

OPERATION  
MANUAL

Microlux III  
CLINICAL MICROSCOPE



## **Instructions or Setting Up the Microscope Optically**

To focus the microscope properly, you must adjust the binocular head to your own eyes by sliding the eyepiece tubes away from each other as far as they will go and then trying to observe with both eyes, moving tubes towards each other until one image is seen with both eyes.

Then, focus the specimen using the coarse adjustment knob with 4x objective in the light path until specimen is seen as clear and sharp as possible.

Turn 10x objective into position and focus it by using only the fine adjustment until the images is sharp and clear. Then, look between the eyepiece tube at the round scale and notice which graduation the small line, spot or arrow is pointing at. This is your individual interpupillary distance, and each individual's is different.

The right eyepiece tube has graduations on the top side of the stationary part of the eyepiece tube. Each line is marked in mm and every fifth line numbered from 55 to 75mm, and they go up and down on the tube vertically. The grip ring around the eyepiece tube is adjustable, and by turning clockwise or counter-clockwise, you can set the edge of the grip ring to the known graduation you need for your interpupillary distance setting.

Do this only when the right diopter tube, then look at the image in the microscope and see if the image in right eyepiece is sharp. To correct, cover or close left eye while viewing with right eye and turn the fine focus adjustment until the image is very sharp and clear.

Then, cover right eye and viewing with left eye, turn left diopter tube outward or counter-clockwise until image is out of focus. Then, turn clockwise slowly until image is sharp and clear.

The microscope should be parfocal, meaning when changing from one objective to the next, they should be written one-half a turn on the fine adjustment knob – it should be focused properly for the other objective at this time. If not, use the fine focus to complete the focusing of the microscope.

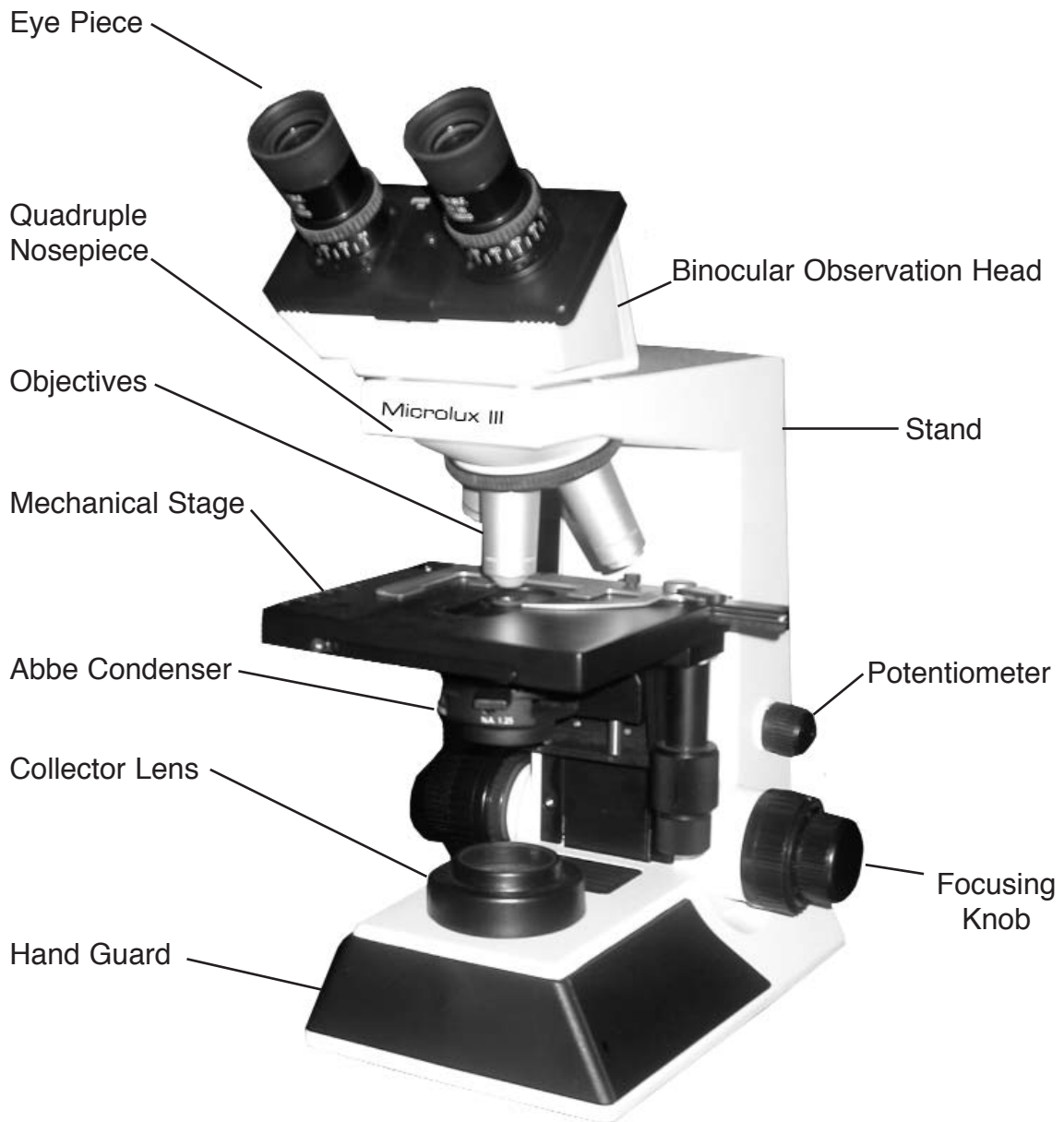
Please contact our Service Department if you have any questions.

## CONTENTS

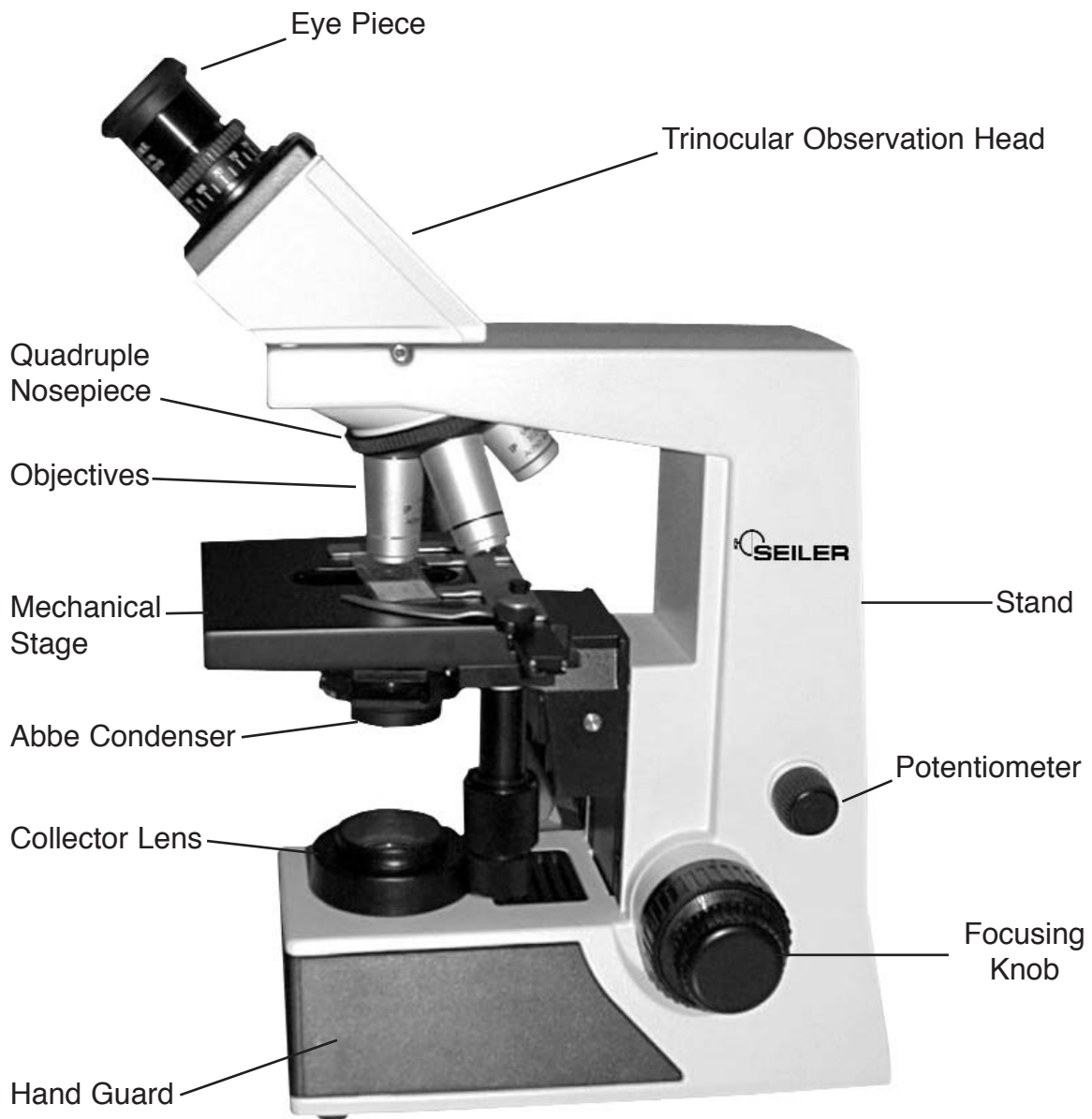
	<b>Page</b>
1. Photographic View Microlux III (Binocular)	1
2. Photographic View Microlux III (Trinocular)	2
3. Schematic Diagram	3
4. Standard Components	4
5. Unpacking	5
6. Initial Set Up	5
7. Operating Procedure	6
8. Fine Adjustment of Binocular Head	8
9. Adjusting the Eyesight Difference	8
10. Adjusting the Tension	9
11. Changing the Bulb	9
12. Caution in Handling	9
13. Care & Maintenance	9
14. Problems & Remedies	10-11



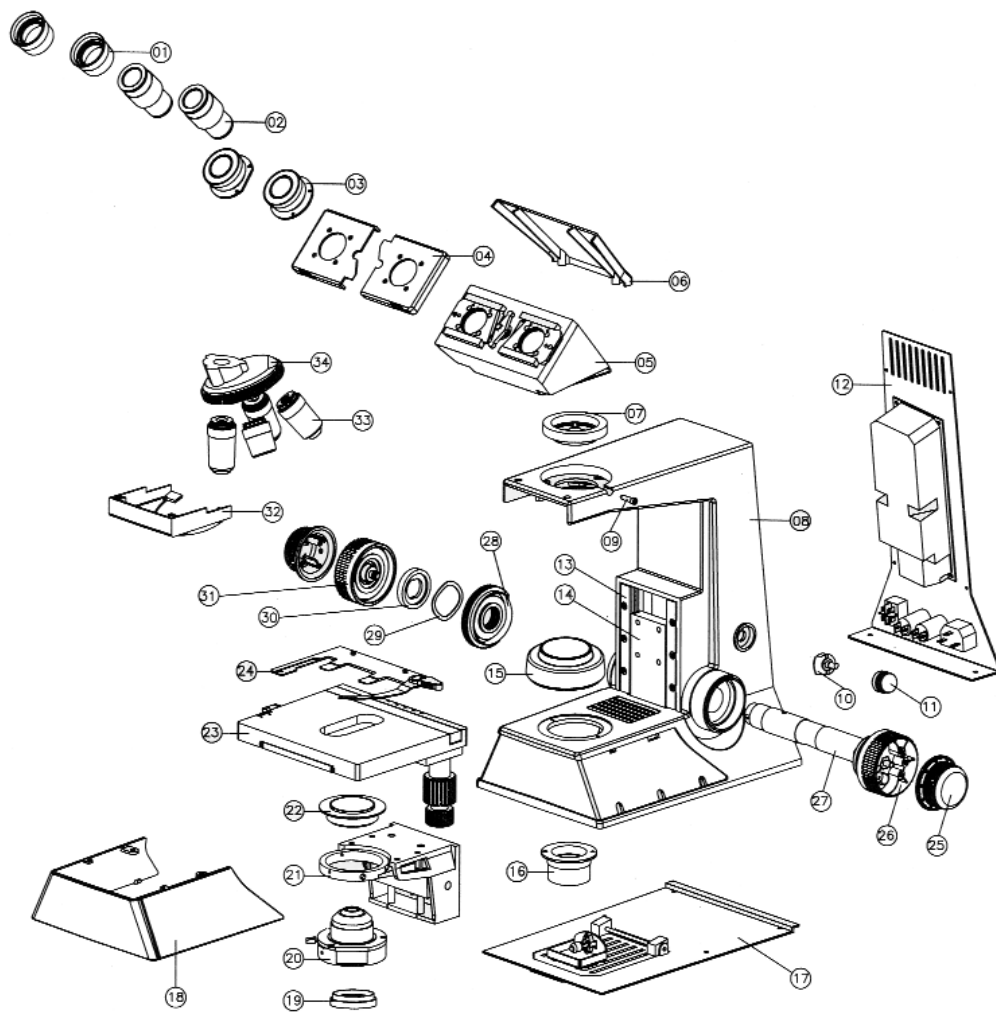
170 East Kirkham Avenue  
St. Louis, MO 63119  
(314) 968-2282  
Toll-Free: (800) 489-2282  
Fax: (314) 968-3601  
E-mail: [micro@seilerinst.com](mailto:micro@seilerinst.com)  
[www.seilerinst.com](http://www.seilerinst.com)



**Microlux III  
(Binocular)**



**Microlux III  
(Trinocular)**



## STANDARD COMPONENTS

Key	DESCRIPTION
1	EYEGUARD
2	EYE PIECE
3	FOCUSSING MOUNT
4	SLIDE COVER
5	BINO HOUSING ASSEMBLY
6	BINO COVER PLASTIC
7	NOSE PIECE ADAPTER
8	STAND
9	LOCKING SCREW
10	POTENTIOMETER
11	POTENTIOMETER KNOB
12	BACK PLATE ASSEMBLY WITH ELECTRICALS
13	FIXED GIB
14	MOVING BALL SLIDE
15	CRITICAL MOUNT
16	LENS BARREL (CRITICAL MOUNT)
17	BOTTOM PLATE ASSEMBLY
18	HAND GUARD
19	FILTER HOLDER
20	ABBE CONDENSER
21	SUB STAGE ASSEMBLY
22	CENTERING RING
23	MECHANICAL STAGE
24	SLIDE CARRIER
25	FINE MOTION KNOB
26	COARSE MOTION KNOB WITH GEAR HOUSING
27	PINION BUSH ASSEMBLY
28	TENSION ADJUSTING RING
29	WAVE WASHER 35 x 28 x 0.15
30	DELRIN WASHER INSIDE-T
31	COARSE MOTION KNOB PLAIN
32	NOSE PIECE COVER PLASTIC
33	IP SERIES OBJECTIVES
34	QUADRUPLE NOSEPIECE

## UNPACKING

Remove the microscope components carefully from the packing box. Please ensure the following components before discarding the packing material:

- 2.1 Stand which includes microscope arm, focusing mechanism, condenser, quadruple nosepiece, base with built-in illumination system, extra fuse and mechanical stage.
- 2.2 IP series Objectives 4x, 10x, 40x (SL), 100x (SL, Oil) or as ordered
- 2.3 10x WF Eyepieces or as ordered
- 2.4 ABBE Condenser N.A. 1.25
- 2.5 Blue Filter or as ordered
- 2.6 Immersion Oil, as ordered
- 2.7 Spare Lamp(s) as ordered
- 2.8 Dust cover
- 2.9 Instruction Manual
- 2.10 Spare electricals, ordered as extras
- 2.11 Binocular Head or Trinocular Head, as ordered
- 2.12 Optional accessories such as Phase Telescope, Darkfield/Brightfield slider, Polarizing kit, Video Adapters, Photo adapter for 35mm SLR camera, Adapter for Digital camera along with 10x Photoeyepiece.

Please note optional accessories are not shipped as part of standard equipment and are shipped in separate packaging as ordered.

## INITIAL SET UP

- 3.1 **Objectives** – Screw the IP series objectives into the nosepiece in the consecutive order of the magnification.
- 3.2 **Eyepieces** – Insert the Eyepieces into the ocular tubes of Observation Head and secure the Eyepieces firmly.
- 3.3 Observation Head – Unpack it to install using following procedures:
  1. Loosen the Head Locking screw.
  2. Place the Observation Head on the stand and engage the dovetail ring provided at the bottom into the engaging recess provided on the stand.
  3. Tighten the Head locking screw after rotating the Binocular Head to your preferred direction of use.

## OPERATING PROCEDURE

This procedure explains how to use the Microlux III microscope. It does not include information on general techniques of microscopy.

- 4.1 Make sure all the exposed optical surfaces are free of dirt. Plug the power cord into a grounded outlet. Bring the light intensity regulator to lowest level and switch on the power.
- 4.2 Adjust the observation head to convenient working position (fine adjustment of observation head is explained later in this manual).
- 4.3 Take down the stage to a fairly low position with the help of coarse focus knob.
- 4.4 Make sure that the stage surface is free of dust, grit or any other material that will interfere with the movement of the specimen slide across the surface of the stage or scratch the slide and the stage between the stage fingers. Position the specimen area of the slide (cover glass upward) over the center of stage aperture. Use the stage control knobs to move the specimen slid to the desired position.
- 4.5 Rotate the nose piece with the help of soft feel knurled nosepiece ring to bring lowest magnification objective (4X) in the viewing position.
- 4.6 Adjust mechanical stage position with the help of focussing mechanism at a position to get crisp and clear image of the specimen.
- 4.7 Adjust the fine focus knob to sharpen the image in the center of the field of view.
- 4.8 Look at the image and adjust the condenser aperture to obtain the clearest possible image. The clarity of the image depends upon the size of the aperture. As the aperture becomes smaller, the contrast and the depth of focus increases, but the resolving power decreases. The clearest image is produced by the combination of these three factors.
- 4.9 Examine the specimen. Move the slide at suitable position to observe some specific features of the specimen at higher magnification.
- 4.10 Use the fine focus knob to sharpen the image. Until you gain sufficient experience in use of this microscope, it is wise to always obtain an image and to do the focusing with lower power objective and then to increase magnification by going to successively higher power objectives one step at a time.
- 4.11 When using objective of higher numerical aperture (N.A.) proper focusing of the abbe condenser is important. Focus the abbe condenser by racking the condenser movement knob up and down so that the field is evenly illuminated.
- 4.12 The Microlux III has a rotary potentiometer coupled with an electronic circuit for regulating the light intensity. Rotate the potentiometer from low to high as you go from low magnification to high magnification objectives for obtaining best light in the field of view.

The procedure for examining a specimen using the oil immersion objectives is as follows:

- a. Rotate the nosepiece so that the low power objective is in the light path.
- b. 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. Keep the oil tightly stoppered and don't shake the bottle.
- c. Rotate the nosepiece so that the IP series 100x oil immersion objective is in the light.
- d. With your eye at the level of the stage, use coarse focus knob to raise the stage with 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 be focussed using the fine focus knob.
- e. 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.

This will:

- Prevent dust and dirt from accumulation on the lens of the objective and degrading its optical performance.
- Keep the slide clean to work with.
- Prevent oil from contaminating the high dry objective (IP series 40x) and deforming its optical performance. Since this objective has a short working distance and might accidentally contact oil.
- Keep your hands free of oil. Oily finger prints accidentally transferred to the optical elements degrade their performance.



**The performance and life of 100x oil immersion objectives is warranted only if proper immersion oil such as E-merck or Cargille labs is used. Liquid paraffin is highly corrosive to the front lens elements and must never be used.**

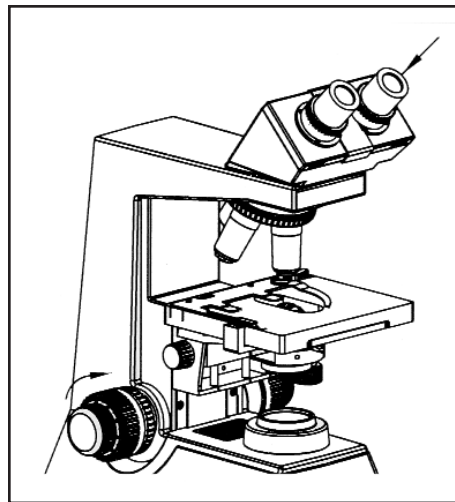
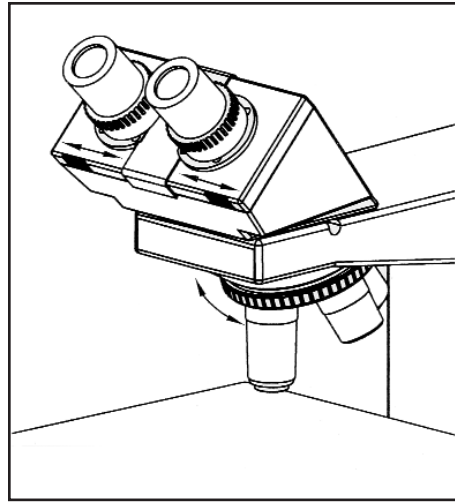
## FINE ADJUSTMENT OF BINOCULAR HEAD

Rotate the Binocular head to bring it to a convenient position. Normally it is kept aligned and not rotated.

Adjust interpupillary distance by bringing the eyepiece tubes closer or apart until you see one fused image.

If the image from both oculars does not fuse, you are required to do Dioptic adjustment on the oculars as explained below:

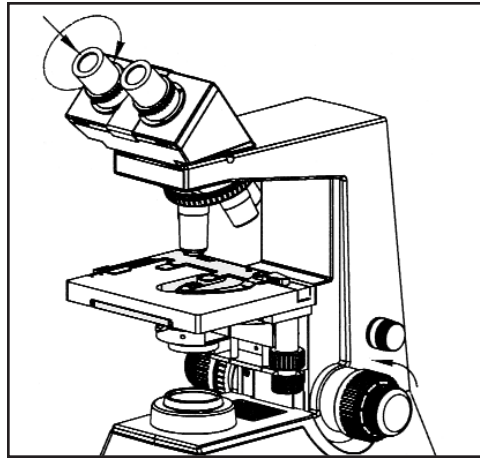
- 1) Set dioptic scale on focusing (left) ocular at 64 (nominal) (or corresponding to your IPD setting number).
- 2) Bring 10x objective in position and focus the slide in the right eye with coarse and fine focus knob keeping the left eye closed.
- 3) Close the right eye and seeing through the left eye, focus the left ocular up and down by rotating the focussing sleeve until the image is in sharp focus.
- 4) Look through both the eyes. If interpupillary adjustment is required, do so as explained earlier.



## ADJUSTING THE EYESIGHT DIFFERENCE

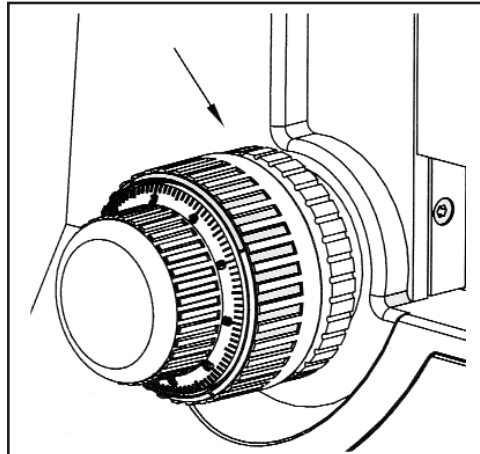
Set dioptic scale on right eye tube to 64 (or corresponding to your IPD Setting). Looking into the right hand eyepiece with the right eye, focus the image by turning focus knob.

Looking into the left hand eyepiece with the left eye, focus the image by turning the focusing sleeve.



### ADJUSTING THE TENSION

Grip the coarse motion knob with gear house from the opposite side and rotate the tension adjusting ring in the counter clockwise direction for increasing and vice-versa for decreasing the tension.

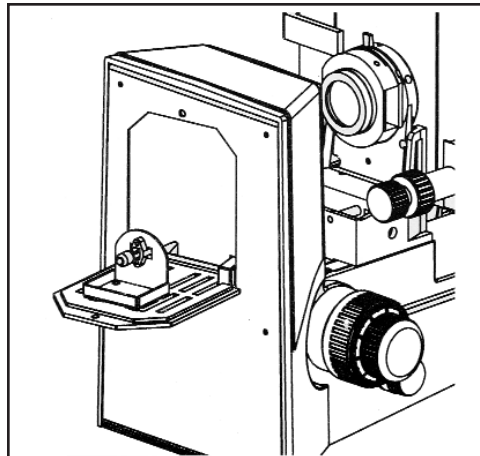


### CHANGING OF BULB

- Halogen Lamp (12V 20W)
- Unplug the microscope cord, keeping the regulator in off position.
- Rest the microscope on the flat back of the arm.
- Pull the plunger to open the door.
- Replace the bulb with due care and caution.

**Note:**

Use tissue paper to handle bulb. Direct contact with fingers will leave grease/stain on bulb which will degrade its performance.



## CAUTION IN HANDLING

- 1. Avoid sharp knocks:**  
Handle the microscope gently, taking care to avoid sharp knocks.
- 2. Location of microscope:**  
Avoid DUST, VIBRATION and exposure to high temperature. Moisture or direct sunlight.
- 3. Replacing the lamp bulb or fuse:**  
Before replacing the lamp or fuse, be sure to turn off the power switch and disconnect the power source cord from the socket.
- 4. Dirt on the lens:**  
Do not leave dust, dirt or finger marks on the lens surfaces. They will prevent you from clear observation of the specimen image.

## CARE & MAINTENANCE

Your microscope has been engineered for long life with a minimum of maintenance required. In general, routine maintenance is limited to keeping the microscope clean. Always protect the microscope with dust cover when not in use.

- 1. Cleaning the lenses:**  
To clean the lens surface, remove dust using a soft brush or gauze. Only for removing finger marks or grease, soft cotton cloth, lens tissue or gauze, lightly moistened with absolute alcohol (ethanol or methanol) should be used. For cleaning the objectives, only use xylene. Observe sufficient caution in handling alcohol and xylene.
- 2. Cleaning the painted surfaces:**  
Avoid the use of any organic solvent (e.g. thinner, xylene, ether, alcohol, etc.) for cleaning the painted surfaces and plastic parts of the instrument. Painted surfaces may be cleaned with dry cloth.
- 3. Never attempt to dismantle:**  
Never attempt to dismantle the instrument so as to avoid the possibility of impairing the operational efficiency and accuracy.
- 4. Periodical checking:**  
To maintain the performance of the instrument, we recommend the customers to get the instrument checked periodically. For details, contact your nearest agency.

## PROBLEMS & REMEDIES

The user will normally not find any disorder in the instrument. However, if some difficulty is encountered, recheck the use referring to this table.

Failure	Cause	Actions
Darkness at the periphery or uneven brightness of view-field	<ul style="list-style-type: none"> <li>• Revolving nosepiece not in click stop position.</li> </ul>	<ul style="list-style-type: none"> <li>• Revolve it to click position</li> </ul>
Dirt or dust on the viewfield	<ul style="list-style-type: none"> <li>• Dirt or dust on eyepiece lens.</li> <li>• Dirt or dust on the slide.</li> </ul>	<ul style="list-style-type: none"> <li>• Cleaning</li> <li>• Cleaning</li> </ul>
No good image obtained (low resolution or contrast)	<ul style="list-style-type: none"> <li>• No coverglass attached to slide</li> <li>• Too thick or thin coverglass</li> <li>• Slide may be upside down</li> <li>• Immersion oil soils the top of dry system objective (especially 40x)</li> <li>• Dirt or dust on the lens (Condenser, Objective Eyepiece, Slide)</li> <li>• No immersion oil used on imm. oil 100x objective</li> <li>• Air bubbles in immersion oil.</li> <li>• Unspecified immersion oil used.</li> <li>• Condenser aperture closed to much.</li> <li>• Position of condenser to low</li> </ul>	<ul style="list-style-type: none"> <li>• Attach coverglass</li> <li>• Use specified thickness</li> <li>• Turn over the slide</li> <li>• Cleaning</li> <li>• Cleaning</li> <li>• Use immersion oil</li> <li>• Remove bubbles</li> <li>• Use specified immersion oil</li> <li>• Open properly</li> <li>• Bring it up to get proper illumination.</li> </ul>

<b>Failure</b>	<b>Cause</b>	<b>Actions</b>
Image moves while being focussed	<ul style="list-style-type: none"> <li>• Specimen rises from stage surface</li> <li>• Revolving nosepiece not in click stop position.</li> </ul>	<ul style="list-style-type: none"> <li>• Place it stable.</li> <li>• Revolve it to click stop position</li> </ul>
Image tinged yellow	<ul style="list-style-type: none"> <li>• Blue filter not used or lamp intensity low</li> </ul>	<ul style="list-style-type: none"> <li>• Use daylight filter. Adjust potentiometer for adequate light.</li> </ul>
Insufficient brightness of illumination	<ul style="list-style-type: none"> <li>• Condenser aperture too much closed</li> <li>• Dirt or dust on lens/ condenser, objective</li> <li>• Too low position of condenser</li> </ul>	<ul style="list-style-type: none"> <li>• Open it properly</li> <li>• Cleaning</li> <li>• Correct positioning</li> </ul>
High power objective touches the slide when changed over from low power	<ul style="list-style-type: none"> <li>• Upside down of slide</li> <li>• Too thick coverglass</li> </ul>	<ul style="list-style-type: none"> <li>• Turn over the slide.</li> <li>• Use specified thickness coverglass</li> </ul>
Slippage of focus in coarse coarse focussing	<ul style="list-style-type: none"> <li>• Tension on knobs too less</li> </ul>	<ul style="list-style-type: none"> <li>• Increase tension on knobs.</li> </ul>
Fine focussing in effective	<ul style="list-style-type: none"> <li>• Tension on knobs too high</li> </ul>	<ul style="list-style-type: none"> <li>• Loosen tension on knobs.</li> </ul>

# Tips & Techniques

## *Troubleshooting the 40x Objective*

One of the most common questions the Seiler technicians are asked is what to do when a 40x objective (400x magnification) won't focus or produces a poor image. A poor image on an objective can be caused from a number of problems. By following the simple procedure below, you will be able to troubleshoot about 90% of these problems and get the microscope back in operation:

**1. Check the slide.** The first step in troubleshooting the 40x objective is make sure the specimen slide is right side up. If the non-cover glass side of the slide is up to the 40x, there will not be enough working distance to focus through the thick glass.

**2. Check the cover glass thickness.** A cover glass number one (0.17mm thick) is recommended for maximum performance.

**3. Make sure the objective is clean.** Unscrew the 40x objective and examine it by using a magnifying glass to look at the front lens. To view the front lens, hold the objective in your left hand (if you are right-handed) under good desk lamp or in a well-lit room. Hold the objective vertical with the front lens up (toward the ceiling). Hold the magnifier close to your eye and focus on the very top of the objective. Slowly tilt the tip of the objective toward your eye and away from your eye. At some point you should be able to see dirt or oil on the lens.

To clean the lens, a cleaning solution for 35mm camera lens is recommended. Apply the solution to the dirty or oily lens area with a cotton tipped applicator. Do not rub or scrub the lens. Lightly rotate the applicator between your forefinger and thumb, moving around the lens area. Rotate about three or four times, then discard the dirty applicator. Repeat this at least one more time and then re-examine with the magnifier to check for dirt or oil. If debris is still present, repeat the cleaning procedure.

After cleaning with the solution, breathe warm air onto the lens and use a clean applicator to remove any moisture from the lens. Rotate the applicator lightly on the lens as you did when using the solution. Repeat this two or three times with a clean applicator each time. Re-examine with the magnifier for dirt or oil and repeat the cleaning procedure if debris is still present.

A substitute cleaning solution of mild soap mixed with a large amount of water can be used for temporary cleaning. Make sure the water is not too soapy. Clean cotton gauze can be used in place of cotton tipped applicators using 1" squares, but this generally cleans only the center of the field of view.

**4. Call Seiler's Service Department.** If the procedures described above do not improve the image of the 40x objective, our Service Department will be happy to provide further assistance.

