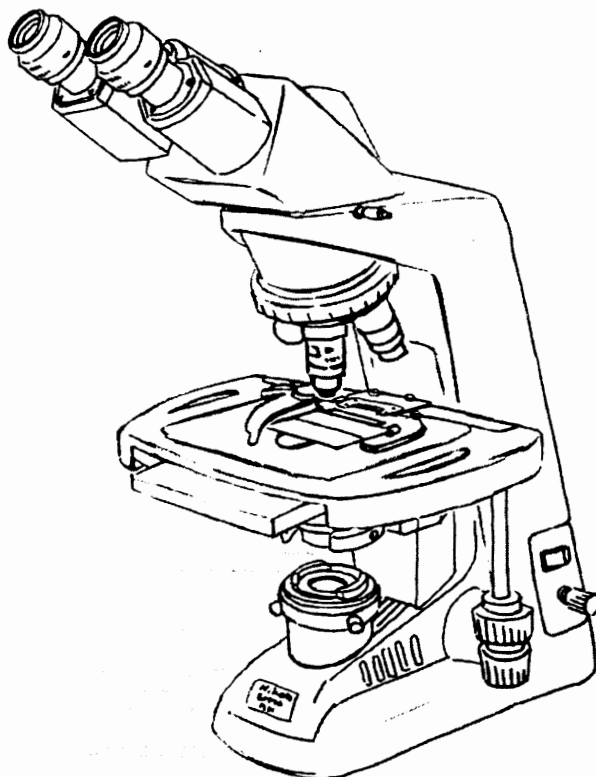


Nikon

Microscope ECLIPSE E200



Instructions





Warning and Caution Symbols Used in This Manual

Though Nikon products are designed to provide you with utmost safety during use, incorrect usage or disregard of the instructions may cause personal injury or property damage. For your own safety, read the instruction manual carefully and thoroughly before using the product. Do not discard this manual. Always keep it near the product for easy reference.

Inside this instruction manual, safety instructions are indicated with the symbols shown below. Be sure to follow the instructions marked with these symbols for your safety.

Symbol	Meaning
 WARNING	Disregarding instructions marked with this symbol may lead to death or serious injury.
 CAUTION	Disregarding instructions marked with this symbol may lead to injury or property damage.

Symbols Labeled on the Product

Symbol	Meaning
	<p>Caution! Hot surface</p> <p>This symbol label attached near the field lens unit (the lamp is set underneath the field lens unit) reminds you of the following.</p> <p>WARNING: Risk of burn injury. The lamp and its surroundings (including the field lens unit) become hot during use. Do not touch them while the lamp is on and for thirty minutes after the lamp is turned off.</p> <p>CAUTION: The lamp and its surroundings remain hot even after the lamp is turned off. Make sure that they are sufficiently cool before replacing the lamp.</p>
	<p>Caution!</p> <p>This symbol label attached near the AC inlet reminds you of the following.</p> <p>CAUTION: Make sure that the input voltage set by the voltage selector matches the voltage provided in your region. The voltage selector on the microscope sent to the United States is set to "120V" at the factory.</p>

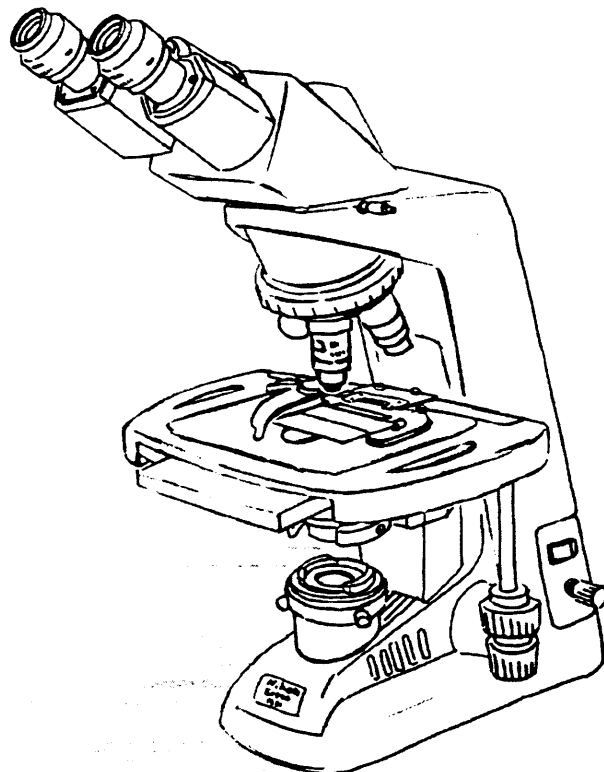
Thank you for purchasing this Nikon product. This instruction manual is for the users of the Nikon Microscope ECLIPSE E200 describing basic operation of the microscope. To ensure correct usage, please read this manual thoroughly before using the microscope.

- It is prohibited to reproduce or transmit this manual in any form without the prior consent of Nikon.
- The instructions and specifications in this manual are subject to change without notice.
- Although every effort has been made to ensure the accuracy of this manual, if you find that any part of this manual is unclear or incorrect, contact your nearest Nikon representative.
- Some ECLIPSE E200 microscope sets may come with different components and accessories from those shown in this manual.
- Also read the manuals for the products used with the microscope, for example, the Nikon photomicrographic equipment.

Nikon

Microscope ECLIPSE E200



Instructions





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Common Sense Safety Instructions

1. Purpose



Use this microscope only for microscopic observation.
Do not use this microscope for any other purpose because the protection provided by the equipment may be impaired.

2. Never Disassemble the Microscope



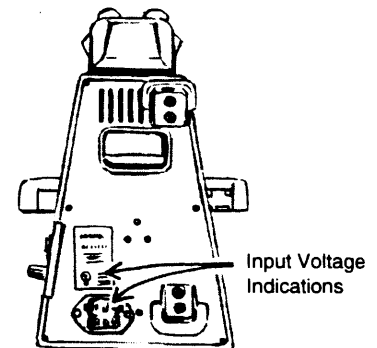
There are no user serviceable parts inside the microscope. Disassembly will void the warranty, and could degrade the performance, cause electrical shock or personal injury, or damage the instrument. If you have a service problem, contact your nearest Nikon representative.

3. Check the Input Voltage



The input voltage is indicated in two places at the rear of the microscope: on the nameplate and above the AC inlet. Confirm that these input voltage indications correspond to the voltage provided in your region. If not, follow one of the instructions below. The use of microscopes with the different input voltage indications will cause overcurrent and overheating, which may result in fire or severe damage to the microscope.

- If the voltage indication on the nameplate differs:
Do not plug in the microscope. Contact your nearest Nikon representative.
- If the voltage indication above the AC inlet differs:
Refer to p. 30 and change the input voltage setting before turning on the power switch.
 - For the microscope with the nameplate showing [100/110/120 V ~]:
The voltage can be set to: AC 100 V, 110 V or 120 V.
 - For the microscope with the nameplate showing [220/230/240 V ~]:
The voltage can be set to: AC 220 V, 230 V or 240 V.



4. Use the Specified Lamp, Fuse, and Power Cord



Use the specified lamp and fuse. Use the power cord provided. Using an incorrect lamp, fuse, or power cord may damage the instrument or cause a fire. (Also see p. 48 on power cord.)

If using an extension cord, only use a cord that includes a protective earth (PE) wire.

- Specified Lamp
 - Halogen lamp 6V-20W (PHILIPS 7388) or
 - Halogen lamp 6V-30W (PHILIPS 5761)
- Specified Fuse
 - 250 V, 1A, time-lag high-breaking type, 5X20 miniature fuse X2

5. Turn Off Power Switch before Assembling the Microscope, Replacing the Lamp or Fuse, and Plugging in or Unplugging the Power Cord



Turn off the power switch before you plug or unplug the power cord to prevent electrical shock or fire. Also turn off the power switch and then unplug the power cord before assembling the microscope, and before changing the lamp or fuse. To turn off the power, turn the power switch to ○.

6. Keep the Microscope Free of Moisture and Foreign Matter



Keep the microscope free of moisture to prevent short circuiting that could result in overheating or other malfunctions. If water splashes on the microscope, immediately turn off the power switch (turn the switch to ○) and unplug the power cord. Then, wipe off the water with a dry cloth. Short circuiting can also result when foreign matter is trapped inside the microscope. If foreign matter or water has entered the microscope, do not use the microscope and contact your nearest Nikon representative.

7. Heat at the Light Source



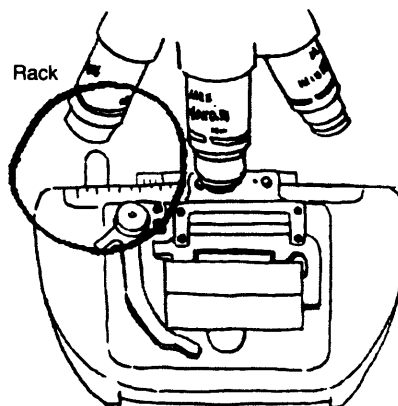
The lamp becomes hot during use. Do not remove the field lens unit while the lamp is on, and be sure the lamp has been off for 30 minutes before touching it.

- When changing the lamp bulb, make sure that the lamp is cool enough to touch (the light should be off at least 30 minutes).
- Do not touch the lamp while it is on or until the lamp has been off for 30 minutes, as doing so could result in burns.
- Never bring cloth, paper or flammable volatile substances such as gasoline, petroleum benzene, acetone, thinner, or alcohol near a hot lamp, as a fire could result.

8. Stage Rack



The rack for the stage protrudes during use. Be careful not to hit the rack with your hand or other parts of your body when handling the microscope as you may get hurt by an edge of the rack.



9. Installation

This microscope is a precision instrument. Using the microscope in an unfavorable environment could result in malfunctions or degraded performance. Consider the following conditions when choosing the installation location.

- Observation conditions are better if light from windows and bright room light can be avoided.
- Install the microscope in a location with a room temperature of 0° to 40° C and with a maximum relative humidity of 85%. High temperature and humidity are to be avoided because they promote mold growth and condensation, which may damage the microscope.
- Dirt and dust degrade optical performance and are to be avoided.
- Vibrations in the environment will degrade the image. Install the microscope in a location free of vibrations.
- Install the microscope on a solid table and keep the microscope level.
- This microscope emits a feeble electromagnetic wave. Do not place a precision electronic device near the microscope as precision could be degraded. Also, avoid placing a radio or TV near the microscope as reception of sound and images may be hampered.

10. Carrying the Microscope

This microscope is a precision instrument. Handle it gently. Strong shocks and forcible operation will damage the instrument. Shocks to the objectives, especially, could degrade image precision.

- When carrying the microscope, hold it at its upper rear and lower front ends.
- Do not hold the focus knobs, the eyepiece tube, or the stage. These parts could easily come off and could result in malfunctions.



11. Handling the Lamp

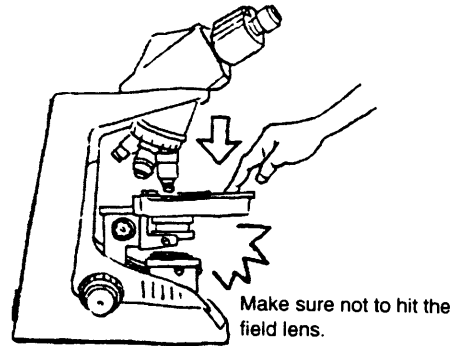
Do not touch the glass part of the lamp with bare hands. Wear gloves or use a cloth when handling the lamp so as not to leave fingerprints on the surface. Wipe off any fingerprints or stains using a clean cloth moistened with alcohol. Fingerprints will etch into the hot surface of the lamp and reduce the brightness, damage the lamp or reduce its service life.

Handle the lamp gently. Shocks and vibrations will damage the lamp or reduce its service life.

When changing the lamp, be sure that the contact is not damaged. If the contact is damaged, the lamp may not light up or may overheat. Insert the lamp's contact pins fully into the socket holes. If the pins are loose, the lamp could come off or result in a contact failure, which will cause overheating or smoke. Also, make sure that the field lens unit is securely attached.

12. Refocusing

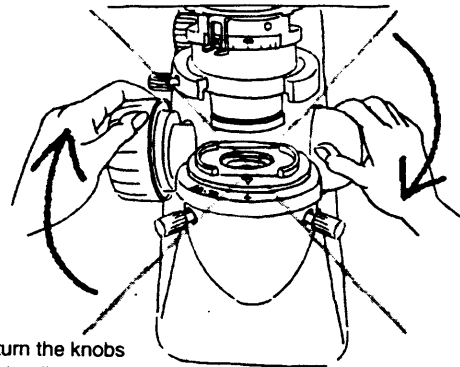
When changing specimens using the refocusing mechanism, gently lower the stage by hand taking care not to hit the field lens with the condenser holder (p. 22).



13. Focus Knobs

Do not turn the right and left focus knobs simultaneously in opposite directions. Do not turn the coarse focus knob any further after the stage has been moved up or down to its limit. These operations will damage the focusing mechanism.

(The coarse focus knob has a protection device. The knob turns freely for a while after it has reached its upper limit.)



14. Oil-Immersion Observation

Use only a minimum quantity of oil. If too much oil is applied, surplus oil could flow out to the stage and the condenser which could lead to degraded performance.

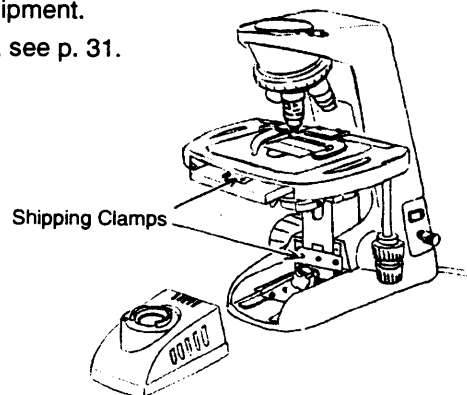


WARNING

When using petroleum benzene or absolute alcohol to wipe off immersion oil or to clean the lenses, follow the instructions provided by their manufacturers. Absolute alcohol and petroleum benzene are inflammable. Take great care when handling them.

15. Shipping Clamps

The microscope is held tightly by the clamps during shipment. Be sure to remove the clamps before use. For details, see p. 31.



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Nomenclature of Each Part

The microscope is made up of the following components.

① Basic unit

② Eyepieces

Screwed on to the eyepiece tube.

③ Eyepiece Tube

This is a binocular eyepiece tube. A trinocular eyepiece tube is available for photomicrography and TV microscopy.

④ Objectives

Objectives with various magnifying powers are available.

⑤ Condenser

Used for condensing light. The condenser should be positioned slightly lower than its upper limit.

Adjust the aperture diaphragm lever according to the objective.

⑥ Field Lens Unit

Draw out the field lens unit when changing lamp.

The microscope may have a field diaphragm. A field diaphragm is used to control the illumination range and should be adjusted according to the objective. (Note that there are two types of microscopes; the one with the field diaphragm, and the one without.)

⑦ Lamp

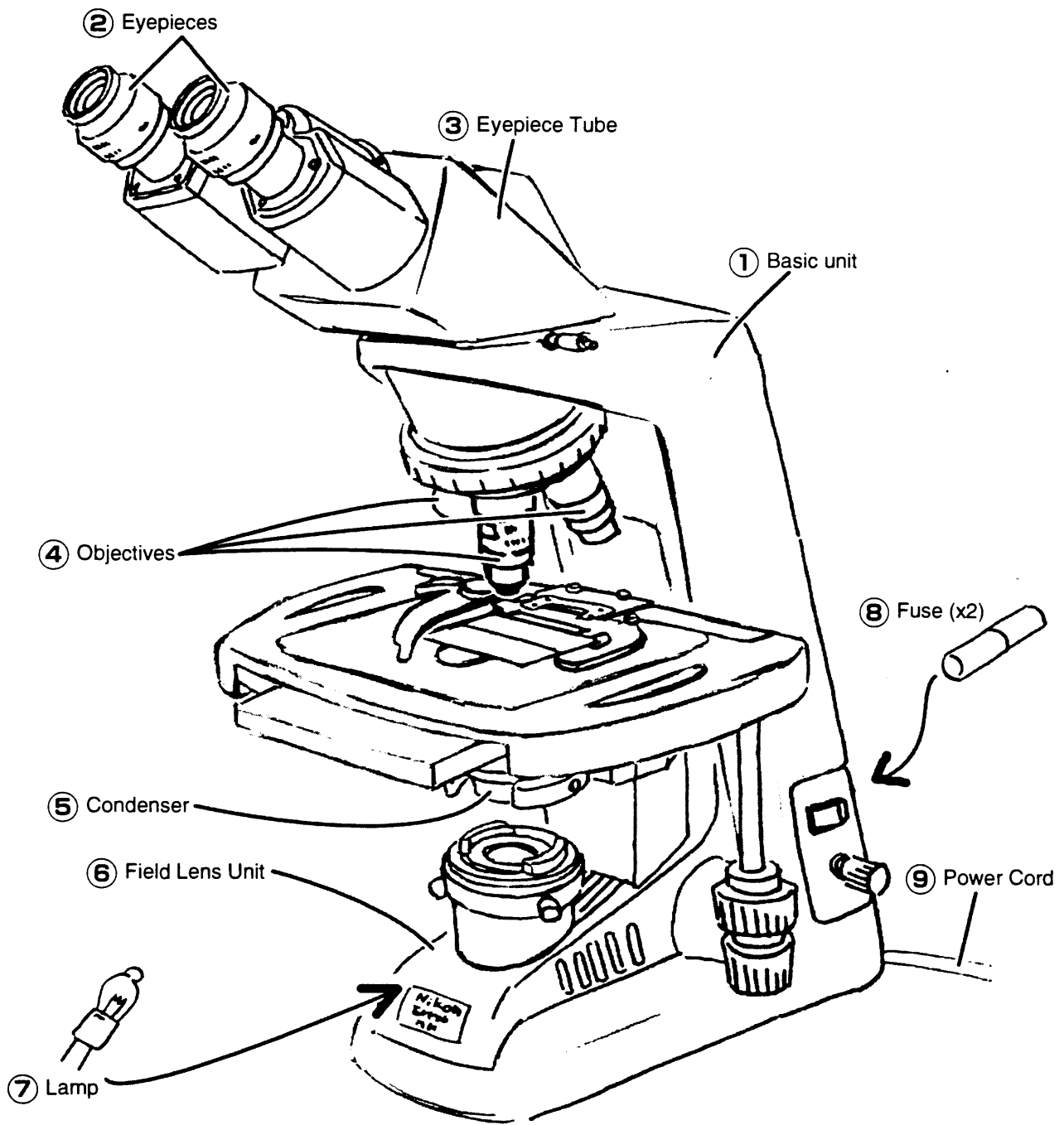
Halogen lamp 6 V-20 W or 6 V-30 W is used.

⑧ Fuse

Two 250 V 1A time-lag high-breaking type fuses are used.

⑨ Power Cord

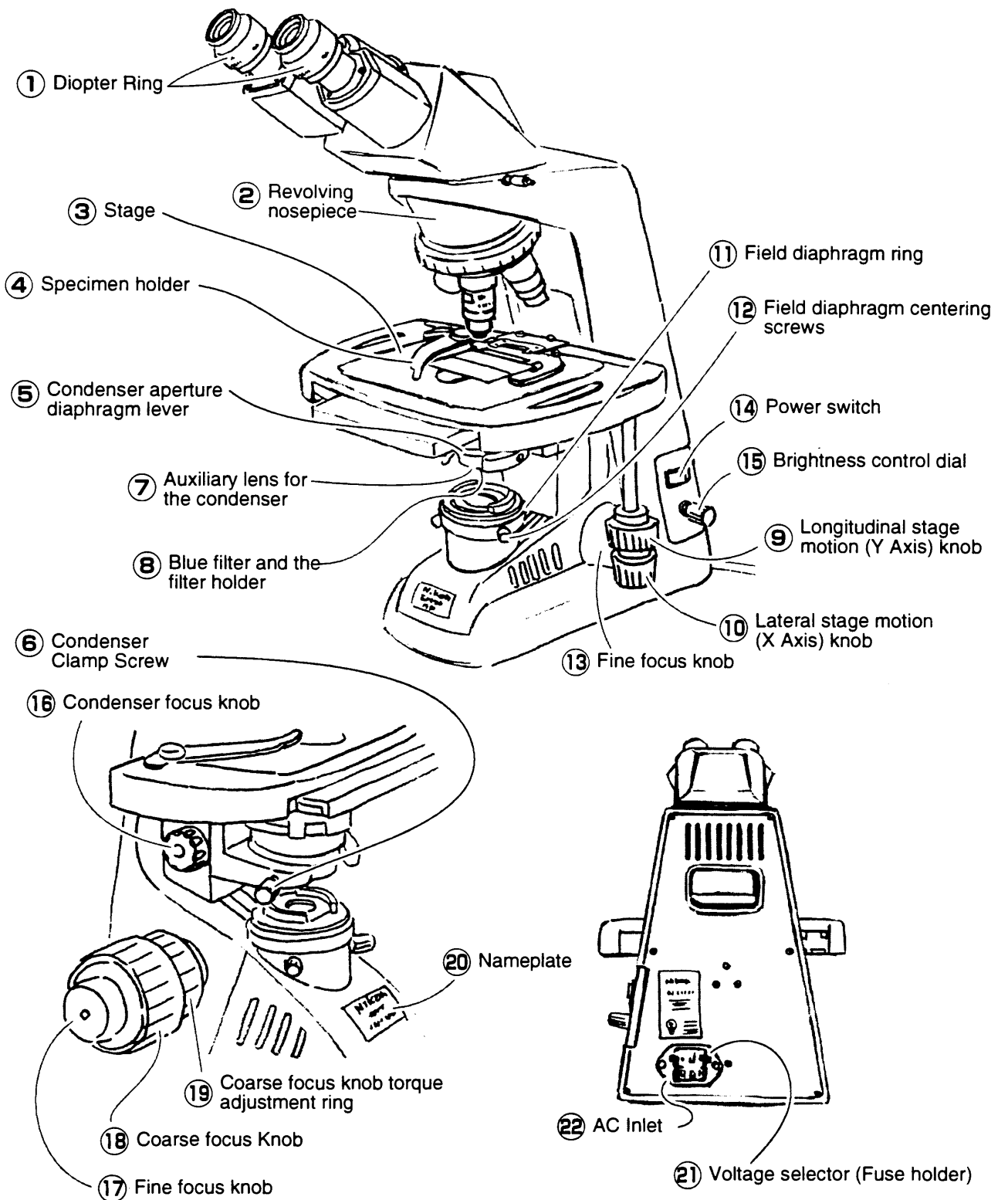
Use the power cord provided.



II

Switches and Controls

- ① **Diopter Ring**
Adjust the diopter ring to compensate for the difference between your right and left eyesight. (p. 19)
- ② **Revolving nosepiece**
Can hold up to four objectives.
- ③ **Stage**
- ④ **Specimen holder**
Put your finger at the root or the tip tilt of the claw to open the claw. (p. 17, 32)
- ⑤ **Condenser aperture diaphragm lever**
Set the lever to match the magnifying power of the objective. (p. 21)
- ⑥ **Condenser Clamp Screw**
- ⑦ **Auxiliary lens for the condenser**
Screw on to the bottom of the condenser if your microscope has a field diaphragm.
- ⑧ **Blue filter and the filter holder**
- ⑨ **Longitudinal stage motion (Y Axis) knob**
- ⑩ **Lateral stage motion (X Axis) knob**
These knobs are located either to the right or the left of the stage.
- ⑪ **Field diaphragm ring**
Set the ring to match the magnifying power of the objective. (p. 22)
This ring is equipped only on the microscope with a field diaphragm.
- ⑫ **Field diaphragm centering screws**
Used to center the field diaphragm image. (p. 19)
These screws are equipped only on the microscope with a field diaphragm.
- ⑬ **Fine focus knob**
Used for focusing. There is no coarse focus knob on the side with the stage motion knobs.
- ⑭ **Power switch**
When turned to I, power is turned on and the lamp lights.
When turned to O, power is turned off and the lamp goes off.
- ⑮ **Brightness control dial**
When turned clockwise, the lamp voltage increases and the viewfield becomes brighter.
When turned counterclockwise, the lamp voltage decreases and the viewfield becomes darker.
- ⑯ **Condenser focus knob**
Use this knob when focusing the field diaphragm image on the specimen. (p. 19)
The condenser focus knob is located on the opposite side of the stage motion knobs.
- ⑰ **Fine focus knob**
- ⑱ **Coarse focus Knob**
There are both coarse and fine focus knobs on the opposite side of the stage motion knobs.
- ⑲ **Coarse focus knob torque adjustment ring**
Used to adjust the tension (torque) of the coarse focus knob. (p. 26)
- ⑳ **Nameplate**
Indicates the input voltage.
- ㉑ **Voltage selector (Fuse holder)**
Use this selector to match the input voltage of the microscope to the voltage provided in your region. (p. 30)
- ㉒ **AC Inlet**
Plug the power cord into this inlet. Make sure that the power switch is off (turned to O) before plugging the cord in.



III

A Swift Microscopic Procedure

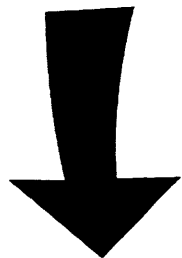
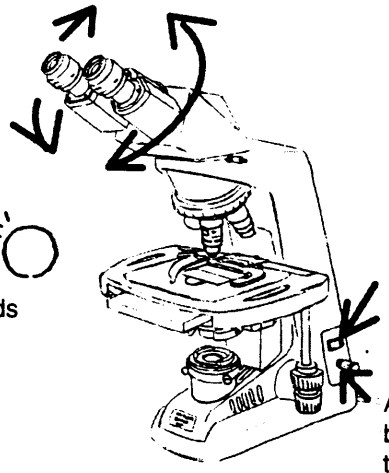
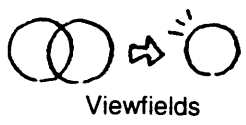
Part 1

For microscopes without a field diaphragm

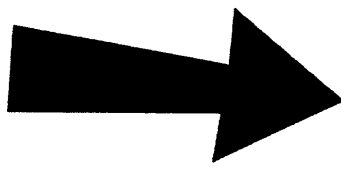
Start

Turn on the lamp and adjust interpupillary distance.

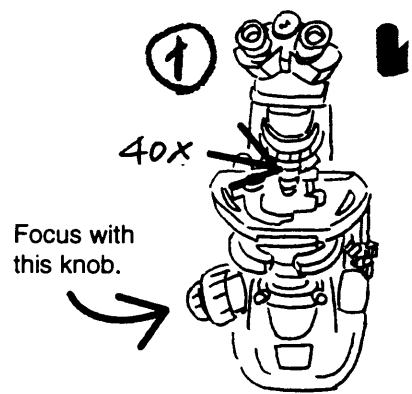
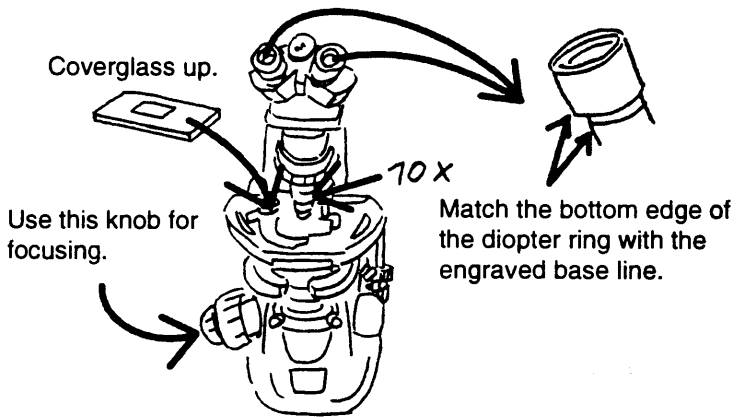
Widen or narrow to merge the viewfields into one.



Focus with 10x objective.



Adjust the diopter.

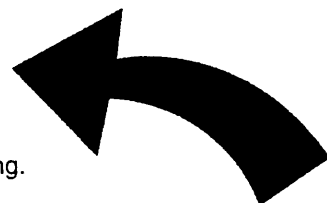




End

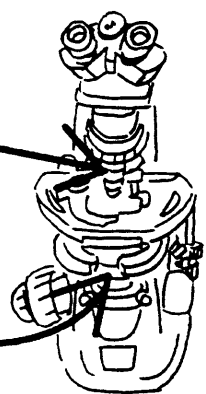
Turn off the power.

Wait till the microscope cools down before storing.

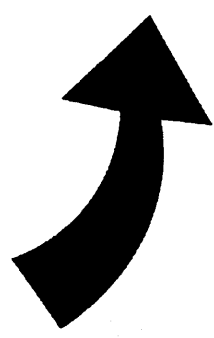


Check the magnifying power.

Move the lever to the magnifying power of the objective.



Magnify the image and observe!



③ Use your left eye.

Then focus with this ring.

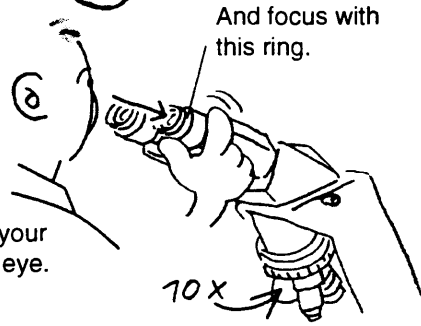
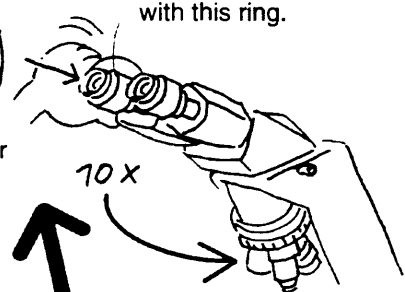
10 X

② And focus with this ring.

Use your right eye.

10 X

Repeat ① to ③ twice.

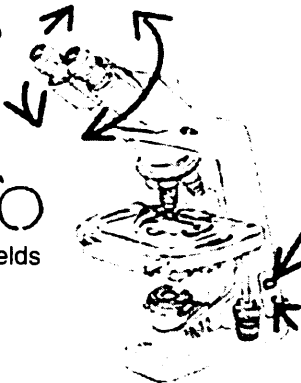


Part 2

For microscopes equipped with the field diaphragm

Start

Widen or narrow to merge the viewfields into one.

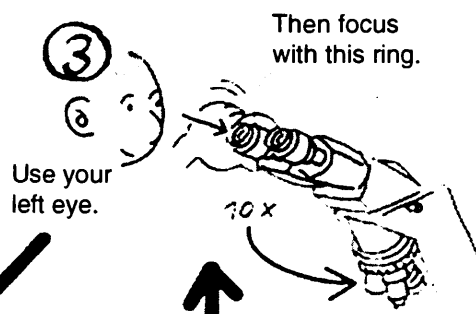
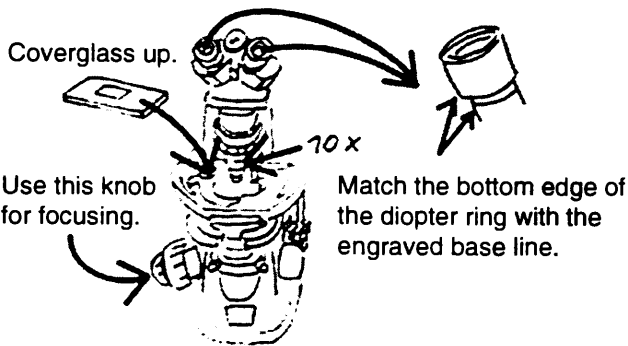


Here's the power switch.

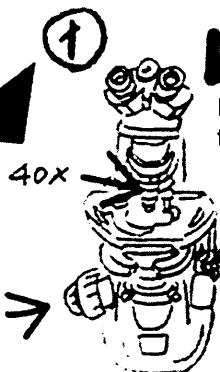
Adjust brightness too.

Turn on the lamp and adjust interpupillary distance.

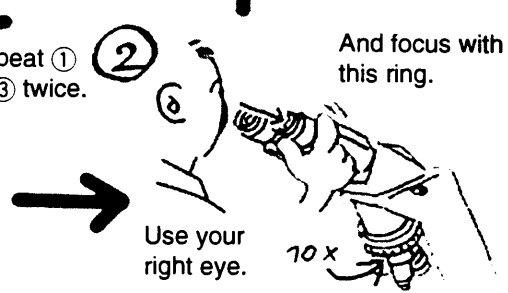
Focus with 10x objective.



Adjust the diopter.



Repeat 1 to 3 twice.



End

Turn off the power.

Wait till the microscope cools down before storing.

Check the magnifying power.

Move the lever to the magnifying power of the objective.



Magnify the image and observe!

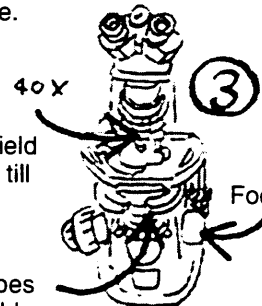
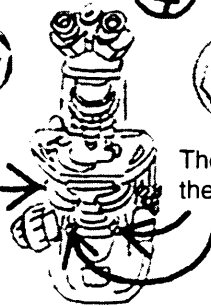
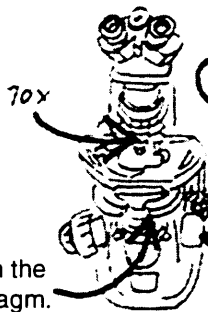
Field diaphragm image

④



Focus on the field diaphragm image with this knob.

Then, center the image.



Close down the field diaphragm.

Focus.

Open the field diaphragm till the field diaphragm image circumscribes the viewfield.

Focus.

Field diaphragm image

②



Focus on the field diaphragm image with this knob.

Then, center the image.

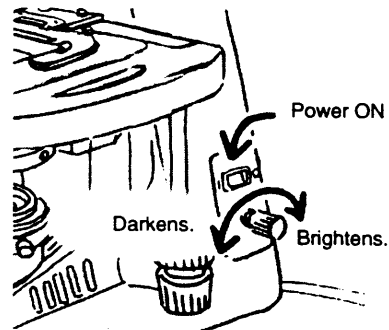
Center the field diaphragm

IV

Microscopy (Detailed Procedure)

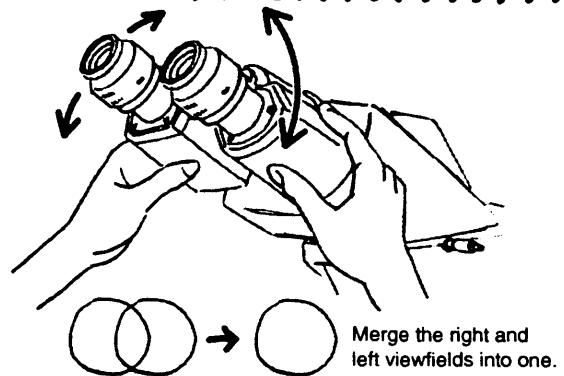
1) Lamp Illumination

Turn on the power switch (turn to I) and the lamp will come on. Turn the brightness control dial to adjust the brightness of the viewfield. (Turning the dial clockwise increases the brightness; turning the dial counterclockwise decreases it.)



2) Interpupillary Distance Adjustment

Adjust the distance between the eyepieces to merge the right and left viewfields into one. (This is an adjustment to match the distance between eyepieces with the distance between your eyes).



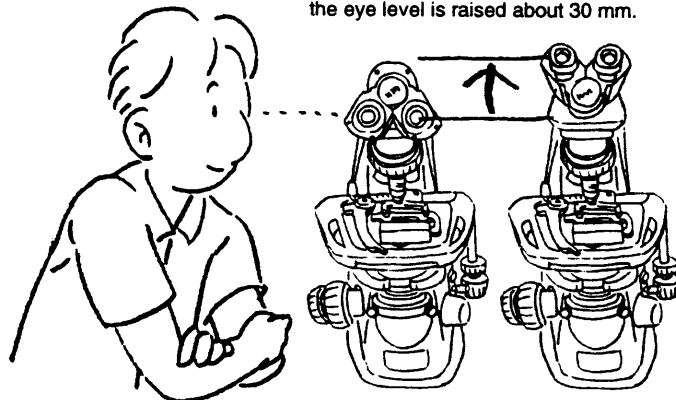
Try!!

Changing the Eye Level

Turn the binocular part of your microscope 180 degrees, and you will get the microscope with higher eye level.*

If you feel uncomfortable in observing the image due to its size, you may find this convenient. There is one condition, however, that should be met. Before returning the microscope in the cabinet, put back the binocular part to its original low position. Since left high, the tip of the eyepiece will become the highest point of the microscope and may be damaged easily when bumped against the shelf. In addition, the microscope may be higher than the shelf.

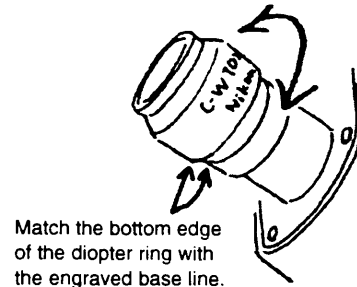
The eye level can be raised even higher (till 50 mm) if an "Eye level raiser (optional)" is installed between the basic unit and the eyepiece tube. See p. 27 for details on the eye level raiser.



*1: When the interpupillary distance is 64 mm, the eye level is raised about 30 mm.

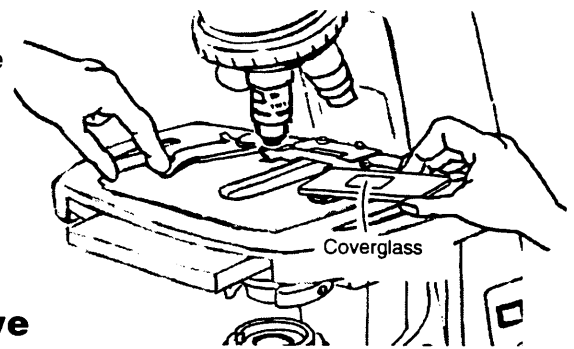
3) Align the Diopter Ring with the Engraved Base Line

Turn the diopter ring on the right eyepiece to align its bottom edge with the engraved base line. Turn and align the diopter ring on the left eyepiece in the same way.



4) Specimen Mounting

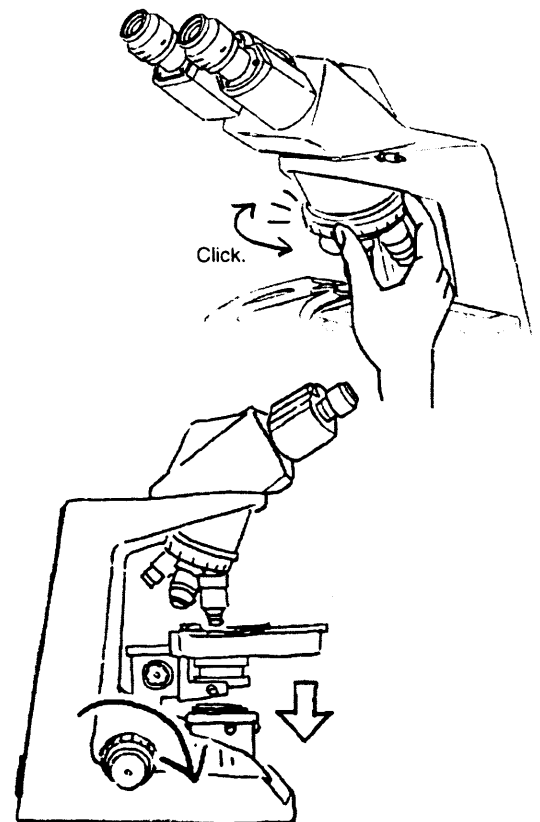
Place specimen slide on the stage with the coverglass facing upward. Open the claw of the specimen holder with your finger at the root or the tip tilt and fix the specimen slide with the claw.



5) Focus with the 10x Objective

Rotate the revolving nosepiece to bring the 10x objective into the optical path. (The objective will click into place when rotated into position.) Bring the specimen image into focus by turning the coarse focus and then fine focus knob.

- Direction of stage movement relative to focus knob rotation is shown in the figure.
- There is no coarse focus knob on the side with the stage motion knobs. There are both coarse and fine focus knobs on the opposite side of the stage motion knobs.
- Do not turn the right and left focus knobs simultaneously in the opposite directions. Do not turn the coarse focus knob further after the stage has reached its lower or upper limit. These operations could result in a malfunction.



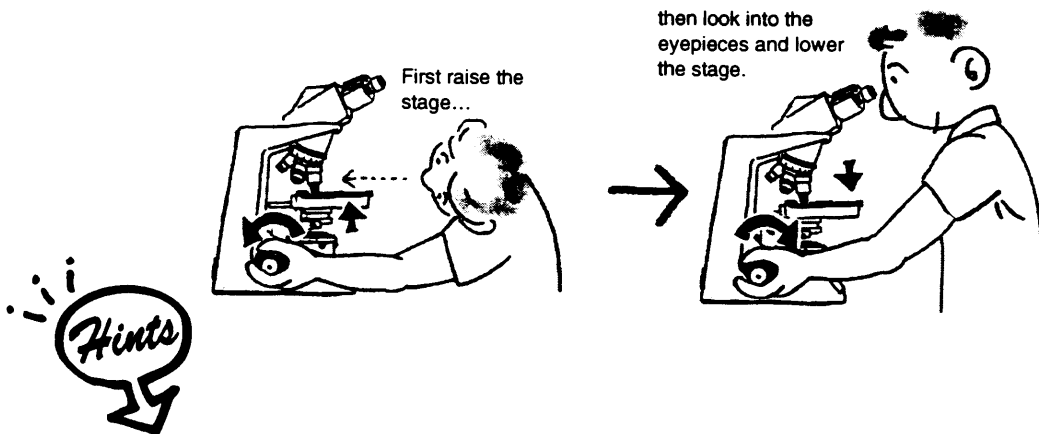
Try!!

Focusing

Turning the focus knobs recklessly is a long and hard way to focus on the image. If you are using a high power objective, you may even damage the specimen by pressing it against the objective. Before breaking the coverglasses or damaging the objectives, read the following and find the correct way to focus on the specimen.

- (1) Put the 10x (or 4x) objective in the optical path.
- (2) Turn the coarse focus knob to raise the stage to its upper limit. ^{*1}
- (3) Looking into the eyepieces, slowly rotate the coarse focus knob to lower the stage. When the specimen image appears, stop rotating the knob.
- (4) Rotate the fine focus knob and precisely focus on the image.

When you want to observe the image with a high power objective, first focus on the image using a 10x (or 4x) objective. Then change to a high power objective and rotate the fine focus knob for precise focusing.



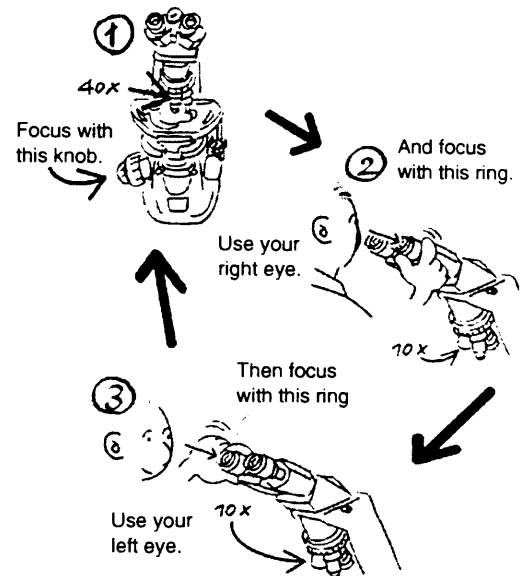
1. When rotating the coarse focus knob while looking into the eyepieces, be sure to turn it only in the direction that lowers the stage.
2. When raising the stage using the coarse focus knob, take your eyes off the eyepieces and look at the gap between the upper surface of the specimen and the front of the objective from the side.
3. First focus with a low power objective. Then change to a high power objective.

*1: Since the working distances of 10x and 4x objectives are large (p. 36), these objectives do not touch the specimen even when the stage is raised to its upper limit provided that the slide and coverglasses of a standard thickness are used. (The standard thickness for slides is 1.2 mm and that for coverglass is 0.7 mm.)

6) Eyepiece Diopter Adjustments

Adjust the diopter ring on the eyepieces according to the difference between your left and right eyesight. This adjustment enables the user to take full advantage of the high-quality objectives, including their parfocality.

- (1) **Swing the 40x objective in the optical path.**
Rotate the coarse and then fine focus knobs to bring the specimen in focus.
- (2) **Switch back to the 10x (or 4x) objective.**
While looking into the right eyepiece with your right eye, focus on the specimen by rotating the right diopter ring and not using the focus knob.
- (3) **While looking into the left eyepiece with your left eye, focus on the specimen by rotating the left diopter ring and not using the focus knob.**
- (4) **Repeat the steps ① to ③.**

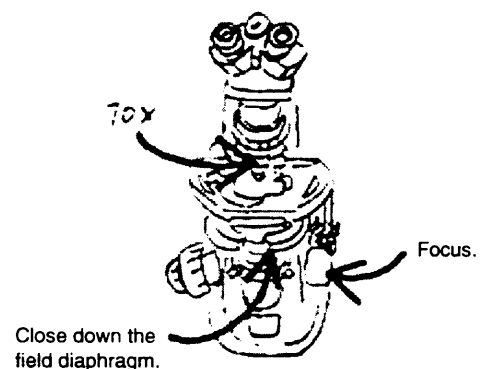


The next procedure is for microscopes equipped with field diaphragm. If the microscope does not have a field diaphragm, confirm the position of the condenser and skip to procedure 8). (The condenser should be a little lower than its highest position.)

7) Field Diaphragm Centering and Focusing (for microscopes with the field diaphragm)

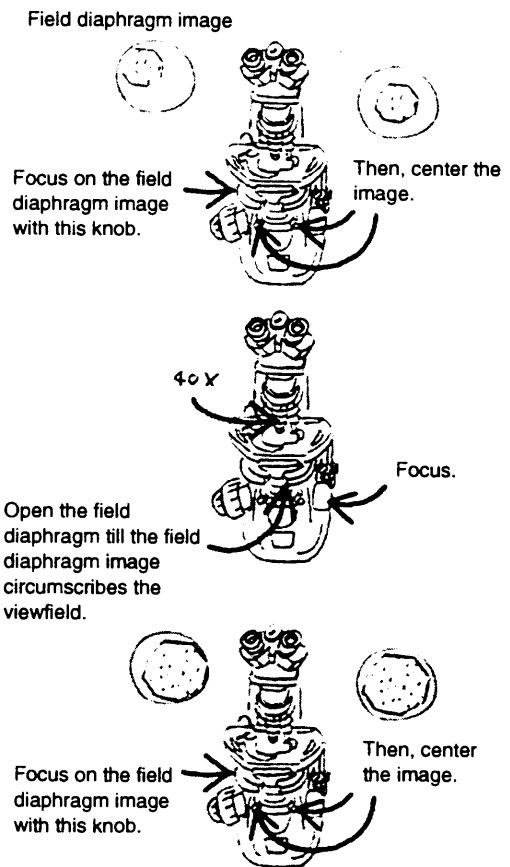
The field diaphragm is used to limit the specimen's illuminated area to the size of the viewfield. If off-centered, its image will also be off-centered in the viewfield especially when closed down. Follow the steps below to match the centers of the viewfield and the field diaphragm image.

- (1) **Swing the 10x (or 4x) objective in the optical path. Close the field diaphragm to its minimum aperture by rotating the field diaphragm ring.**



(Continued on the following page)

- (2) While looking into the eyepieces, rotate the condenser focus knob to focus the field diaphragm image on the specimen surface. (Focus on the edge of the diaphragm image.)
- (3) Rotate the field diaphragm centering screws until the field diaphragm image comes to the center of the viewfield.
- (4) Switch to the 40x objective and rotate the field diaphragm ring so that the field diaphragm image becomes about the same size as the viewfield.
- (5) If the field diaphragm image is not centered, use the centering screws again.



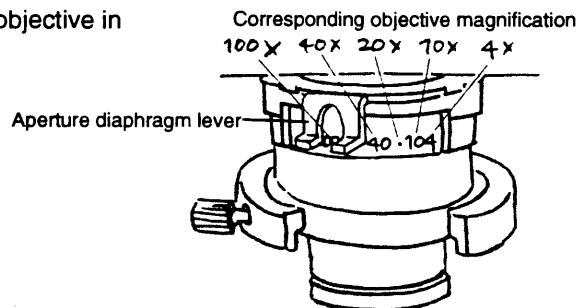
8) Objective Selection

Rotate the revolving nosepiece to the desired objective magnification. (The objective will click into place when rotated into position.)

Adjust the aperture diaphragm lever according to the selected objective. If the microscope is equipped with a field diaphragm, also adjust the size field diaphragm (see the procedures 9) and 10)).

9) Aperture Diaphragm Adjustment

Set the condenser aperture diaphragm lever to the same figure as the magnification of the objective in the optical path.



Try!!

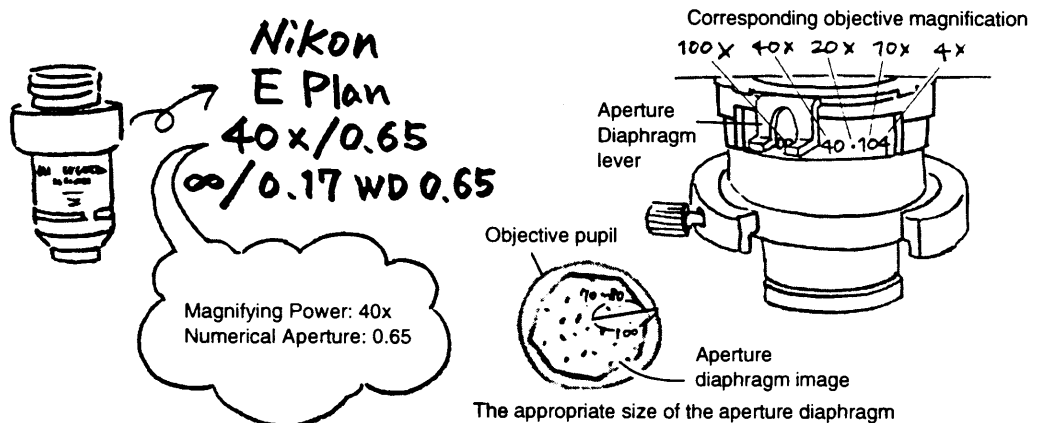
Adjusting the Aperture Diaphragm

The aperture size is increased or decreased by rotating the condenser aperture diaphragm lever. If the aperture diaphragm 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 but the contrast and range of focus are decreased.

Generally, a good image of sufficient contrast can be achieved with the aperture diaphragm closed to approximately 70% - 80% of the objective's numerical aperture. Since the image resolution will be degraded when the aperture diaphragm is closed too much, do not close the aperture diaphragm to less than 60% of the objective's numerical aperture except when observing a specimen with low contrast, such as a near-transparent specimen.

The aperture diaphragm controls the numerical aperture of the illumination. Do not use it to control brightness. Use the brightness control dial to control the brightness.

- The objective's numerical aperture is indicated on the side of the objective.
40x / 0.65 = magnifying power 40x, numerical aperture 0.65
- To observe the diaphragm image, remove the eyepiece and look down the open tube. (The eyepiece is fastened to the eyepiece tube. Loosen the screw before removing the eyepiece.)
- The figures on the condenser show the approximate positions of the aperture diaphragm lever corresponding to each objective magnification. (When the aperture diaphragm lever is moved to that position, the size of the aperture diaphragm will be 70% - 80% of the objective's numerical aperture.) Each time you switch the objective, align the aperture diaphragm lever to the same figure as the magnifying power of the objective to get a good image with sufficient contrast.

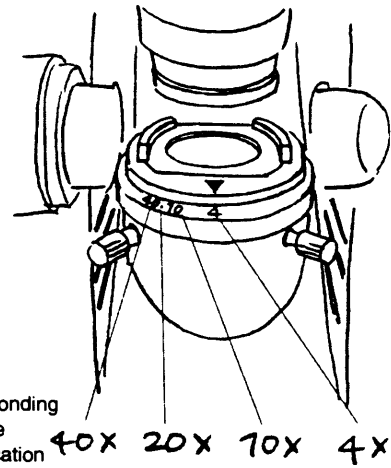


The next procedure 10) is for the microscopes with field diaphragms. If the microscope does not have a field diaphragm, skip to procedure 11).

10) Field Diaphragm Adjustment (for microscopes with the field diaphragm)

The field diaphragm is used to control the specimen's illuminated area relative to the microscope's viewfield. If it is opened to a larger aperture than necessary, extraneous light will enter the viewfield, which may reduce the image contrast. Every time you change the objective magnifications, rotate the field diaphragm ring until the diaphragm just leaves the viewfield.

- The figures around the field diaphragm show the approximate positions for field diaphragm ring corresponding to each objective magnification when 10x eyepieces are used.
- For 100x objectives, the field diaphragm cannot be closed enough.

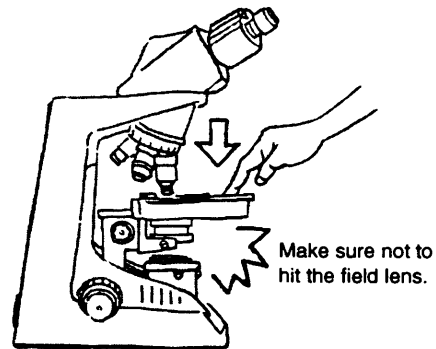


Try!!

Replacing a Specimen Using the Refocusing Mechanism

Try focusing on the specimen with 40x or higher magnification objective. You will find the specimen is brought very near to the objective.¹ It will be very difficult to change the specimen without moving the focus knob. In a case like this, use the refocusing mechanism for easy specimen replacement.

- (1) Use one hand to gently press down the stage.²
- (2) While holding the stage at that position, change the specimen.
- (3) Gradually release the stage so that it rises slowly. The stage will return to the focal position.



¹: The distance between the front of the objective and the specimen when the specimen is in focus is called the "working distance" of the objective. For details, see p. 36.

²: When lowering the stage, take great care not to hit the field lens with the condenser and the parts under the condenser.

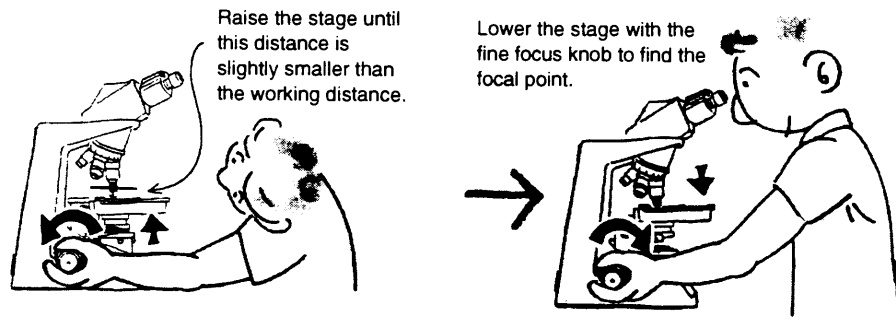
Try!!

Using the Working Distance for Focusing

Each objective has its working distance indicated on its side. The working distance is the distance between the front of the objective and the specimen when the specimen image is in focus. If you have difficulties in focusing with the standard procedure described on p. 18, try one of the following methods using the working distance for focusing.

Method 1:

While looking at the microscope from the side, rotate the coarse focus knob to bring the specimen close to the objective. When the distance between the specimen and the front of the objective becomes slightly smaller than the working distance, take your hands off the coarse focus knob. The specimen is now almost in focus. Look into the eyepieces and rotate the fine focus knob in the direction that lowers the stage.



Method 2:

Swing the 40x objective into the optical path. While looking at the microscope from the side, rotate the coarse focus knob until the specimen almost touches the objective (about 0.5 mm apart from the front of the objective). The specimen is now almost in focus. Switch to the 10x objective, look into the eyepieces, and rotate the fine focus knob slightly to find the focal point. Be careful not to hit the objective with the specimen.

11) Turning Off the Lamp

Turning off the power switch (turn to ○) switches off the lamp.

When storing the microscope:

- Unplug the power cord.
- Wait until the field lens unit is cool enough to touch.
- Return the binocular part to its lowest position.
- Cover the microscope with the vinyl dust cover. (Before covering the microscope, make sure that the field lens unit is cool enough to touch.)
- When carrying the microscope, hold it at its upper rear and lower front ends.



Miscellaneous Operations

1

Oil-Immersion Observation

The "Oil" mark on the side of an objective indicates that it is an oil-immersion type objective. (The oil-immersion objective also has a black band around the barrel end.) An oil-immersion objective is used with the immersion oil applied between the front of the objective and the coverglass. For an oil-immersion objective with a numerical aperture of 1.0 or more, use of an oil-immersion type condenser is required to take full advantage of its performance. An oil-immersion type condenser, like an oil-immersion type objective, needs immersion oil to be applied between the front of the condenser and the coverglass.

The abbe condenser included in the bright viewfield set can be used for oil immersion observation. The condenser has an oil receptacle around its front lens.

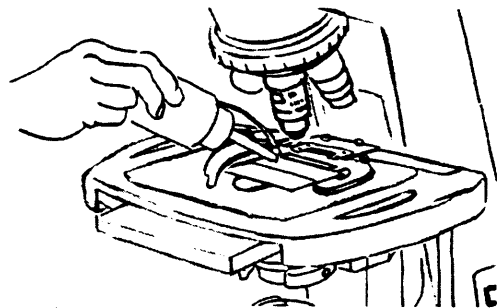
● Example of Oil-Immersion

Condenser:

Move the specimen toward the back and lower the condenser slightly. Add a drop of oil on the front of the condenser from the long hole on the stage. Bring the specimen back over the condenser and slowly raise the condenser.

Objective:

Rotate the revolving nosepiece to move the objective out of position. Add a drop of oil to the specimen. Slowly rotate the revolving nosepiece to bring the objective back into position.



● Eliminate Air Bubbles

Make sure that air bubbles are not trapped during oil application. Air bubbles degrade the image. To see if any air bubbles are trapped in the oil, remove one eyepiece and fully open the aperture diaphragm (and field diaphragm, if the microscope has the field diaphragm). Look into the eyepiece tube and check the objective pupil (a bright round part). If you cannot see it well, replace one of the eyepieces with the adapter and the centering telescope (both optional) and look through the eyepieces of the centering telescope while rotating the eyepiece part of the centering telescope.

Do any of the following to eliminate air bubbles:

- Rotate the revolving nosepiece to move the objective back and forth.
- Gently rotate the condenser focus knob to move the condenser up and down.
- Add another drop of oil.
- Wipe off the oil and apply again.

● Handling of the Immersion Oil

Use a minimum quantity of oil. If too much oil is applied, surplus oil could flow out onto the stage and the condenser and degrade performance.

After completing oil-immersion observation, be sure to clean the objective, condenser, and any other parts that may be stained by oil. Any oil residue left on the lenses of oil-immersion type objectives or adhesion of oils on the front lens of dry type objectives will degrade image quality. Use petroleum benzene to wipe off oil and finish with absolute alcohol (ethyl or methyl alcohol). If petroleum benzene is not available, use methyl alcohol instead. In that case, wipe off the oil several times (generally 3 or 4 times) as the detergency of methyl alcohol is weaker than petroleum benzene.



WARNING

When handling petroleum benzene and absolute alcohol, be sure to follow the instructions provided by the manufacturers. Since they are highly inflammable take great care when handling them.

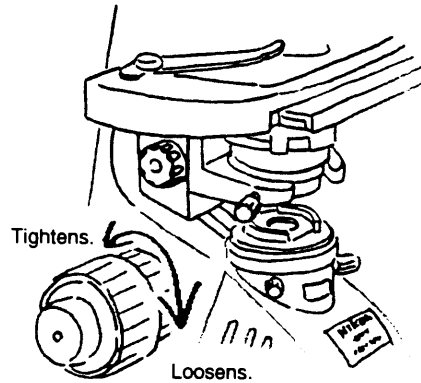
● Cautions on Handling the Immersion Oil

- Close the container cap tightly after use. Make sure that the cap is closed tight after refilling the container. Check the cap periodically to make sure it has not come loose, allowing oil to leak out.
- Do not press the container hard. Oil could splash out.
- If you find an oil drips around the container, wipe them off.
- Avoid contact of immersion oil with eyes or skin. In the event of contact with eyes or skin, take one of the following measures although Nikon immersion oil does not contain any toxic ingredients.
 - ◇ **Contact with skin: Rinse your skin thoroughly with soap and water.**
 - ◇ **Contact with eye: Rinse your eye thoroughly with water (more than 15 minutes) and see a doctor.**
- Do not leave immersion oil in the sun (ultraviolet rays can damage it).

2

Adjusting the Torque of the Coarse Focus Knob

The tension (torque) of the coarse focus knob rotation can be adjusted. To increase the tension, turn the coarse focus knob torque adjustment ring counterclockwise. The torque adjustment ring is located at the back of the coarse focus knob. To decrease the tension, turn the ring clockwise. Do not decrease the tension too much. If it is too loose, the stage will fall under its own weight.

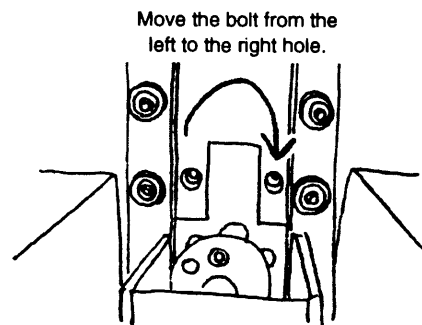


3

Upper Limit Bolt

The upper limit bolt is used to prevent the specimen touching the objective when a 40x or larger-power objective (objectives with a small working distance) is used. Using the upper limit bolt, the stage does not move up from a certain position. Attach the bolt as follows.

- (1) Bring an objective with 40x or larger power into the optical path. Focus on the specimen.
- (2) Lower the stage to slightly below the position set in step (1).
- (3) Remove the field lens unit.
- (4) A hexagonal socket head bolt is located in the left hole at the lower part of the focusing mechanism. Remove the bolt using a supplied hexagonal wrench and screw it into the right hole.

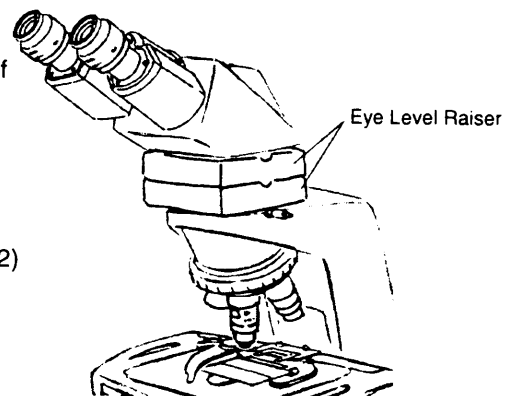


Note: The upper limit bolt may not work well depending on the thickness of the specimen or the microscope itself. The specimen may touch the 40x objective or the stage may be stopped by the limit before the specimen image is in focus. Check that the bolt works before relying on it.

4

Eye Level Raiser

The eye level raiser (optional) adjusts the height of the eyepiece tube according to the eye level of the user. Install the eye level raiser between the basic unit and the eyepiece tube. One eye level raiser is 25 mm high. You can use up to two raisers—this raises the eyepiece tube by 50 mm. Use a hexagonal wrench (nominal size 2) for M4 set screws to install the raisers.



5

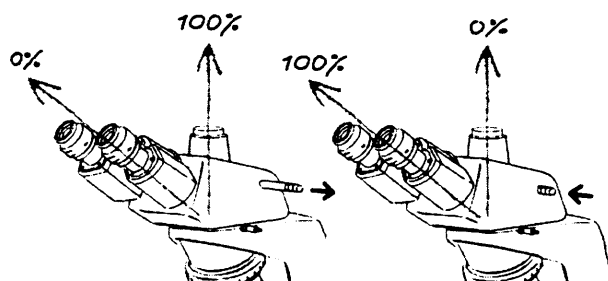
Photomicrography and TV Microscopy

The microscope ECLIPSE E200 can be used for photomicrography and TV microscopy. For those observations, trinocular eyepiece tube, photomicrographic equipment, TV vertical tube, and C-mount CCTV camera (optional) are available. Read the manuals provided with these devices for installation and operating conditions.

Eyepiece tubes and relay lenses come in various types. For details, ask your nearest Nikon representative.

● Trinocular Eyepiece Tube

Push or pull the optical-path selection lever to adjust the amount of light sent to the binocular part and the vertical tube. The eyepiece tubes for the ECLIPSE E400 and E600 can be also used for the E200.



Distribution of Light for Trinocular Eyepiece Tube (Example)

● Vertical Tube Adapters

When installing the photomicrographic equipment and TV camera on the vertical tube of the trinocular eyepiece tube, vertical tube adapters are required in-between. For details, ask your nearest Nikon representative. Typical combinations are shown below.

- Photomicrographic equipment: Use the TV vertical tube and the photomicrographic vertical tube adapter.
- C-mount CCTV camera: Use the TV vertical tube and the direct C-mount adapter. The relay magnification is 1x.
- Digital still camera: Use the TV vertical tube and the direct C-mount adapter. Use the relay lens for the C-mount adapter, as necessary.

-
- **● TV Relay Lenses**

- For the C-mount CCTV camera, 0.6x, 0.45x and 0.35x relay lenses are available. Select the magnification of the relay lens according to the size of the photographic element. When a 3CCD TV camera is used with some relay lenses, the colors of the video image may blur. For details, ask your nearest Nikon representative.

-
- **● Color Tone**

- The color tone of the light from the lamp varies with the position of the brightness control dial. If the dial is turned clockwise and the voltage is increased, the light has a bluish tone. If the voltage is reduced, the light has a reddish tone.

- Attach the provided blue filter to the bottom of the condenser and check the color tone of the specimen.

-
- **● Uneven Viewfield Brightness**

- When a 4x objective is used for the photomicrographic equipment or digital still camera, the viewfield may look partially dark. Make the brightness of the viewfield uniform using one of the following methods.

-
- **• Lower the condenser.**

- Slightly lower the condenser to take more space between the specimen and the condenser. If the microscope is equipped with a field diaphragm, the field diaphragm image may blur slightly.

-
- **• Use a phase-contrast condenser and diffuser slider (both optional).**

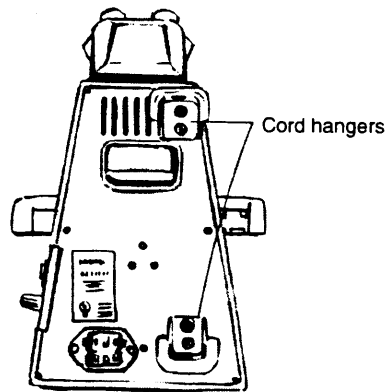
- Attach the phase-contrast condenser and the diffuser to the microscope. When the diffuser is inserted into the optical path, the amount of light will drop to about 60% of its initial value. Also, you will not be able to see the field diaphragm in the viewfield.

-
- **6 ND Filter for the Objective**

- When observing the specimen with 10x and 40x objectives in turns, placing an ND3 filter (specially designed for objectives; optional) to the rear end of the 10x objective will facilitate the observation. With the ND filter attached, you will have the same brightness and color tones for both 10x and 40x objectives without adjusting the brightness control dial.

7 Cord Hangers

Push the cord hangers (optional) into the holes on the rear of the microscope. The hangers can be used for winding the power cord around when the microscope is not in use. To remove the hangers, use a screwdriver.



VI

Assembly

Read the “Common Sense Safety Instructions” in this manual before assembling the microscope. Be sure to follow the instructions written therein. Also, make sure that the power switch is off (turned to ○) before assembly to prevent electrical shock.

Tools Required for Assembly

Hexagonal wrench (one hexagonal wrench is provided with the microscope), flatblade screwdriver

1 Assembly of Standard Set

1) Input Voltage Check

The input voltage is indicated in two places at the rear of the microscope: on the nameplate and above the AC inlet. Confirm that these input voltage indications correspond to the voltage provided in your region. If not, follow one of the instructions below. The use of microscopes with the different input voltage indications will cause overcurrent and overheating, which may result in fire or severe damage to the microscope.

- **If the voltage indication on the nameplate differs:**

Do not plug in the microscope. Contact your nearest Nikon representative.

- **If the voltage indication above the AC inlet differs:**

Change the input voltage setting before turning on the power switch.

- For the microscope with the nameplate showing

[100/110/120 V ~]:

The voltage can be set to: AC 100 V, 110 V or 120 V.

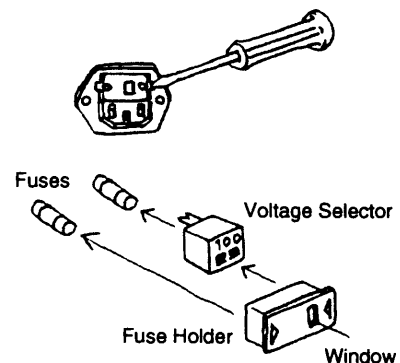
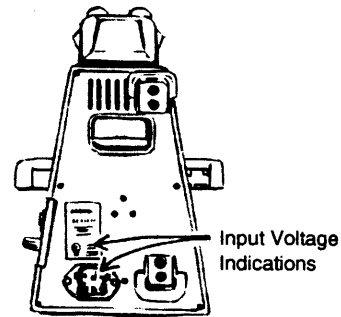
- For the microscope with the nameplate showing

[220/230/240 V ~]:

The voltage can be set to: AC 220 V, 230 V or 240 V.

- **Changing the Voltage Setting**

- (1) Turn off the power switch (turn to ○) and unplug the power cord.
- (2) Remove the fuse holder using the flatblade screwdriver.
- (3) Remove two fuses and the voltage selector from the fuse holder.
- (4) Attach the voltage selector to the fuse holder so that the indication of the voltage provided in your region appears in the window of the fuse holder.
- (5) Put the fuses and the fuse holder back in place.



2) Removal of Shipping Clamps

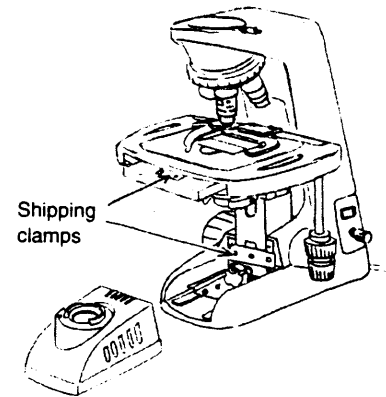
The stage top plate and focusing mechanism are clamped for protection against vibration and shocks during transportation. Remove these shipping clamps with the hexagonal wrench provided.

- **Stage Top Plate:**

The top plate of the stage is retained in the Y-axis direction by a plate fastened with two bolts. Remove the bolts and the plate.

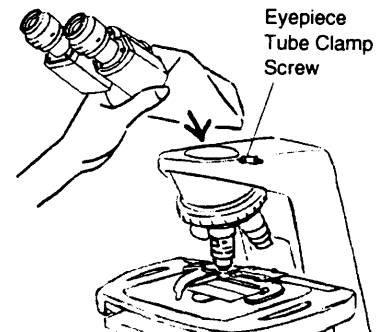
- **Focusing Mechanism:**

Remove the field lens unit to expose a plate retaining the vertical movement of the focusing mechanism. The plate is fastened with 3 bolts. Remove the bolts and the plate.



3) Installing the Eyepiece Tube

Loosen the eyepiece tube clamp screw by hand and place the eyepiece tube on the circular dovetail mount. Tighten up the eyepiece tube clamp screw by hand.



4) Connecting the Power Cord

Turn off the power switch of the microscope (turn to ○). Connect one end (socket) of the supplied power cord to the AC inlet on the rear of the microscope. Connect the other end (plug) to an AC line receptacle with the ground conductor (earth conductor). Make sure that the power cord is securely connected.

- Note that the microscope should be installed near the AC line receptacle and the AC line receptacle should be placed within your reach.
- Use the power cord provided. The use of other cords may damage the instrument or cause a fire hazard.
- If using an extension cord, use only a cord that includes a protective earth (PE) wire.

This completes the assembly of the microscope standard set.

2

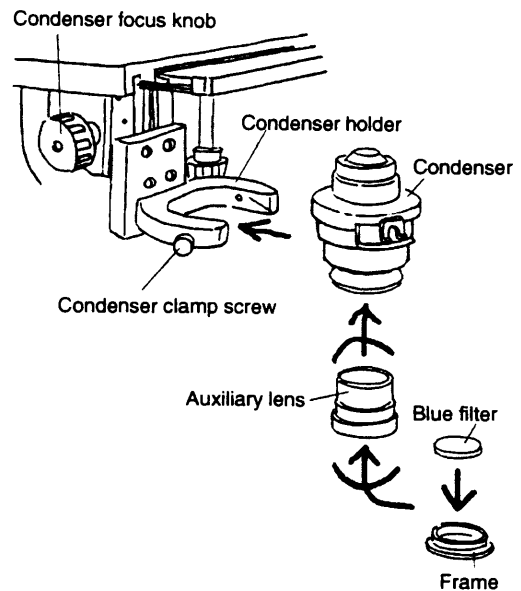
Assembly of Additional Components

1) Condenser

The condenser is attached to the microscope before shipment.

When removing or replacing the condenser, follow the procedure below.

- (1) Lower the condenser holder to its full limit by rotating the condenser focus knob.
- (2) If the microscope is equipped with the field diaphragm, screw in the auxiliary lens to the bottom of the condenser.
- (3) Slide the condenser into the condenser holder.
- (4) Position the condenser with its nameplate facing front. Tighten the condenser clamp screw located to the left.
- (5) Raise the condenser holder to its full limit by rotating the condenser focus knob.
- (6) Place the blue filter in the frame provided and insert them into the bottom of the condenser.
- (7) Focus the condenser so that light passing through the condenser focus the image on the correct position of the specimen (center of the optical path).



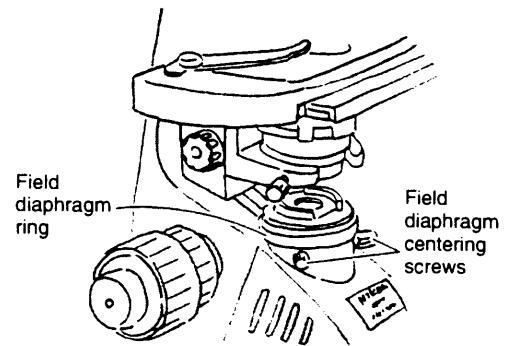
● Microscopes without the field diaphragm

Rotate the condenser focus knob to raise the condenser to its full limit and then slightly lower it to the position where the diffuser image can no longer be seen in the viewfield.

● Microscope with the field diaphragm

- (7-1) Focus on the specimen with the 10x objective.
- (7-2) Close the field diaphragm to its minimum aperture by rotating the field diaphragm ring.
- (7-3) Focus the field diaphragm image on the specimen surface by rotating the condenser focus knob.
- (7-4) Center the field diaphragm image in the viewfield of the eyepiece by manipulating the centering screws.
- (7-5) Change to the 40x objective and focus on the specimen by rotating the fine focus knob.
- (7-6) Focus the field diaphragm image on the specimen surface by rotating the condenser focus knob.

(7-7) Center the field diaphragm image in the viewfield of the eyepiece by manipulating the centering screws. Centering is easier to perform if the size of the field diaphragm image is adjusted so that it is slightly smaller than the viewfield.



2) Objectives

Objectives are attached to the microscope before shipment. When replacing an objective, remove the specimen from the stage and lower the stage. Remove the objective holding it with both hands. Be careful not to drop the objective. Screw a new objective into the revolving nosepiece. Set the objectives in such an order that the objective magnification increases as the revolving nosepiece is turned clockwise (as viewed from the top of the microscope).

3) Specimen Holder

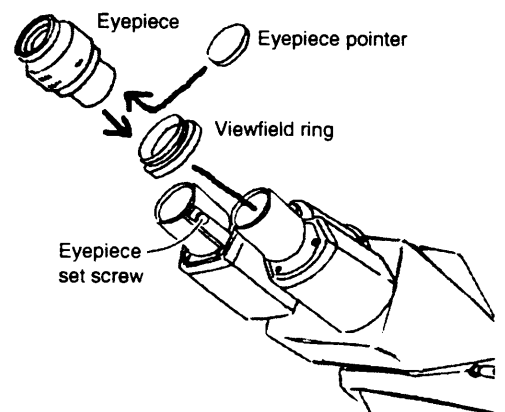
The specimen holder is attached to the stage before shipment. When removing the holder, loosen the two hexagonal socket head bolts furthest from the specimen using the hexagonal wrench provided.

4) Eyepiece and Eyepiece Pointer

The 10x eyepieces are attached to the eyepiece tube before shipment. When removing an eyepiece, loosen the eyepiece set screws using the hexagonal wrench provided and then remove the eyepiece. When attaching an eyepiece, push the eyepiece down to its full limit and tighten up the set screw. Be careful not to tighten too hard.

When changing to a 15x eyepiece (optional), be sure to change both the right and left eyepieces together. The right and left eyepieces should be of the same magnification.

The eyepiece pointer (optional) serves as a reference for pointing out the specimen. Attach the pointer to one of the eyepieces. Rotate and remove the viewfield ring from the eyepiece end. Attach the eyepiece pointer to the eyepiece and then put back the viewfield ring.



5) Other Accessories

For installation of other accessories such as the photomicrographic equipment, see the manual provided for each product.

3 Replacement of Consumable Materials

1) Replacing the Lamp



WARNING

- To avoid electrical shock or damage to the instrument, turn off the power switch (turn to ○) and unplug the power cord before lamp replacement.
- Use the specified lamp. Using a different kind of lamp may damage the instrument or cause a fire hazard.

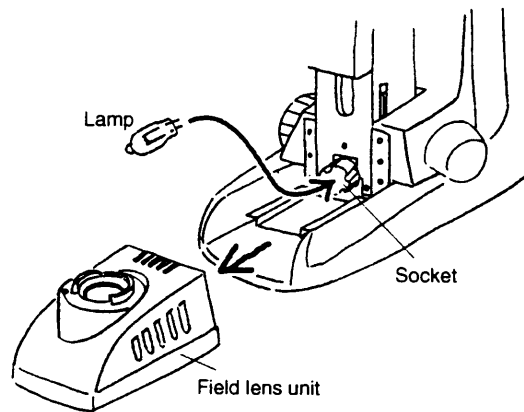
Specified Lamp: Halogen lamp 6V-20W (PHILIPS 7388) or
Halogen lamp 6V-30W (PHILIPS 5761)



CAUTION

- The lamp is hot when in use. To avoid burn injury, turn off the microscope and wait at least 30 minutes (until the lamp is cool enough to touch) before attempting to change the lamp.
- Make sure that the contacts of the lamp and socket are not damaged before installing a new lamp. If the contacts are damaged, they may cause poor illumination or overheating.
- Insert the lamp's contact pins fully into the socket holes. If the pins are loose, the lamp could come loose or result in a contact failure, which will cause overheating or smoke.
- Be sure to put the field lens unit back in place after replacing the lamp. Never turn on the lamp without the field lens unit.
- Do not touch the glass part of the lamp using your bare hands. Wear gloves or use a cloth when handling the lamp to protect the surface from fingerprints. Wipe off any fingerprints or stains using a clean cloth moistened with alcohol. Fingerprints will etch into the hot surface of the lamp and reduce the brightness, damage the lamp or reduce its service life.
- Handle the lamp gently. Shocks and vibrations will damage the lamp or reduce its service life.

- (1) Turn off the power switch (turn to ○) and unplug the power cord.
- (2) Wait about 30 minutes until the lamp and its surroundings are cool enough to touch.
- (3) Hold the field lens unit at the vertical grooves on both sides and pull it toward you to remove it.
- (4) Remove the old lamp.
- (5) Hold a new lamp wearing gloves or using a cloth. Insert the lamp's contact pins fully into the socket holes straight and securely.
- (6) Put the field lens unit back in place.
- (7) Plug the power cord.



2) Replacing the Fuse



WARNING

- To avoid electrical shock or damage to the instrument, turn off the power switch (turn to ○) and unplug the power cord before replacing the fuse.
- Use the specified fuse. Using a different fuse may damage the instrument or cause a fire hazard.

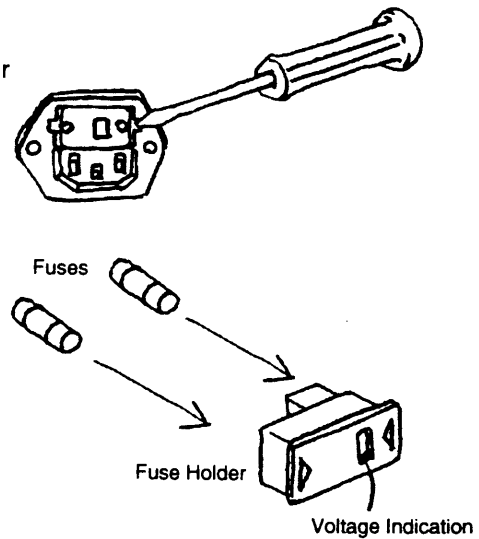
Specified Fuse: 250V 1A, time-lag, high-breaking type, 5x20 miniature fuse x2



CAUTION

- Make sure that the contact of the fuse is not damaged before installing a new fuse. If the contact is damaged, a malfunction or overheating may result.
- Attach the fuse to the fuse holder securely. If not, the fuse may come loose or a contact failure may occur, resulting in overheating or smoke.
- Put back the fuse holder securely to its original position.

-
- (1) Turn off the power switch (turn to ○) and unplug the power cord.
 - (2) Remove the fuse holder using a flatblade screwdriver.
 - (3) Remove the fuses and attach new fuses.
 - (4) Make sure that the voltage indication shown in the window of the fuse holder corresponds to the voltage provided in your region. If not, change the voltage setting by relocating the voltage selector. For details, see P.30.
 - (5) Put the fuse holder back in place.



VI

Optical Characteristics

Combinations of 10x (Field No. 20) Eyepiece with E-Plan Objectives

1

Objective Magnification	Total Magnification	Numerical Aperture	Real Viewfield	Depth of Focus	Resolving Power	Working Distance
4×	40×	0.1	5 mm	63.2 μm	2.8 μm	30 mm
10×	100×	0.25	2 mm	10.1 μm	1.1 μm	7 mm
40×	400×	0.65	0.5 mm	1.2 μm	0.4 μm	0.65 mm
100×	1000×	1.25	0.2 mm	0.4 μm	0.2 μm	0.23 mm

2

Microscope Terminology

(1) Total Magnification

The total magnification of a microscope is the individual magnifying power of the objective multiplied by that of the eyepiece.

(2) Numerical aperture (N.A.)

The numerical aperture is an important factor in determining the efficiency of the condenser and objective. It is represented by the formula:

$$\text{N.A.} = n \sin \alpha$$

where n is the refractive index of the medium (air, immersion oil, etc.) between the objective lens and the specimen or condenser, and α is half of the maximum angle at which light enters or leaves the lens from or to a focused object point on the optical axis.

The larger the numerical aperture the brighter the image and the higher the resolution.

(3) Resolving Power

The ability of an optical system to discriminate between two discrete objects separated by a minute distance. The more minute the distance, the higher the resolving power of the optical system. In relation to the numerical aperture, the resolving power is represented by the following formula:

$$\text{Resolving power} = \frac{\lambda}{2 \times \text{N.A.}}$$

where λ is the used wavelength of light. (The resolving power in the above table is indicated for $\lambda = 0.55 \mu\text{m}$.)

(4) Working Distance (W.D.)

The clearance between the front of the objective and the upper surface of the coverglass, when a specimen image is sharply focused. Generally, the higher the magnifying power of the objective, the shorter the working distance.



Troubleshooting Tables

If difficulties should be encountered in the course of operation, please recheck the symptoms, referring to the tables below, before contacting your nearest Nikon representative.

1

Optical

Darkness at the periphery, no viewfield seen, or uneven viewfield brightness.

Causes

Corrective Measures

Revolving nosepiece not in click-stop position (objective not centered in the optical path).



Revolve to click-stop position (swing the objective correctly into the optical path).

Condenser position too low.



If the microscope is equipped with a field diaphragm, correct positioning so that the field diaphragm image is focused on the specimen surface. (P.19)
If the microscope is not equipped with a field diaphragm, position the condenser slightly lower than the upper limit.

Condenser not installed correctly.



Install correctly. (P.32)

Field diaphragm not centered (if the microscope is equipped with a field diaphragm).



Center the field diaphragm. (P.19)

Field diaphragm closed too far (if the microscope is equipped with a field diaphragm).



Open properly. (P.22)

Field lens unit not installed correctly.



Install correctly. (P.34)

Lamp not installed correctly.



Install correctly. (P.34)

Dirt or dust on the lens (condenser, objective, field lens, eyepiece, specimen)



Clean the lens. (P.47)

Dirt or dust in the viewfield.

Causes

Condenser position too low.



Aperture diaphragm closed too far.



Dirt or dust on the lens (condenser, objective, field lens, eyepiece, specimen).



Corrective Measures

If the microscope is equipped with a field diaphragm, correct positioning so that the field diaphragm image is focused on the specimen surface. (P.19)

If the microscope is not equipped with a field diaphragm, position the condenser slightly lower than the upper limit.

Open properly. (P.21)

Clean the lens. (P.47)

Poor image quality (low resolution, contrast too low or too high)

Causes

Condenser position too low.



Cover glass too thick or thin.



Slide upside down.



No cover glass attached to the slide.



No immersion oil used on the front lens of the oil-immersion objective.



Corrective Measures

If the microscope is equipped with a field diaphragm, correct positioning so that the field diaphragm image is focused on the specimen surface. (P.19)

If the microscope is not equipped with a field diaphragm, position the condenser slightly lower than the upper limit.

Use a cover glass of the specified thickness (0.17 mm).

Turn over the slide so that the cover glass faces up.

Attach a cover glass 0.17 mm thick.

Apply Nikon immersion oil to the objective. (P.24)

Nikon immersion oil is not used for oil-immersion observation.	→	Use Nikon immersion oil. (P.24)
Air bubbles in immersion oil.	→	Remove bubbles. (P.24)
Immersion oil found on dry type objective (especially 40x objective).	→	Clean the objective. (P.25)
Aperture diaphragm and field diaphragm opened or closed too far.	→	Close or open properly. (P.21, 22)

Image dark on one side.

Causes		Corrective Measures
Revolving nosepiece not in click-stop position.	→	Revolve to click-stop position.
Specimen rises from stage surface.	→	Stabilize it using the holder.

Image shifts during focus.

Causes		Corrective Measures
Revolving nosepiece not in click-stop position.	→	Revolve to click-stop position.
Specimen rises from stage surface.	→	Stabilize it using the holder.
Field diaphragm not centered (if the microscope is equipped with a field diaphragm)	→	Center the field diaphragm. (P.19)
Field lens unit not installed correctly.	→	Install correctly. (P.34)

Image tinged yellow.

Causes

Blue filter not used.

Lamp voltage too low.

Corrective Measures

→ Use blue filter. (P.32)

→ Adjust the voltage by rotating the brightness control dial. (P.16)

Image too bright.

Causes

Lamp voltage too high.

Corrective Measures

→ Adjust the voltage by rotating the brightness control dial. (P.16)

Insufficient brightness.

Causes

Lamp voltage too low.

Aperture diaphragm closed too far.

Condenser position too low.

Incorrect input voltage.

Corrective Measures

→ Adjust the voltage by rotating the brightness control dial. (P.16)

→ Open properly. (P.21)

→ If the microscope is equipped with a field diaphragm, correct positioning so that the field diaphragm image is focused on the specimen surface. (P.19)
If the microscope is not equipped with a field diaphragm, position the condenser slightly lower than the upper limit.

→ Using the voltage selector, select the voltage that corresponds to the voltage provided in your region. (P.30)

(Also see the causes and corrective measures for electrical problems.)

2

Mechanical Problems

Image cannot be focused with high-power objectives.

Causes

Slide upside down.



Turn over the slide so that the cover glass faces up.

Cover glass too thick.



Use a cover glass of the specified thickness (0.17 mm).

High-power objective contacts slide when changed over from low power.

Causes

Slide upside down.



Turn over the slide so that the cover glass faces up.

Cover glass too thick.



Use a cover glass of the specified thickness (0.17 mm).

Diopter not adjusted correctly.



Adjust. (P.19)

Difference in focal point too large when switching from one objective to another.

Causes

Diopter not adjusted correctly.



Adjust. (P.19)

Specimen image jumps when specimen is moved by the stage.

Causes

Specimen holder not securely fastened to the stage.



Corrective Measures

Fasten securely. (P.33)

Binocular images not integrated.

Causes

Interpupillary distance not adjusted correctly.



Adjust. (P.16)

Diopter not adjusted correctly.



Adjust. (P.19)

Excessive eye fatigue.

Causes

Interpupillary distance not adjusted correctly.



Adjust. (P.16)

Diopter not adjusted correctly.



Adjust. (P.19)

Inadequate brightness or illumination.



Adjust brightness using the control dial. (P.16)

3

Electrical Problems

Lamp does not light when switched on.

Causes

Corrective Measures

- | | | |
|-------------------------|---|-------------------------------------|
| No electrical power. | → | Check power cord connection. (P.31) |
| Lamp bulb not inserted. | → | Insert correctly. (P.34) |
| Lamp bulb burnt out. | → | Replace bulb. (P.34) |
| Incorrect lamp used. | → | Use the specified lamp. (P.34) |
| Fuse blown out. | → | Replace fuse. (P.35) |

Flickering or unstable lamp brightness.

Causes

Corrective Measures

- | | | |
|--|---|--------------------------|
| Lamp bulb about to fail. | → | Replace bulb. (P.34) |
| Power cord not correctly connected. | → | Connect correctly. |
| Bulb not correctly inserted into socket. | → | Insert correctly. (P.34) |

Sudden lamp failure.

Causes

Incorrect lamp used.

Incorrect input voltage.

Corrective Measures

→ Use the specified lamp. (P.34)

→ Select the voltage that corresponds to the voltage provided in your region using the voltage selector. (P.30)



Care and Maintenance

1 Cleaning the Lenses

- Dust is best removed using a soft brush or gauze.
- More persistent dirt, such as fingerprints, grease and oil, may be removed with lens tissue (or soft cotton, gauze) lightly moistened with absolute alcohol (anhydrous ethyl alcohol or methyl alcohol; do not use rubbing alcohol).
- To clean immersion oil off the oil-immersion type objective, use lens tissue, soft cotton or gauze lightly moistened with petroleum benzine. If petroleum benzine is not available, use methyl alcohol. In this case, you need to wipe three or four times because the detergency of the methyl alcohol is somewhat weak.
- Absolute alcohol and petroleum benzine are quite inflammable. Take great care when handling them and when turning the power switch on and off. Be very careful with fire.

2 Cleaning the Microscope

- Avoid using organic solvents (such as alcohol, ether, thinner, etc.) to clean the microscope. Doing so could result in discoloration of the painted or plastic parts or in peeling of the printed characters.
- We recommend that you use a silicon cloth to wipe down the painted or plastic parts of the microscope.
- More persistent dirt may be cleaned using gauze lightly moistened with mild detergent solution.

3 When Not in Use

- When the microscope is not in use, cover with the vinyl dust cover, and store it in a dry place where mold is not likely to form.
- Make sure that the power switch is off (turned to ○) and the lamp is cool enough to touch before covering with the vinyl dust cover.
- We especially recommend that the objectives and eyepieces be kept in a container (such as a desiccator) with desiccant in it.

4 Periodical Inspections

- To maintain the performance of the microscope, periodical inspections and maintenance are recommended.
 - For details, contact your nearest Nikon representative.
-



Specifications

- (1) **Model Name:** ECLIPSE E200 (Microscope basic unit)
- (2) **Optical System:** CF infinity corrected optical system
Second objective focal length $f = 200$ mm
Built-in diascopic illumination system (Simplified Kohler's illumination system)
- (3) **Focusing Mechanism:** Fine focus knob graduation: $2 \mu\text{m}/\text{graduation}$
Fine focus knob travel: 0.2 mm up or down / revolution
Coarse focus knob travel: about 37.7 mm up or down / revolution
Stage vertical movable range: 1.5 mm upward and 25 mm downward from the focal plane.
- (4) **Stage:** Stroke: X axis: 77 mm
Y axis: 53 mm
- (5) **Revolving Nosepiece:** 4-hole fixed type
- (6) **Electrical Specifications**
- **Lamp Rating:** Halogen lamp 6V-20W (PHILIPS 7388) or
Halogen lamp 6V-30W (PHILIPS 5761)
 - **Output Rating:** 6V 5A max.
 - **Input Rating:** **Model for 100, 110, and 120 V Areas**
 - Input voltage: Select from 100 V, 110 V or 120 V AC by relocating the fuse holder in the AC inlet.
 - Frequency: 50/60 Hz
 - Voltage fluctuation: $\pm 10\%$
 - Rated current: 0.8 A max.
 - Fuse rating: 250 V, 1A, time-lag high-breaking type, 5 \times 20 miniature fuse $\times 2$
 - Power Cord: Use only the following power supply cord. Using the wrong power cord could result in danger or fire. The protection Class I equipment should be connected to PE (protective earth) terminal.
 - UL listed detachable power cord set. 3-conductor grounding type SVT, No.18 AWG, 3 m long maximum, rated at 125 V AC minimum.

Model for 220, 230, 240 V Areas

- Input voltage: Select from 220 V, 230 V or 240 V AC by relocating the fuse holder in the AC inlet.
- Frequency: 50/60 Hz
- Voltage fluctuation: $\pm 10\%$
- Rated current: 0.4 A max.
- Fuse rating: 250 V, 1A, time-lag high-breaking type, 5×20 miniature fuse ×2
- Power Cord: Use only the following power supply cord. Using the wrong power cord could result in danger or fire. The protection Class I equipment should be connected to PE (protective earth) terminal.
 - Approved according to EU/EN standards, 3 conductor grounding Type H05VV-F, 3 m long maximum, rated at 250 V AC minimum.

• **Protection Class:** Class I

(7) Operating Environment

- Room Temperature: 0° to 40°C
- Relative Humidity: 85% Max. No condensation should form.
- Altitude: 2000m Max.
- Pollution: Degree 2
- Installation Category (Overvoltage Category): Category 2
- For indoor use only.

(8) Conforming Standards

- The model for 100, 110, and 120 V areas is a UL-listed product.
- The model for 220, 230, and 240 V areas satisfies the EU Low-Voltage Directive.
- The model for 220, 230, and 240 V areas satisfies the EU EMC Directive.



(The model for 100, 110, and 120 V areas is not covered by the FCC.)

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