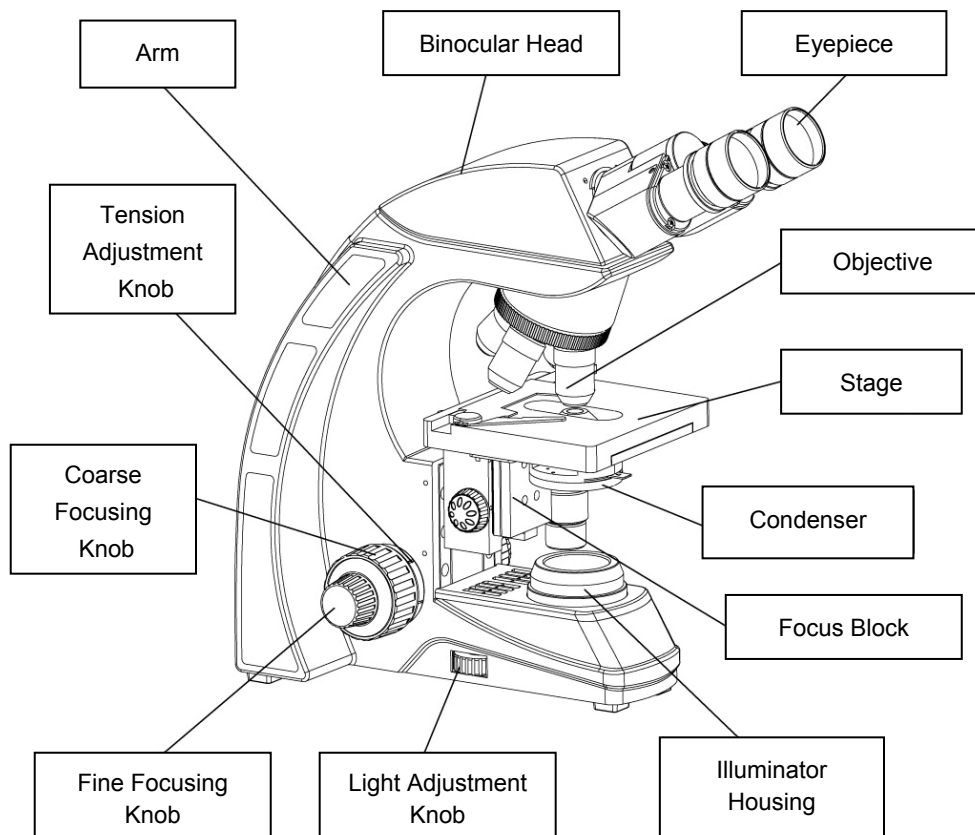
INTRODUCTION

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.

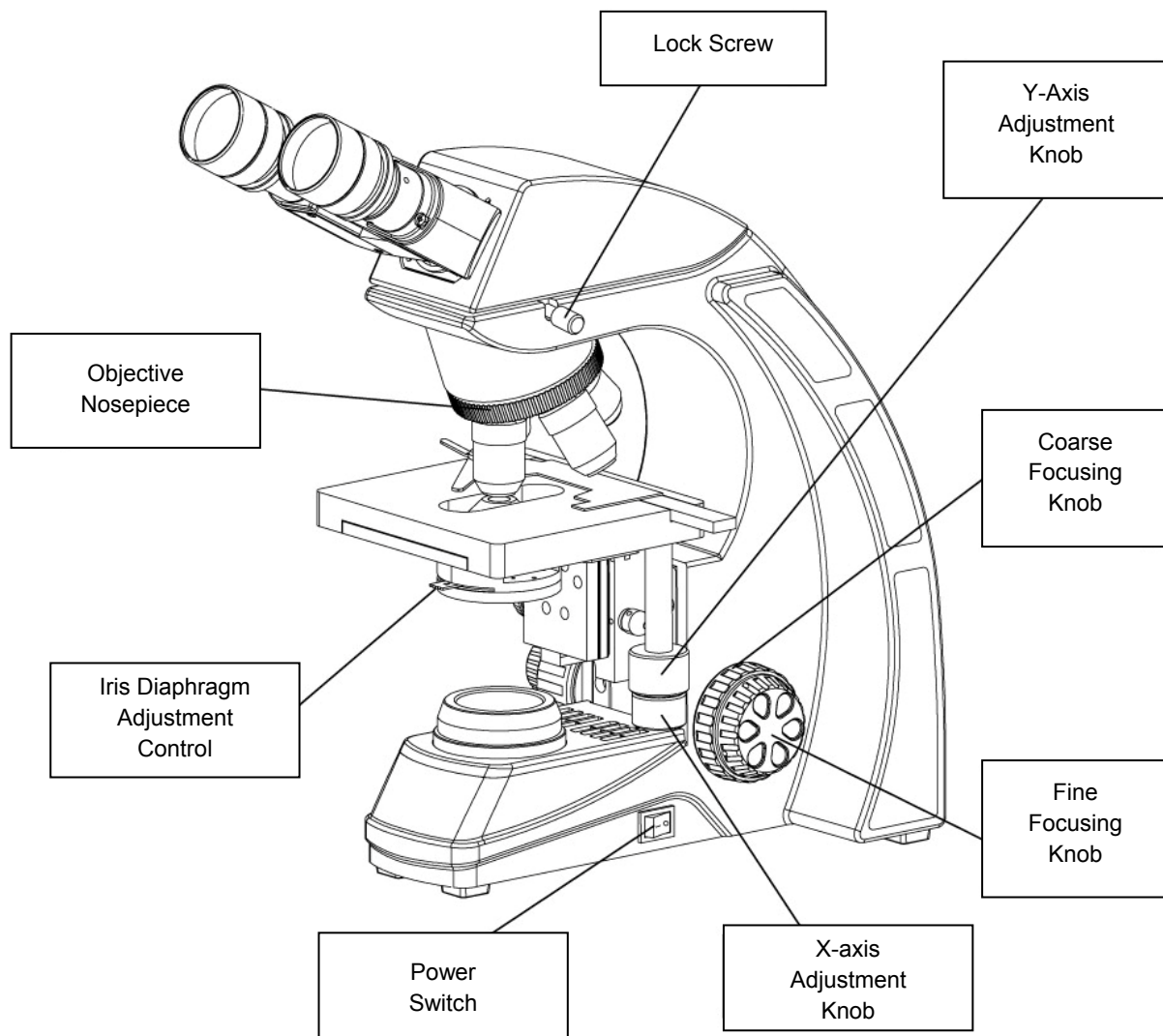
UNPACKING AND COMPONENTS

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



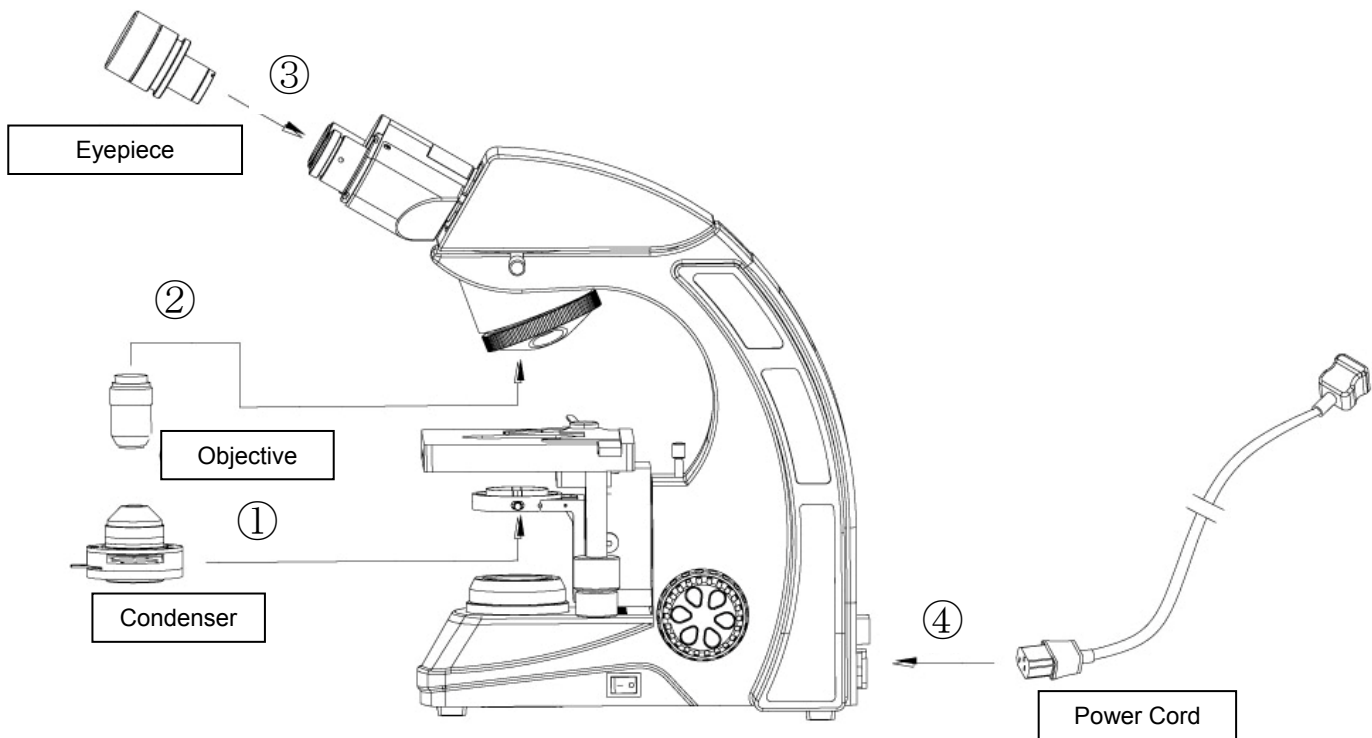
COMPONENTS DIAGRAM



ASSEMBLY DIAGRAM

The diagram below shows how to assemble the various modules. 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)*

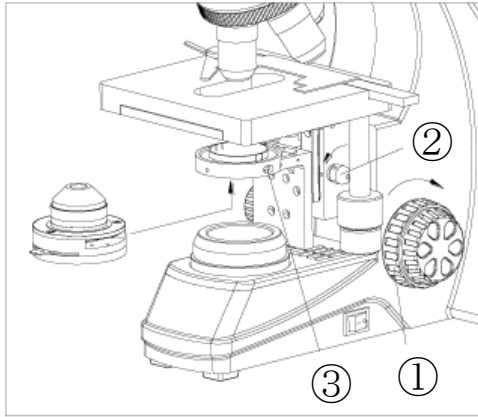


Fig. 1

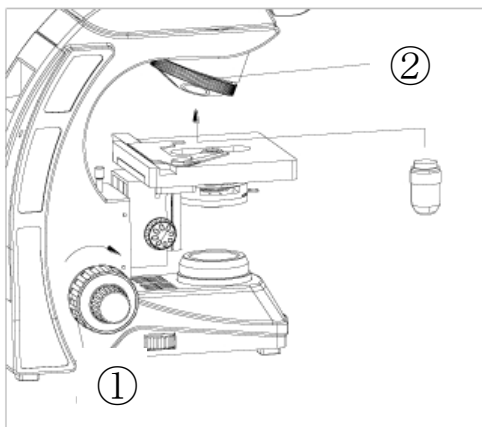


Fig. 2

Condenser

The condenser was installed and centered by our technicians prior to delivery. If the condenser needs to be re-installed or adjusted in the future, rotate the coarse focusing knob ① to raise the stage to the highest position (see Fig. 1).

Rotate the condenser up-down knob ② to lower the bracket of condenser to the suitable position.

Fully loosen the condenser lock-screw ③.

Insert the condenser into the hole of the stand according to the directional arrow, until the condenser is even with the stand, and then rotate the condenser to make sure the iris diaphragm control lever faces forward.

Tighten the lock-screw ③ of the condenser, then raise the condenser with the up-down knob to the highest position.

Objectives

Rotate the coarse focusing knob ① to lower the stage to a suitable position (see Fig. 2).

Install the objectives into the objective nosepiece ② from the lowest magnification to the highest in a clockwise direction from the rear.

ASSEMBLY *(continued)*

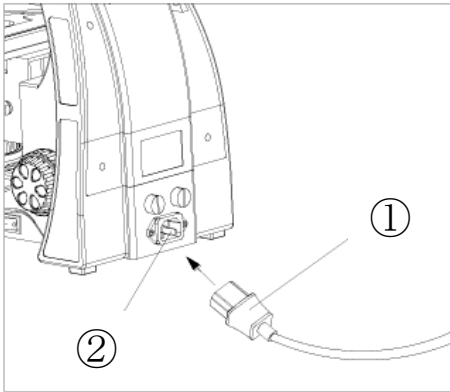


Fig. 3

Connecting the Power Cord

IMPORTANT: Use care when storing the power cord so that it does not bend or twist.

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

Insert the connector ① of power cord securely into the power socket ②, (see Fig. 3).

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.

An optional cord hanger can be installed on your microscope for simple and easy storage. (see Photos 1 & 2)

Photo 1

*Optional
Cord Hanger*

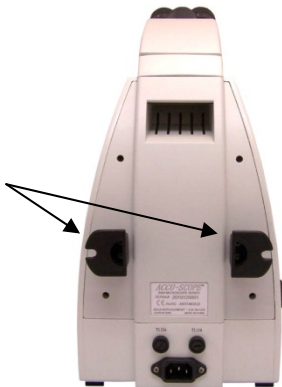
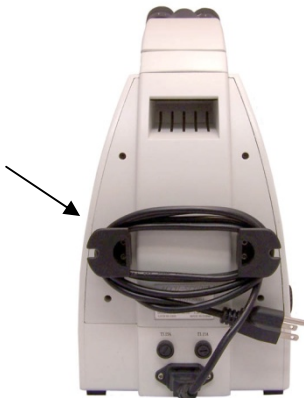


Photo 2

*Optional
Cord Hanger
Shown
With Cord*



ADJUSTMENT & OPERATION

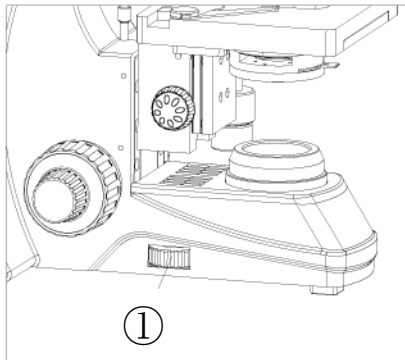


Fig. 4

Illumination

With the microscope turned on, rotate the light adjustment knob ① until the illumination is comfortable for observation. Rotate the light adjustment knob clockwise to raise the voltage and brightness. Rotate the light adjustment knob counterclockwise to lower the voltage and brightness (see Fig. 4).

Installing A Mirror (Optional)

Turn the power switch to the “0” off position.

Loosen the Allen screw ① with an Allen wrench to screw off the built-in illuminator housing ② (see Fig. 5).

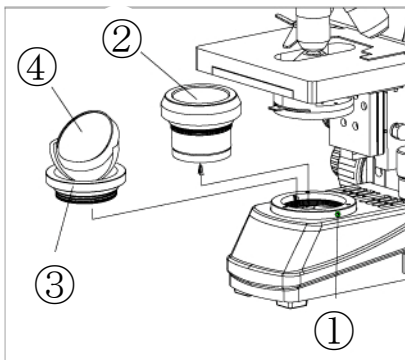


Fig. 5

Screw on the mirror ③ according to the directional arrow, and tighten the Allen screw ① with the Allen wrench.

Rotate the mirror stand ④, to fill the field with light.

Placing the Specimen Slide

Push the slide finger ① of the specimen holder backwards.

Place the slide ② into the slide holder with the cover glass facing up and 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. (Fig. 6)

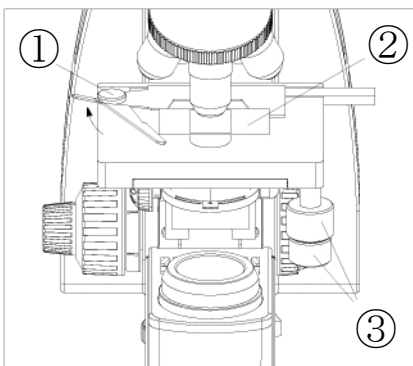


Fig. 6

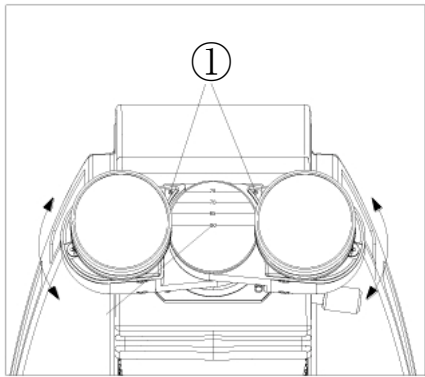


Fig. 7

Adjusting the Interpupillary Distance

To adjust the interpupillary distance, hold the left and right eyetubes 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 “.” ① on the eyepiece tube lines up, then that is the number for the interpupillary distance. Range: 50~75mm. (Fig. 7).

Remember your interpupillary for future operation.

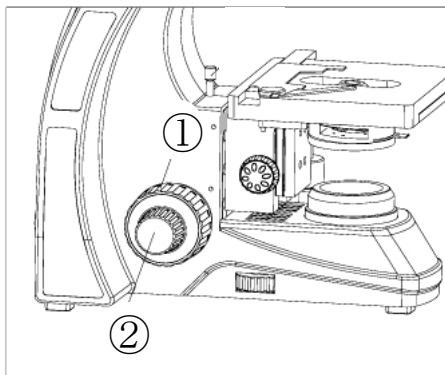


Fig. 8

Adjusting the Focus

To ensure that you obtain sharp images with both eyes (since 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. When the image is in view, refine the image to its sharpest focus by turning the fine adjustment knob ②. 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 severe problems and damage to the focusing system. (Fig. 8)

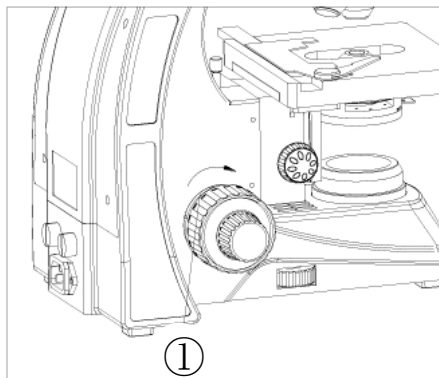


Fig. 9

Adjusting the Focusing Tension

If the handle is very heavy when focusing or the specimen leaves the focus plane after focusing or the stage lowers by itself, please adjust the tension adjustment ring ①. Located on the left side of the stand between the coarse adjustment knob and the vertical arm is an adjustable tension control dial that is preset at our facility. This allows the user to adjust the coarse control tension to their individual preference. (Fig. 9).

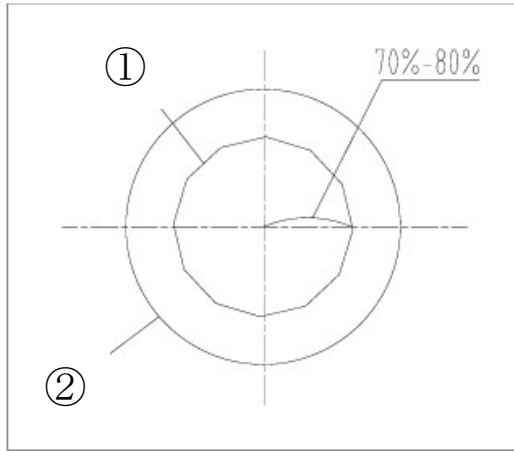


Fig. 10

Adjusting the Field Diaphragm (Optional)

By limiting the diameter of the light entering the condenser, the field diaphragm can prevent other light and strengthen the image contrast. When the image is just on the edge of the field of view, the objective can show the best performance and obtain the clearest image (Fig. 10).

Iris Diaphragm Koehler Illuminator Condenser Optional

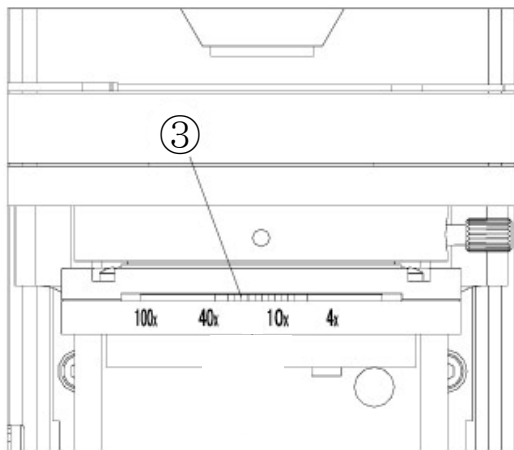


Fig. 11

Adjusting the Aperture Diaphragm

The aperture size is increased or decreased by rotating the condenser aperture diaphragm lever ③. When the aperture is closed, the brightness and resolution are decreased but the contrast and range of focus are increased. If the aperture diaphragm is opened, the brightness and resolution are increased; however, the contrast and range of focus are diminished. For optimal viewing conditions set the condenser aperture diaphragm lever to match the magnification of the objective in the optical path (Fig. 11).

Using the Oil Objective (100x)

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 ① (Fig 12). 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.

Rotate the nosepiece so the 100xR oil immersion objective is in the light path.

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.

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) and deforming its optical performance, prevent dust and dirt from accumulating on the lens of the objective and degrading its optical performance, and will keep the slide clean to work with.

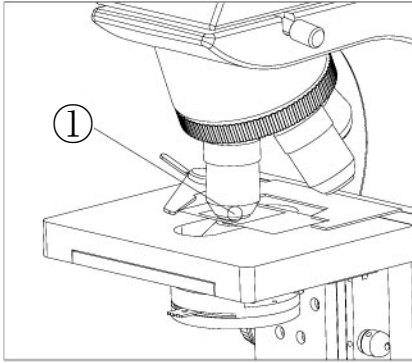


Fig. 12

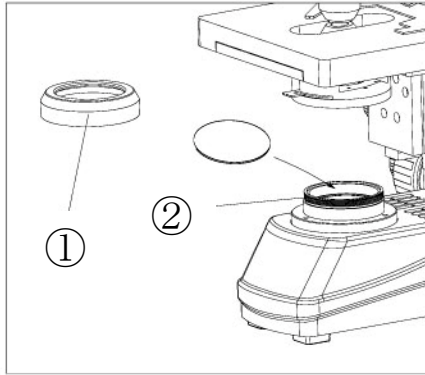


Fig. 13

Using & Installing A Filter

A filter is used to make the background color more suitable for the application and as a method to increase the contrast.

Using a small jeweler's flathead screwdriver, remove the set screw that secures the illuminator housing cover ① to illuminator condenser. Install the filter (rough side downward) onto the groove of the illuminator condenser ②. Place the cover back on the illuminator condenser and re-install the set screw (Fig. 13).

Filters are available in clear blue, frosted blue, green, yellow and white.

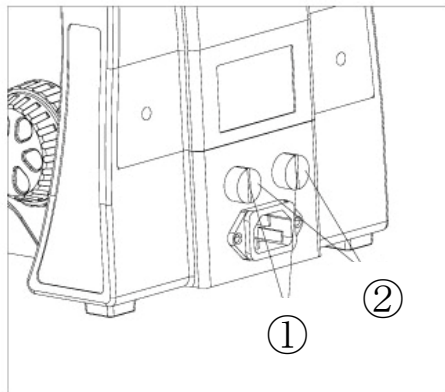


Fig. 14

Replacing the Fuses

Turn the main switch to "0" (OFF) before replacing a fuse. Unplug the power cord from the microscope. Screw off the fuse ① or ② from the fuse base with a Phillip's head type screwdriver. Install a new fuse and screw it on the fuse base (see Fig. 14).

Specification of the fuse: 250V, 3.15A.

CAT #00-3277-3A



Figure 15

Replacing the LED Bulb

Turn the main switch to “0” (OFF) before replacing the LED bulb. Unplug the power cord from the microscope.

Gently place the microscope on its arm as shown in Figure 15.



Figure 16

Using a Philips head screwdriver, remove the 4 screws to release the base plate (Figure 16).

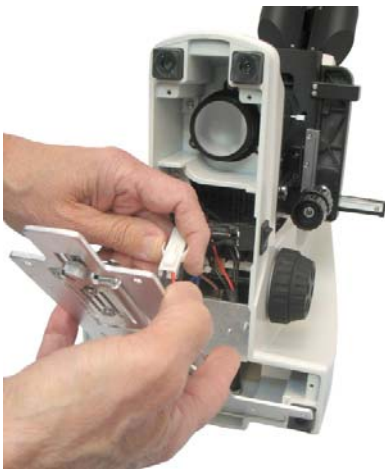


Figure 17

Disconnect the make/break connector (Figure 17).

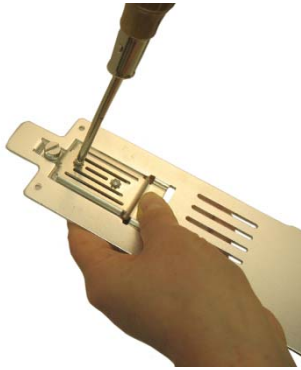


Figure 18

Replacing the LED Bulb *(continued)*

Using a Philips head screwdriver, unscrew the 2 screws to remove the LED bulb from its mount (Figure 18).

Install the new bulb in position and screw it to its mount (Figure 19 & Figure 18 above).

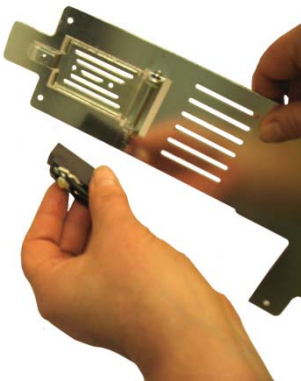


Figure 19

Reinstall the base plate and reconnect the make/break connector with the connector from the new bulb (Figure 20).

Secure the base plate with the 4 Philips screws (Figure 21).

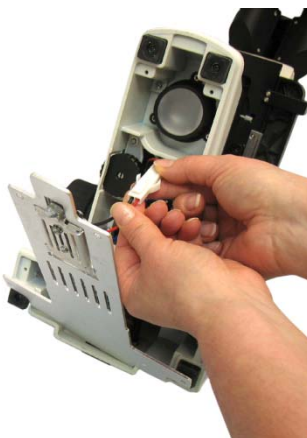


Figure 20



Figure 21

NOTE: With the new bulb installed, the condenser may need to be re-centered. To adjust the condenser centration, please follow the Assembly instructions for the Condenser on page 7.

TECHNICAL SPECIFICATIONS

Optical system	AIS E-Plan optical system
Head	Siedentopf binocular viewing head, inclined 30°
Eyepiece	PL10X/20mm diopter adjustable eyepiece, 20mm field of view
Nosepiece	Reversed quadruple nosepiece
Objective	AIS E-Plan achromat objective (4X, 10X, 40X, 100X)
Focusing system	Coaxial coarse & fine focusing system, with stop limit & tension adjustment. Travel range: 25mm. Fine focusing precision: 0.002mm
Stage	Built in low position coaxial control mechanical stage, area 140x132mm, moving range 76x50mm
Condenser	Built-in Koehler illuminator systems, Pre-centered. Iris diaphragm Koehler illuminator condenser and mirror optional.
Illuminator	Universal power supply 90~240V voltage, 3W LED light with variable intensity control
Operation Environment	<ul style="list-style-type: none"> • Indoor use • Altitude: max. 2000m • Environment temperature: 5°C-40°C (41°F-109°F) • Max. relative humidity: 80% at 31°C (88°F) , and then declined linearly. 70% at 34°C (93°F) , 60% at 37°C (99°F) , 50% at 40°C (104°F) . • Degree of pollution: 2 (refer to IEC664)

Objectives

Type	Objective	Numerical aperture (N.A.)	Conjugate distance (mm)	Parfocal distance (mm)	Thickness of the cover slip	Magnification market (color ring)
Infinity Plan achromatic objective	4X	0.10	∞	45	0.17	Red
	10X	0.25	∞	45	0.17	Yellow
	40X(S)	0.65	∞	45	0.17	Light Blue
	100X(S) oil	1.25	∞	45	0.17	White

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	Revolve 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 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 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 Revolving nosepiece is not in the click-stop position	Secure the specimen in the slide holder Revolve the nosepiece to the click-stop position
Image tinged yellow	Lamp intensity is too low Blue filter not used	Adjust the light intensity by rotating the intensity control dial and/or iris diaphragm 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 Aperture diaphragm closed too far Condenser position too low	Adjust the light intensity by rotating the intensity control dial and/or iris diaphragm Open to the proper setting Position the condenser slightly lower than the upper limit

MECHANICAL PROBLEMS

Image will not focus with high power objectives	Slide upside down Cover glass is too thick	Turn the slide over so the cover glass faces up Use a 0.17mm cover glass
High power objective contacts slide when changed from low power objective	Slide upside down Cover glass is too thick Diopter adjustment is not set properly	Turn the slide over so the cover glass faces up Use a 0.17mm cover glass 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 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.

ACCU-SCOPE is a registered trademark of ACCU-SCOPE INC., Commack, NY 11725