# User Guide
# Auto lensmeter ALM 500


Version 1

# Introduction

This device is aims to measure S, C, A and prism refractive power of the framed lens and contact lens.

# About This Manual

**Please read this manual thoroughly so that safe and effective operation is ensured.**

(1) The information contained in this manual is subject to change without notice.
(2) While reasonable efforts have been made in the preparation of this document to ensure its accuracy, you should contact your local distributor immediately if any queries arise due to editorial errors or omissions etc.
(3) If finding any imperfect collating or missing pages, contact your local distributor for replacement.

This manual contains important contents to prevent users or others from harms and to use this device safely.

Read this manual after understanding the symbols below and follow the instructions in use

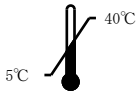
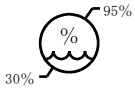
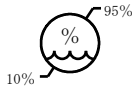
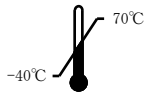
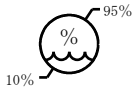
| | |
|---|---|
| **Warning** | This symbol indicates that mishandling as a result of failure to comply with the indications can result in "personal death" or "serious injury". |
| | Denote general ban or prohibition. |
| | General mandatory action. |
| **NOTE** | Additional information which is important to the text or useful/ convenient to know. |
| 5℃ 40℃ | The number on the left is the lower limit and the one on the right is the upper limit of the temperature. |
| 10% % 90% | The number on the left is the lower limit and the one on the right is the upper limit of the humidity. |
| | Avoid direct sunlight. |

This manual contains the information about basic operation, inspection and maintenance etc. of ALM500.

# Safety Consideration

## General Cautions

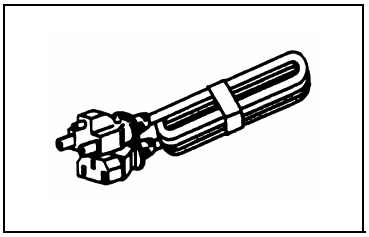
- It affects its measurement accuracy if fingerprints or dust etc. are on the optical components such as glass parts under the lens stand.
  Do not touch them with hands, and avoid dust.
- If fingerprints or dust are adhered on the optical parts such as a lens etc., wipe it gently with a soft cloth.
- Observe the following environmental conditions for use, storage and transportation.

| | | |
|---|---|---|
| Use |  |  |
| Storage |  |  |
| Transportation |  |  |

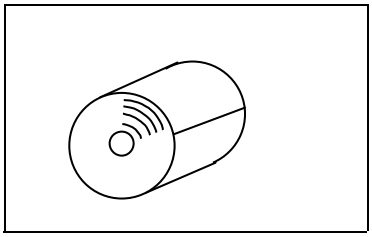

- Avoid installation near TV or radio. The reception can be disturbed by electrical noise.
- If liquid is spilled on this device or a foreign substance is entered in it, unplug the power cord and contact your local distributor.
- Turn off the power immediately and contact your local distributor if malfunction (noise, smoke etc.) occurs. It can result in fire or injury if you keep using it.
- Do not attempt to disassemble it. It can result in malfunction or fire.
- If malfunction occurs, do not touch the inside of this device. Unplug the power cord and contact your local distributor.

# Contents

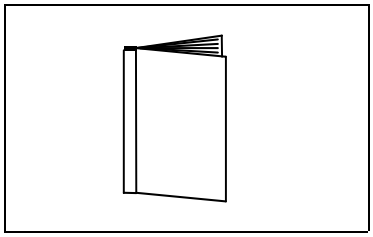
# 1. Accessories



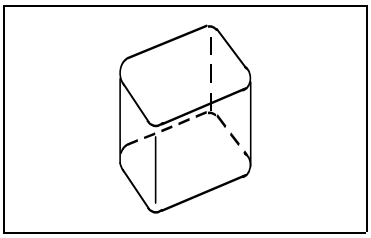
Power cord: 1
(2.5m)



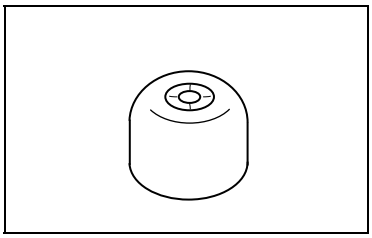
Printer paper: 1
(Width: 58mm)



Operation manual: 1



Dust cover: 1



Contact lens stand: 1

Use the accessories specified by us.

The printer paper is the thermal paper roll.

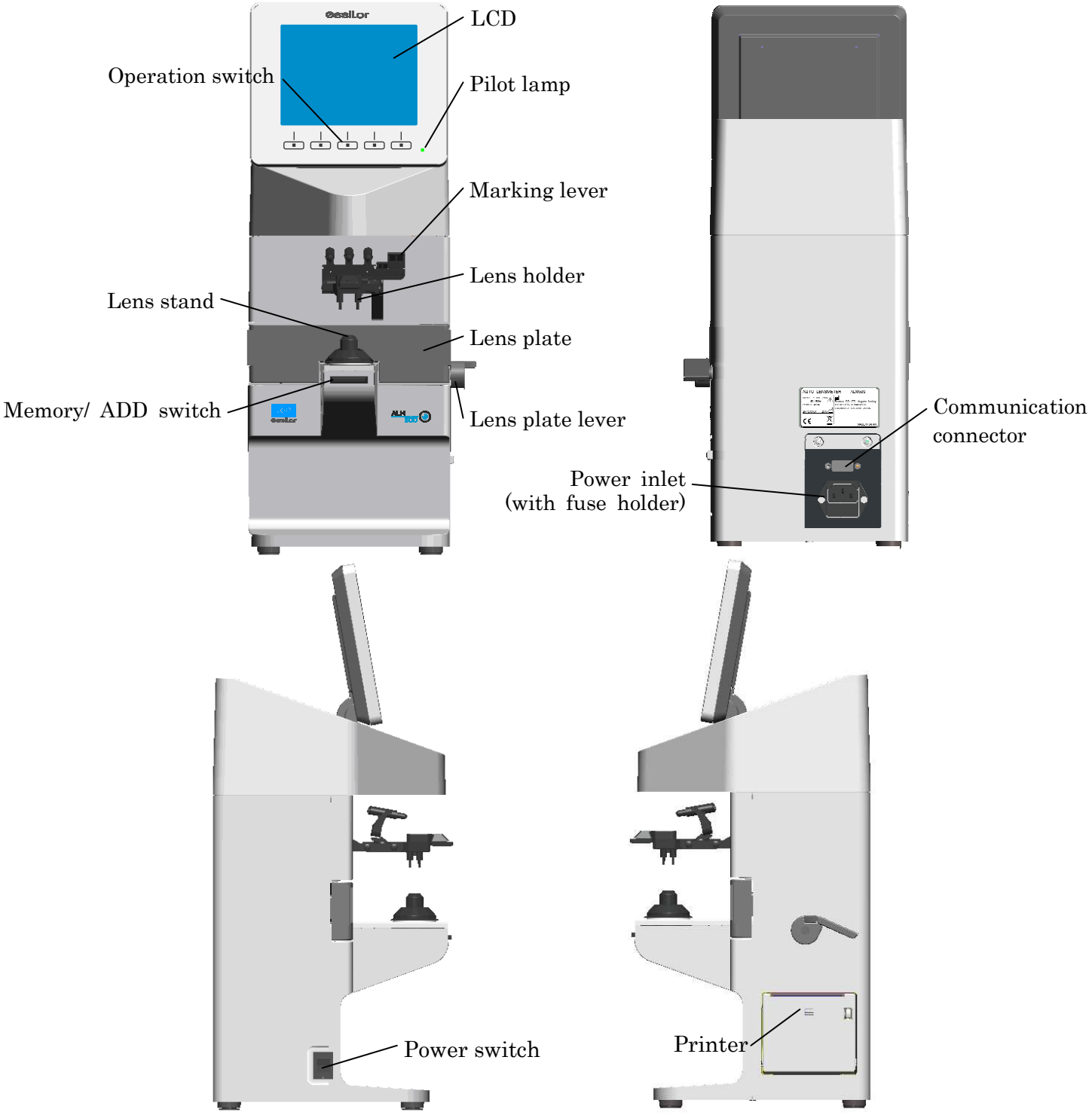
Avoid direct sunlight, high humidity and high temperature at the time of storage.

# 2. Device

## 2.1 General Description of Device

This device aims to take the measurements of S, C, A, prism refractive power and optical axis coordinate of unprocessed lens, processed framed lens and contact lens, and to put dots on them to find its axis.
As an external feature, the angle of the LCD can be changed.
Refer to “3. Instructions for Use” about the operating precautions of this device.

## 2.2 Parts Identification



LCD
Color LCD (640X480 dots)
User-friendly LCD which is adjustable vertically within operating range (60°)
Operation switch
Feather touch sensor button in consideration of interaction with screen and interface

Pilot lamp
Indicate ON (light is on)/ OFF (light is off) and power saving mode (blinking).
Marking lever/ lens holder
The marking lever and lens holder are integrated.
・Marking lever: presses the lever down and put the dots.
・Lens holder: fixes the framed glass on the lens stand by moving the lever up and down.

Lens stand
Takes a measurement by placing the framed lens on the lens stand

Lens plate
The plate to be reference of the cylindrical axis and the specified direction of the prism
For the framed lens, take a measurement so as that the lens frame contacts with the lens plate.

Lens plate lever
Moves the lens plate back and forth.

Memory/ ADD switch
Stores the measurement values of the short focus lens, multifocal lens and contact lens on the measurement screen in memory.
Freezes the display of the measurement values and stores them in memory.
For the measurement screen of the progressive lens, this switch is to set the near and far points in case of the manual measurement.

Communication connector
Transfers the measurement data to another equipment or PC.

Power inlet
Connects the accompanied power cord for power supply

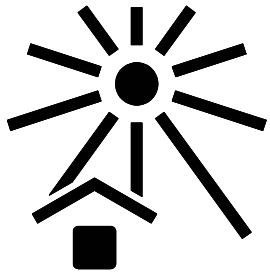
Power supply switch
Turns on/off the device

Printer
Prints out the measurement values.

# 3. Instructions for Use

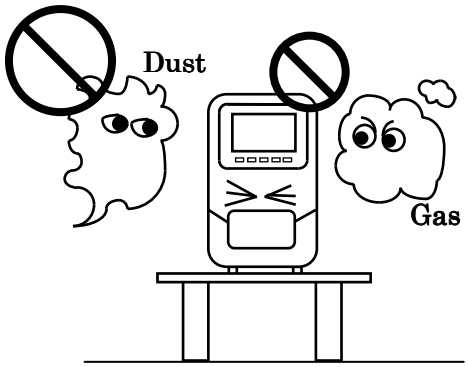
## 3.1 Installation

(1) Do not expose the device to sunlight or bright light from other sources.



> NOTE Take extra caution to avoid strong light because it may cause the failure of measurement.

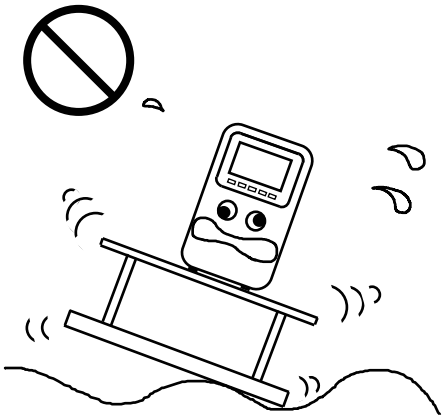
(2) Do not install the device in places where either dust or rubbish may accumulate.
Also, the environments with extremes in heat and humidity should be avoided.
In case of using the device, ensure to comply with the environmental conditions of unpacking and usage before starting a measurement.




- Temperature range for use: 5℃ to 40℃
- Humidity range for use: 30%HR to 95%HR
- Temperature range for storage: -10℃ to 55℃ (No dew condensation)
- Humidity range for storage: 10%HR to 95%HR (No dew condensation)

(3) Keep away from inflammable or explosive gases as well as storage area of the medical supplies and chemicals.

(4) Keep away from the sites that experience strong vibrations or sudden shocks.



(5) The device might be broken if it falls down. Also, it might cause injury if dropping it. Therefore, do not store it at an unstable place or in high, 'out of reach' place.

(6) Keep this device away from water (liquid).

- Degree of protection: IP20

## 3.2 Connection/ Wiring

(1) The earth cable of the power code should be connected to the earth terminal.

(2) Avoid damaging the power cord (such as bending it in an extremely small size, pulling, placing a heavy object on it etc.). Also, do not fabricate the cord.

(3) When the power cord is damaged, (breaks, damage of cover etc.), replace it to the new one. Fire or electric shock may occur if you keep using it.

(4) Insert the power cord firmly into the outlet and device. If not, fire or electric shock may occur.

(5) Keep the power cord clean without any dust or oil etc. on it. The dirty terminal may cause malfunction or fire.

(6) When the power cord gets hot after use, check for the dirt of the terminal unit. If you find no dirt, replace the power cord to the new one. Fire or electric shock may occur if you keep using it.

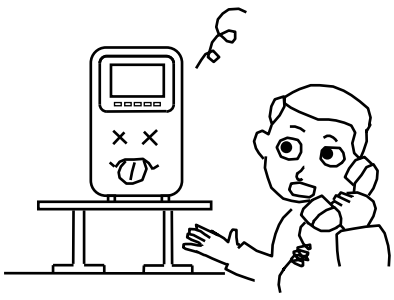
(7) Use it with the correct power-supply voltage. Fire or electric shock may occur if using it with more than the rated supply voltage.

(8) Always hold the plug when plugging or unplugging the power cord.

(9) Do not touch the plug with wet hands. You may get an electric shock.

(10) If the device is not used for a long time, unplug the power cord from the outlet.

## 3.3 Maintenance/ Inspection

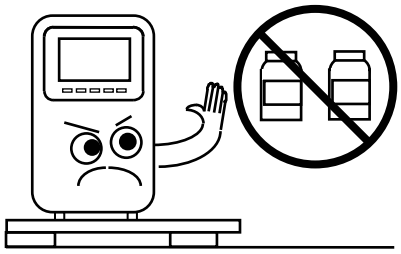


(1) This is the precision optical device. Make sure not to mishandle or drop it.

(2) **Do not touch** or allow dust to adhere on the optical parts (i.e. lenses), as the measurement accuracy could be adversely affected by fingerprints and dust etc.

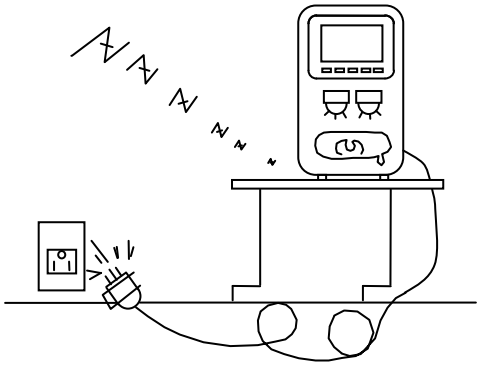
When fingerprints or dust are adhered onto the optical parts, gently wipe them with the accompanying dust cloth or a soft cloth. In this instance, make sure not to scratch them.

(3) If the main unit cover or operation panel is dirty, gently wipe it with a dry cloth. For hard to remove stains, a damp cloth or neutral cleanser is recommended.



Avoid using organic solvent such as thinner which may damage the water based paint finish or device.

(4) If the device is not used for any length of time, unplug the power cord.



(5) When the device is not in use, protect it with the accompanying dustproof cover. The measurement accuracy could be affected by dust.

(6) Never attempt to fix or remodel the device. When the device fails to function properly, **do not touch the inside**. Contact us or your local distributor.

## 3.4 Disposal

Dispose this device according to the regulations of each local government and recycle plan. Inappropriate disposal affects the environment.

# 4. Measurement Screen

## 4.1 Description of Measurement Screen

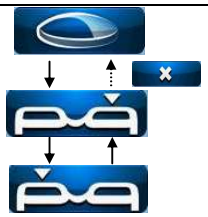

Measurement screen of single focus lens, multifocal lens and contact lens

※The display of the measurement screen reflects the setting and condition of the device.

The functions of the operation switches under the monitor are correspondent to the icons displayed at the bottom of the screen.

At the time of normal measurement, they are correspondent to the icons shown below.

【Explanation about switches】

| Name of switch | Icon | Description of function |
|---|---|---|
| **Bottom of screen: 5** | | |
| Function setting switch |  | Switches to the Setup (device setting) screen. |
| Measurement selection switch |  | Switches to multifocal lens measurement from single focus lens. |
| Unprocessed lens/ framed lens selection switch |  | Selects unprocessed, left or right lens. |
| Clear switch |  | Deletes measurement values stored in memory. |
| Measurement value output switch |  | Prints out measurement result, outputs data from RS232C or both. |
| **Lens stand unit: 1** | | |
| Memory/ ADD switch | No icon | Stores measurement values in memory and take a measurement of ADD. |

## 4.2 Preparation for Measurement

### 4.2.1 Device Setting

This device is ready for use with the standard mode but the setting can be changed easily as needed.

Switch to the Setup (setup of device) screen by pressing  at the bottom of screen.

NOTE

**Change of switch function**

The functions of each switch are changed on the menu screen.
The icons corresponding to each switch are displayed at the bottom of the screen.
Operate each switch in accordance with the display.

 : Moves the cursor downward at each setting item

 : Moves the cursor upward at each setting item

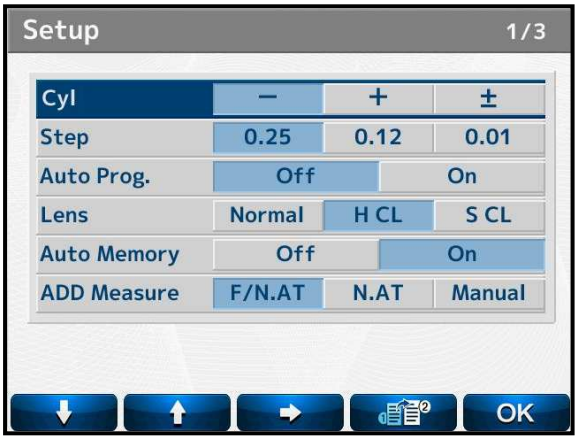
 : Goes to a further page of Setup (  )

 : Selects the item in each setting item. The cursor is moved horizontally.

 : Returns to the measurement screen

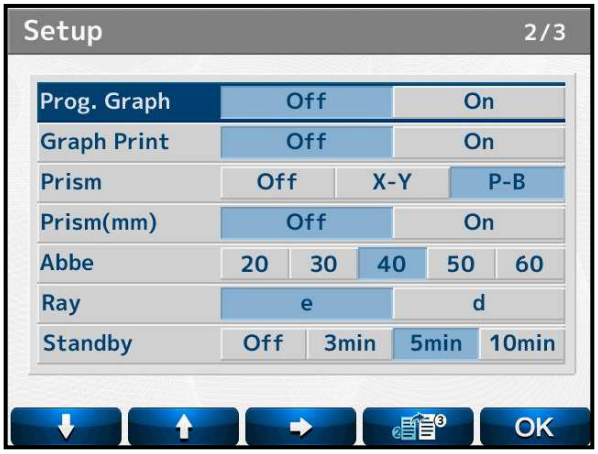
### 4.2.2 Setup (Device Setting) Screen

【1/3 screen】



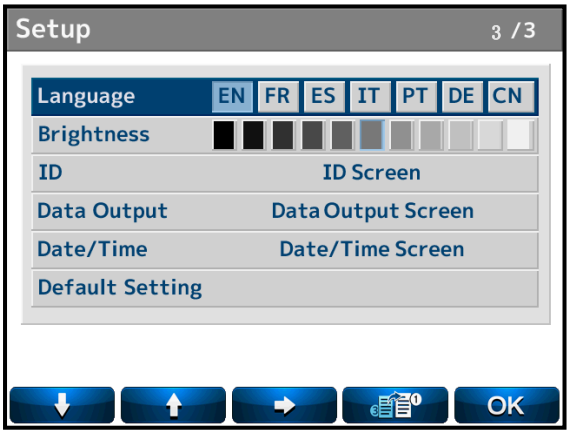

| Item | Description of Function |
|---|---|
| **Cyl** | Selects sign for Cyl : **-** / **＋** / **±** |
| **Step** | Selects step to display measurement value |
| | **0.25 / 0.12 / 0.01** |
| **Auto Prog.** | Sets auto detection of progressive lens |
| | **On / Off** |
| **Lens** | Selects lens to be measured |
| | **Normal** : Framed lens<br>**H CL** : Hard contact lens<br>**S CL** : Soft contact lens |
| **Auto Memory** | Sets auto memory at the time of “Marking OK” |
| | **On / Off** |
| **ADD Measure** | Selects auto/ manual memory of far and near points |
| | **F/N.AT** : Stores both near and far points automatically<br>**N.AT** : Stores only near point automatically<br>**Manual** : Stores data manually |

【2/3 screen】




| Item | Description of Function |
|---|---|
| **Prog. Graph** | Sets display of ADD value and assessment graph on progressive lens measurement screen |
| | **On** / **Off** |
| **Graph Print** | Sets printing of ADD value and assessment graph after measuring progressive lens |
| | **On** / **Off** |
| **Prism** | Selects display of prism value and unit to be displayed |
| | **Off** : No display **X-Y** : X-Y display<br>P-B : Prism value - base direction |
| **Prism(mm)** | Displays prism value of **X-Y** direction in mm |
| | **On** / **Off** |
| **Abbe** | Selects Abbe number:<br>**20 / 30 / 40 / 50 / 60** |
| **Ray** | Selects measurement wavelength |
| | **e** line / **d** line |
| **Standby** | Selects time to activate standby mode |
| | **Off** / **3**min / **5**min / **10**min |

【3/3 screen】

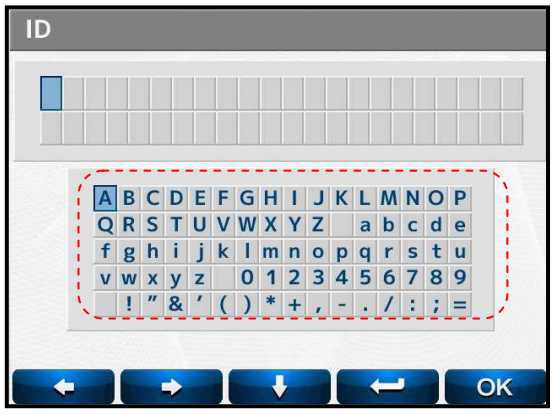



| Item | Description of Function |
|---|---|
| **Language** | Selects language displayed on screen |
| | English/ French/ Spanish/ Italian/ Portuguese/ German/ Chinese |
| **Brightness** | Sets brightness of screen (50% to 100%) |
| **Sound Mute** | Sets On/Off of sound at the time of operating switches |
| **Data Output** | Switches to **Data Output** screen |
| **Date/Time** | Switches to **Date/Time** screen |
| **Default Setting** | Displays the Setup items changed from default and changes the setting back to the default by pressing . |

### 4.2.3 ID Screen

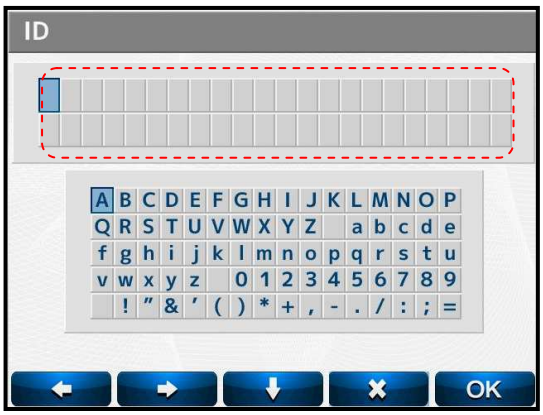
This screen is to create the data for printing out the distributor's name or message on the printout.

(1) The cursor in [ ] moves by pressing the arrows.




The cursor in [ ] moves while the Memory/ADD switch is held

(2) While Memory/ADD switch is held




The cursor in [ ] moves while the Memory/ADD switch is held

The screen shown on the left appears by selecting "ID Screen".

(2) is the screen for changing or erasing the information.

**How to input**

In the Screen (1), select the characters with ← → ↓ and enter them with ↵.

Any changes made will overwrite the original characters.

The maximum number of characters is 44 (22 characters X 2 lines).

In case of changing the characters, move the cursor to the one changed by pressing ← → ↓ with holding the Memory/ ADD switch. Return to Screen (1) and select the character to be input with ← → ↓ and press ↵.

**How to delete**

In case of deleting the characters, move the cursor to the one deleted with ← → ↓ and press ✕.

### 4.2.4 Data Output Screen

This screen is to set the communication parameter for outputting the measurement values to the externally-connected PC etc.

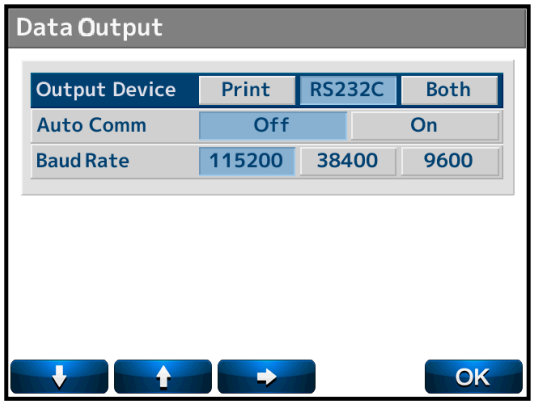
The measurement values and data created on the "**ID screen**" are output by selecting "**RS232C**" or "**Both**" of "**Data Output**" on the Setup screen.

> NOTE The output content is same with the one of the printout.
> However, the graph at the time of progressive lens measurement is not output.

**Setting of Communication to PC etc.**

The communication from RS232C port is set on "**Data Output**".

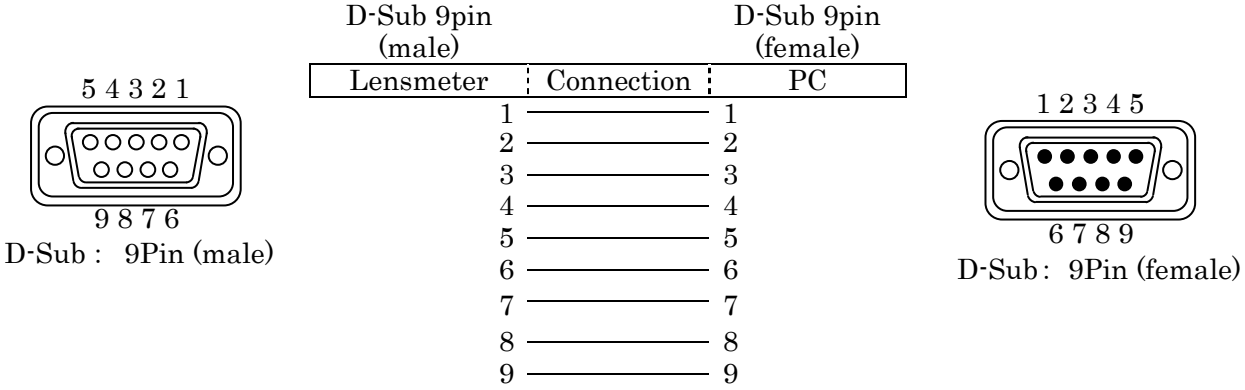
【Setting screen in case of outputting from RS232C 】




| Item | Description | | |
|---|---|---|---|
| **Output Device** | Setting of output destination | | |
| | **Print** | **RS232C** | **Both** |
| | **Device printer** | **RS232C terminal** | **Both** |
| **Auto Comm** | Setting | | |
| | "**Off**" | "**On**" | |
| | By pressing "Output" switch on measurement screen | Measurement values are output continuously | |
| **Band Rate** (Communication speed) | Select from **115200**, **38400** or **9600**. | | |

> NOTE In case of output from RS232C, the data is output only in English regardless of language setting.

【Example of connection】




Use the straight cable (D-sub 9 pin: male/ D-sub 9: female) as the connection cable at the time of outputting the measurement values by using the RS232C.

※ Contact your local distributor if you have anything unclear or any questions regarding operation and connection.

> NOTE Use a shield wire for a connecting cable to protect the output data from noise.

### 4.2.5 Data/Time Screen

The screen to set the date and time for printout and communication output

(1)


Select the item to be changed with ▼ ▲ and set the detail with → .

"**Date Form**" : **YMD** → Year, Month, Day

"**Date Form**" : **DMY** → Day, Month, Year

"**Date Form**" : **MDY** → Month, Day, Year

**Date: change of date**

Select "Date" with ▼ ▲ .

Move the cursor to the item to be changed with → .

While the Memory/ ADD switch is held, the Screen (2) is displayed. Make changes with − + .

(2) While the Memory/ ADD switch is pressed


**Time : change of time**

Select "Time" with ▼ ▲ .

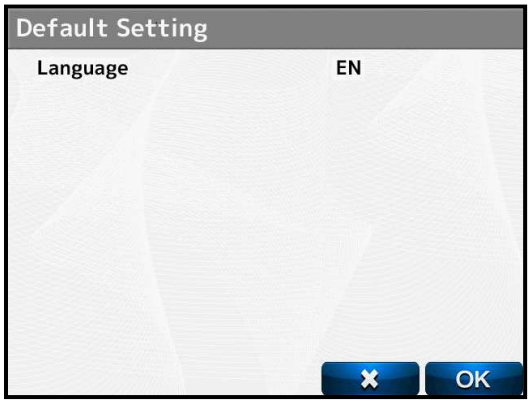
Move the cursor to the item to be changed with → .

While Memory/ Add switch is pressed, the Screen (2) is displayed. Make changes with − + .

### 4.2.6 Default Setting Screen

The screen to change the setting of the device back to the default

The list of the items changed from the default is also displayed.



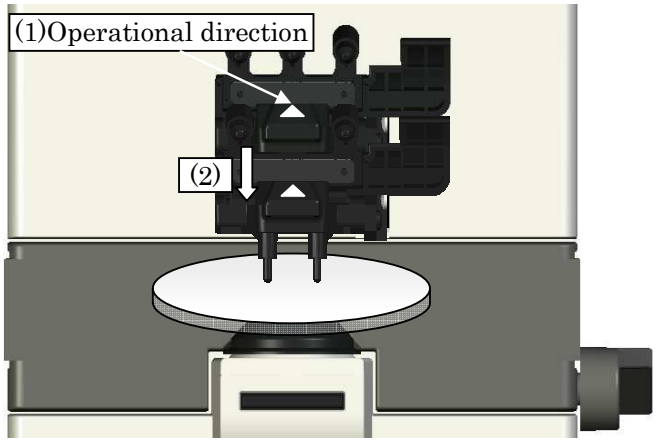

Press ✖ if you wish to change the setting back to the default.

Press OK if you do not wish to change the setting back to the default. It goes back to the measurement screen after pressing either switch.

# 5. Operating Instructions of Device

## 5.1 Lens Holder

(1) Raise the lever to the operational direction until it is unlocked.
(2) Lower the lens holder slowly and fix the lens.

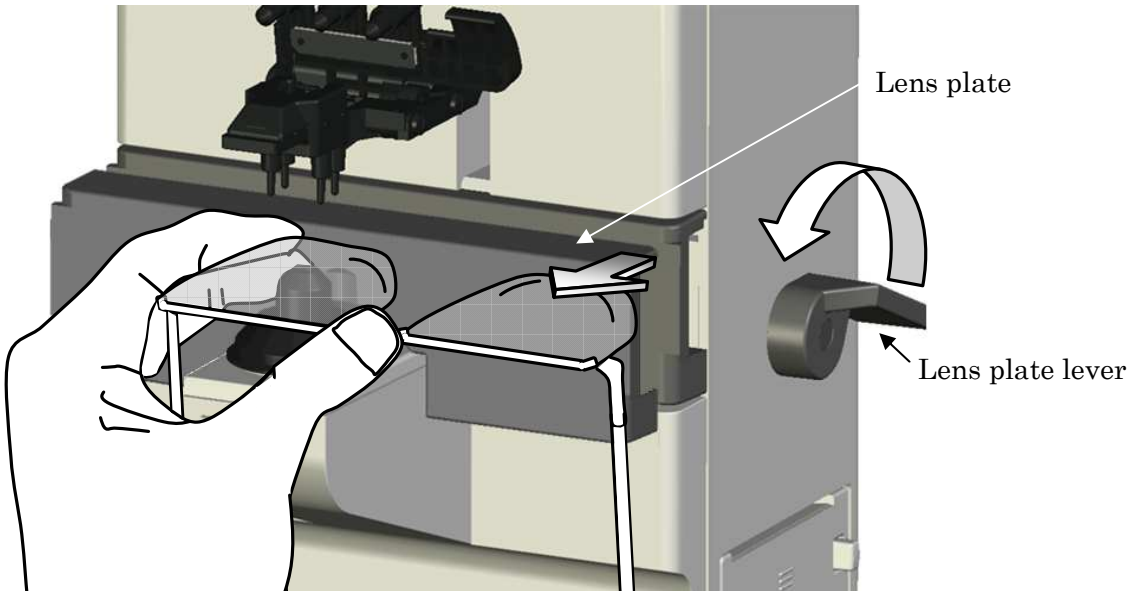



Do not give strong impact to a lens when lowering the lens holder.
When rising the lens holder, make sure to move to the top.

## 5.2 Lens Plate

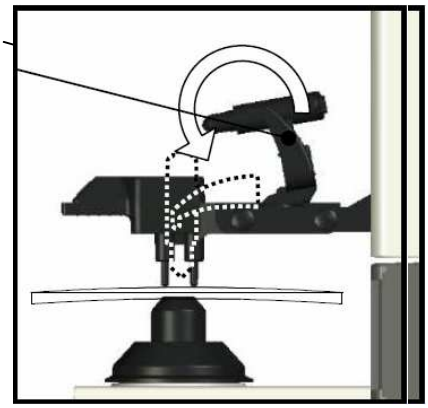
The lens plate is the reference of the cylindrical axis.

Place the framed lens and rotate the lens plate lever to the direction of the arrow so that the bottom of the lens touches the lens plate. After that, lower the lens holder and fix the lens.



## 5.3 Marking Lever

Marking lever

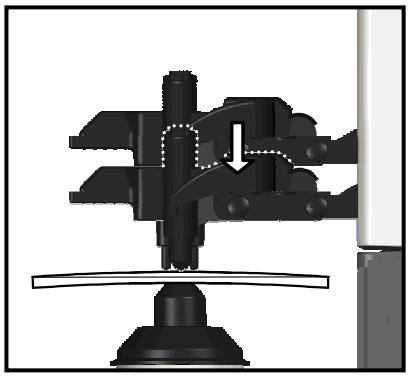


### 5.3.1 Operating Instructions

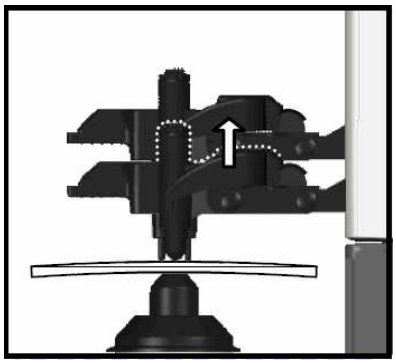
(1) Turn and lower the marking lever..

(2) Place the tips of the marking pens on the lens surface softly.

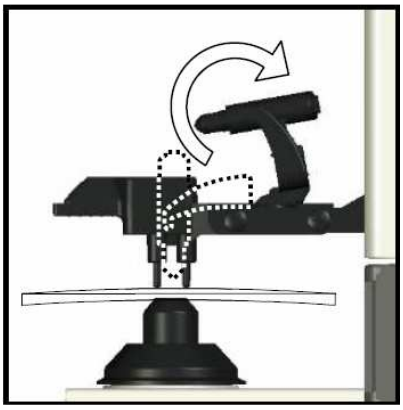
> Do not mark several times at the same point.
> The marking pen may be worn out quickly.



(3) Release the finger after marking.



(4) The marking lever returns to the initial position.



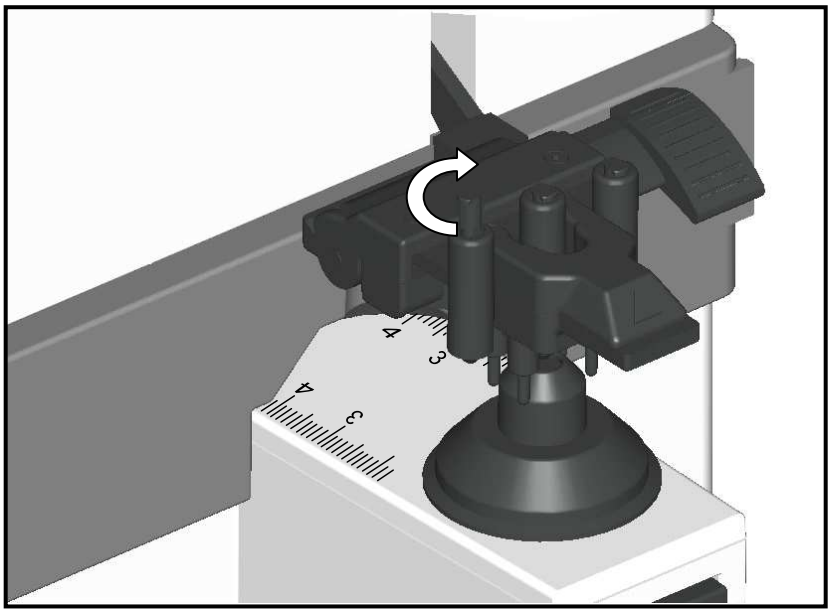
> Avoid the followings since they may damage the tips of the marking pens.
> - Perform marking roughly
> - Operate the marking lever without a lens set.
> - Touch a tip of the marking pen during cleaning.

### 5.3.2 Replacement of Marking Pen

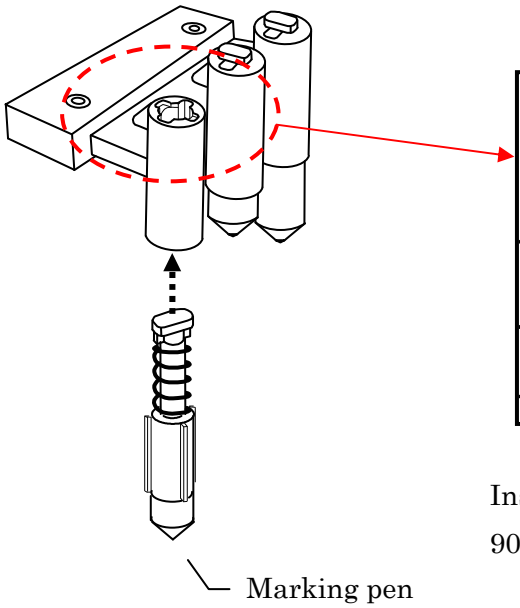
The marking pen is the consumable item.

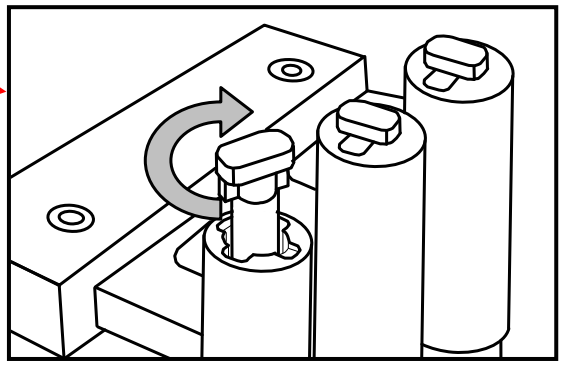
Replace it if the imprint becomes thin or the pen tip is worn.

(1) Remove the marking pen by pressing and rotating it 90 degrees as shown below.



(2) Insert the new pen back to the initial position as shown below.



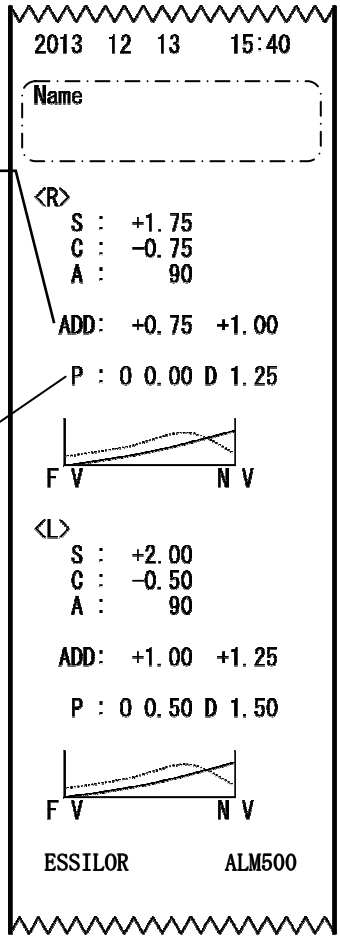
Insert the marking pen, and fix it by rotating 90 degrees.

- Ensure to use the marking pen specified for “DL-900”.
- Do not touch the pen tip at the time of replacement.

## 5.4 Printer

### 5.4.1 Operating Instructions

The measurement values can be printed out by pressing  after taking the measurements.




Add measurement values are displayed only at the time of measurements of multifocal lens and progressive lens (Left: ADD1, Right: ADD2)

The unit of the prism value is different according to the setting.

Distributor's name, comment etc. (printed out only when ID is set) Maximum number of characters: 44 characters (22 characters X 2 lines)

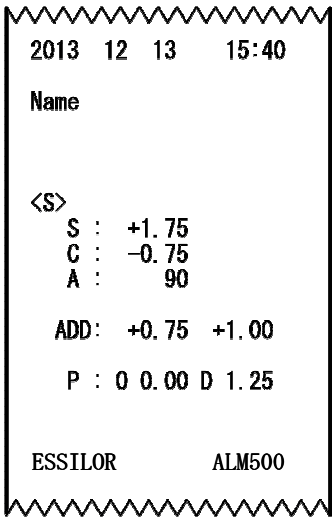
Measurement value of right lens

When the ADD value and assessment graph is printed (when "Graph Print" is set as "On" at the time of progressive lens measurement)

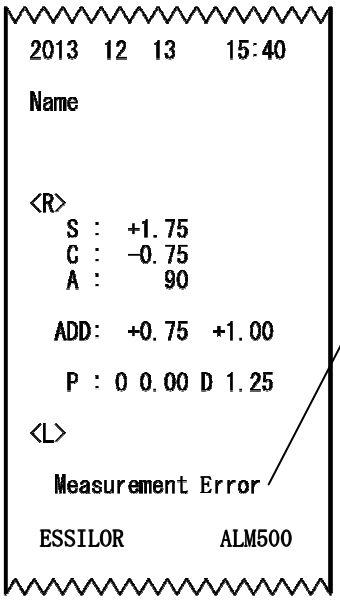
Shown below is the measurement value of the left lens (Same as that for a right lens)

Line feed

【Printout sample when unprocessed lens is measured】



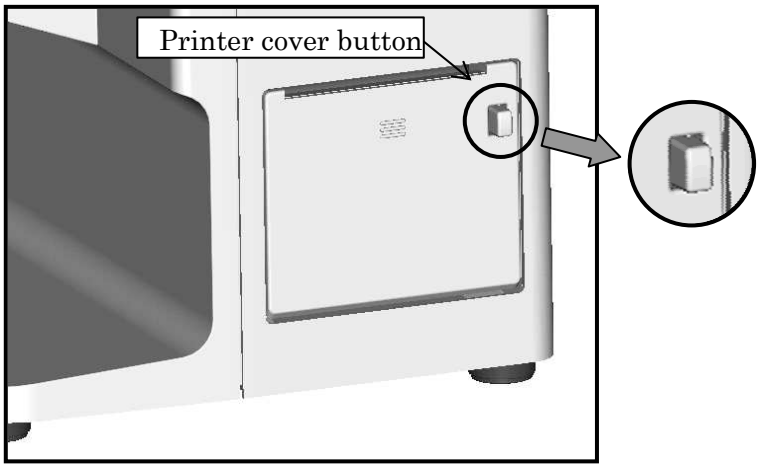

【Printout sample in case of measurement error】




Error display
Other error displays
・SPH Over
・CYL Over
・Prism Over
・Center Error

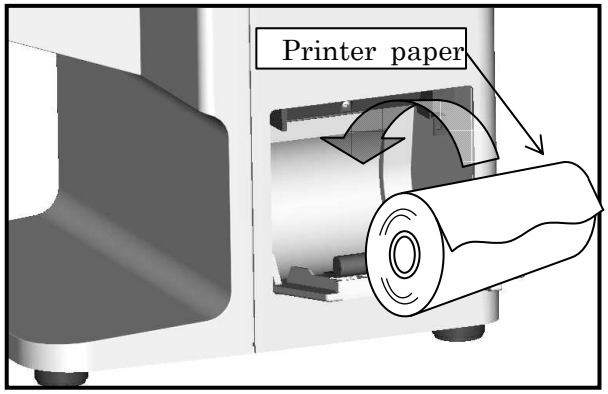
### 5.4.2 Installation and Replacement of Printer Paper

(1) Open the printer cover by pressing the printer cover button.

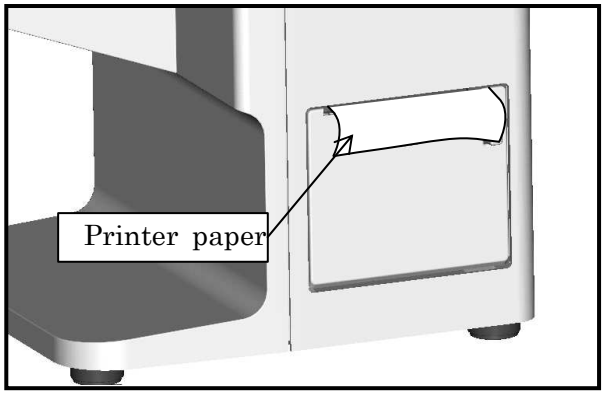



(2) Insert the printer paper with attention to the winding direction.

Note) Insert the printer paper so as that the printer paper comes out from the upside.




(3) Close the printer cover with the end of the paper taken out a little.
At this time, close it completely until hearing the clicking noise. The error is displayed and the data is not printed out if the cover is opened.




Use the printer paper specified for “ALM500”.

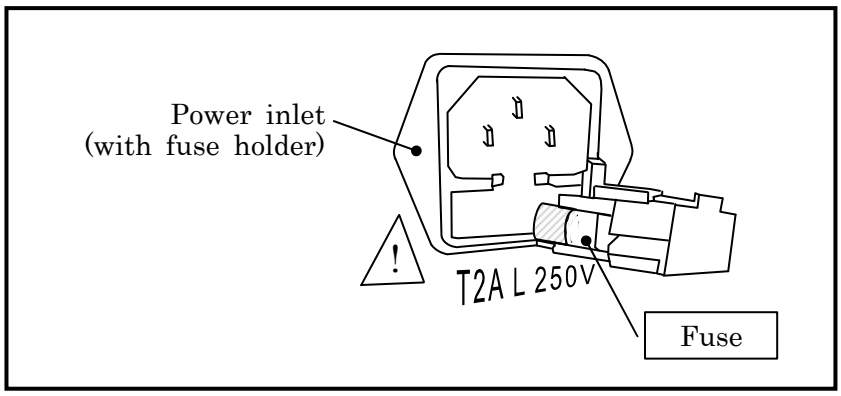
## 5.5 Replacement of Fuse

| | |
|---|---|
| **Warning** | Unplug the power cord before removing the fuse holder at the time of replacing the fuse. Electric shock may occur if removing the fuse holder without unplugging the power cord. |

When the fuse is brown out, replace it after removing the fuse holder of the power inlet.

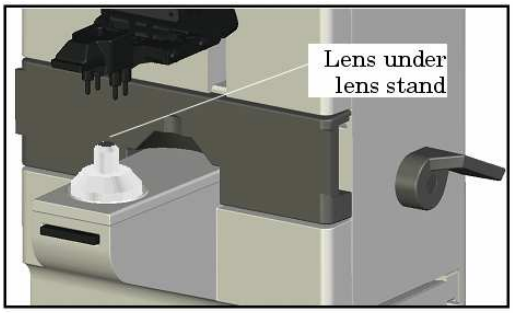
The fuse holder is removed from the main unit by pulling it out.

Always use the specified fuse (T2A 250V)



# 6. Measurement

## 6.1 Checkup before Measurement



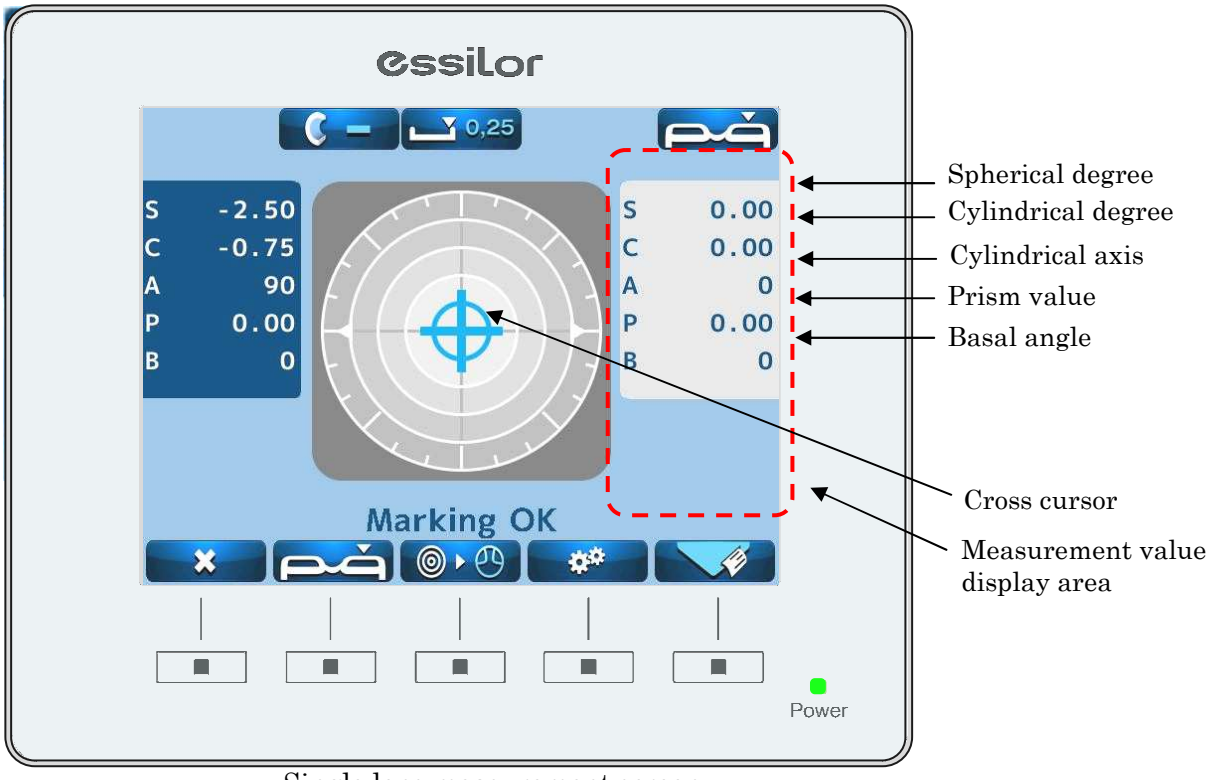
Lens stand is removed

- The lens holder is set properly.
- The lens under the lens stand is clean.
  (In case that the lens is dirty, clean it with a soft cloth.)

- Plug the power cord to the outlet.

> Always connect the earth terminal to a ground.

- Set the printer paper in the printer.
  (Refer to "5.4.2 Installation and Replacement of Printer Paper".)
- Confirm that the lens is not placed on the lens stand.
- Turn on the power switch. The screen is displayed in seconds.



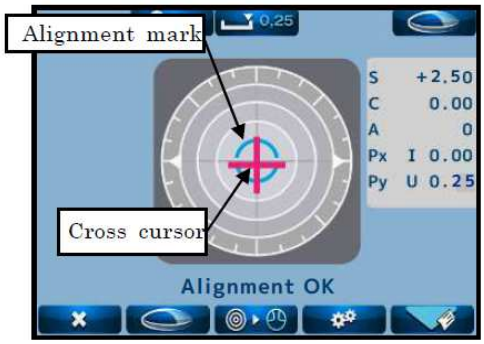
Single lens measurement screen

## 6.2 Measurement of Single Lens

(1) Place the lens on the lens stand.
Lower the lens holder softly on the lens.
The screen as shown on the right appears.


Do not give strong impact to a lens when lowering the lens holder.
When rising the lens holder, make sure that it is moved to the top and locked.

(2) Bring the cross cursor to the alignment mark by moving the lens. The message "**Alignment OK**" appears on the screen when alignment completes.
If the lens is the cylindrical one, rotate the lens to fit the axis direction.



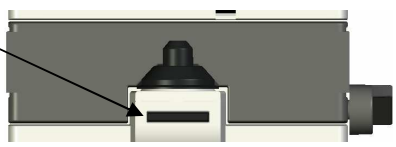

NOTE
The alignment mark represents the optical center of the lensmeter and the cross cursor represents the optical center of the lens.

(3) Overlap the cross cursor and the alignment mark by moving the lens. When they overlap, the message "**Marking OK**" appears to indicate that the marking is ready to be carried out.
S, C, A and prism are stored in memory by pressing the Memory/ ADD switch.
The color of the measurement value area is reversed, and the values are fixed.


※ In case of setting "**Auto Memory**" on the Setup screen as "**On**", the measurement values are stored in memory automatically after the message "Marking OK" appears.
In case of deleting the data stored in memory, press ✖ .

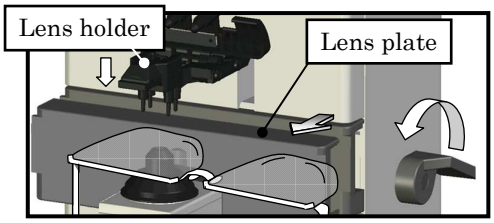
※In case of printing it out, press ✎ .


Memory/ ADD switch



## 6 . 3 Measurement of Framed Lens

(1) Place the framed lens on the lens stand and lower the lens holder softly on the lens. Move the lens plate to the near side with the lens plate lever so that the bottom of the lens touches the lens plate.




(2) Specify the right or left of the framed lens by pressing  .
The display in the upper right-hand part is changed to  by pressing  .


(3) Perform alignment so as that the bottom of the framed lens always touches the lens plate in a manner similar to the single lens.

(4) Save the measurement values in memory by pressing the Memory/ ADD switch after measurement.
The color of the measurement value area is changed, and the measurement values are fixed.


NOTE In case of setting “Auto Memory” on the Setup screen as “On”, the measurement values are automatically stored in memory after the message “Marking OK” appears.

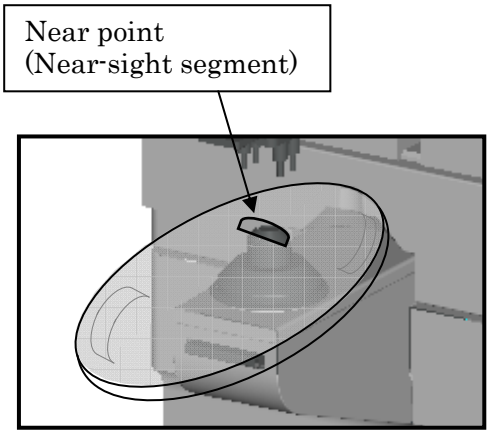
(5) Switch the lens from right to left and place the lens in a manner similar to (1).
Switch the measurement to the left lens by pressing  . At this time, the measurement values of the right lens remain on the screen.


NOTE The measurement of the lens can be started from either right or left.
In case that the measurement values of both right and left are stored, the values on the selected side are deleted by pressing  .

## 6.4 Measurement of Multifocal Lens


(1) Place the lens on the lens stand and lower the lens holder softly on the lens.

(2) Take a measurement of far point and press the Memory/ ADD switch.
The values of SPH, CYL, AX and prism value are stored in memory.
The measurement result stored is fixed, and the color of the measurement value area is changed. “Ad1” is displayed by pressing the Memory/ADD switch one more time.




(3) Take a measurement of near point after confirming that “Ad1” is displayed. Move the lens so as that the near point (near-sight segment) comes to the center of the lens stand.

NOTE A measurement can be taken even if the messages “Alignment OK” and ”Marking OK” are not displayed.

(4) Store the ADD value of the near point (near-sight segment) in memory by pressing the Memory/ ADD switch.

In case of trifocal lens, display “Ad2” by pressing the Memory/ ADD switch one more time. After that, repeat (3) and (4) after bringing the second near point (near-sight segment) to the center of the lens stand.


Display of ADD value

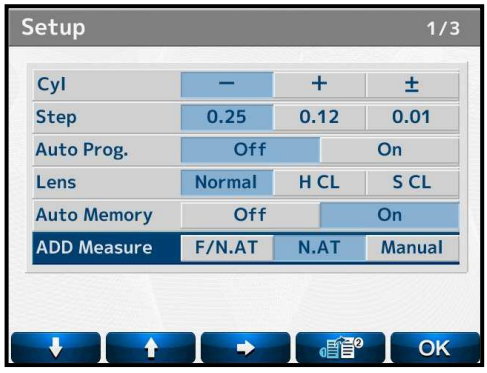
Refer to “6.3 Measurement of Framed Lens” about the measuring procedure of the framed lens.

## 6.5 Measurement of Progressive Lens


(1) Take a measurement of progressive lens.
Set "**Auto Prog.**" and "**ADD Measure**" in reference to the below.

NOTE

Auto Prog.
Off : No auto judgment for a progressive lens
On : Auto judgment for a progressive lens
ADD Measure
F/N.AT : Auto memory of far and near points
N.AT : Auto memory of a near point
Manual : Manual memory of far and near points




(2) Switching to progressive lens measurement screen
The switch is changed to , and the progressive lens measurement screen is displayed by pressing (single/ progressive lens selection switch).


In case that **Auto Prog** is set as "**On**", the lens is automatically judged whether the lens is a progressive lens or not.
Set the lens in the center region of the progressive zone. It starts the auto judgment of the progressive lens. When the lens is identified as a progressive lens, the screen is switched to the progressive lens measurement screen. If not, the measurement screen remains as the single focus lens measurement screen.
When the ADD value is small (less than 1D), the auto detection may not be performed. Also, if the progressive zone cannot be found at where the lens is set, the auto detection may not be performed.
In these cases, move the lens back and forth, and right and left slowly.、
When the ADD value is small (less than 1D), the framed lens is small, or the lens is dirty or has some flaws, the far point and near point may not be detected automatically. In such case, take a measurement manually.

(3) Measuring procedure of progressive lens (when N.AT is selected for ADD Measure)

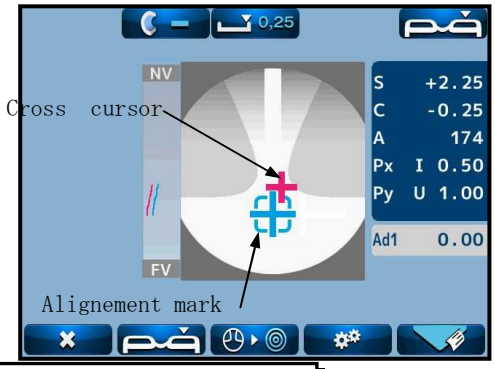
1) Detection of progressive zone

First, find the progressive zone by moving the lens back and forth, and right and left slowly.
The cross cursor (screen shown below) appears when the progressive zone is found.

> **NOTE** Press the Memory/ ADD switch in case that the progressive zone cannot be detected because ADD value is small etc. It switches to the measurement screen of the far point.

2) Measurement of far point

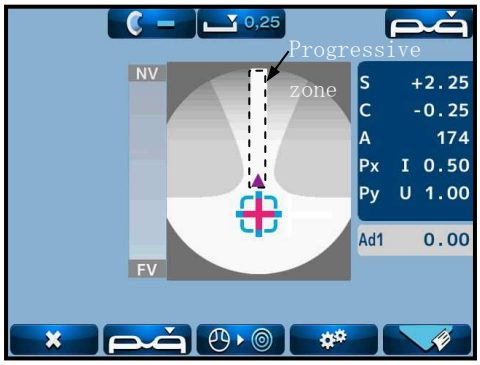
Take a measurement of far point. Move the lens toward the device so as that the center of the alignment mark overlaps with the cross cursor.
The color of the cross cursor is changed to orange by pressing the Memory/ADD switch after they overlaps.
At this time, the measurement values at far point are stored in memory.




> **NOTE** When "ADD Measure" on the Setup screen is set as "F/N.AT", it is detected automatically and the measurement values are stored in memory.

3) Measurement of near point

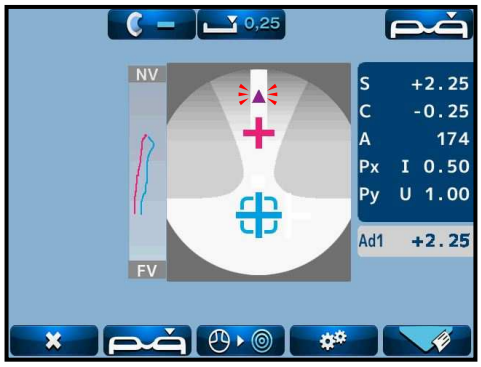
Take a measurement of near point.
As shown on the right, move the lens **slowly** to move the cross cursor (red) according to ▲.
If it goes out of the progressive zone, the cross cursor moves right or left. If it goes out of the progressive zone, bring it back to the zone and move the lens toward near point.



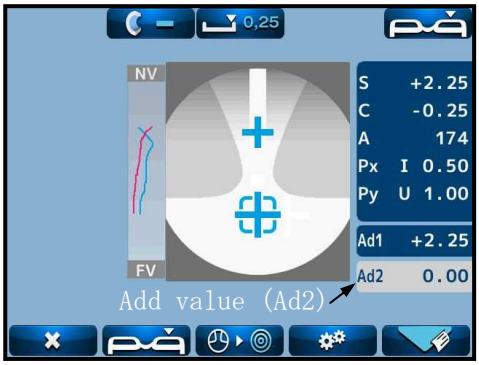

> **NOTE** The cross cursor on the screen indicates the actual measurement position on the lens. For example, if it goes to the right side of the lens which is out of the progressive zone at the time of moving from far point to near point, the cross cursor is displayed on the right deviated from the progressive zone.

Perform the alignment carefully when it comes closer to the near point and ▲ starts blinking. Once the near point is detected, it blips. The cross cursor is fixed at the near point and its color changes to blue. When the near point is attained, the ADD value is stored in memory automatically.

※Another ADD value (Ad2) can be stored in memory anywhere by pressing the Memory/ ADD switch after measurement.



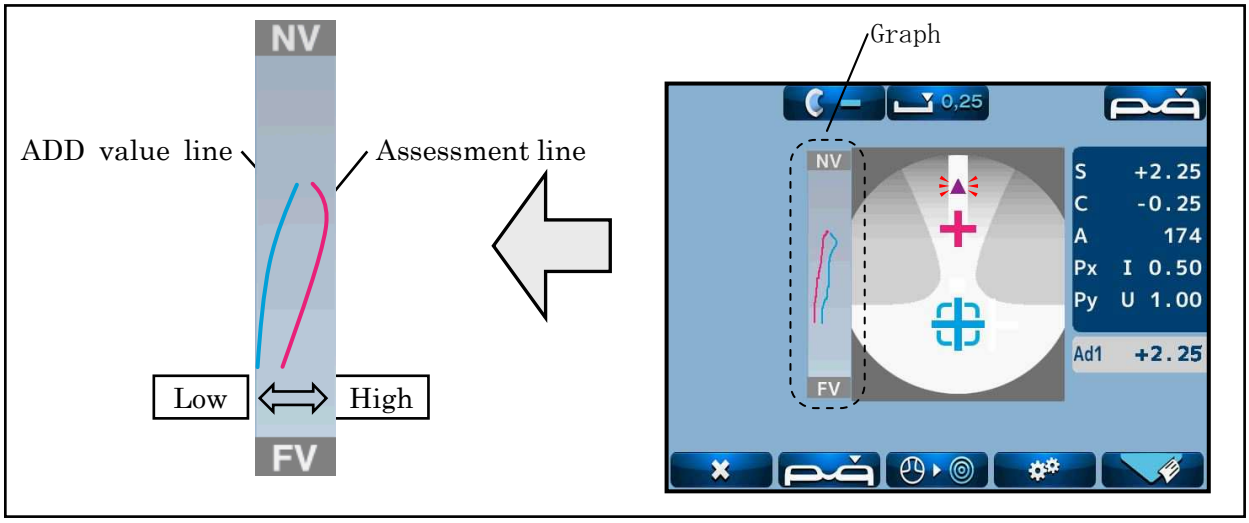

The progressive judgment screen appears again by setting the lens for the left eye and press [OK] after completing the measurement.
Take a measurement of the left lens in the same manner as right lent.



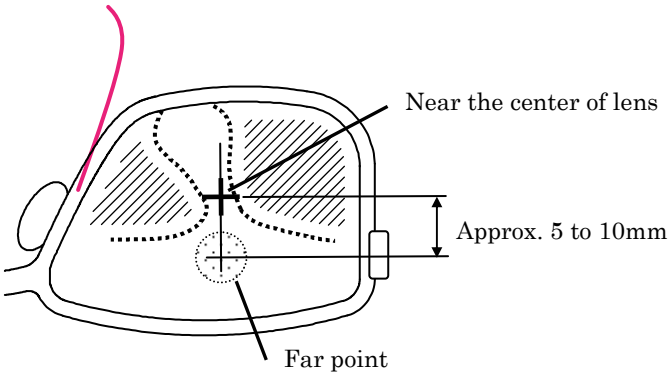

※Measurement can be started from either right or left lens.

(4) Display of ADD value and assessment graph, and manual operation
(when “Manual” of “ADD Measure” is selected)

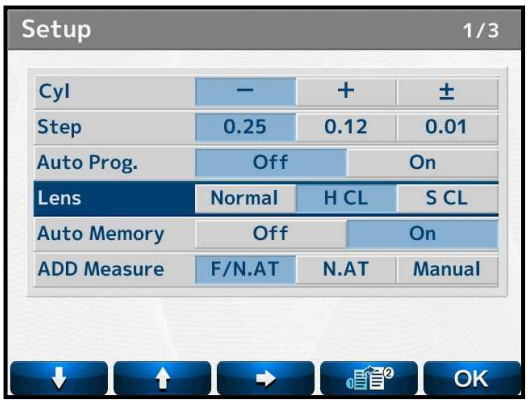
When setting “Prog. Graph” as “On” on the Setup screen, the graph is displayed on the progress lens measurement screen.
Depending on the type of lens, it may be difficult to detect each point automatically even though normally the near and far points are detected automatically. In such case, take a measurement manually by reference to the ADD value and assessment graph.
To take a measurement of far point manually, carry out the alignment in the same manner as the auto measurement.
For the measurement of near point, press the Memory/ ADD switch where the ADD value is the highest while the alignment cursor stays in the progressive area.
The near point is where the assessment line moves closer to the Y coordinate. Therefore, carry out alignment by reference to the shape of the graph and blinking of ▲ .




【Framed lens: reference】



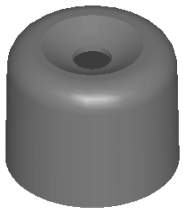
## 6.6 Measurement of Contact Lens




### 6.6.1 Preparation

(1) In case of taking a measurement of hard contact lens, select “H CL” on Setup screen. In case of taking a measurement of soft contact lens, select “S CL” on Setup screen.

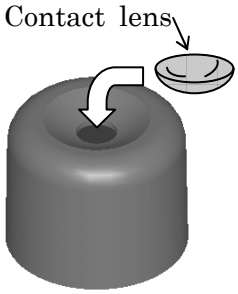
(2) Change the lens stand to the accompanying contact lens stand.



Contact lens stand

### 6.6.2 Measurement Procedure

(1) Set the contact lens on the contact lens stand as shown below.

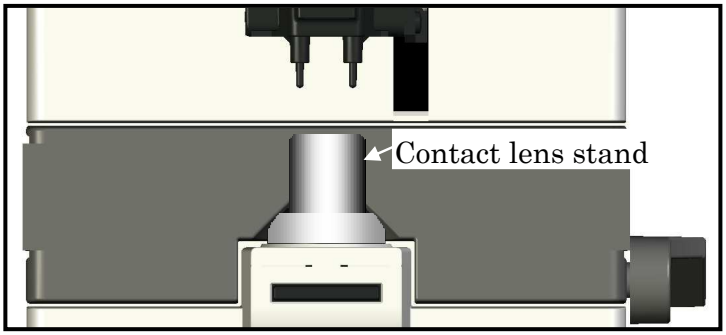



Contact lens stand

NOTE

Remove the water or moisture from the lens, and set it on the stand with paying attention not to distort it. Then, take a measurement quickly.
A bifocal contact lens cannot be measured.

(2) Replace the standard lens stand with the contact lens stand.




(3) Lower the lens holder, and hold the contact lens stand which the contact lens is already placed.

# 7. Marking

Refer to “5.3 Marking Lever” about the operation of the marking lever.

## 7.1 Lens without Astigmatism


(1) Overlap the cross cursor with the alignment mark on the screen by moving the lens.
You are ready for marking when the message “Marking OK” is displayed.

(2) Lower the marking lever to mark on the lens.

## 7.2 Lens with Astigmatism


■ Marking according to the axis in the prescription

(1) Move the lens so as that the axis mark aligned with the angle in the prescription approximately.

(2) To be more precise, align it according to the axis value indicated.


■ Marking on the cylindrical axis

(1) Move the lens so as that the axis mark aligned with 0° approximately.

(2) To be more precise, align it so as that the axis value indicated becomes 0°.

## 7.3 Marking of Prism Lens


■ In case that prescription is expressed in X-Y

(1) Select “X-Y” from “Prism” on the “Setup” screen.

(2) Move the lens so that the prism values displayed on the screen match with the ones on the prescription.

The meanings of the prism values displayed are as shown below.

| | | | |
|---|---|---|---|
| Px | I | Base In | (base inward) |
| Px | O | Base Out | (base outward) |
| Py | U | Base Up | (base upward) |
| Py | D | Base Down | (base downward) |

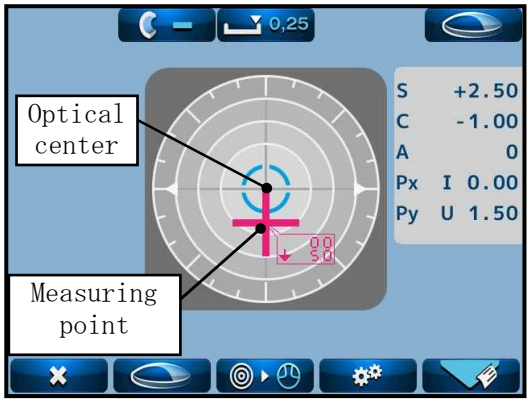

■ In case that prescription is expressed in P-B

(1) Select “P-B” from “Prism” on the “Setup” screen.

(2) Move the lens so that the prism values displayed on the screen match with the ones in the prescription.

P: Prism value

B: Base direction




■ In case that prescription is expressed in mm

(1) Set “Prism (mm)” as “On” on the “Setup” screen.

(2) Move the lens so that the prism values displayed on the screen match with the ones in the prescription.

The arrows (↑ ↓ ← →) indicate the direction of the measuring position on the lens from its optical center.

# 8. Other Functions

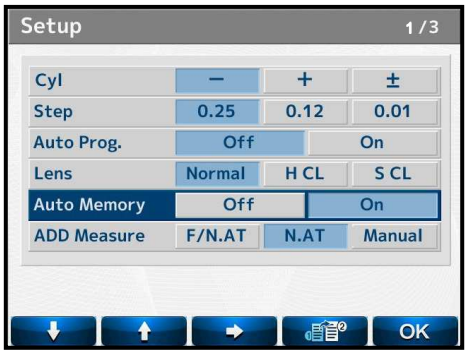
## 8.1 Auto Memory Function

This device has the function to store the measurement values in memory automatically when the alignment is achieved, and the message “Marking OK” is displayed at the time of the measurements of single focal lens, multifocal lens and contact lens.

【Operation Procedure】

Move the cursor to “Auto Memory” with  or  and select “On” with  .

Return to the measurement switch with  after the settings or changes are completed.




The measurement values are stored in memory automatically when the message “Marking OK” appears after the alignment mark and cross cursor overlap as shown on the right.


## 8.2 Power Saving Function

The power saving function is activated if no switches are operated or no measurement values are updated with the power on. The switching time to the power saving mode can be set on “Standby” of the Setup screen.

Measurement mode
Power indicator (PW) Light on

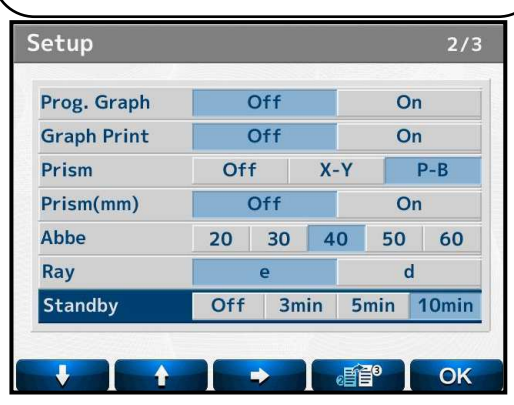
↓ No operation for a set time

Power saving
Power indicator (PW) Blinking

↓ Press any switch

Return to measurement mode
Power indicator (PW) Light on

While this function is activated, the power to the measurement light and LCD monitor is turned off.
It returns to the measurement mode by pressing any switch.



# 9. Error Messages

An error message appears when the measurement condition or measurement result is judged as unreasonable. Also, an error message appears when the performance of the device is abnormal.

## 9.1 Types

※ Display with a three-digit code (number)

| Message | Status | Error Detail |
|---|---|---|
| Initial error | Abnormality of device | Any of the measurement values is more than "±0.25".<br>Lens is set on the lens stand.<br>Abnormal measurement because of dust or unnecessary light. |
| Paper Empty | | No printer papers. |
| Printer Cover Opened | | Printer is opened. |
| Printer Heat Overheated | | Printer head overheated. |
| EEPROM Failure | | Abnormality of memory |
| Sensor Error | | Abnormality of CMOS sensor |
| ※Error * * * (100 -163) | | Abnormality of electronic parts |
| SPH Over | Measurement abnormality | SPH measurement value is more than the upper limit of the measurement range. |
| CYL Over | | CYL measurement value is more than the upper limit of the measurement range. |
| Prism Over | | The prism measurement value is more than the upper limit of the measurement range. |
| ADD Over | | ADD measurement value is more than the upper limit of the measurement range |
| Measurement Error | Abnormality of image processing | Abnormal light receiving image because of dust, scratch on lens or unnecessary light etc.<br>(The measurement light does not enter into the light receiving sensor normally.) |
| | | Measurement light LED does not light on. |
| Center Error | | Unexpected light receiving image because of unnecessary light. |

## 9.2 Error Handling Procedure

| | |
|---|---|
| **Warning** | Do not disassemble, remodel or repair.<br>It may cause electric shock. |

・Initial Error

This message appears if the lens is placed on the lens stand when the power is turned on or the lens under the lens stand is dirty.

Remove the lens. When the lens under the lens stand is dirty, gently wipe it with a soft cloth. After that, turn the power back on.

(Refer to "6.1 Checkup before Measurement".) ※

・Paper Empty

This message appears if no papers are set or papers are not set appropriately.

Set the paper appropriately. (Refer to "5.4.2 Installation and Replacement of Printer Paper".)

・Printer Cover Opened

This message appears when the printer cover is opened. Check the cover and close it properly.

・SPH/CYL/Prism/ADD Over

This message appears in case of measuring the lens which exceeds the upper limit of the measurement range of the device.

Take a measurement of the lens within the measurement range (Refer to "Specification".)

・Measurement Error or Center Error

This message appears when the direct sunlight or strong glare is on the device, or the lens under the lens stand is extremely dirty or has scratches.

If the lens under the lens stand is extremely dirty, gently wipe it with a soft cloth. Then, turn the power back on.

If an error message other than shown above is displayed or an error message is still displayed even after performing the procedure above, turn off the power, disconnect the power cord and contact your local distributor.

# 10. Storage

(1) Points to be checked for long-term storage

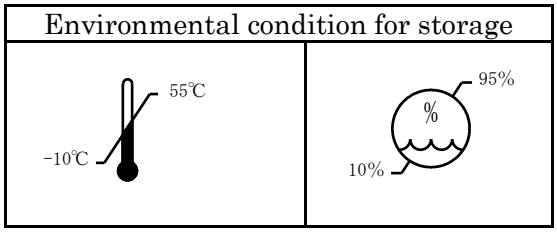
- Turn OFF the power.
- Remove the power cord from the outlet.
- Put the dust proof cover on the main unit.

(2) Notes on storage environment

Avoid storage under the following conditions

- Dusty place
- Where water may get on the device
- High-temperature and humidity
- Where sunlight directly contacts
- Unstable and high place

  Observe the environment conditions below for storage.

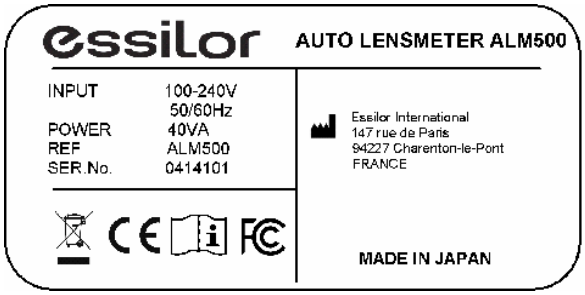



Check the above in case that the device is not used or is stored for a long time. When using the device after long-term storage, operate it in accordance with "4.2 Preparation for Measurement".

# 11. Specification

| | | | |
|---|---|---|---|
| Measurement Range | Sphere | -25D to +25D | (0.01/0.12/0.25 step) |
| | Cylinder | 0 to ±10D | (0.01/0.12/0.25 step) |
| | Axis | 0 to 180° | (1°) |
| | Addition | 0 to +10D | (0.01/0.12/0.25 step) |
| | Prism | 0 to 10△ | (0.01/0.12/0.25 step) |
| Measurable Lens | Unprocessed lens (diameter:100mm)<br>Framed processed lens | Single lens, multifocal lens, progressive lens | |
| | Hard contact lens<br>Soft contact lens | Accompanying lens stand is necessary | |
| Measurement Wavelength | 525nm | | |
| Power Rating | 100 to 240V<br>50/60Hz | | |
| Power Consumption | 40VA | | |
| Printer | Thermal printer (paper width 58mm) | | |
| Monitor | Color LCD monitor (5.7 inches) | | |
| Size, weight | 170mm(W)×205mm(D)×468mm(H)(400mm: when the monitor is stored)<br>Approx. 4.3kg | | |
| Environmental condition of use | Temperature range: 5℃ to 40℃<br>Humidity range: 30 to 95%HR (No dew condensation allowe) | | |

**Symbols marked on the instrument :**




| Symbol | Description |
|---|---|
| ~ | Alternating Current |
| ⚠ | Caution |
| | Manufacturer |
| | Date of Manufacture |
| FC | Marking for compliance with FCC part 15 |
| CE | Marking for compliance with applicable European Directives |
| | Follow Operating Instructions |
| ○ | Power off (separated with power source) |
| \| | Power on (connected with power source) |
| | According to WEEE Directive, do not throw away the waste to inappropriate place |

# 12. EMC (Electromagnetic Compatibility)

This device conforms to the requirements of the EMC (electromagnetic compatibility) standard as shown below.

<table>
<tr><td colspan="3">Guidance and manufacturer's declaration – electromagnetic emissions</td></tr>
<tr><td colspan="3">This device is intended for use in the electromagnetic environment specified below.<br>The customer or user of this device should assure that it is used in such an environment.</td></tr>
<tr><td>Emission test</td><td>Compliance</td><td>Electromagnetic environment – guidance</td></tr>
<tr><td>RF emissions<br>CISPR11</td><td>Group 1</td><td>This device uses RF energy only for its internal function.<br>Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.</td></tr>
<tr><td>RF emissions<br>CISPR11</td><td>Class A</td><td rowspan="3">This device is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.</td></tr>
<tr><td>Harmonic emissions<br>IEC 61000-3-2</td><td>Class A</td></tr>
<tr><td>Voltage fluctuations/<br>flicker emissions<br>IEC 61000-3-3</td><td>Complies</td></tr>
</table>

| Guidance and manufacture's declaration – electromagnetic immunity | | | |
|---|---|---|---|
| This device is intended for use in the electromagnetic environment specified below.<br>The customer or user of this device should assure that it is used in such an environment. | | | |
| Immunity test | IEC 60601<br>test level | Compliance level | Electromagnetic environment<br>- guidance |
| Electrostatic discharge (ESD)<br>IEC 61000-4-2 | ±6kV contact<br>±8kV air | ±6kV contact<br>±8kV air | Floors should be wood, concrete of ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%. |
| Electrical fast transient/ burst<br>IEC 61000-4-4 | ±2kV for power supply lines<br>±1kV for input/ output lines | ±2kV for power supply lines<br>±1kV for input/ output lines | Mains power quality should be that of a typical commercial or hospital environment. |
| Surge<br>IEC 61000-4-5 | ±1kV differential mode<br>±2kV common mode | ±1kV differential mode<br>±2kV common mode | Mains power quality should be that of a typical commercial or hospital environment. |
| Voltage dips, short interruptions and voltage variations on power supply input lines<br>IEC 61000-4-11 | <5 % $U_T$<br>(>95% dip in $U_T$)<br>for 0.5cycle<br><br>40 % $U_T$<br>(60% dip in $U_T$)<br>for 5 cycles<br><br>70 % $U_T$<br>(30% dip in $U_T$)<br>for 25 cycles<br><br><5 % $U_T$<br>(>95% dip in $U_T$)<br>for 5s | <5 % $U_T$<br>(>95% dip in $U_T$)<br>for 0.5 cycle<br><br>40 % $U_T$<br>(60% dip in $U_T$)<br>for 5 cycles<br><br>70 % $U_T$<br>(30% dip in $U_T$)<br>for 25 cycles<br><br><5 % $U_T$<br>(>95% dip in $U_T$)<br>for 5s | Mains power quality should be that of a typical commercial or hospital environment. If the user of this device requires continued operation during power mains interruptions, it is recommended that this device be power from an uninterruptible power supply or a battery. |
| Power frequency (50/60Hz) Magnetic field<br>IEC 61000-4-8 | 3A/m | 0.3A/m | If image distortion occurs, it may be necessary to position the device further from sources of power frequency magnetic fields or to install magnetic shielding. The power frequency magnetic field should be measured in the intended installation location to assure that it is sufficiently low. |
| NOTE $U_T$ is the a.c. mains voltage prior to application of the test level. | | | |

<table>
<tr><td colspan="4">Guidance and manufacturer's declaration – electromagnetic immunity</td></tr>
<tr><td colspan="4">This device is intended for use in the electromagnetic environment specified below. The customer or the user of this device should assure that it is used in such an environment.</td></tr>
<tr><td>Immunity test</td><td>IEC60601<br>test level</td><td>Compliance<br>level</td><td>Electromagnetic environment - guidance</td></tr>
<tr><td>Conducted RF<br>IEC 61000-4-6</td><td>3 Vrms<br>150 kHz to 80 MHz</td><td>3 Vrms</td><td>Portable and mobile RF communications equipment should be used no closer to any part of this device, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.<br><br>Recommended separation distance<br><br>$d=1.2\sqrt{P}$</td></tr>
<tr><td>Radiated RF<br>IEC 61000-4-3</td><td>3 V/m<br>80 MHz to 2.5 GHz</td><td>3 V/m</td><td>$d=1.2\sqrt{P}$ 80 MHz to 800 MHz<br><br>$d=2.3\sqrt{P}$ 800 MHz to 2.5 GHz<br><br>where $P$ is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and $d$ is the recommended separation distance in metres (m).<br><br>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b]<br><br>Interference may occur in the vicinity of equipment marked with the following symbol:<br><br>  </td></tr>
<tr><td colspan="4">NOTE 1 At 80 MHz and 800MHz, the higher frequency range applies.<br><br>NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</td></tr>
<tr><td colspan="4">[a] Field strengths from fixe transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which this device is used exceeds the applicable RF compliance level above, this device should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating this device.<br><br>[b] Over the frequency range 150kHz to 80MHz, field strengths should be less than 3 V/m.</td></tr>
<tr><td colspan="4">Recommended separation distances between portable and mobile RF communications equipment and this device</td></tr>
</table>

This device is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of this device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and this device are recommended below, according to the maximum output power of the communications equipment.

| Rated maximum output power of transmitter W | Separation distance according to frequency of transmitter m | | |
|---|---|---|---|
| | 150kHz to 80MHz $d=1.2\sqrt{P}$ | 80MHz to 800MHz $d=1.2\sqrt{P}$ | 800MHz to 2.5GHz $d=2.3\sqrt{P}$ |
| 0.01 | 0.12 | 0.12 | 0.23 |
| 0.1 | 0.38 | 0.38 | 0.73 |
| 1 | 1.2 | 1.2 | 2.3 |
| 10 | 3.8 | 3.8 | 7.3 |
| 100 | 12 | 12 | 23 |

For transmitters rated at a maximum output power not listed above, the recommended separation distance $d$ in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where $P$ is the maximum output power rating of the transmitter in watts (W) according to the transmitter, where $P$ is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

# ALM500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Essilor International (Compagnie Générale d'Optique)

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