
UNITRON®

Z645 SERIES

ZOOM STEREO MICROSCOPE

MANUAL



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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. 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.  **FUSE REPLACEMENT --** For safety when replacing the fuse (ONLY replace with the same size, type and rating of original fuse), be sure the main switch is in the off position, disconnect the power cord from outlet, and replace the fuse. Reconnect the power cord and turn unit on.
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.
NOTE: Always plug the microscope power cord into a suitable grounded electrical outlet. A grounded 3-wire cord is provided.

CARE AND MAINTENANCE

1. Do not attempt to disassemble any component including eyepieces, objectives 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. UNITRON® 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 UNITRON® distributor can arrange for this service.

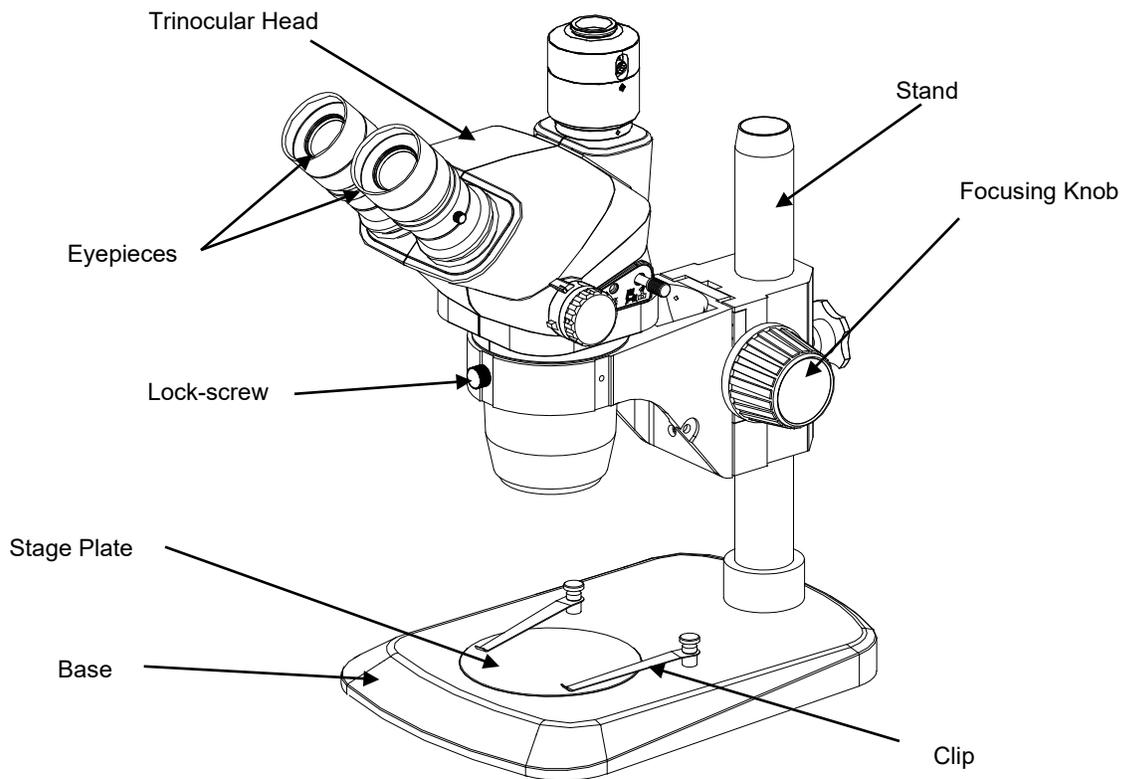
INTRODUCTION

Congratulations on the purchase of your new UNITRON® microscope. UNITRON microscopes are engineered and manufactured to the highest quality standards. Your microscope will last a lifetime if used and maintained properly. UNITRON 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

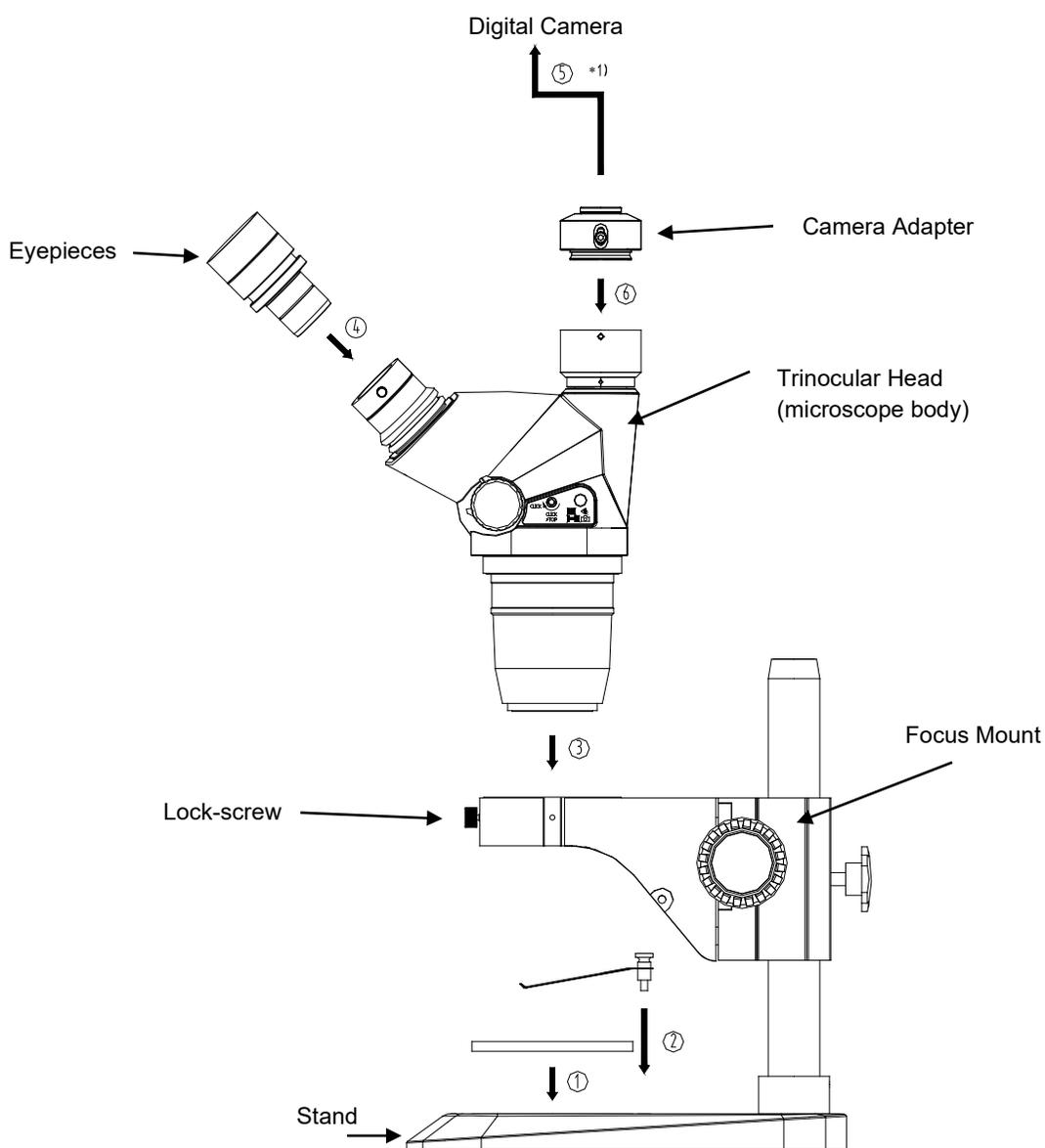


NOTE: Stand ordered may not be as pictured above.

ASSEMBLY

The diagram below shows how to assemble the various modules. The numbers indicate the order of assembly.

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



DETAILED ASSEMBLY PROCEDURE

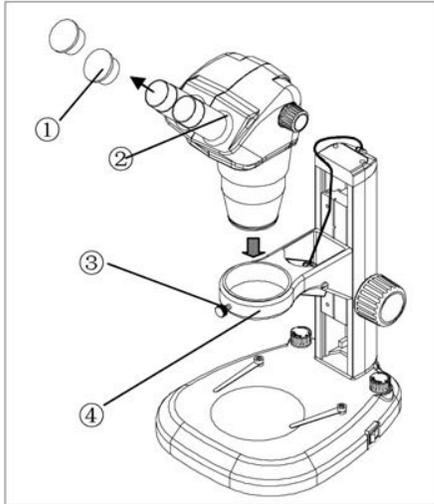


Fig. 1

Mounting the Binocular Head (Fig. 1)

Loosen the lock screw ③ on the focus mount ④ and insert the binocular head and zoom body assembly ② into the bracket of the focus mount, then tighten the lock screw ③.

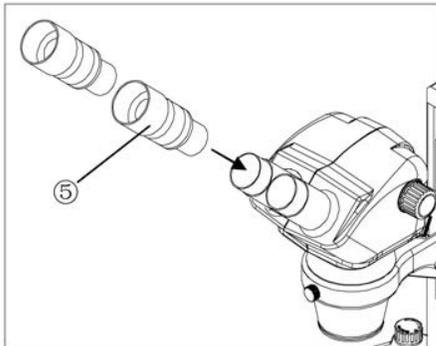


Fig. 2

Mounting the Eyepieces (Fig. 1, Fig. 2, Fig. 3)

Remove the eyepiece dust caps ① (Fig. 1) and gently insert the two adjustable eyepieces ⑤ (Fig. 2) into the eyepiece sleeves until they stop, as shown in Fig.3. Replace the dust caps when not in use.

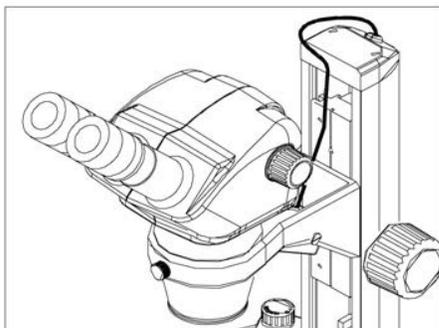


Fig. 3

IMPORTANT

ENVIRONMENT REQUIREMENTS

- 1 Ambient temperature: 0°C to 40°C (32°F to 104°F), Maximum R.H : 85%.
- 2 High temperatures and wide swings in temperature will result in moisture and mildew and could damage instrument.
- 3 Avoid placing the instrument in a dusty environment. When not in use, cover the microscope with the dust cover.
- 4 Keep the microscope on a flat and stable surface.

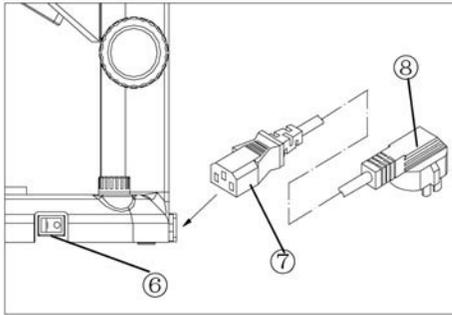


Fig. 4

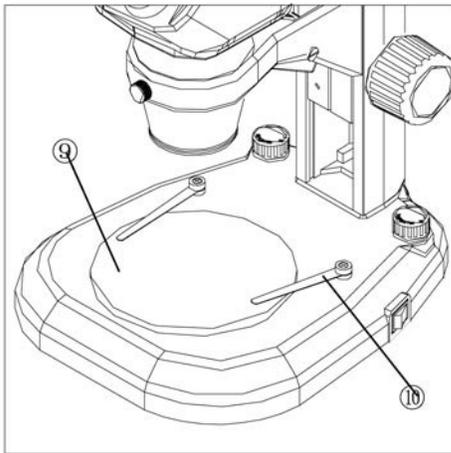


Fig. 5

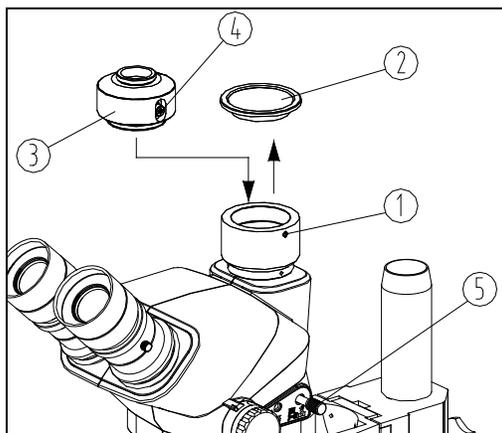


Fig. 6

For Microscopes Purchased With Illuminated Stands

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. 4)

Turn the power switch ⑥ to the off position (O) before connecting the power cord ⑦.

Insert the power cord plug ⑦ into the power jack of the microscope; make sure the connection is snug.

Plug the power cord ⑧ into the power supply receptacle.

Using the Glass Stage (Fig. 5)

Set the glass stage plate ⑨ on the center of the base, and secure the slide with the two clips ⑩.

Video/Photography Accessories Assembly and Use (Fig. 6)

Loosen the lock screw ① of trinocular head with an Allen key and remove the dust cover ②.

Thread the camera adapter ③ onto the bottom of the camera.

Insert the camera adapter ③ with camera into the camera port in the direction shown in Fig. 6, and tighten the lock screw ①.

Focus on a sample using the eyepieces, then compare to the live image on the camera software. If the camera image is out of focus, loosen the adjustment screw ④ on the camera adapter ③, and move the adjustment screw ④ up and down for focusing, then lock the adjustment screw ④ until the image is clear. (See Fig. 6)

★ Rotate the camera tube, to make the camera display image and the observation image in the same direction.

ADJUSTMENT AND OPERATION

Adjusting Binocular Viewing Head

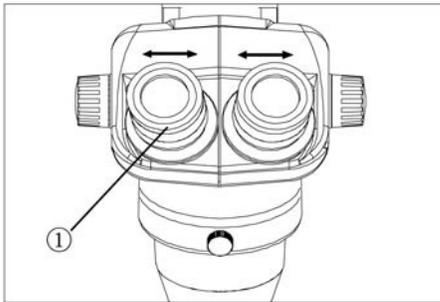


Fig. 7

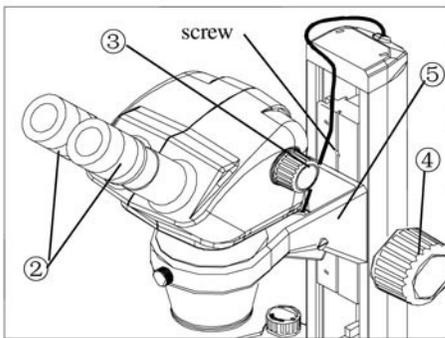


Fig. 8

Adjusting Interpupillary Distance (Fig. 7)

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

While looking through the eyepieces, hold the left and right eyetubes of the viewing head and adjust the eyetubes by opening or closing them until the left and right fields of view coincide completely and you are able to see a complete circle.

Adjusting Diopter Ring (Fig. 8)

Set the diopter rings ② of both eyepieces to “0” position. (Do this when users change, because different users will have different diopter settings.)

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

Rotate the zoom knob ③ to the highest magnification 5x, then turn the focusing knob ④ to focus the specimen.

Rotate the zoom knob ③ to the lowest magnification 0.8x, looking only into the left eyepiece, adjust the diopter ring on left eyepiece to focus the specimen. Then repeat procedure for the right eyepiece.

NOTE: The working distance (the distance between the microscope objective to the top of the specimen) of the microscope is 115mm, the binocular head bracket ⑤ can be mounted onto higher or lower positions according to your needs by removing the clamping bolt with the Allen wrench provided.

Focus Adjustment

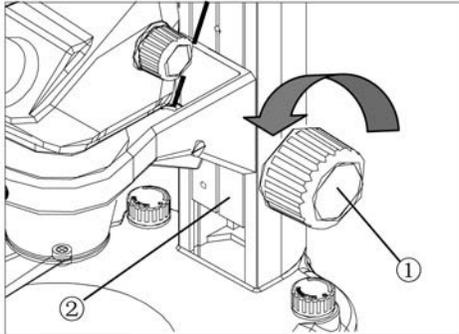


Fig. 9

Adjusting the Rotation Tension of the Focus Adjustment Knob (Fig. 9, Fig. 10)

To adjust 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.

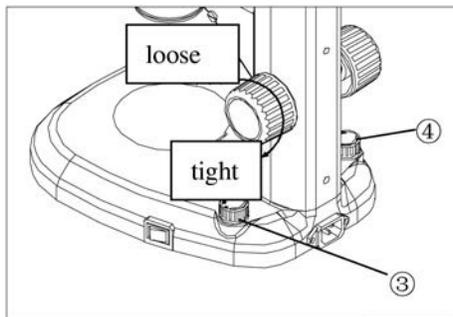


Fig. 10

Changing the Magnification

The zooming knobs located on both sides of the zooming body will change the magnification of the specimen image.

Total Magnification = Magnification of zoom body x magnification of eyepiece
(i.e., 0.8 x 10=8x)

NOTE: *If using any of the optional auxiliary objectives, then the above magnification would be multiplied by auxiliary objective magnification. (i.e., auxiliary 0.5 x 8=4x)*

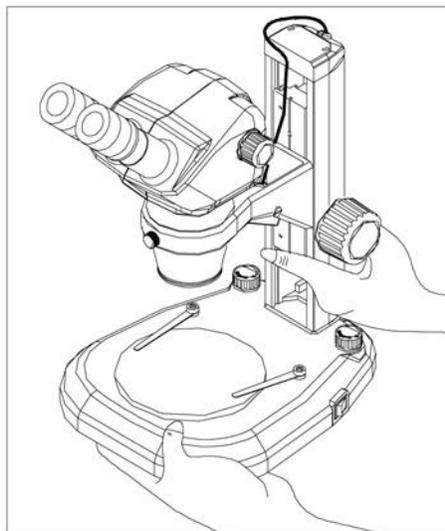


Fig. 11

Moving the Microscope (Fig. 11)

Before moving the microscope, be sure to remove any slide/samples. When moving the microscope, hold the stand and base as shown in Fig. 10 to keep it level.

SPECIFICATIONS

Optical System	Greenough optical design; 0.67x – 4.5x zoom range
Viewing Body	45° inclined binocular head with fixed eyepiece tube or trinocular head with 50:50 light split; Ø76mm body; interpupillary distance 52mm - 76mm; click stops at 0.67, 0.8, 1, 1.2, 1.5, 2, 2.5, 3, 3.5, 4, 4.5; zoom range limits
Eyepieces	WF10x/22mm; WF10x/25mm; WF15x/16mm; WF20x/12.5mm; all with diopter adjustment
Magnification	6.7x – 45x magnification range with 10x eyepieces and included 1x glass lens shield
Auxiliary Objectives	1x glass shield (included); Optional: 0.3x, 0.4x, 0.5x, 0.7x, 1.5x, 2.0x
Working Distance	110mm with included 1x; With optional auxiliary objectives: 177mm with 0.5x; 120mm with 0.7x; 47mm with 1.5x
Stands & Illumination	Variety of plain focusing stands, pole stands, diascopic stands, boom stands, ball bearing boom stands, articulating arms; wide variety of ring lights and fiber optic illuminators
Camera Adapters (trinocular model only)	Optional: 0.35x, 0.5x, 0.65x, 1.0x C-mount adapters; photo tube
Digital Cameras	Excelis™ and Teledyne Lumenera® digital cameras

OPTICAL DATA

Auxiliary Objective	Working Distance (mm)	EYEPIECE					
		WF10x/22mm		WF15x/16mm		WF20x/12.5mm	
		Magnification range	FOV (mm)	Magnification range	FOV (mm)	Magnification range	FOV (mm)
None or 1.0x	110	6.7x – 45x	32.8 - 4.8	10.1x - 67.5x	23.8 - 3.5	13.4x – 90x	18.6 - 2.7
0.3x	287	2x - 13.5x	109.3 - 16	3x - 20.3x	79.3 - 11.6	4x – 27x	62 – 9
0.4x	217	2.7x – 18x	82 - 12	4x – 27x	59.5 - 8.7	5.4x – 36x	46.5 - 6.7
0.5x	177	3.4x - 22.5x	65.6 - 9.7	5.1x - 33.8x	47.7 - 7.1	6.8x – 45x	37.3 - 5.5
0.75x	120	5x - 33.8x	43.7 - 6.5	7.5x - 50.7x	31.8 - 4.7	10x - 67.6x	24.8 - 3.7
1.5x	47	10.1x - 67.5x	21.8 - 3.2	15.2x - 101.3x	15.9 - 2.3	202.2x – 135x	12.4 - 1.8
2.0x	26	13.4x – 90x	16.4 - 2.4	20.1x – 135x	11.9 - 1.7	26.8x – 180x	9.3 - 1.3

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.

Trouble	Cause	Remedy
Double images	Interpupillary distance is not correct	Readjust it
	Diopter adjustment is not correct	Readjust it
Dirt appears in the view field	Dirt on the specimen	Clean specimen
	Dirt on the surfaces of eyepieces	Clean eyepieces
Image is not clear	Dirt on the surface of objectives	Clear objectives
Image is not clear while focusing change	Diopter adjustment is not correct	Readjust diopter
	Focusing is not correct	Readjust it
The focusing knob is not smooth	The focusing knob is too tight	Loosen it to a suitable position
The image is obscure because of the head slipping down during observation	The focusing knob is too loose	Tighten it to a suitable position

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

UNITRON® 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 UNITRON distributor can arrange for this service. Should unexpected problems be experienced with your instrument, proceed as follows:

1. Contact the UNITRON 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 UNITRON distributor or to UNITRON 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 is warranted to be free from defects in material and workmanship for a period of five (5) years for mechanical and optical components and one (1) year for electrical components 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 UNITRON 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 Unitron Ltd. This warranty expressly excludes any liability by Unitron Ltd. 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 UNITRON distributor or UNITRON at (631) 543-2000. 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 Unitron Ltd., 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.