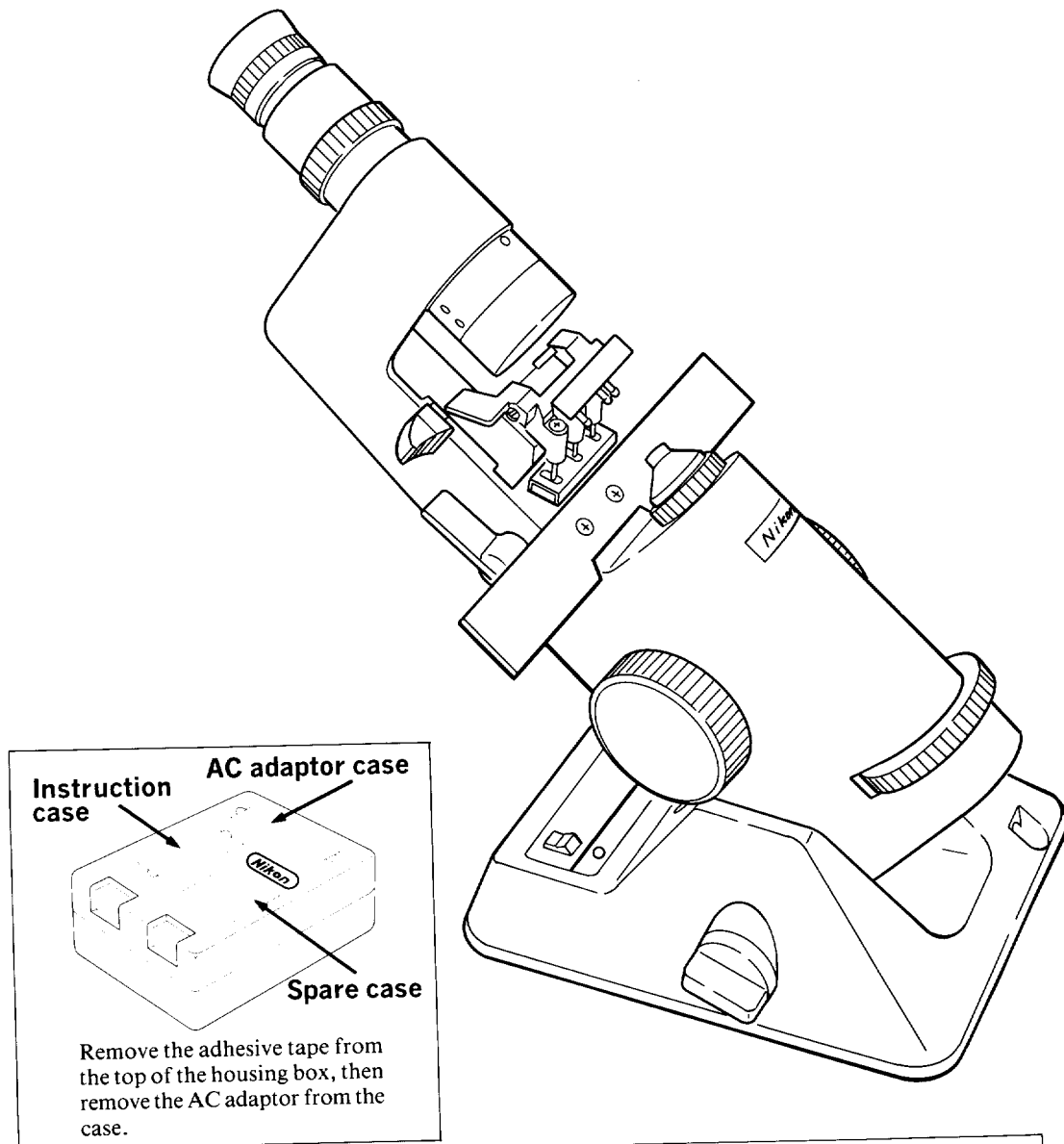


# **Nikon**

## **LENSMETER OL-7/OL-7S EL-7/EL-7S/EL-8**

### **INSTRUCTIONS**



- Thank you for purchasing Nikon Lensmeter OL-7/OL-7S/EL-7/EL-7S/EL-8. Read through this manual and keep it within easy reach to ensure correct use of this lensmeter. It will help you to avoid ambiguity or confusion.
- This manual is applicable in all countries other than Japan.
- Be sure to obtain the warranty card.

**NIKON CORPORATION**

# CONTENTS

※ Read items with “▲” mark in the event of urgency.

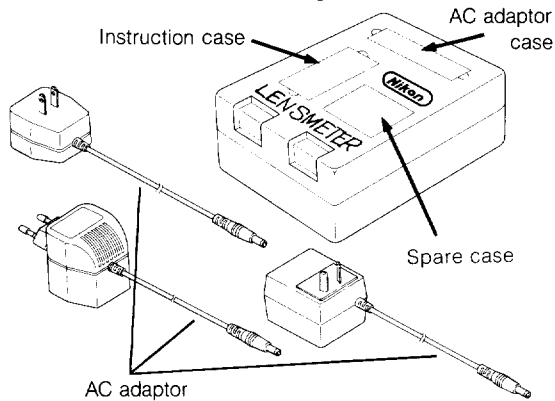
▲ Precautions for use .....	4
1. Nomenclature .....	6
▲ 2. Preparation for Measurement .....	8
2-1 Lighting .....	8
2-2 Adjustment of Tilting Angle .....	8
2-3 If You Wear Spectacles .....	9
2-4 Eyesight Adjustment .....	9
2-5 Lens Setting .....	10
▲ 3. Measurement .....	11
3-1 Spherical Lens .....	11
3-2 Astigmatic Lens .....	12
3-3 Prismatic Power .....	14
3-4 Prismatic Power of Astigmatic Lens .....	18
3-5 Contact Lens .....	19
4. Marking .....	20
4-1 Operation .....	20
4-2 Marking Position .....	21
5. Maintenance .....	22
5-1 After Use .....	22
5-2 Adjustment of Target Position .....	22
5-3 Setting of Ink Cartridge (optional accessory) .....	24
5-4 Replacement of Battery .....	25
5-5 Attaching the Prism Compensator .....	26
6. Principal Specifications .....	28
7. Standard Set and Optional Accessories .....	28

## Lensmeter OL-7•OL-7S/EL-7•EL-7S/EL-8 (Difference between outer reading and inner reading type)

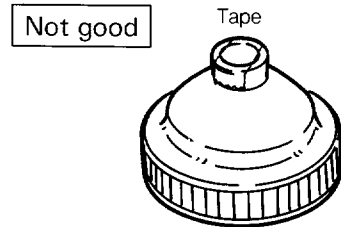
Type	OL-7•EL-7	OL-7S•EL-7S	EL-8
Marking on the main body			
Target rotation handle	Provided	Provided	Not provided
View field through eyepiece (inner reading type)			

# PRECAUTIONS FOR USE

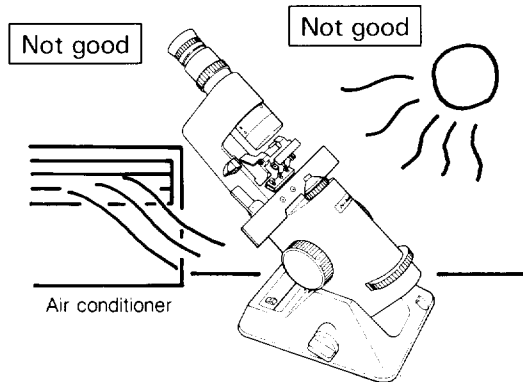
- Remove adhesive tape from the right-hand part of the top lid and remove the inner lid, then take out the AC adaptor.



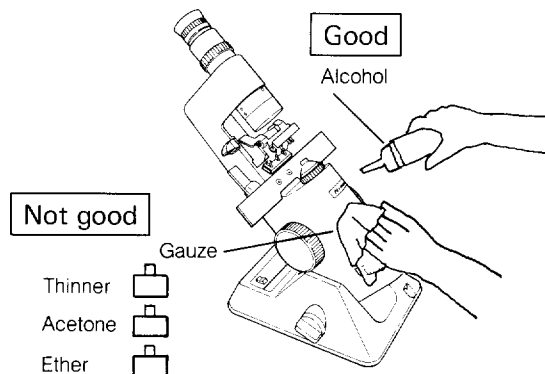
- Do not tape or grind the lens table top surface or accuracy will be lost.



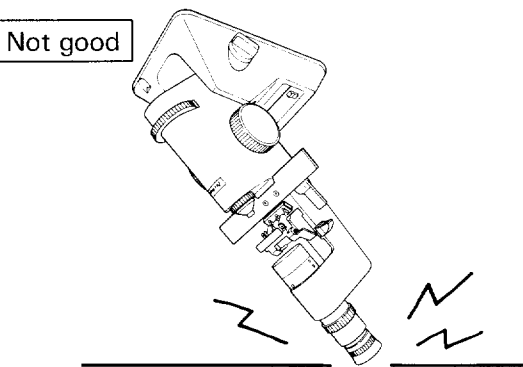
- Set this instrument in a flat, dry place, not in sunlight or near a heater or air conditioner. Keep the environment temperature during 5°C ~ 40°C.



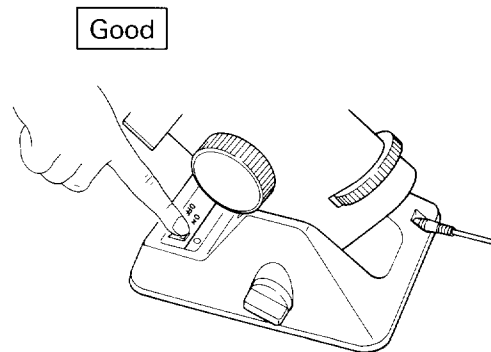
- If this instrument becomes dirty, either wipe with dry soft cloth such as gauze or wipe with cloth soaked with alcohol. Do not use an organic solvent other than alcohol.



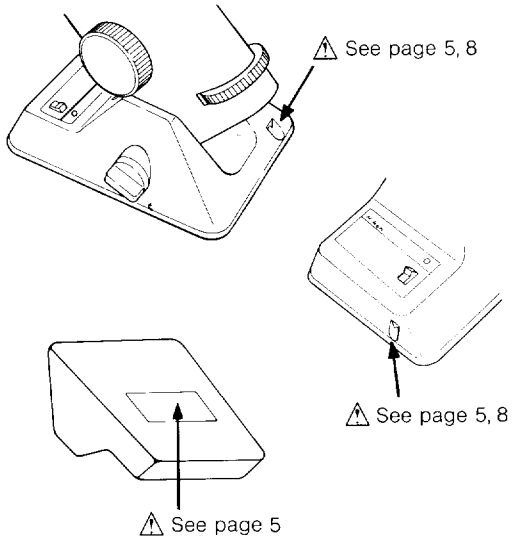
- This is a precision optical instrument and should be handled with care. Do not try to disassemble this instrument.



- Turn OFF the POWER switch and put the vinyl cover over the instrument after use.



“⚠” mark on the product means that “See Instruction Manual”. This product has “⚠” mark at three locations. Please see the page indicated below.



Use any one of the following power supplies (1) to (2) for this instrument :

- (1) AC adaptor (standard accessory)
- (2) SUM-1 (Type D) dry cell (1.5V) x 2

\* AC Adaptor

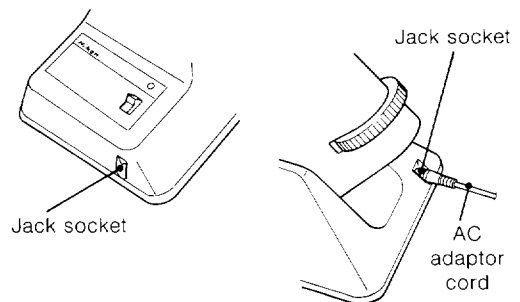
Please make sure to use the AC adaptor of the below models in accordance with the wall outlet voltage. This device is not Listed by Underwriters Laboratories Inc. When used with any adaptor other than the Model QFK-620B1.

- AC 120V area (U. S. A., etc)  
Model QFK-620B1  
Input AC120V 60Hz 4W  
Output DC 6V 200mA
- AC 230V area (Germany, etc)  
Model DBB-00015/416FG41013  
Input AC230V 50Hz 5VA  
Output DC 6V 200mA  
or  
Model DBB-00011  
Input AC220V 50/60Hz 4W  
Output DC 6V 200mA  
This device is accepted by TÜV in combination with Model DBB-00015/416FG 41013.
- AC 240V area (Australia, etc)  
Model DBB-00012  
Input AC240V 50Hz 4W  
Output DC 6V 200mA

Use the wall outlet which the AC adaptor can be easily connected to and disconnected from.

Connect one of the three types of AC adaptors to a corresponding socket outlet (AC 120V or 230V or 240V). When using this instrument with a battery, the AC adaptor is not necessary.

When this instrument is used with an AC adaptor, the battery, if installed in the instrument, will not be drained of power. There are two jack sockets for the AC adaptor plug at the front and the rear of the instrument base. The plug may be put in either of these sockets.



# 1. NOMENCLATURE

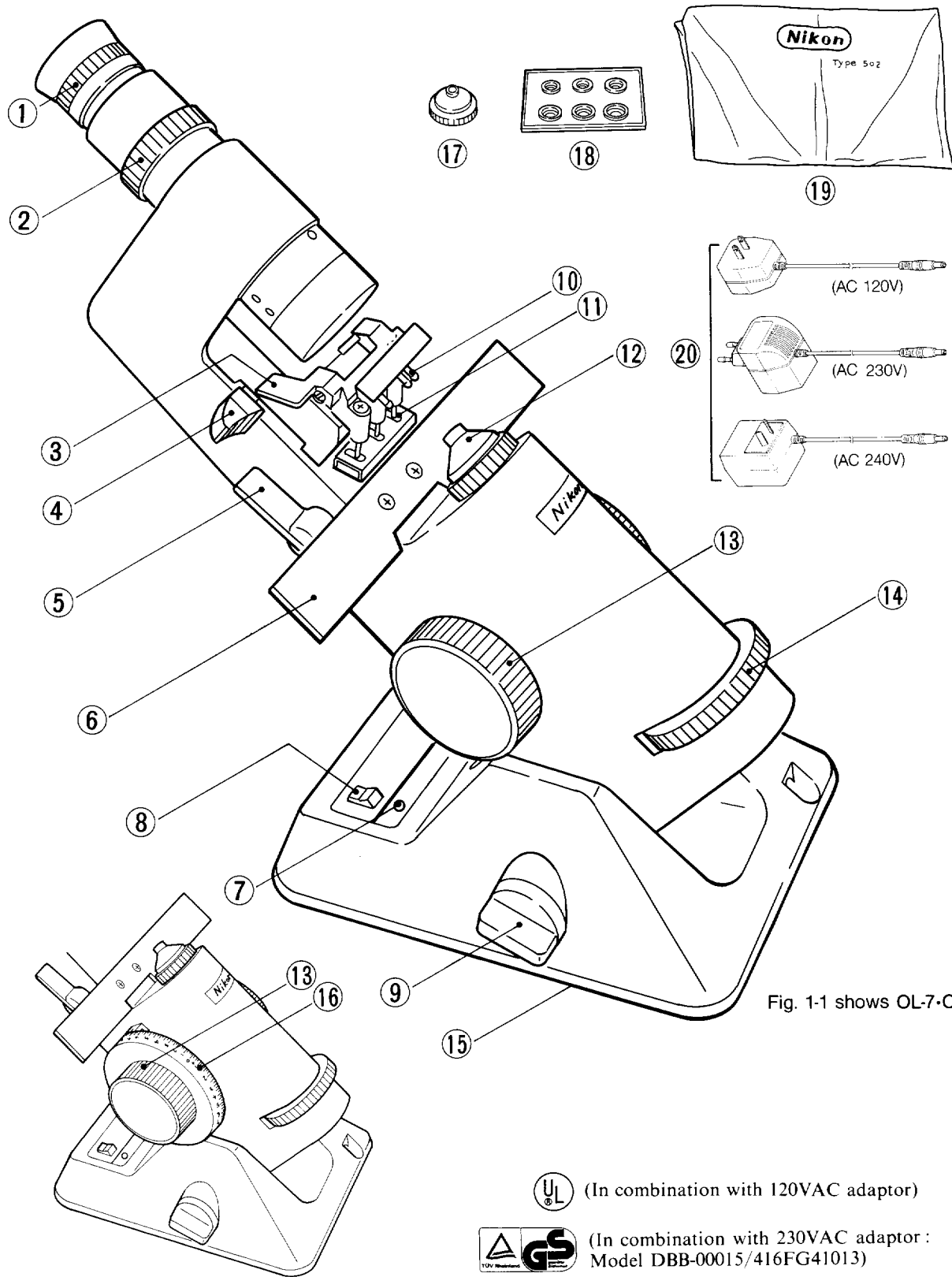




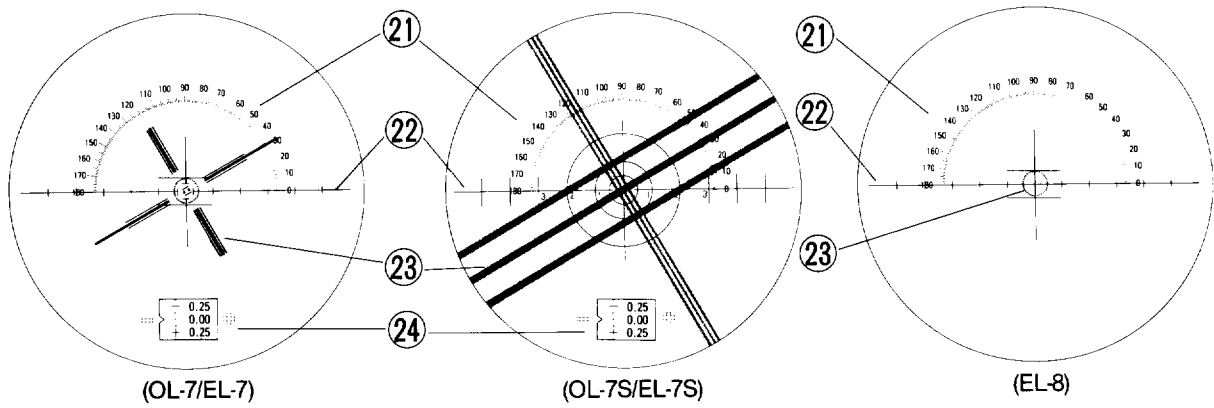
Fig. 1-1 shows OL-7•OL-7S

Fig. 1-2 shows EL-7•EL-7S/EL-8

 (In combination with 120VAC adaptor)

 (In combination with 230VAC adaptor : Model DBB-00015/416FG41013)

**(View field)**



- ① Eyesight adjusting ring
- ② Angle measuring ring
- ③ Marking lever
- ④ Lens holder lever
- ⑤ Lens positioning rule lever
- ⑥ Lens positioning rule
- ⑦ Pilot lamp
- ⑧ POWER switch
- ⑨ Tilting clamp handle
- ⑩ Lens holder
- ⑪ Marking ink cartridge
- ⑫ Lens table  $\phi 8\text{mm}$
- ⑬ Diopter measuring handle
- ⑭ Target rotation handle (for the inner reading type OL-7·OL-7S)
- ⑮ Battery lid
- ⑯ Diopter scale (for the outer reading types EL-7, EL-7S, EL-8)
- ⑰ Lens table  $\phi 5\text{mm}$
- ⑱ Contact lens holder
- ⑲ Vinyl cover
- ⑳ AC adaptor
- ㉑ Angular scale
- ㉒ Black crosslines
- ㉓ Target
- ㉔ Diopter scale (not provided for EL-7, EL-7S, EL-8)

## 2. PREPARATION FOR MEASUREMENT

Use any one of the following power supplies (1) to (2) for this instrument:

- (1) AC adaptor (standard accessory)
- (2) SUM-1 (Type D) dry cell (1.5V) × 2

Take steps 2-1 to 2-5 before measurement:

### 2-1 Lighting

- ① Connect one of the three types of AC adaptors to a corresponding socket outlet (AC 120V or 230V or 240V). Use the socket which the AC adaptor can be easily connected to and disconnected from. When using this instrument with a battery, the AC adaptor is not necessary. When this instrument is used with an AC adaptor, the battery, if installed in the instrument, will not be drained of power. There are two jack sockets for the AC adaptor plug at the front and the rear of the instrument base. The plug may be put in either of these sockets. For installation and removal of the battery, refer to page 23.
- ② Turn ON the POWER switch.
- ③ The pilot lamp is lit.  
The internal lamp illuminates the target for measurement.

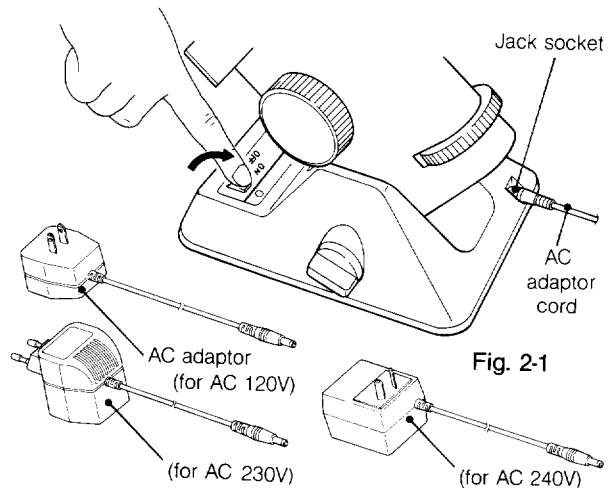


Fig. 2-1

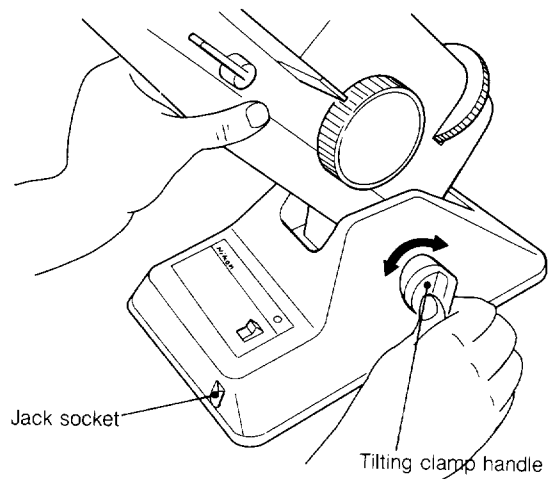


Fig. 2-2

### 2-2 Adjustment of Tilting Angle

Hold main body with one hand and loosen the tilting clamp handle by turning it counterclockwise. After tilting main body to a desired angle, turn clockwise to fasten the tilting clamp handle and fix the tilting angle.

### 2-3 If You Wear Spectacles

If you wear spectacles, collapse the rubber eyecup, so that the view field will not be narrowed.

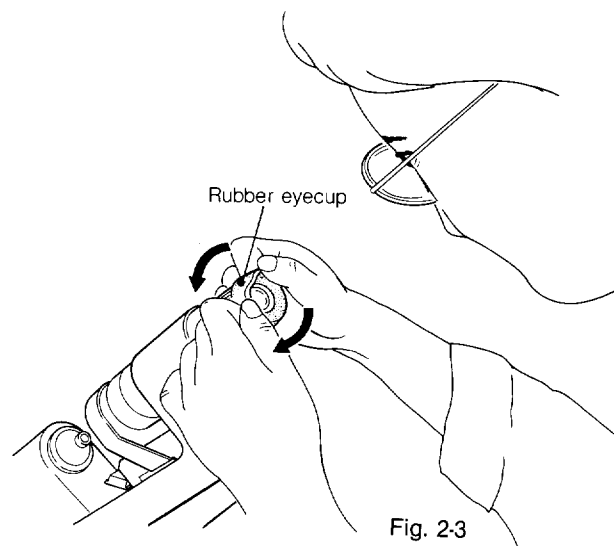


Fig. 2-3

## 2-4 Eyesight Adjustment

- ① Rotate the eyesight adjusting ring counterclockwise as far as it will go.
- ② Look through the eyepiece and rotate the ring clockwise until the black crosslines in the view field are in sharp focus.

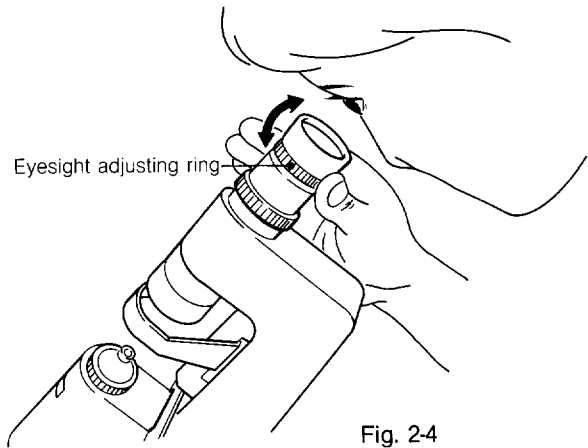


Fig. 2-4

\* This eyesight adjustment is very important for correct measurement. If eyesight adjustment is neglected, measurement result will not be correct.

**OL-7/EL-7**

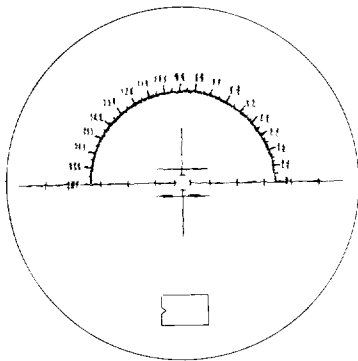


Fig. 2-5

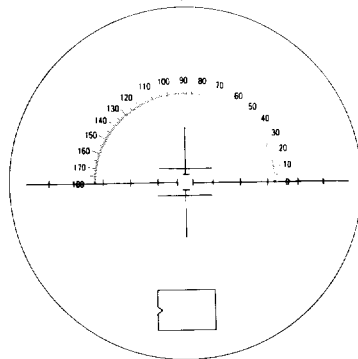


Fig. 2-6

**OL-7S/EL-7S**

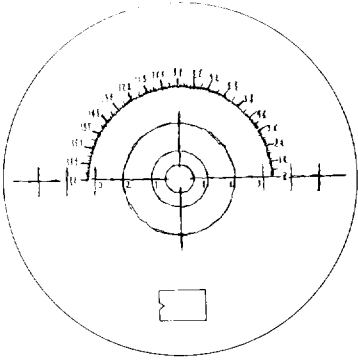


Fig. 2-7

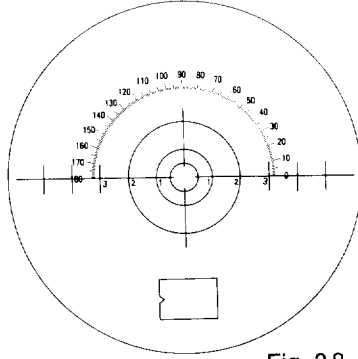


Fig. 2-8

**EL-8**

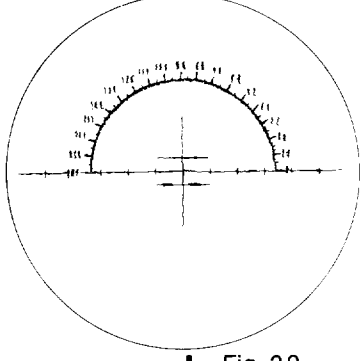


Fig. 2-9

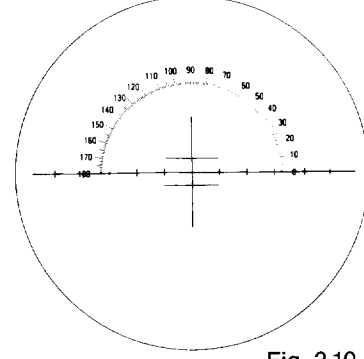


Fig. 2-10



## 2-5 Lens Setting

① Hold the lens with your left hand and place its concave surface against the lens table. (Fig. 2-11)

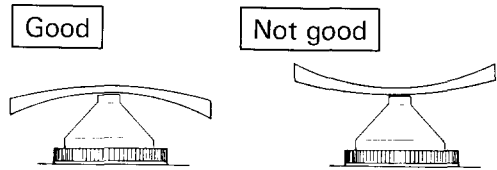


Fig. 2-11

② Push up the lens holder lever and lower it while holding the lens with one hand. (Fig. 2-12)

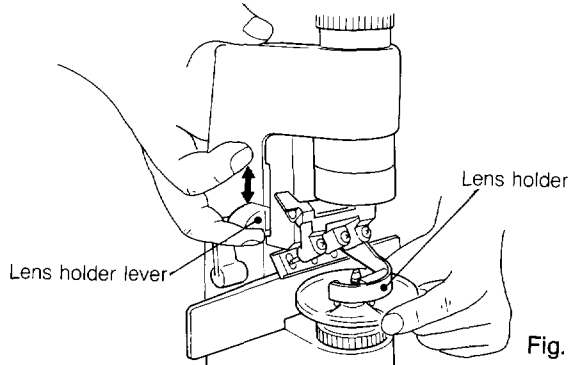


Fig. 2-12

③ To remove the lens, hold it with your left hand and lift the lens holder lever fully up with the other hand. (Fig. 2-12)

The top edge of the lens table is made of soft material that will not hurt the lens surface. However, if a plastic lens is being measured, it is better to lift the lens holder slightly, whenever the lens position is adjusted, so that the back surface of the lens will not be scratched by the edge of the lens table.

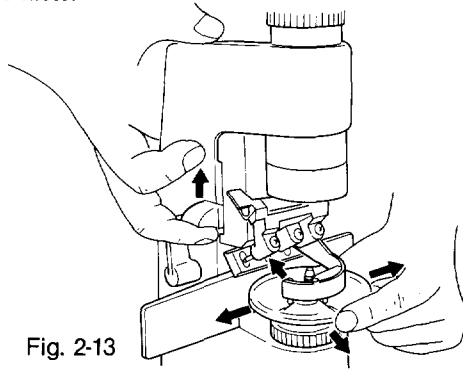
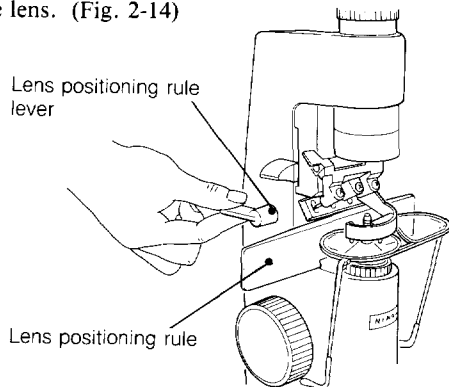


Fig. 2-13

After many years, the internal oil may deteriorate and cause the lens holder to move slowly. Contact your Nikon dealer.

The lens positioning rule is moved up and down by operating the lens positioning rule lever. To measure framed lenses, place the front bottom of the frame precisely against the lens positioning rule to prevent slanting of the lens. (Fig. 2-14)



Place the front bottom of the frame against the lens positioning rule.

Fig. 2-14

# 3. MEASUREMENT

## 3-1 Spherical Lens

Set the lens and turn the measuring handle on the side of the body, until the green target appears sharpest in the view field. If the green target is not at the center of the field, move the lens to the center.

The number appearing at the bottom of view field is the diopter (vertex power) of the spherical lens (in case of OL-7/OL-7S).

Note: The diopter scale does not appear within the view field for EL-7•EL-7S/EL-8. Read the diopter scale (see page 4) on the right-hand measuring handle.

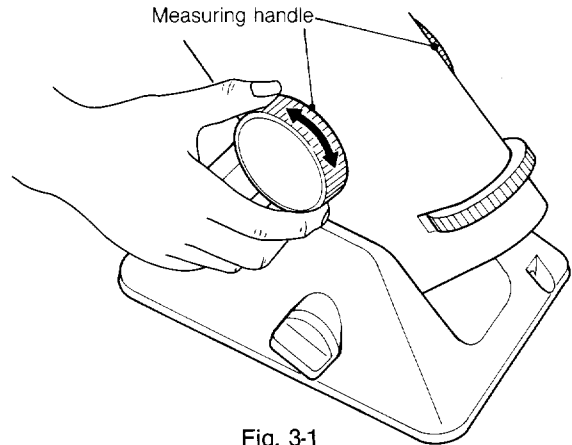


Fig. 3-1

### OL-7/EL-7

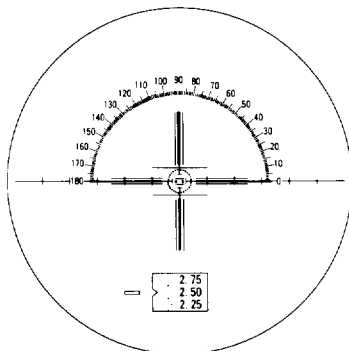


Fig. 3-2

### OL-7S/EL-7S

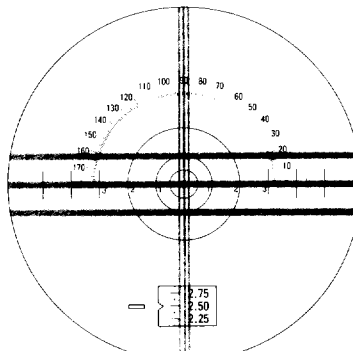


Fig. 3-3

### EL-8

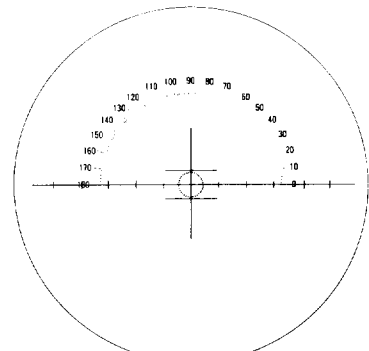


Fig. 3-4

Figs. 3-2, 3-3, and 3-4 show examples with  $S = -2.50D$ .

## 3-2 Astigmatic Lens

### OL-7/EL-7

#### 1) Spherical power

- Turn the diopter measuring knob, until the dotted circle of the green target stretches to form a sharp image.

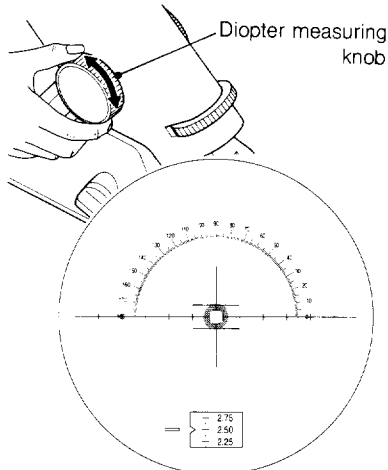


Fig. 3-5

- Turn the target rotation handle to overlap the shorter lines of blurred target crosslines to the oval-shaped lines, so that the blurred shorter lines become three sharp parallel lines. Read the diopter scale when these lines are sharpest. This reading is the spherical power.

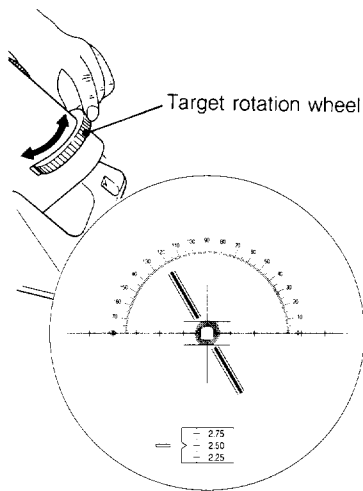


Fig. 3-6

### OL-7S/EL-7S

- The green target is not focused, when direction of the target is different from cylindrical axis.

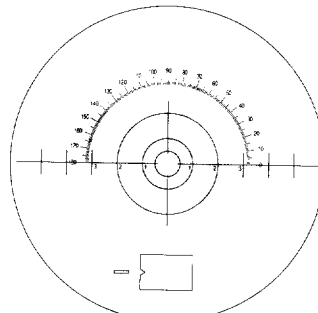


Fig. 3-7

- Turn both the diopter measuring knob and the target rotation wheel, so that the narrower lines of the green target appear sharpest. Spherical power of the astigmatic lens is shown in the diopter scale.

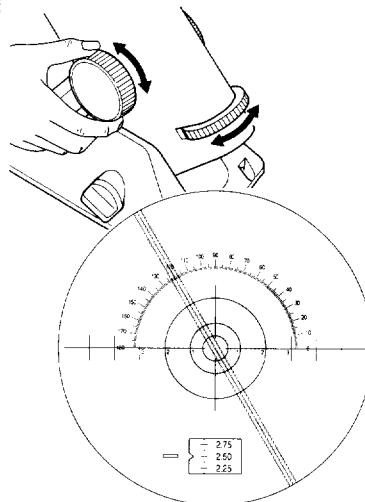


Fig. 3-8

### EL-8

- Set the lens and turn the measuring handle from 0.00D. The target corona extends and appears in the shape of an oval. Read the diopter scale when the edge of the oval is the sharpest. This reading is the spherical power.

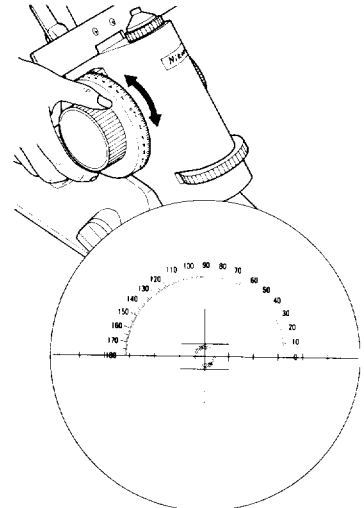


Fig. 3-9 ①

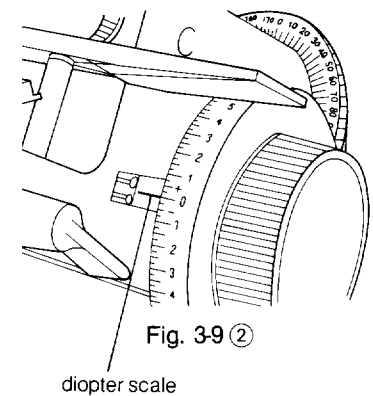


Fig. 3-9 ②

diopter scale

Figs. 3-6, 3-8 and 3-9 show examples with  $S = -2.50D$ .

## OL-7/EL-7

### 2) Cylindrical power

- Turn the measuring handle further in the same direction until the shorter lines of the crosslines become blurred and the longer lines become three parallel sharp lines.

The diopter read in the state is the sum of the spherical and cylindrical powers.

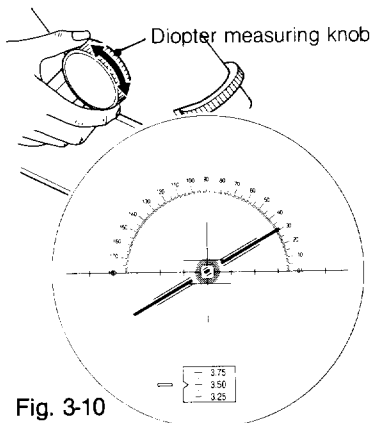


Fig. 3-10

- Subtract the spherical power on page 10 from the above reading, then, cylindrical power will be  $C = -1.00D$ .

### 3) Cylindrical axis

Measure the cylindrical axis direction simultaneously in above 2). Turn the angle measuring ring until the longer line of the black crosslines is in the same direction of the sharply focused longer lines of the target. Read the angle at the point where the line intersects the angular scale.

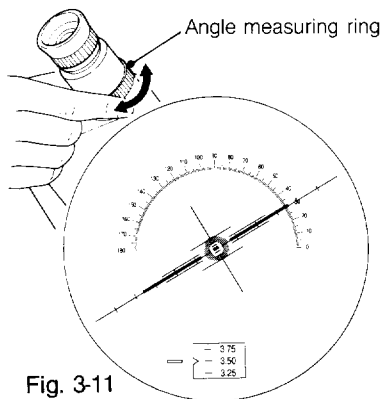


Fig. 3-11

## OL-7S/EL-7S

- Turn the measuring handle further in the same direction until the shorter lines of the crosslines become blurred and the longer lines become three parallel sharp lines.

The diopter read in the state is the sum of the spherical and cylindrical powers.

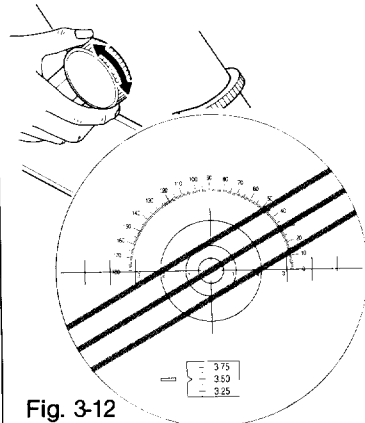


Fig. 3-12

- Subtract the spherical power on page 10 from the above reading, then, cylindrical power will be  $C = -1.00D$ .

Figs. 3-10, 3-12 and 3-14 show examples with  $S + C = -3.50D$ .

Measure the cylindrical axis direction simultaneously in above 2). Turn the angle measuring ring until the longer line of the black crosslines is parallel to the sharp lines of the target. Read the angle at the point where the line intersects the angular scale.

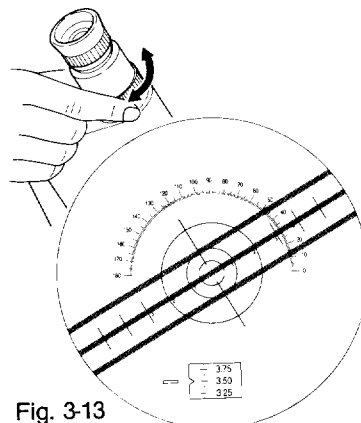


Fig. 3-13

Figs. 3-11, 3-13 and 3-15 show examples with  $Ax = 30^\circ$ .

## EL-8

- Turn the measuring handle further in the same direction until the target corona is blurred and focused again in the shape of an oval. The direction of the oval-shaped lines is make a right angle with the spherical direction on page

The diopter read in this state is the sum of the spherical and cylindrical powers.

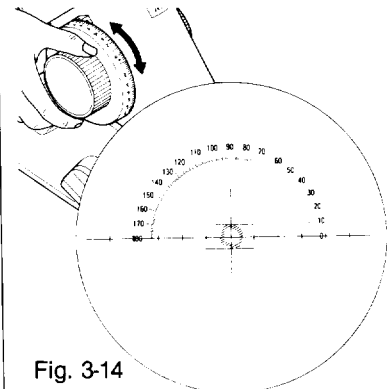


Fig. 3-14

- Subtract the spherical power on page 10 from the above reading, then, cylindrical power will be  $C = -1.00D$ .

Measure the cylindrical axis direction simultaneously in above 2). Turn the angle measuring ring until the longer line of the black crosslines within the view field is parallel to the sharp lines of the target. Read the angle at the point where the line intersects the angular scale.

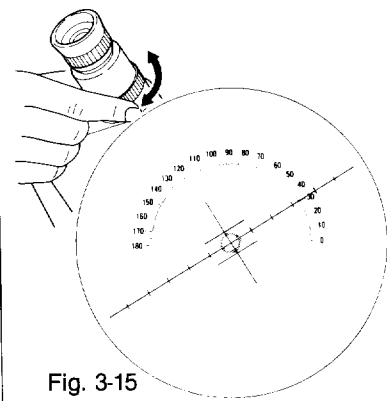


Fig. 3-15

### 3-3 Prismatic Power

In both spherical and astigmatic lenses, if the optical center of the lens is off from the optical axis of this instrument, the target will be off from the center of the view field. To measure the prism diopter is to measure the decentering amount.

For a framed lens, mark the position of the pupil center on the lens when the patient is wearing the spectacles. Set the lens on the lens table so that the pupil center mark on the lens coincides with the optical axis of this instrument. Though the center of the lens table is approximately at the optical axis, it is better to locate the lens exactly using the marking cartridge.

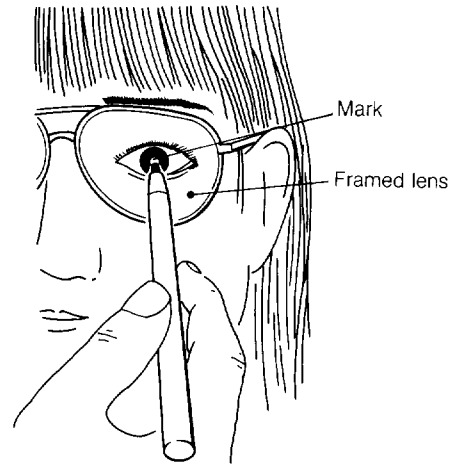


Fig. 3-16

(1) When the prism compensator is not used

It is possible to measure up to  $6\Delta$  in the view field. When the target appears sharpest by turning the diopter measuring handle, the target is off from the center of the view field. Measure this distance and direction. Turn the angle measuring ring so that the longer measuring ring so that the longer line of the black crosslines intersects the center of the decentered target. Read the prism diopter from the graduations of the longer line of the black crosslines.

One graduation of the scale is equal to  $1\Delta$  (prism diopter). Read the direction of its prismatic base at the point where the longer line of black crosslines intersects the angular scale.

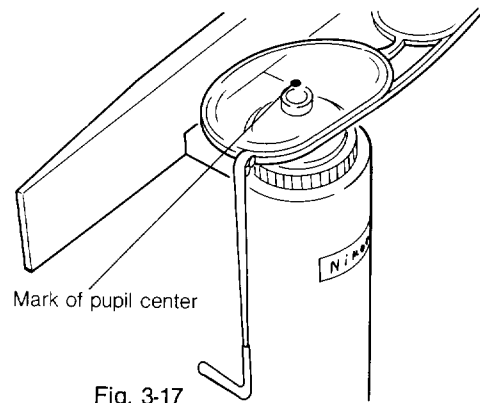


Fig. 3-17

**OL-7/EL-7**

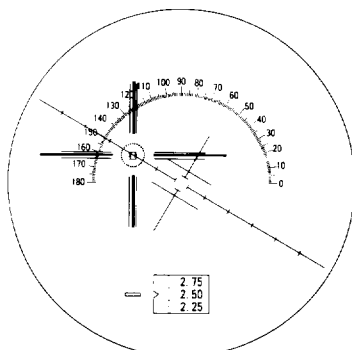


Fig. 3-18

**OL-7S/EL-7S**

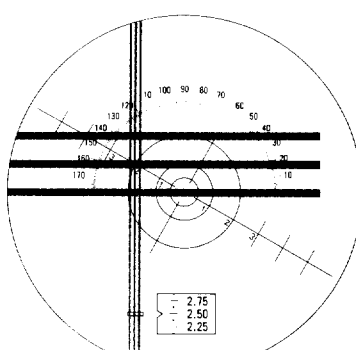


Fig. 3-19

**EL-8**

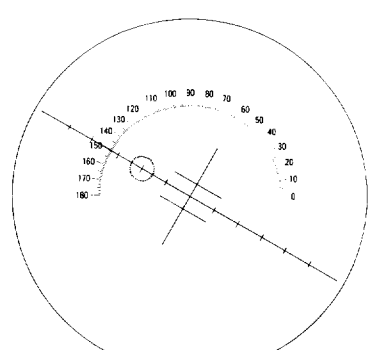


Fig. 3-20

Figs. 3-18, 3-19 and 3-20 show examples with the prism diopter at the direction of the prismatic base at  $150^\circ$

Note: If the target is located in the lower half of the view field, add 180° to the reading.

**OL-7/EL-7**

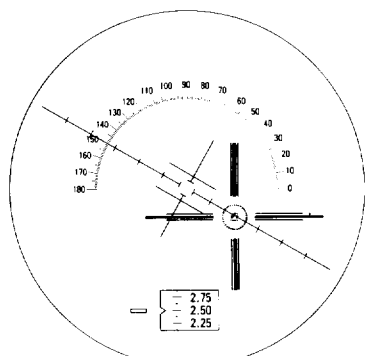


Fig. 3-21

**OL-7S/EL-7S**

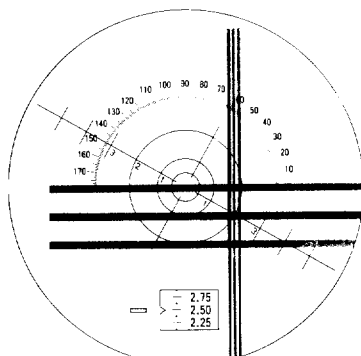


Fig. 3-22

**EL-8**

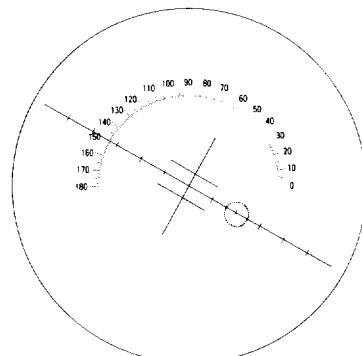


Fig. 3-23

Figs. 3-21, 3-22 and 3-23 show examples with the prism diopter at 2Δ and the direction of the prismatic base at 330°.

Note: If the target is located at 270°, it may overlap the diopter scale in the view field. In this case, move your eye down so that the diopter scale disappears.

(2) When the prism compensator is used  
(In case prism diopter is 6Δ or less)

When the target appears sharpest, the target is off from the center of the view field. Bring it to the center of the field with the prism compensator. Read the prism diopter and direction of prismatic base on the scale of the prism compensator.

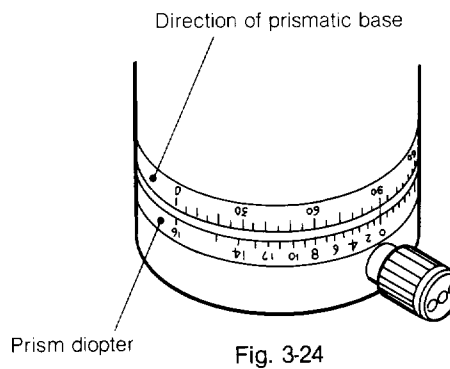


Fig. 3-24

Fig. 3-23 shows an example with the prism diopter at 0Δ and the direction of prismatic base at 0° (90°).

(In case prism diopter is  $6\Delta \sim 16\Delta$ )

It is impossible to read prism diopter higher than  $6\Delta$  in the view field only.

- ① Turn the diopter measuring handle to the expected diopter beforehand.
- ② Turn the prism compensator knob only or swing the prism compensator to right and left, until the target comes to the center of the view field.

Note: The target will be found more easily, if you set the prism compensator to the horizontal ( $0^\circ$ ) or vertical ( $90^\circ$ ) position, then swing the prism compensator.

- ③ When the target is in the center of the view field, turn the diopter measuring handle, so that the target becomes sharpest. Then, bring the target to the exact center of the view field. Read the scale of the prism compensator.

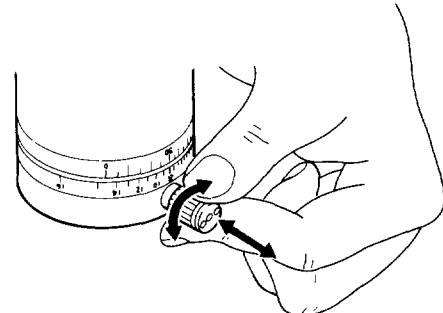


Fig. 3-25

Fig. 3-25 shows an example with the prism diopter at  $8\Delta$  and the direction of prismatic base at  $30^\circ$ .

Note: If prism diopter is indicated by the red scale of the prism compensator, add  $180^\circ$  to the reading to obtain the actual direction of the prismatic base. In Fig. 3-25, prism diopter is indicated by the white scale. Therefore, reading will be  $8\Delta$  and  $30^\circ$ .

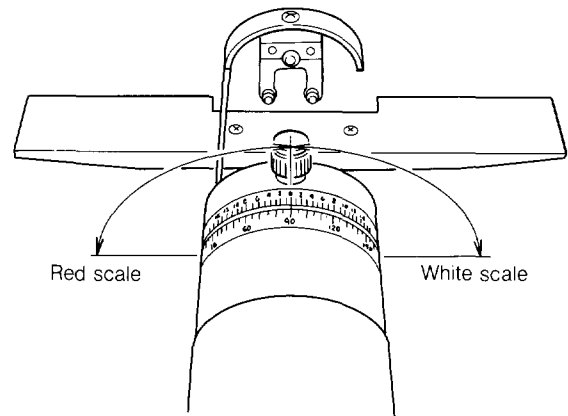


Fig. 3-26

(In case prism diopter is higher than 16 $\Delta$ )

- ① Set the prism compensator to 16 $\Delta$ .

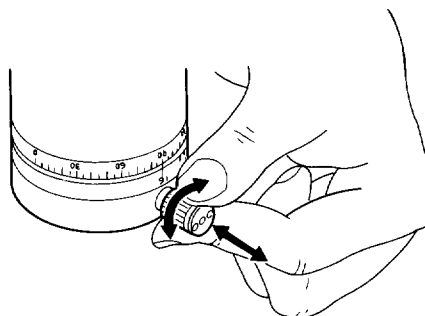


Fig. 3-27

- ② Swing the compensator.  
The target will move across the view field while drawing an arc.

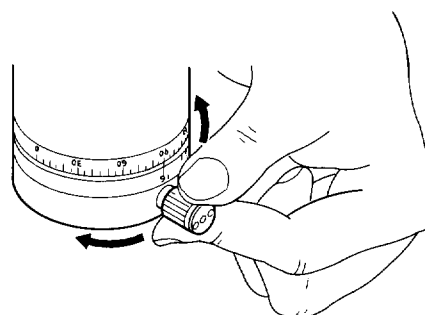


Fig. 3-28

- ③ When the target is nearest to the center, stop swinging the compensator. Read the prism diopter from the graduations on the longer line of the black crosslines. Add 16 $\Delta$  to this reading to obtain the actual prism diopter. Read the direction of prismatic base from the prism compensator.

**OL-7/EL-7**

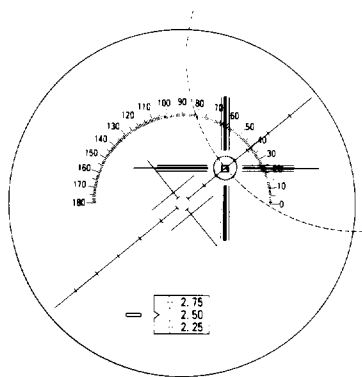


Fig. 3-29

**OL-7S/EL-7S**

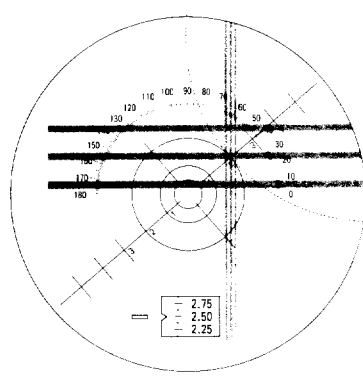


Fig. 3-30

**EL-8**

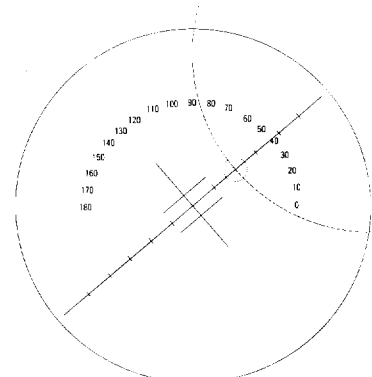


Fig. 3-31

Figs. 3-29, 3-30 and 3-31 show examples with the prism diopter at 18 $\Delta$  and the direction of prismatic base at 40 $^\circ$ .



### 3-4 Prismatic Power of Astigmatic Lens

To measure prismatic power of astigmatic lens, measurement of cylindrical power and that of prismatic power are combined.

(See pages 10 ~ 15)

It is better to read the axis direction of astigmatic lens from the angular scale of the target rotation handle (for OL-7/OL-7S/EL-7/EL-7S). In this case, the longer line of the black crosslines is used to read the direction of the prismatic base.

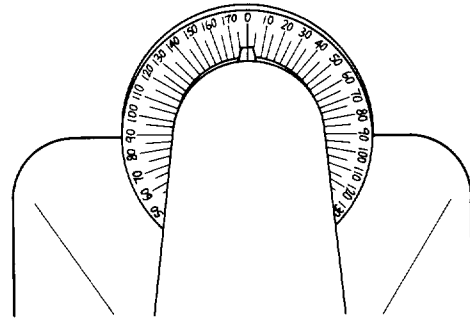


Fig. 3-32

**OL-7/EL-7**

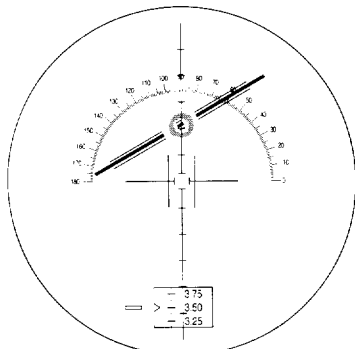


Fig. 3-33

**OL-7S/EL-7S**

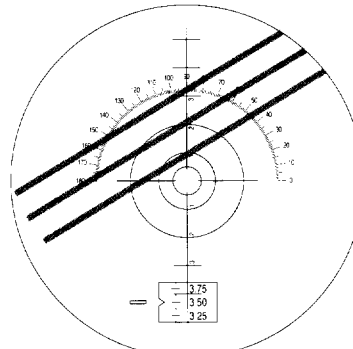


Fig. 3-34

**EL-8**

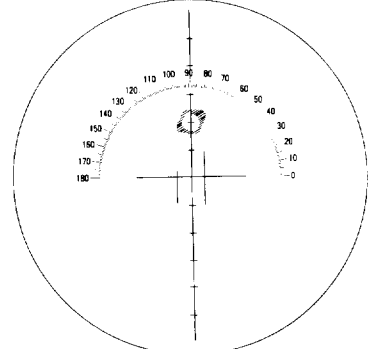


Fig. 3-35

Figs. 3-33, 3-34 and 3-35 show examples with  $S = -2.50D$ ,  $C = -1.00D$ ,  $Ax = 30^\circ$ , prism diopter at  $2\Delta$ , and the direction of prismatic power at  $90^\circ$ .

Note: If the prism compensator is used, measurement will be simplified because the target can be observed in the center of the view field.

### 3-5 Contact Lens

Measurement will become easier when the instrument is set vertically and the tilting clamp handle is fastened.

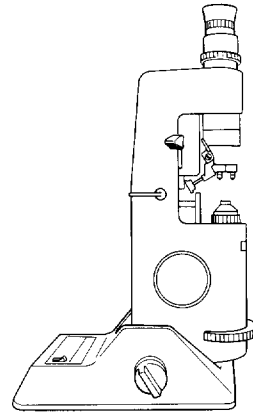


Fig. 3-36

Pull up and off the  $\phi 8\text{mm}$  lens table for general lenses, and place the  $\phi 5\text{mm}$  lens table for contact lenses.

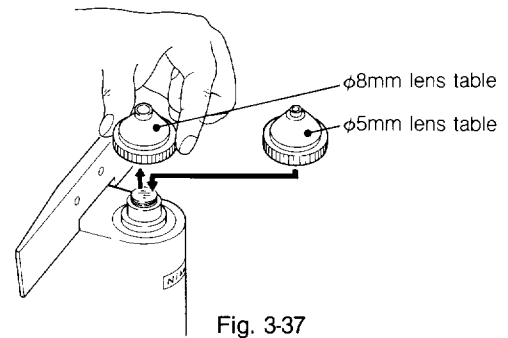


Fig. 3-37

Note: Do not use the  $\phi 5\text{mm}$  lens table for contact lenses to measure spectacles lenses. Do not use the  $\phi 8\text{mm}$  lens table to measure contact lenses. Measurements will not be correct.

$\phi 8\text{mm}$  lens table for spectacles lenses

$\phi 5\text{mm}$  lens table for contact lenses

Fig. 3-38

Though you can hold the contact lens with your fingers or round-tipped tweezers, we recommend that you use the contact lens holder.

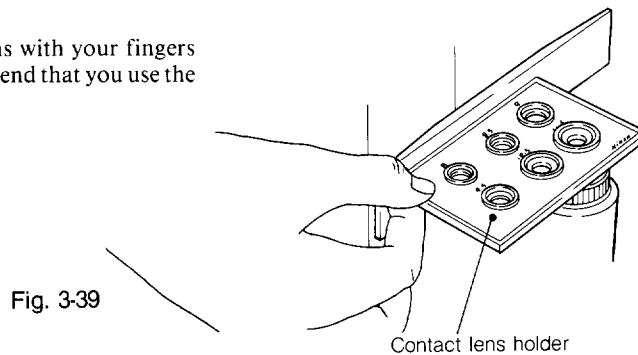


Fig. 3-39

## 4. MARKING

This instrument has a pen immersion marker. Fill the ink pod with blue ink (provided) through the three windows. It is also possible to pull out the ink pod laterally from this instrument as shown in Fig. 4-2 and fill it with ink.

### 4-1 Operation

Lift up the marking lever first and push three pins against the ink pod.

Push down the marking lever, then push it further in the same direction to mark the lens surface lightly. Release your finger from the lever to let the marker return to its original position.



Fig. 4-1

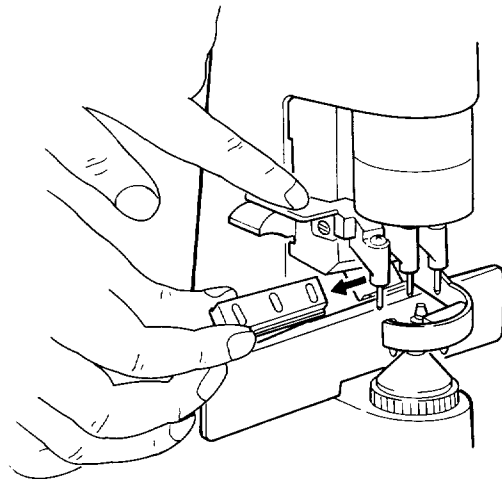


Fig. 4-2

Ink cartridge marking set (optional accessory)

The ink cartridge marking set is also available as optional accessory. (Fig. 4-3) It is made of a special stamping rubber containing ink. When using this set, remove the 3-pins pen and ink pod from the instrument as Fig. 4-4.

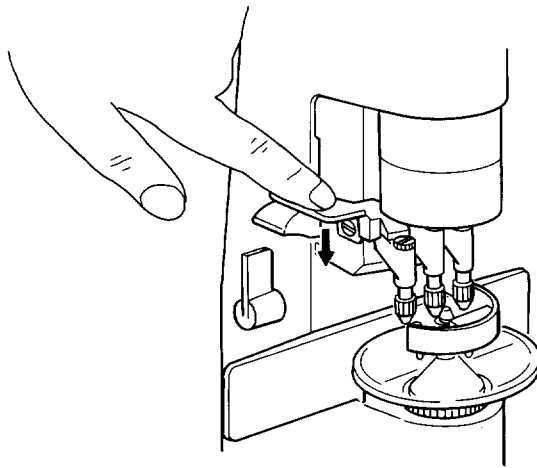


Fig. 4-3

Ink cartridge marking set

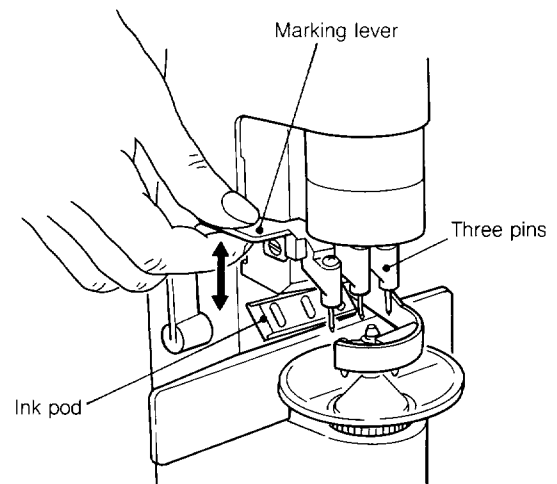


Fig. 4-4

## 4-2 Marking Position

### (1) Marking on the optical center

#### 1) Lens without astigmatism

Look through the eyepiece and set the lens position so that the target center is in the center of the view field, and mark the lens.

#### 2) Lens with the astigmatism

- ① Look through the eyepiece and turn the angle measuring ring to set the longer line of the black crosslines to the cylindrical axis of the prescription.
- ② Turn the target rotation handle to align the longer lines of the target crosslines to the longer line of the black crosslines (for OL-7/EL-7).
- ③ Turn the diopter measuring handle to set the diopter scale to the sum of the prescribed S and C value ( $S + C$ ).
- ④ Place the prescribed lens on the lens table. Rotate the lens on the lens table until the lens axis is aligned to the direction of the cylindrical axis angular scale of the lens meter. Now the target is sharply focused.
- ⑤ Adjust the lens position so that the target center is aligned with the center of the view field.

- ⑥ Turn the diopter measuring handle to plus side, so that the shorter lines (OL-7/EL-7) of the target crosslines will be focused. Then, check if the center of the target coincide exactly will the center of the black crosslines. If it does not coincide, adjust the lens position.
- ⑦ Next, turn the diopter measuring handle back to minus side, so that the longer lines (OL-7/EL-7) of the target crosslines will be focused. Then, check if the center of the target will coincide exactly with the center of the black crosslines. If it does not coincide, adjust the lens position. Repeat the above ⑥ and ⑦, until the correct centering is obtained.
- ⑧ Mark the lens.  
Steps ① through ③ should be made without placing the lens on the lens table.

**OL-7/EL-7**

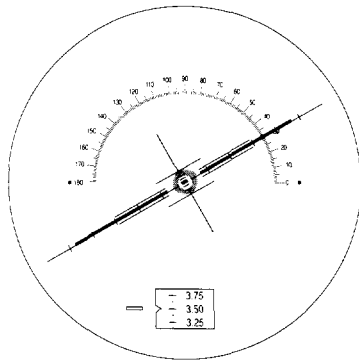


Fig. 4-5

**OL-7S/EL-7S**

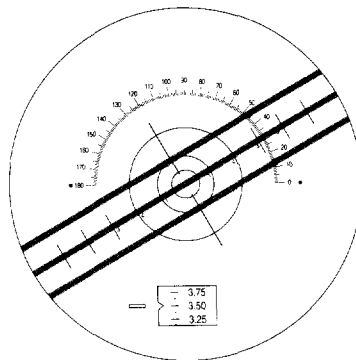


Fig. 4-6

**EL-8**

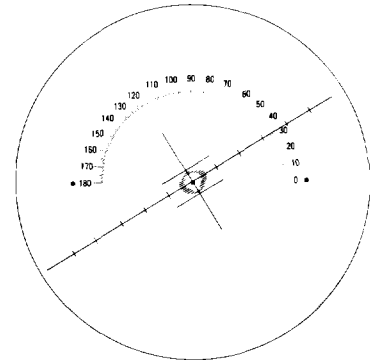


Fig. 4-7

By marking in this state, three dot marks will be positioned on the horizontal line of the frame.

#### 3) Lens with prism (decentering)

Take a step ① or ② as follows:

- ① Mark the lens after moving the target from the center of the view field to the required position.
- ② Set the prism beforehand with the prism compensator and adjust the lens position so that the target is in the center of the view field. Then mark the lens.

## 5. MAINTENANCE

### 5-1 After Use

Be sure to turn OFF the POWER switch after completion of measurement. This is to ensure extended battery life. In case the AC adaptor is used, disconnect the plug of the AC adaptor from the wall outlet after completion of measurement, so that the AC adaptor will be protected from overheating while it is not used. Put on the vinyl dust cover provided, whenever the instrument is not in use.

The power switch indicates nothing more than the state of a secondary circuit. Even if the power switch is at "OFF" position, a primary circuit is still live in case of AC adaptor is connected to the wall outlet.

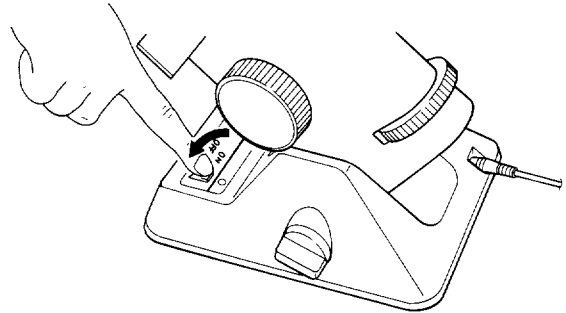


Fig. 5-1

### 5-2 Adjustment of Target Position

- (1) Make sure that the lens is not placed on the lens table.  
(Set to  $0\Delta$  when the instrument is equipped with the prism compensator.)
- (2) Turn the diopter measuring handle to obtain the sharpest target.
- (3) Check the target position.
  - (3-1) There is no problem if the target is in the center of view field as shown in Fig. 5-2.

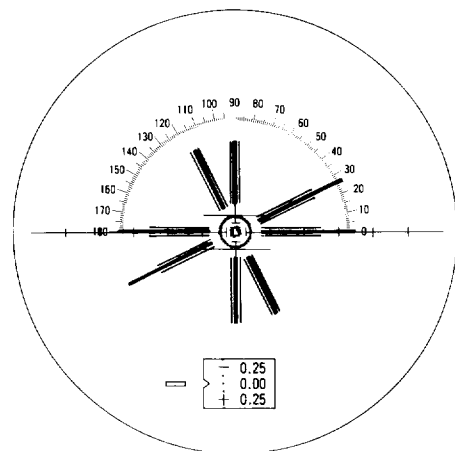


Fig. 5-2

- (3-2) If the target is off the center of view field as Fig. 5-3 and the target rotates around its own axis when operating the target rotation handle, carry out adjustment as follows:

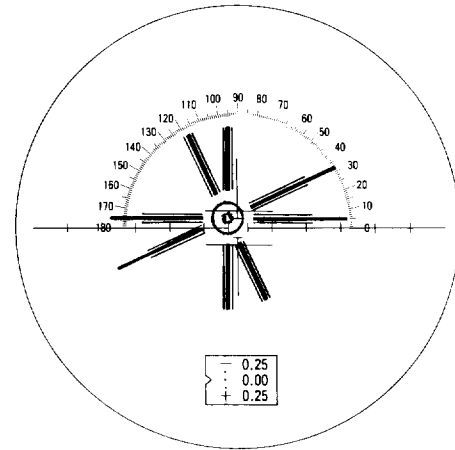


Fig. 5-3

First, loosen or tighten the three  $\ominus$  adjusting screws with a standard screwdriver as shown in Fig. 5-4. Tighten the screw which is facing toward the direction to move the target. (In this event, loosen other screw about one half turn beforehand.) Be sure to loosen the screws little by little at a time.

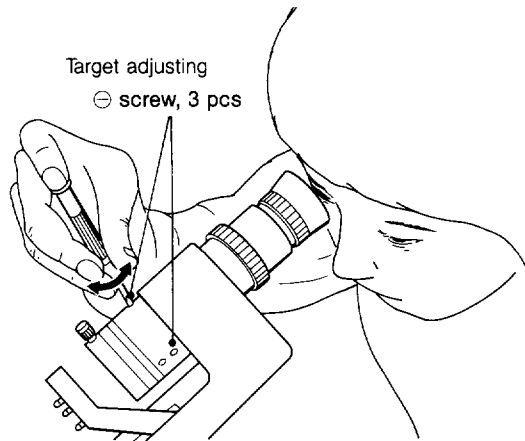


Fig. 5-4

Upon completion of adjustment, all three screws should be tightened fully.

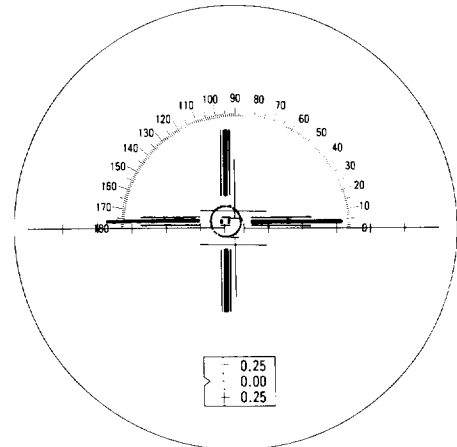


Fig. 5-5

(3-3) If the center of the target moves when the target is rotated, as shown in Fig. 5-6, contact your Nikon dealer or distributor because it may require special repair.

However, in case the prism compensator is attached, it may be caused by incorrect fine zero adjustment of the prism compensator. Check the zero adjustment according to the procedure on page 24, before requesting repair.

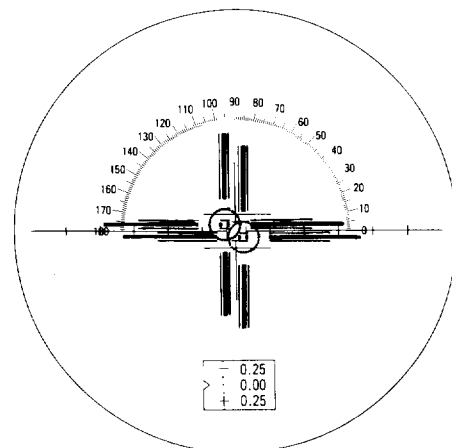


Fig. 5-6

### 5-3 Setting of Ink Cartridge

(Optional accessory)

To set the ink cartridge, first fix the tip of the marking pen and loosen the retaining screw on its top with screwdriver. While removing the screw, hold the pen so that it will not pop out because of the internal spring. The spring and retaining screw are used again. When inserting the ink cartridge (optional accessory), reset the removed spring again and insert the cartridge, then fasten the cartridge retaining screw provided with the cartridge.

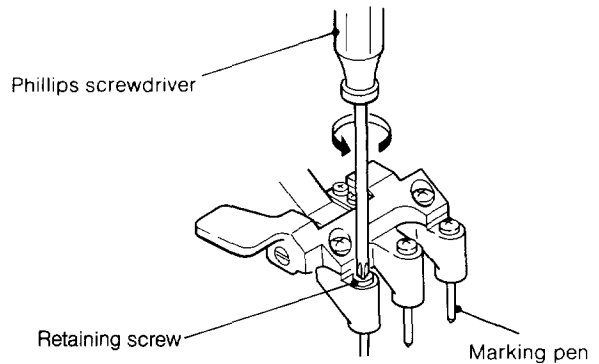


Fig. 5-7

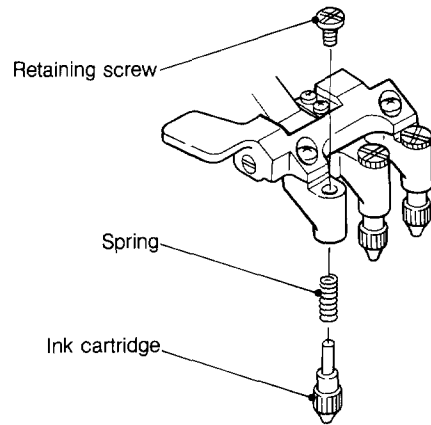


Fig. 5-8

The height of the three tips is normal if the central tip is 1.5mm higher. If it is not correct, the retaining screw may be loose. Fasten the screw.

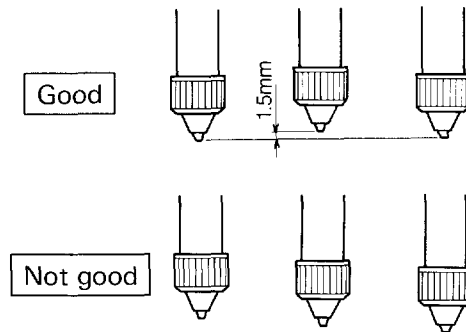
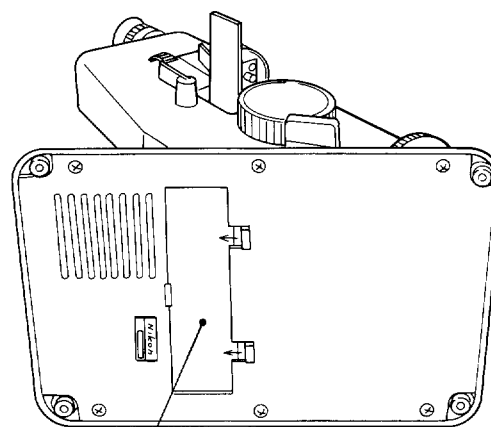


Fig. 5-9

## 5-4 Replacement of Battery

- ① Replacing the dry cell  
There is a battery lid at the bottom of this instrument. Push the two clicks in the battery lid in the direction of the arrows to open the lid. Place dry cell paying attention to their + and - direction. Close the lid. (The life of dry cells is about 150 hours under continuous use.)



Battery lid

Fig. 5-10



## 5-5 Attaching the Prism Compensator

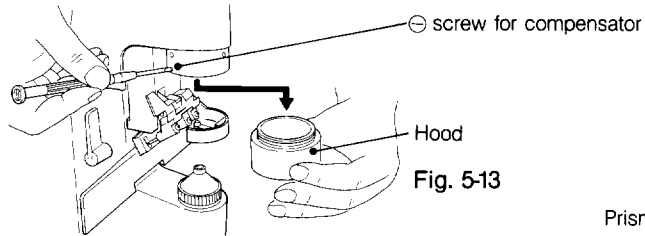
(The below figure is for OL-7.)

Finish adjustment of target position in pages 20 ~ 21 before taking steps (1) and (2) below.

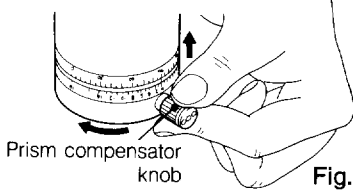
### (1) Fine zero adjustment

- ① When attaching the prism compensator newly, remove the hood first by loosening two screws for the compensator.

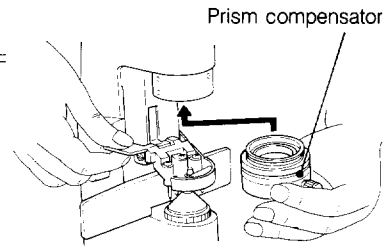
- ② Attach the prism compensator. The graduation of 90° should be positioned exactly at the center of the instrument body. Tighten two screws.



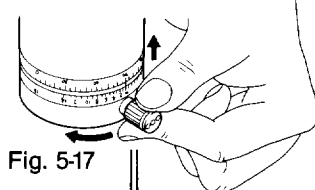
- ③ Set the prism compensator to 90° by the knob.



- ④ Pull out the knob.  
⑤ Turn the knob only to set to "0" of the prism diopter scale.



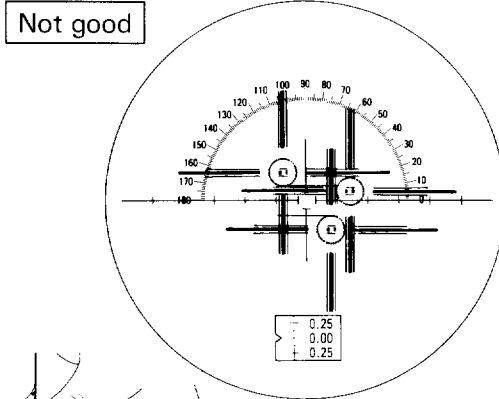
- ⑦ Hold the compensator knob and swing the compensator to right and left.



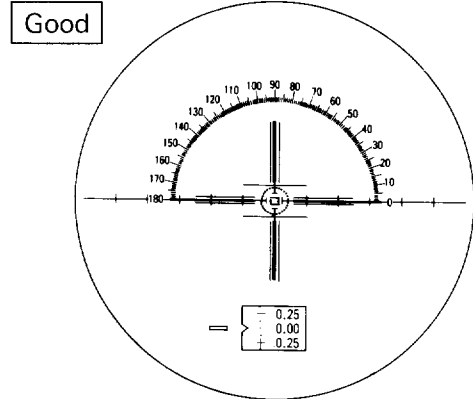
- ⑥ Push to lock the knob.

Fig. 5-16

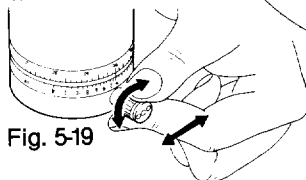
- ⑧-1 If the target moves as shown below:



- ⑧-2 If the target does not move, proceeds to (2) on the next page.



(A) Repeat from ⑦.

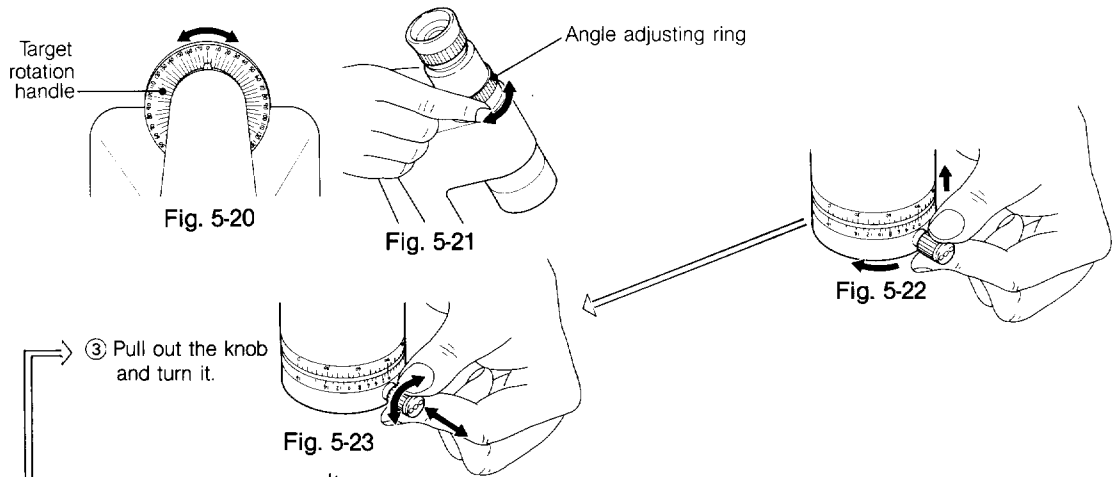


Pull out the knob again and turn it for readjustment.

**(2) Prism compensator position adjustment**

① Set the target rotation handle to 90°. Turn the angle adjusting ring to set the longer line of the black crosslines within the view field to 90°.

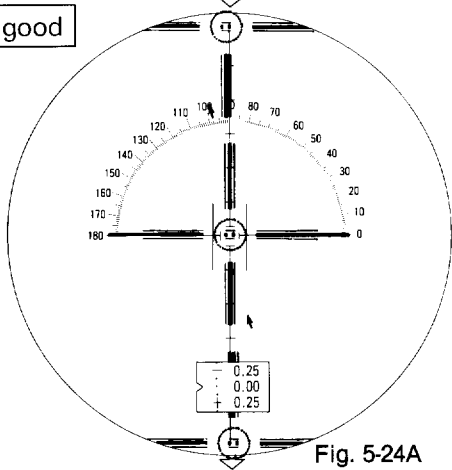
② Set the prism compensator angle scale to 90°.



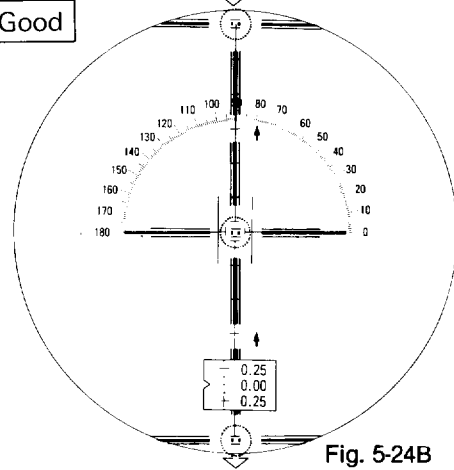
③ Pull out the knob and turn it.

Fig. 5-23

Not good

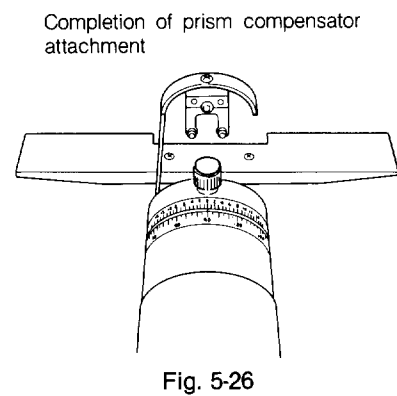
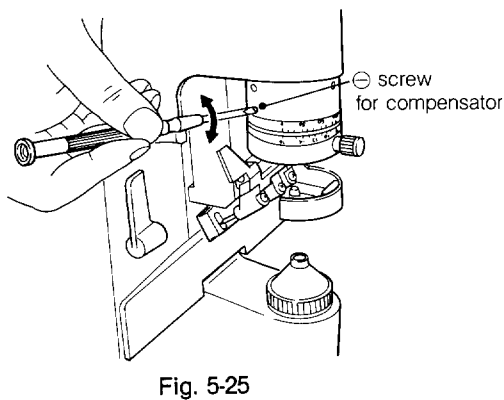


Good



④-1 When the target moves off from the 90° - 270° direction, loosen two ⊖ screws for the compensator. Adjust the position of the prism compensator and tighten the screws.

④-2 Adjustment is over when the target moves without deviation from the 90° - 270° direction.



## 6. PRINCIPAL SPECIFICATIONS

		OL-7·OL-7S	EL-7·EL-7S/EL-8
Spherical power (Diopter)	Measurement range	± 25.00D	± 20.00D
	Increments	~ ± 3.00D ± 3.00D ~	0.125D 0.25D
Prismatic power	Measurement range	6 Δ (without prism compensator) upto 22 Δ (with prism compensator) Optional	
	Increments	1 Δ	
Cylindrical axis	Measuring range	0° ~ 180°	
	Increments	1°	
Tilting angle		25° ~ 90°	
Acceptable lens diameter		~ 90mm	
Power supply (2 types)		1 SUM-1 (Type D) dry cell (1.5V) x 2 2 AC adaptor (Input voltage — 120VAC, 230VAC, 240VAC)	
Source of light		LED 555nm	
Dimensions		H(446) × D(286) × W(183)mm	
Weight		Approx. 3.6 kg	

D=Diopter    Δ =prism

## 7. STANDARD SET AND OPTIONAL ACCESSORIES

### Standard Set

- Lensmeter (OL-7·OL-7S/EL-7·EL-7S/EL-8) ..... either 1
- φ5mm lens table ..... 1
- AC adaptor (for 120V or 230V or 240V) ..... either 1
- Contact lens holder • Vinyl cover ..... 1
- φ8mm lens table ..... 1
- Marking ink ..... 1

### Optional Accessories

- Prism compensator
- \* Spare lens tables, φ5mm and φ8mm
- Ink cartridge type marking set
- \* AC adaptor (for 120V or 230V or 240V)
- \* Vinyl cover
- \* Contact lens holder

★ Also available as an optional accessory, although provided as standard accessory.