Nikon

STEREOSCOPIC MICROSCOPE SMZ-U

Basic Set / Instructions

NIKON CORPORATION

CAUTIONS

① Avoid Strong Shocks!
Handle the microscope gently, taking care to avoid strong shocks.

② Place of Use
Avoid the use of the microscope in a dusty place, or where it may be subject to vibrations, or exposed to temperatures, moisture, or direct sunlight.

③ Power Source Voltage and Fuse
Check the power source voltage and fuse referring to p.5.

④ Changing the Fuse
Before replacing the fuse, turn OFF the power switch and disconnect the power source plug.

⑤ Dirt on the Lens
Do not leave dust, dirt, or finger marks on the lenses. They will prevent you from clearly observing the specimen image.

Thank you very much for purchasing a Nikon microscope.
This instructions describe the main components of Nikon stereoscopic microscope model SMZ-U.
For information regarding accessories, please refer to individual instruction manuals.

CARE AND MAINTENANCE

① Cleaning the Lenses
To clean the lens surfaces, remove dust using a soft brush or gauze. When removing finger marks or grease, use a soft cotton cloth, lens tissue, or gauze lightly moistened with pure alcohol (methyl alcohol or ethyl alcohol). Observe sufficient caution in handling alcohol, as it is inflammable.

② Cleaning the Painted Surfaces
Avoid the use of any organic solvent (for example, thinner, ether, alcohol) for cleaning the painted surfaces and plastic parts of the instrument.

③ Never Attempt to Dismantle!
Never attempt to dismantle the instrument since you may impair its functions.

④ When Not in Use
When not in use, cover the instrument with the accessory vinyl cover, and store it in a place free from moisture and fungus.

⑤ Periodic Checking
To maintain the best performance of the instrument, we recommend that the instrument be periodically checked. (For details of this check, contact your authorized Nikon distributor.)

★ Please note as per your Nikon warranty, "Any defects or damage directly or indirectly caused by the use of unauthorized replacement parts and/or performed by unauthorized personnel" will void the warranty.

Contents

I. Nomenclature and Function

Focusing mount

Torque adjustment ring

Coarse focus knob

Fine focus knob

Zoom body clamp screw

Pillar

Groove for mounting accessories

Plain stand

Interchangeable with other types of stands.

Power switch

Brightness control dial

Diopter scale

Eyepiece 10×

15×, 20×, and 30× eyepieces are also available.

Diopter ring

Eyepiece clamp screw

* Eyepiece tube clamp screw

Refer to 5 on p.9

Diaphragm control knob

○ Open ↔ ✪ Close

Brightness: Bright Dark

Depth of focus: Shallow Deep

Note: Stopping down the diaphragm will lower the resolving power.

Groove for mounting accessories

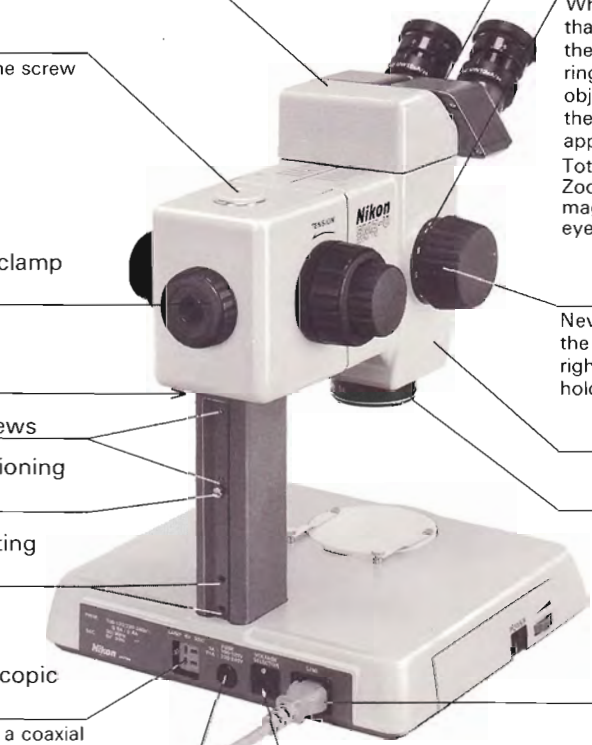
Color code

* Stage plate clamp screw

Stage plate

Specimen clip

Fig. 1



Standard binocular eyepiece tube

A low eyelevel binocular eyepiece tube is also available.

Clamp tool

Used for clamping the screw marked with ∗.

Focusing mount clamp knob

Pillar cap

Refer to ⑤ on p.7

∗ Pillar clamp screws

Pillar height positioning screw

Accessory mounting screws

Outlet for an episcopic illuminator

Used for connecting a coaxial episcopic illuminator or an epi-illuminator (6V-20W halogen lamp) sold separately.

Fuse holder

Fuse: 1A250V(100-120V), time lag 1A250V(220-240V)

Prism box

Zoom magnification (when 1× objective is used.)

When an objective other than 1× is used, attach the magnification indication ring supplied for each objective. These rings show the zoom magnifications applicable to the objective. Total magnification is: Zoom magnification × magnification of the eyepiece.

Zoom knob

Never turn the knob beyond the limit, or never turn the right or left knob while holding the other.

Zoom body

Objective 1×

0.5×, 0.75×, 1.5× and 2× objectives are also available.

AC inlet

Voltage change-over switch

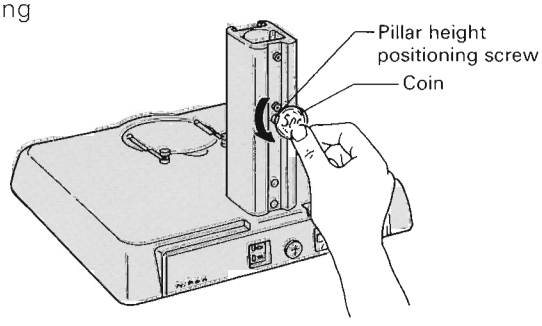
(100-120V/220-240V)

Fig.2

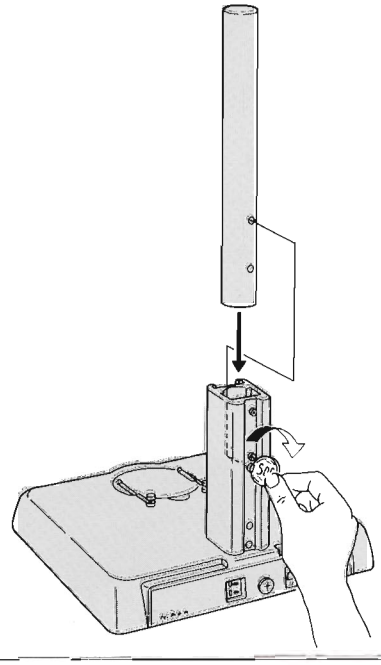
II. **Assembly**

1. Plain stand

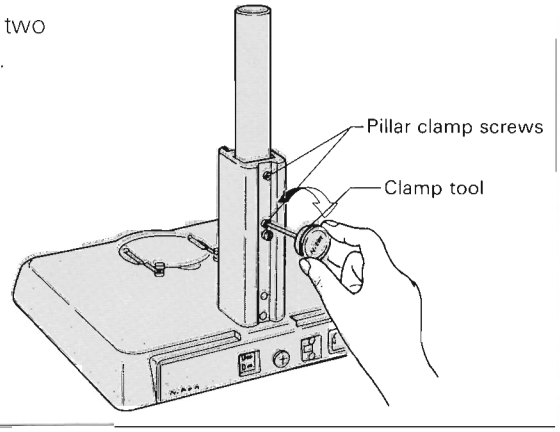
① Release the pillar height positioning screw.



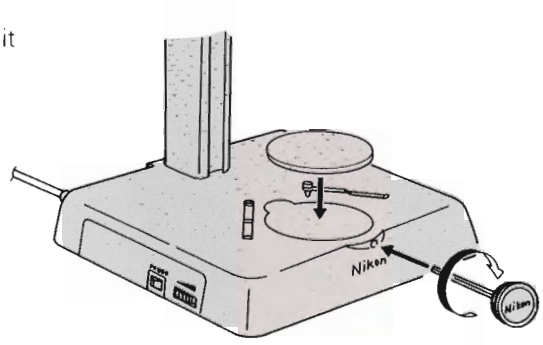
② Insert the pillar to its limit and tighten the pillar height positioning screw fitted into the hole of the pillar.



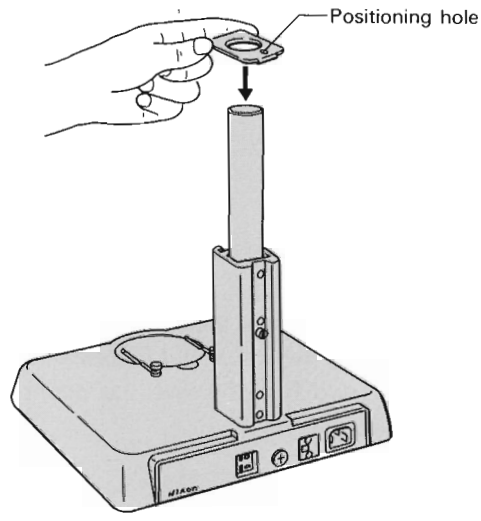
③ Fasten the pillar by tightening the two clamp screws with the clamp tool.



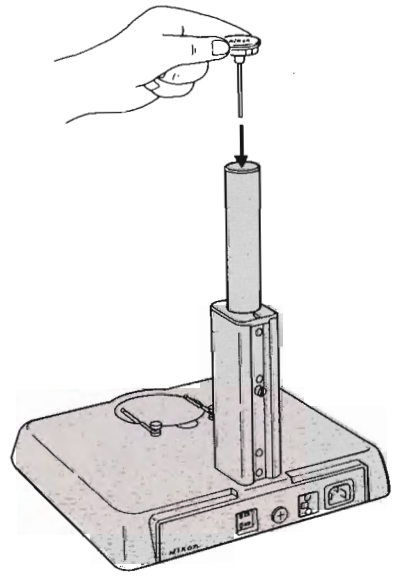
④ Mount the stage plate and fasten it using the clamp tool.



⑤ Mount the pillar cap so that the positioning hole is at the rear.

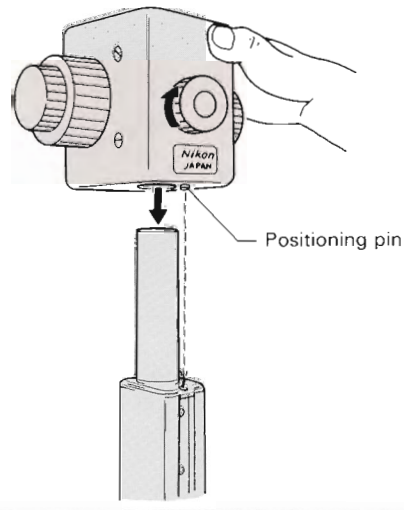


Note: The clamp tool is used for assembling components such as the binocular eyepiece tube. To avoid loss, always store the tool in the top of the pillar.



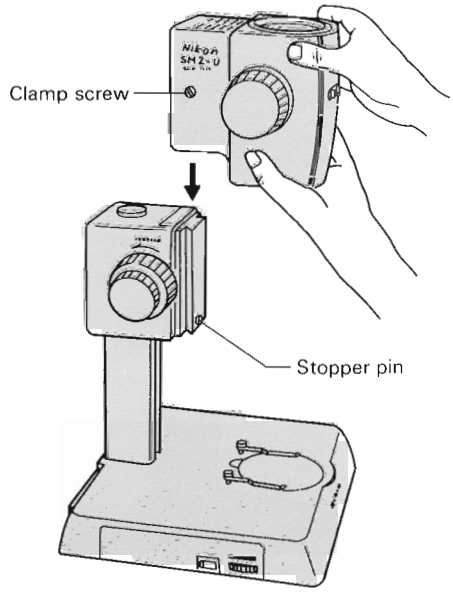
2. Focusing mount

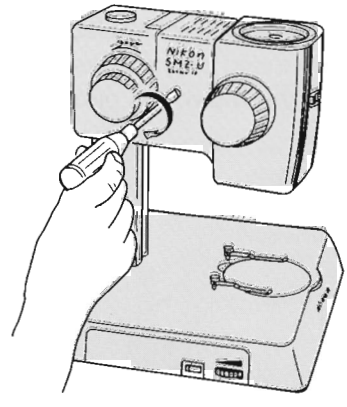
Mount the focusing mount to the pillar so that the positioning pin on the bottom can be inserted into the positioning hole of the pillar cap and fasten it with the clamp knob.



3. Zoom body

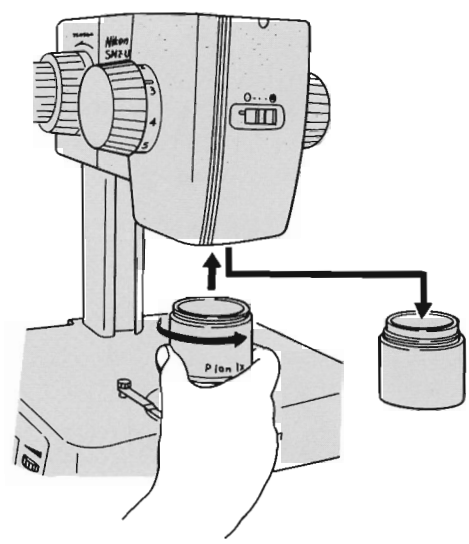
Mount the zoom body along the dovetail of the focusing mount until it reaches the stopper pin and fasten it with the clamp screw.





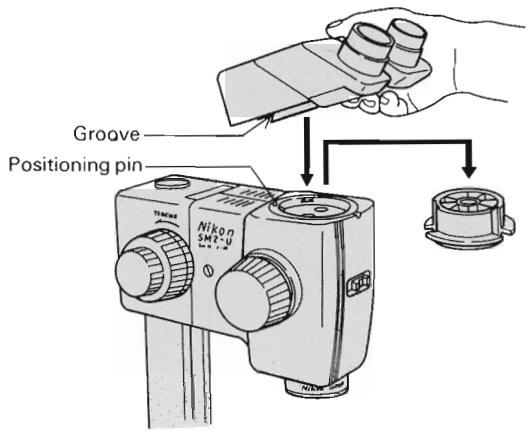
4. Objective

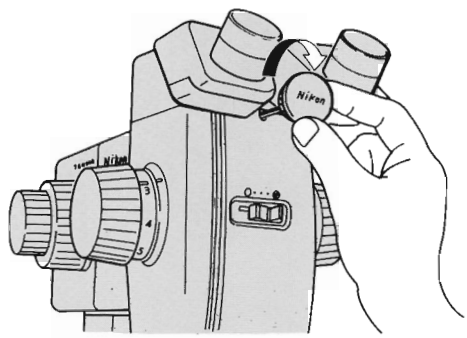
After removing the packaging cap from the zoom body, screw in the desired objective. See page 14 for additional information.



5. Binocular eyepiece tube

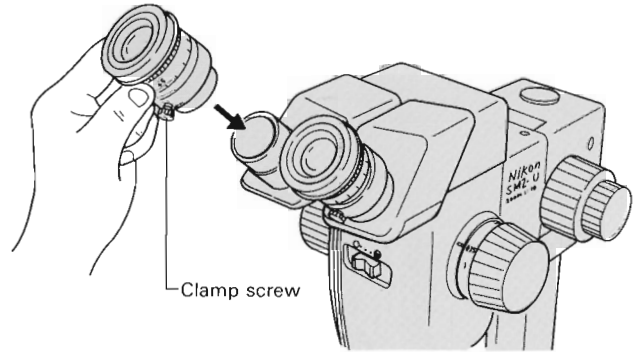
Remove the packaging cap from the zoom body. Tilt and mount the binocular eyepiece tube on the zoom body so that its groove aligns with the positioning pin on the zoom body. Open to the widest inter-pupillary distance.
Fasten it with the clamp tool.

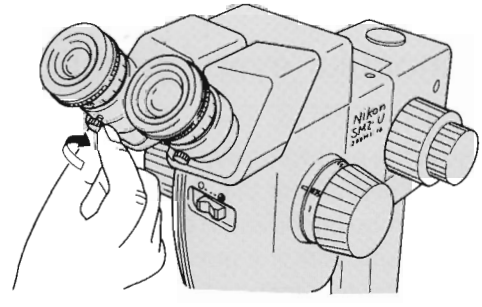




6. Eyepiece

Insert the eyepiece, with its clamp screw positioned at the bottom, into the eyepiece tube sleeve. Tighten the clamp screw.

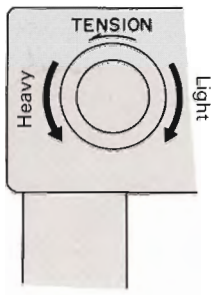




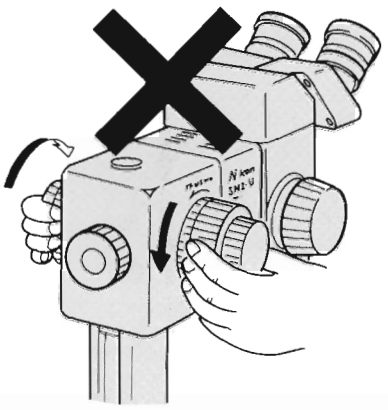
III. Use

1. Focusing mount

Adjust the tension of the focus knobs so that the zoom body does not slip.



Note: Do not twist or rotate the coarse or fine focus knobs that are located on the left and right sides beyond their limit. Do not rotate the fine or coarse focus knob when holding the other. This will cause damage.

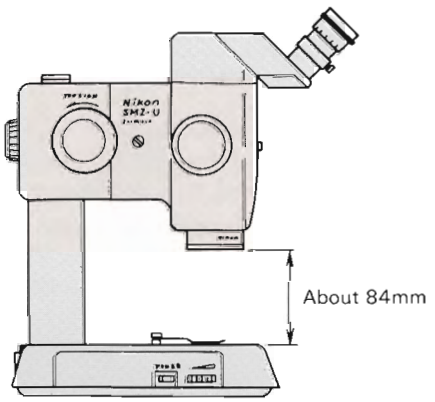


2. Diopter Adjustment····· (A change of magnification should not cause the defocus.)

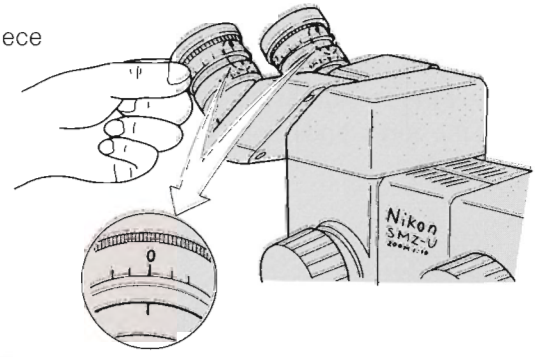
Instructions using 1× objective is shown below :

① Adjust the distance between the specimen and the objective to about 84 mm by turning the coarse focus knob. (See note.)

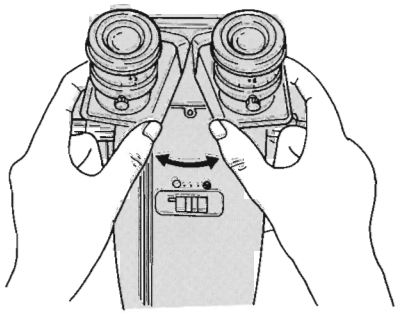
Note: This distance is called the "working distance". See Table 2 (p.18) for the working distance of each objective.



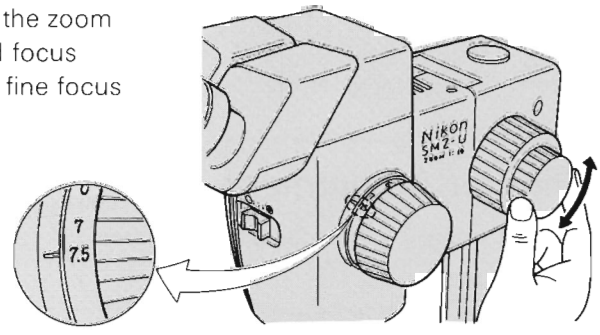
② Set the diopter scale of each eyepiece to "0".



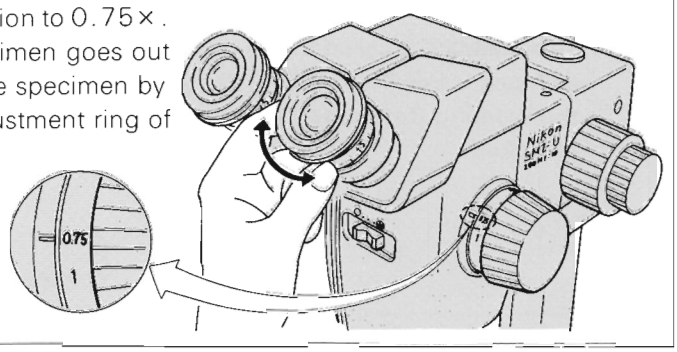
③ Move the prism box to adjust the interpupillary distance.



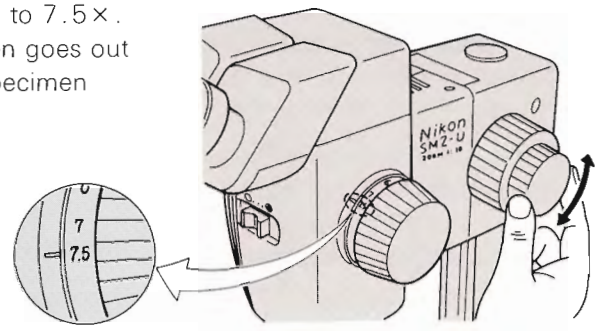
④ Turn the zoom knob to set the zoom magnification to 7.5× and focus on the specimen using the fine focus knob.



⑤ Set the zoom magnification to 0.75×. If the image of the specimen goes out of focus, refocus on the specimen by rotating the diopter adjustment ring of each eyepiece.



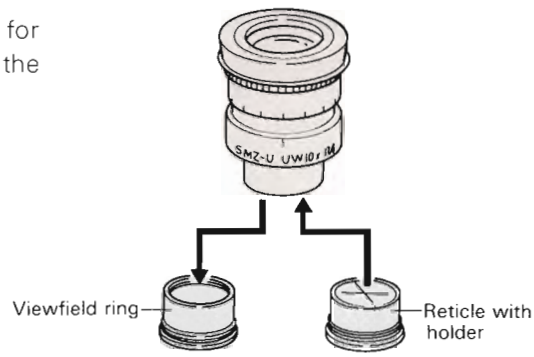
⑥ Set the zoom magnification to 7.5×. If the image of the specimen goes out of focus, refocus on the specimen using the fine focus knob.



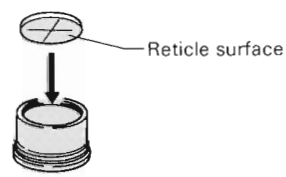
⑦ Repeat the procedures in ⑤ and ⑥ until the focusing with 0.75× and 7.5× will coincide.

3. Eyepiece

A separately sold reticle with holder for SMZ-U can be mounted in place of the viewfield ring.



Note: When installing the reticle prepared individually, place it into the viewfield ring with the reticle surface faced down. See Table 1 for the size of the reticle to be mounted.

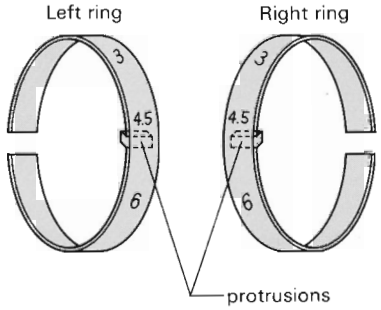


4. Objective

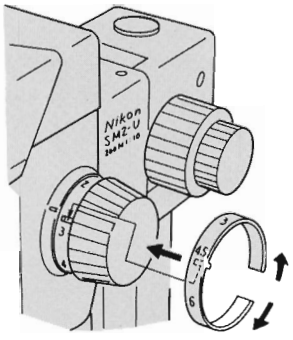
●Attaching the magnification indication ring

All objectives, except 1×, have their own pair of magnification indication rings.

① Each magnification ring is attached to the right and left zoom knobs. Confirm the right or left ring referring to the figure before attaching.



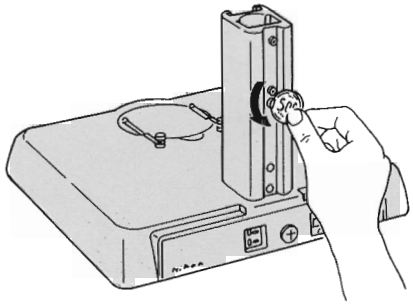
② Spread the magnification indication ring as shown in the figure. Put the indication ring on the zoom knob so that the protrusion fits into the groove on the zoom knob.



●0.75× Objective

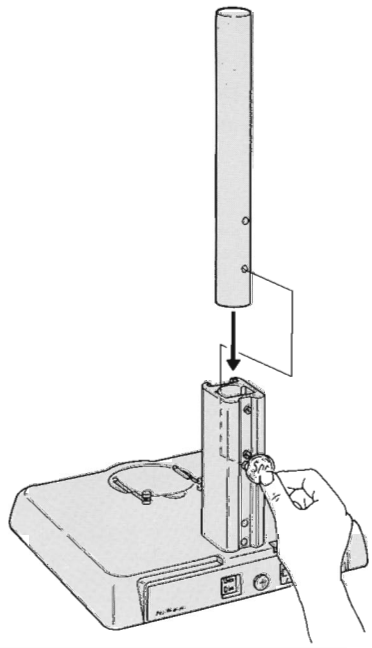
When the specimen requires greater working space, the pillar should be extended.

① Loosen the height positioning screw.



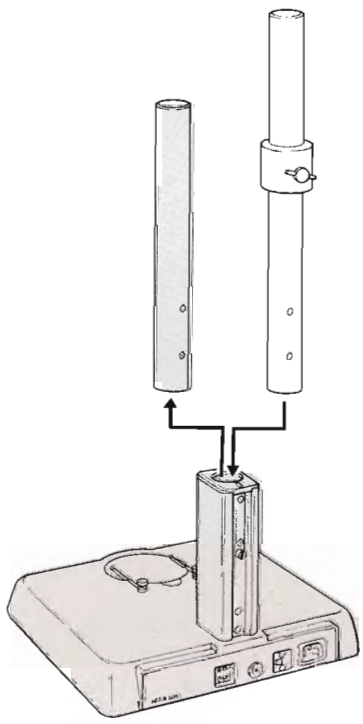
② Fit the height positioning screw in the lower hole of the pillar and tighten the screw, then clamp the two clamp screws.
The pillar can be extended further by screwing in the height positioning screw before inserting the pillar.

Note: **Be careful that the focusing mount does not slip when it is fastened in the middle of the pillar.**

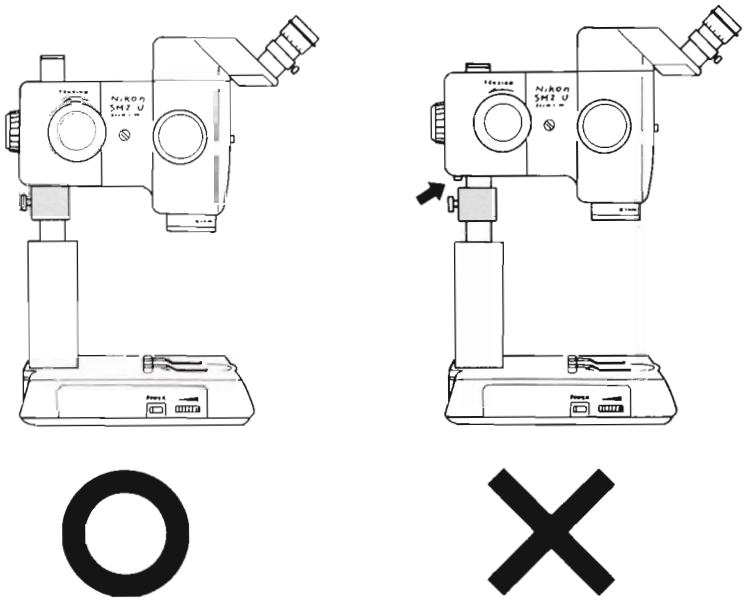


● 0.5× Objective

Replace the standard pillar with the extension pillar sold separately.



Note: Bring the stopper ring of the extension pillar in close contact with the bottom surface of the focusing mount.



Correct

Wrong

Table 1: Pillarr Position and Observable Height of Specimen

Unit: mm

Objective / Pillar position	0.5×	0.75×	1×	1.5×	2
Standard position			0~40	0~50	0~60
Middle position		0~45	0~80	0~90	0~90
High position	0~40	0~90	0~125	0~135	0~135

Note: When using the optional extension pillar, each of the above observable height will increase about 80mm.

5. Stage Adapter

Stage for the Optiphot-2 can be attached using the optional 4" Stage Adapter.
Set the pillar at the highest position.
(Refer to ② on p.15.)

※ ● Rectangular mechanical stage "R3"
● Circular graduated stage "G"
● Large mechanical stage "4R"
can be mounted on this stage adapter.

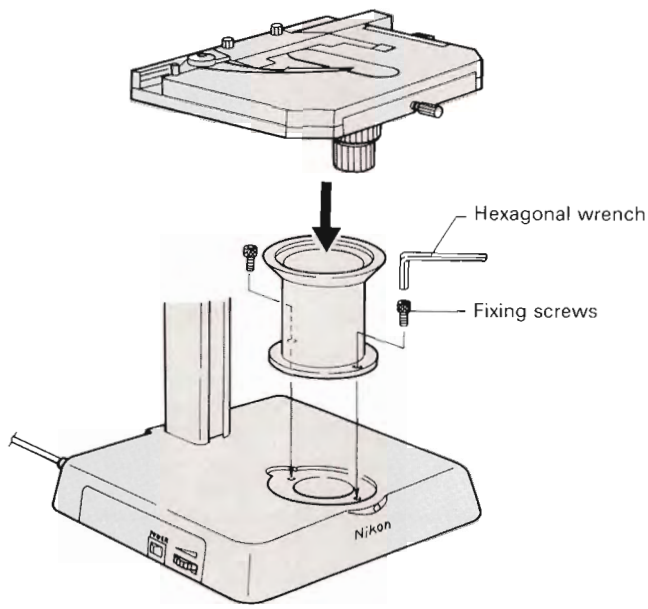


Table 2. Objective/Eyepiece Magnification Chart

Eyepiece (Field number, Reticle ※2) \ ED plan objective (Working distance, Color code ※1)		0.5× 155mm (Red)	0.75× 117 (Yellow)	1× 84 (White)	1.5× 50.5 (Green)	2× 40 (Blue)
UW10× 24 (φ25)	Total mgf.	3.75× ∫ 37.5×	5.63× ∫ 56.25×	7.5× ∫ 75×	11.25× ∫ 112.5×	15× ∫ 150×
	Real field	64 ∫ 6.4	42.67 ∫ 4.27	32 ∫ 3.2	21.33 ∫ 2.13	16.0 ∫ 1.6
UW15× 17 (φ25)	Total mgf.	5.63× ∫ 56.25×	8.44× ∫ 84.38×	11.25× ∫ 112.5×	16.88× ∫ 168.8×	22.5× ∫ 225.0×
	Real field	45.33 ∫ 4.53	30.22 ∫ 3.02	22.67 ∫ 2.27	15.11 ∫ 1.51	11.33 ∫ 1.13
UW20× 15 (φ21)	Total mgf.	7.5× ∫ 75×	11.25× ∫ 112.5×	15× ∫ 150×	22.5× ∫ 225×	30× ∫ 300×
	Real field	40.0 ∫ 4.0	26.67 ∫ 2.67	20.0 ∫ 2.0	13.33 ∫ 1.33	10.0 ∫ 1.0
UW30× 7 (※3)	Total mgf.	11.25 ∫ 112.5×	16.88× ∫ 168.8×	22.5× ∫ 225×	33.75× ∫ 337.5×	45× ∫ 450×
	Real field	18.67 ∫ 1.87	12.44 ∫ 1.24	9.33 ∫ 0.93	6.22 ∫ 0.62	4.67 ∫ 0.47

Unit: mm

※1: The color code and the color of the number on the magnification indication ring are the same.

※2: Use the reticle of 1.5mm or thinner in thickness.

※3: Consult your dealer how to attach the reticle to 30× eyepiece.

Table 3. Depth of Focus Chart (Diaphragm size: Min. ~ Max.)

Observation; Eyepiece UW10×

ED plan objective / Zoom magnification	0.5×	0.75×	1×	1.5×	2×
0.75×	5.46 ∫ 69.6	2.43 ∫ 30.9	1.36 ∫ 17.4	0.61 ∫ 7.7	0.34 ∫ 4.4
4×	0.39 ∫ 5.0	0.15 ∫ 2.2	0.09 ∫ 1.2	0.03 ∫ 0.6	0.02 ∫ 0.3
7.5×	0.22 ∫ 3.8	0.1 ∫ 1.7	0.06 ∫ 1.0	0.02 ∫ 0.4	0.01 ∫ 0.2

Unit : mm

Photomicrography

ED plan objective / Zoom magnification	0.5×	0.75×	1×	1.5×	2×
0.75×	2.12 ∫ 52.9	0.94 ∫ 23.5	0.53 ∫ 13.2	0.24 ∫ 5.9	0.13 ∫ 3.3
4×	0.16 ∫ 4.1	0.07 ∫ 1.8	0.04 ∫ 1.0	0.02 ∫ 0.5	0.01 ∫ 0.3
7.5×	0.14 ∫ 3.4	0.06 ∫ 1.5	0.03 ∫ 0.85	0.02 ∫ 0.4	0.01 ∫ 0.2

Unit : mm

Nikon reserves the right to make such alterations in design as may be considered necessary in the light of experience. For this reason, particulars and illustrations in this handbook may not conform in every detail to models in current production.

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Printed in Japan

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Nikon

STEREOSCOPIC MICROSCOPE
SMZ-U

Accessories for Photomicrographing and TV Monitoring

Instructions

NIKON CORPORATION

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② Place of Use
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③ Dirt on the Lens
Do not leave dust, dirt, or finger marks on the lens surfaces. They will prevent you from clearly observing the specimen.

This manual describes the accessories required for photomicrographing or TV monitoring with the SMZ-U stereoscopic microscope. Before using these accessories, please also read the manuals for the basic unit, accessories, Microflex FX series, and TV equipment.

CARE AND MAINTENANCE

① Cleaning the Lenses
To clean the lens surfaces, remove dust using a soft brush or gauze. Only when removing finger marks or grease, use a soft cotton cloth, lens tissue, or gauze lightly moistened with pure alcohol (methyl alcohol or ethyl alcohol). Observe sufficient caution in handling alcohol and xylene, as they are inflammable.

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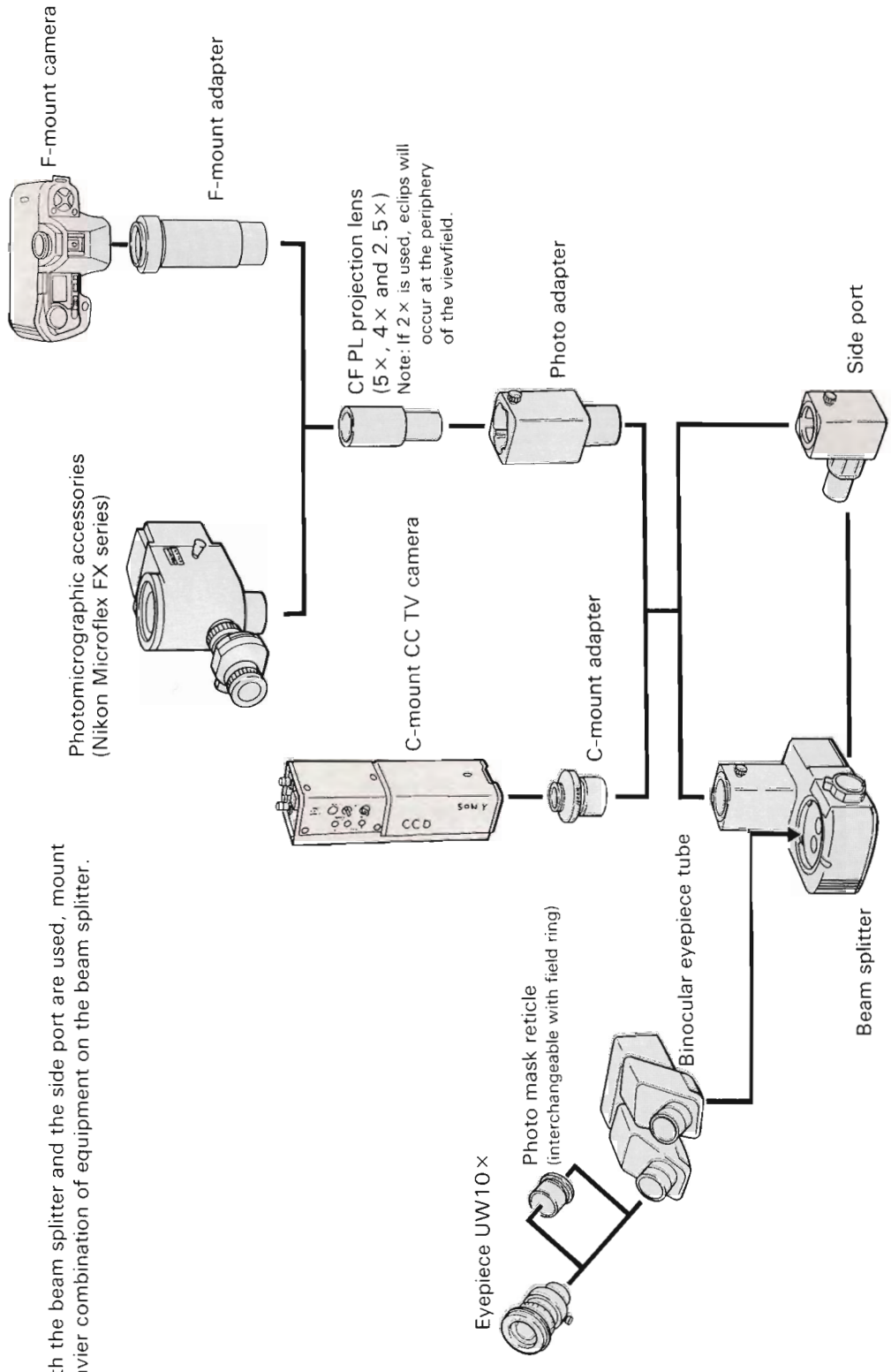
Contents

I .Systematic Chart of Equipment Required for Photomicrographing and TV Monitoring



Note: If both the beam splitter and the side port are used, mount a heavier combination of equipment on the beam splitter.

Fig. 1

II. Name and Function of Each Section

● Beam splitter

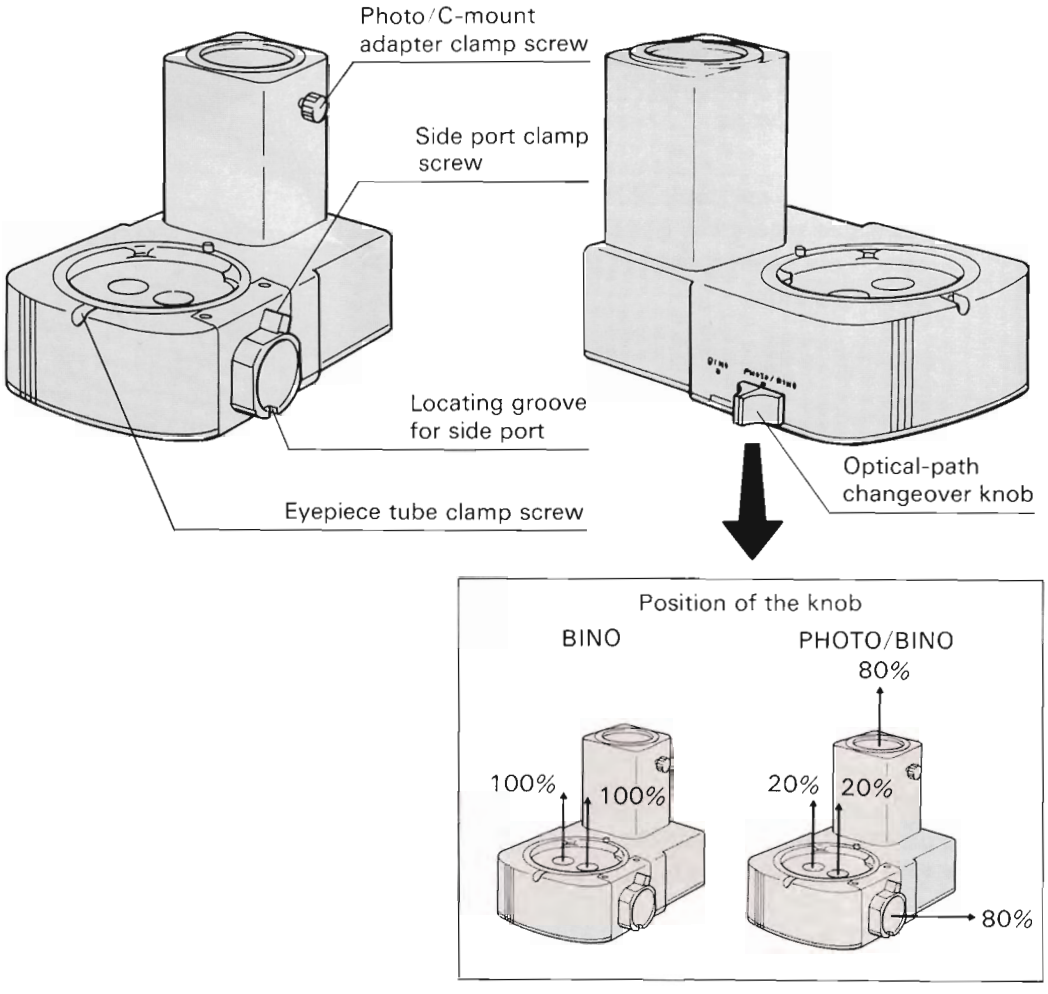


Fig. 2-1

● Side port

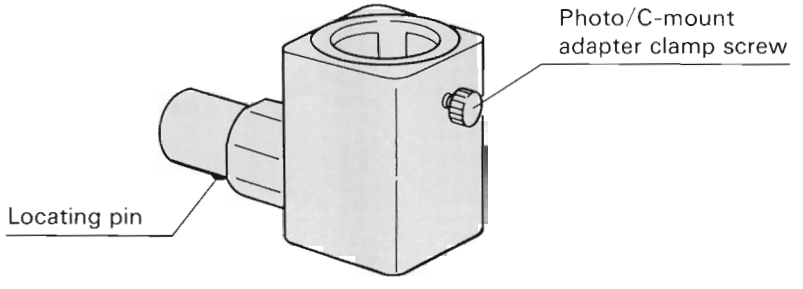


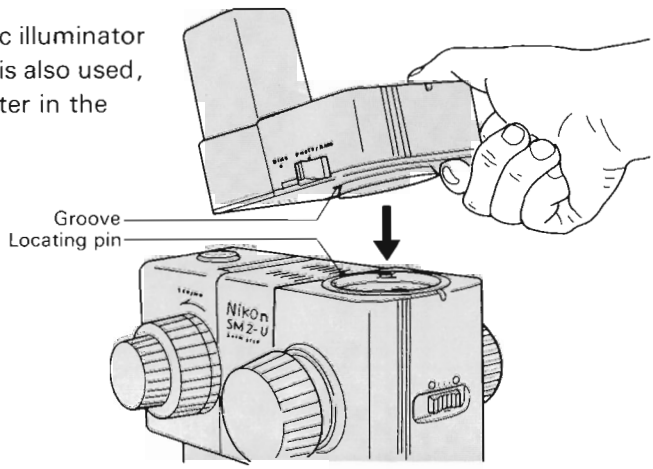
Fig. 2-2

III. Assembly

1. Beam splitter

● Tilt the beam splitter slightly as shown in the figure and position the groove at the locating pin of the zoom body. Fit the beam splitter and tighten the clamp.

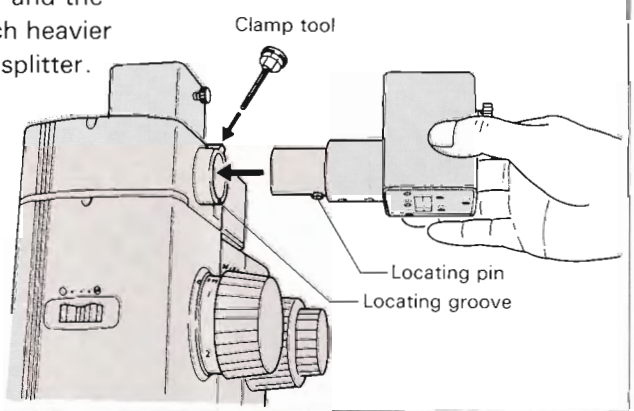
Note: If the coaxial episcopic illuminator (available separately) is also used, attach the beam splitter in the upper position.



2. Side port

● Fit the locating pin of the side port into the groove of the beam splitter. Insert the side port and fix it with the clamp.

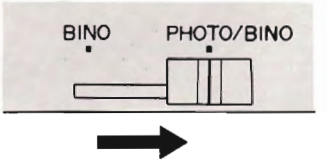
Note: If both the beam splitter and the side port are used, attach heavier equipment to the beam splitter.



Ⅳ.Operation (Photomicrographing)

1.Optical path changeover

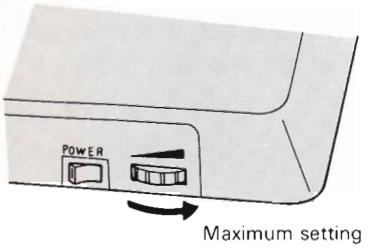
- Slide the optical-path changeover knob of the beam splitter to the position of PHOTO/BINO.



2. Brightness adjustment

- For color photomicrographing, turn the brightness control dial of the stand to the maximum setting, and adjust the brightness using the color compensation filter.

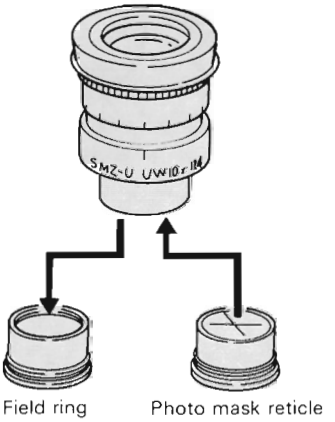
Note: See the instructions provided separately for the illuminators.



Maximum setting

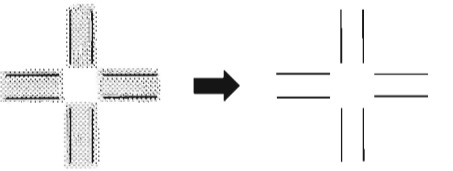
3. Focusing through the binocular eyepiece tube

① Attach the photo mask reticle (available separately) to the eyepiece.



Field ring Photo mask reticle

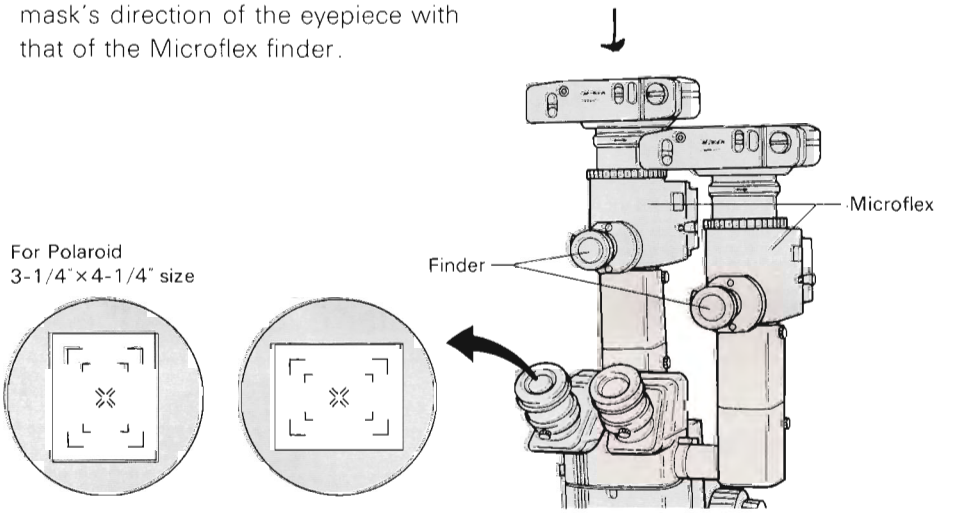
② Bring the mask into focus using the diopter ring.



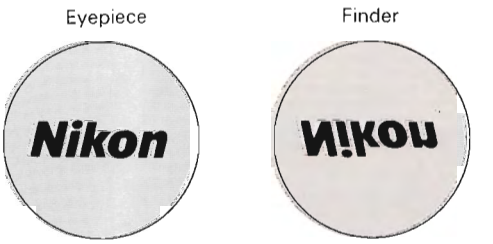
The double cross hair lines in the center of the reticle must be clearly distinguishable.

③ Turn the fine focus knob to bring both the mask and the image into sharp focus.

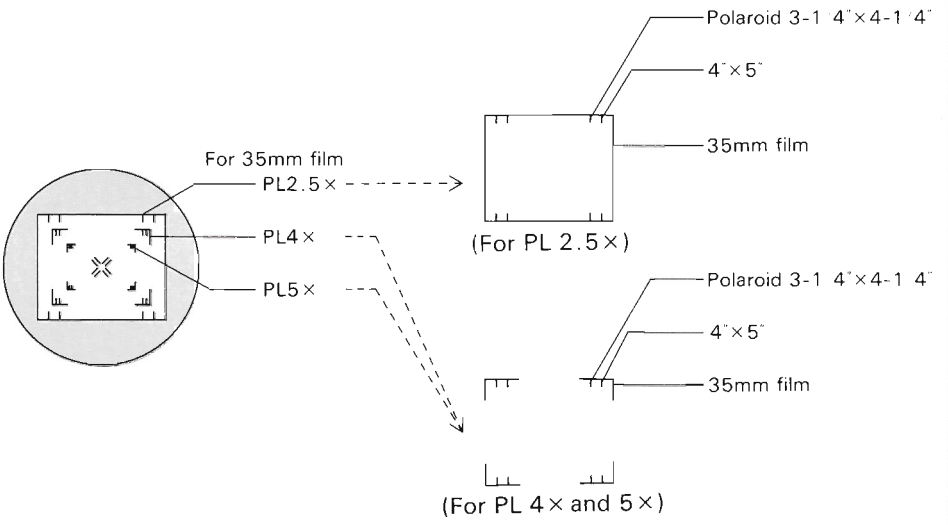
④ Rotate the eyepiece and align the mask's direction of the eyepiece with that of the Microflex finder.



● Images viewed through the eyepiece and finder.



● Photo mask reticle



Note: 1)For more accurate focusing, use the focusing magnifier (available separately).
2)Focusing can be also performed using the finder of the Microflex.
3)Use the finder to strictly check the framing for picture composition.

4. Photomicrographing magnification

● Photomicrographing magnification = Zoom magnification × CF PL projection lens magnification.

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