



# MANUAL



## 3012-LED 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 shipping carton; 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 halogen lamp or fuse, be sure the main switch is off ("O"), remove the power cord, and replace the halogen 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.

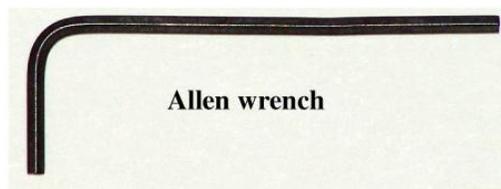
## **IMPORTANT NOTICE TO PREVENT DAMAGE TO THE STAGE**

To prevent damage to the mechanical stage during transit, the mechanical stage is locked into place by a metal plate and two screws.

**PRIOR TO OPERATION** of the microscope, the metal plate and both screws **MUST** be removed.

An Allen wrench is included in the shipping carton to use for removing the screws. Failure to remove the metal plate and two screws prior to operation will cause severe damage to your mechanical stage.

See diagram on next page.



Allen wrench

## 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<sup>®</sup> microscope. ACCU-SCOPE<sup>®</sup> microscopes are engineered and manufactured to the highest quality standards. Your microscope will last a lifetime if used and maintained properly. ACCU-SCOPE<sup>®</sup> 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

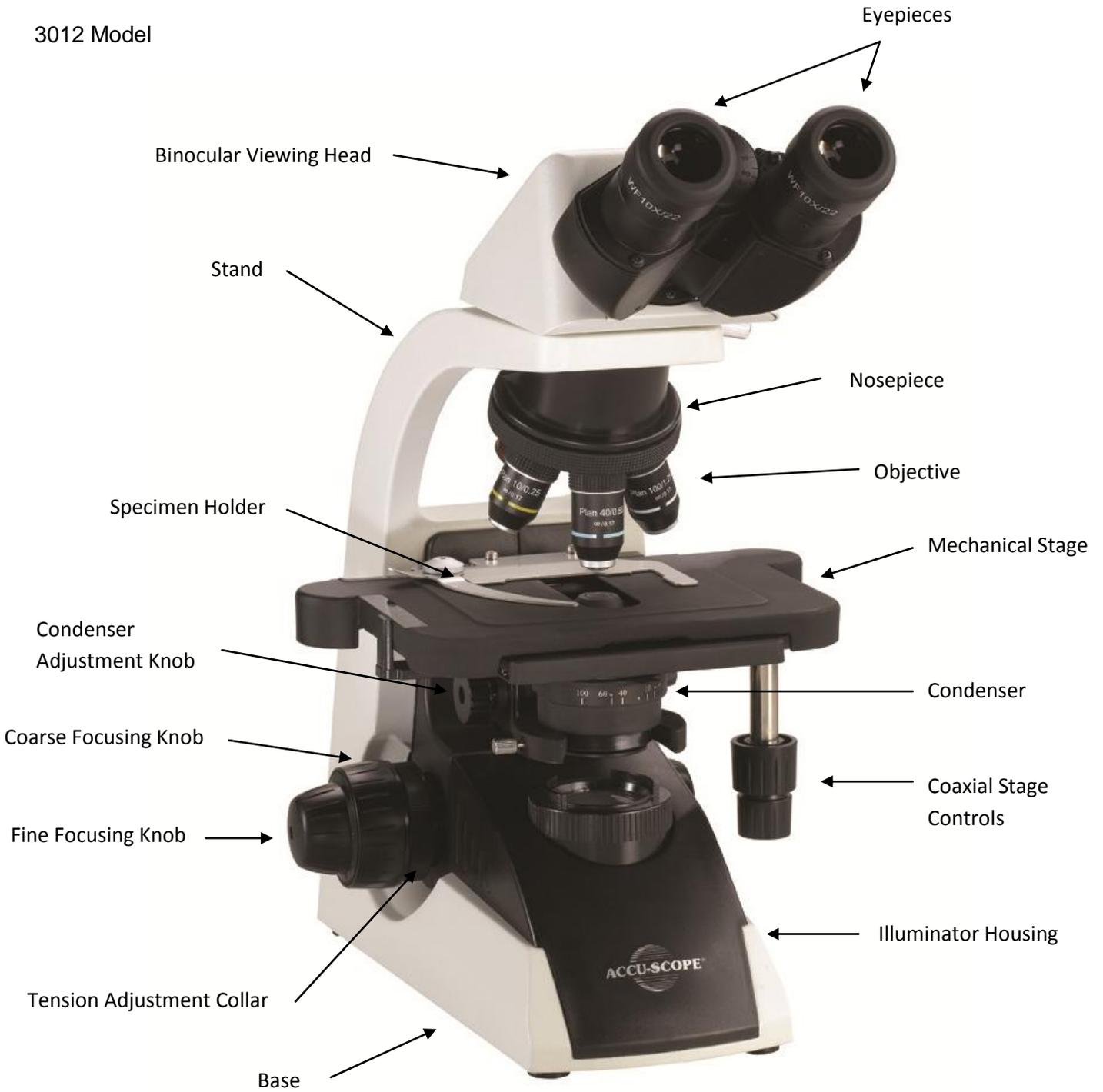
Your microscope arrived packed in a molded shipping carton. ***Do not discard the carton:*** the carton should be retained for reshipment of your microscope if needed. Avoid placing the microscope in dusty surroundings or in high temperature or humid areas as mold and mildew will form. Carefully remove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

1. Stand, which includes the supporting arm, focusing mechanism, mechanical stage, slide holder, nosepiece, N.A. 1.25 Abbe condenser with iris diaphragm and illumination system.
2. Viewing head (binocular or trinocular depending upon the model ordered)
3. Eyepieces as ordered
4. Objectives as ordered
5. Immersion oil
6. Dust cover
7. 3-prong electric power cord

Optional accessories such as optional objectives and/or eyepieces, slides sets, etc., are not shipped as part of the standard equipment. These items, if ordered, are shipped separately.

# COMPONENTS DIAGRAM

3012 Model



## COMPONENTS DIAGRAM

3013 Trinocular Model



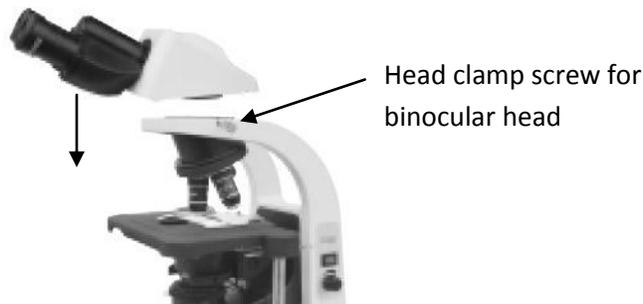
## ASSEMBLY

### Objectives

The objectives have been pre-installed on the microscope. Always rotate the nosepiece by using the knurled nosepiece ring.

### Viewing Head

Remove the protective plastic disk from the head and neck. Loosen the viewing head clamp screw slightly and set the head onto the microscope arm. Tighten the thumb screw to lock the head in the desired position. Ensure the viewing head is firmly secured by the dovetail and thumb screw before releasing your hold.



### Eyepieces

Remove the eyetube plugs and insert the eyepieces into the eyepiece tubes. Lock in the eyepieces using the supplied Allen wrench to tighten the Allen screw on each eyetube.

### Mechanical Stage

The mechanical stage is held in place by a metal retainer. Remove the two screws holding the retainer using the supplied Allen wrench.

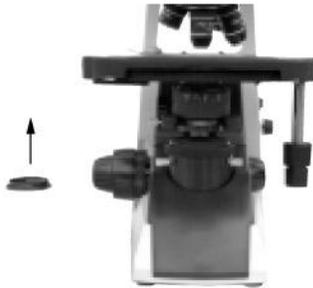
### Condenser

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, please follow the following procedure: from below, mount the condenser on the condenser holder with the aperture control lever facing forward. Tighten the two centering screws until the condenser is in the center of the field of view when the diaphragm is closed.

## ASSEMBLY *(continued)*

### Filter

If desired, a blue filter may be installed onto the bottom of the condenser. **NOTE:** When installing the filter, hold it from the edges as you do not want to leave fingerprints on the filter. Remove the filter holder from the bottom of the condenser and insert the filter into the filter holder. Insert the filter holder back into the bottom of the condenser.



### 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.

## OPERATION

Plug the 3-prong line cord into the microscope and then into a grounded 120V or 220V A.C. electrical outlet. Usage of a surge suppressor outlet is highly recommended. Turn the illuminator switch to “—.” For longer bulb life always turn the illuminator variable intensity knob to the lowest illumination intensity setting possible before turning the power on or off.

### Binocular or Trinocular Viewing Head

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.

## **OPERATION** *(continued)*

### **Illumination**

The light level may need adjustment depending upon the specimen density and objective magnification. Adjust the light intensity for comfortable viewing. The illumination level may vary when changing from one objective to another. To eliminate irregular light when using low power objectives (4X, 10X) raise or lower the condenser using the condenser adjustment knob. The iris diaphragm should be slightly opened or closed to obtain optimal contrast of the specimen being observed. Adjust the iris diaphragm to the smallest size allowable for a clear, sharp image of the specimen. The setting for the iris diaphragm will vary depending on the specimen being viewed.

### **Focusing**

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. When the image is in view, refine the image to its sharpest focus by turning the fine adjustment knob. 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 knobs as this will cause severe problems and damage to the focusing system.

Interpupillary Distance Adjustment



Diopter Adjustment Rings

### **Adjustable Tension Control**

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.

## **OPERATION** *(continued)*

### **Aperture Diaphragm Adjustment**

The aperture size is increased or decreased by rotating the condenser aperture diaphragm lever. 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.

### **Using Oil Immersion**

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

1. Rotate the nosepiece so the low power objective is in the optical path.
2. Place one drop of immersion oil on the lighted area of the specimen slide. 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.
3. Rotate the nosepiece so the 100xR oil immersion objective is in the light path.
4. 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.
5. 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 degrading 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.

### **Focus Stop**

The focus stop on the ACCU-SCOPE 3012-LED Series is built-in for ease of use and is pre-adjusted by our factory technicians.

### **Lamp Replacement**

The LED lamp is rated for 20,000 hours and should last for many years under normal use. However, should your lamp need replacing, please contact an authorized ACCU-SCOPE service center or call ACCU-SCOPE at 1-888-289-2228 for an authorized service center near you.

**Replacement Bulb: Catalog #12-3259 (5 watt LED with heat sink)**

## 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

<b>Problem</b>	<b>Cause</b>	<b>Corrective Measure</b>
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  Lamp bulb burnt out  Fuse blown out	Check power cord connection  Replace bulb  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<sup>®</sup> 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<sup>®</sup> distributor can arrange for this service. Should unexpected problems be experienced with your instrument, proceed as follows:

1. Contact the ACCU-SCOPE<sup>®</sup> 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<sup>®</sup> distributor or to ACCU-SCOPE<sup>®</sup> 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. LED lamps are warranted for a period of two years from the date of original invoice to the original (end user) purchaser. The mercury power supply 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 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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