Operator Manual

Auto Lensmeter CLM-3100P

Huvitz Co., Ltd.

Contents

1. Features

(1) You can measure the center and refraction power of lenses with ease and rapidity.

(2) In case of framed lens, single/binocular PD can be measured automatically in addition to the refraction power of each lens.

(3) Transmission ratio of UV (Ultra Violet) light can also be measured with this CLM3000.

(4) CLM3000 provides the wide measurement range from – 25D to +25D.

(5) CLM3000 supports precise measurements guaranteed by 0.01D measurement unit.

(6) Measuring progressive multi-focal lenses and general multi-focal lenses can be performed easily and rapidly.

(7) CLM3000 covers soft and hard contact lens too.

(8) CLM3000 supports various screen layouts so that you can select any as your configuration.

(9) The measured data can be provided to the customers by using the printing function.

2. Cautionary Notes

(1) Handle with care this instrument. Unexpected impact may result in damage to the machine.

(2) Install this instrument on a level, stabilized table with no vibration to keep it normal state.

(3) Do not install this instrument where it might be exposed to the direct sunlight or too bright indoor light.

(4) To get accurate measurements, always keep it clean. Dust may result in malfunction. After using this instrument, turn off power supply and keep the dust cover over it.

(5) Contact your local distributor or agent if there is electronic beep sound when you turn on the power. It might be mechanic problem.

3. Components List and Functions

3.1 Main Unit

LCD Display

Key Button

Brightness Button

Mark Lever

Lens Holder

Lens Table

Table Lever

PD Sensor

Lens Support

Save Button

Printer Cover

UV Cover

Foot Switch
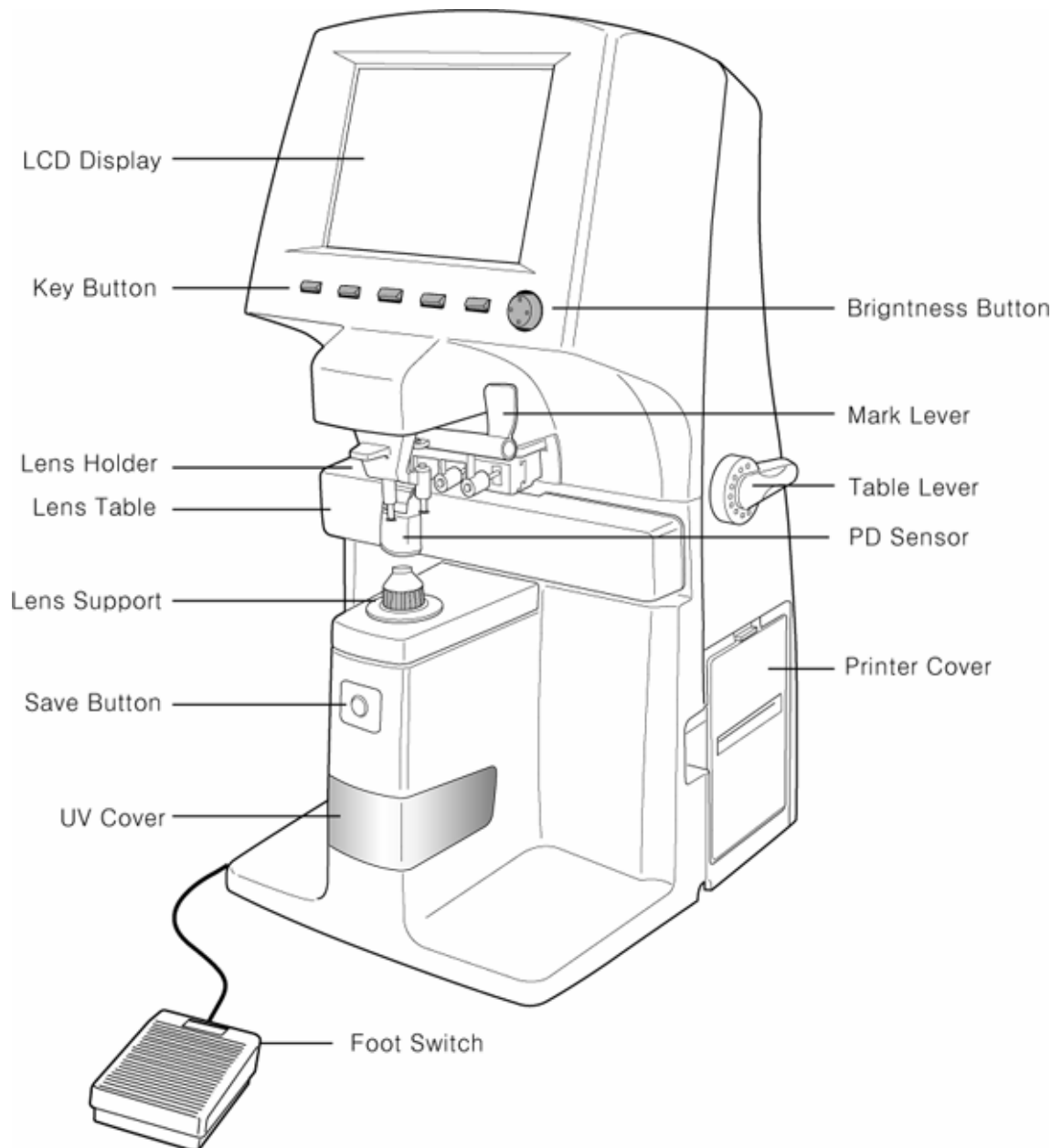
Figure 1. Component Names (I)

Foot Switch
Connector

Interface
Connector

Power
Switch
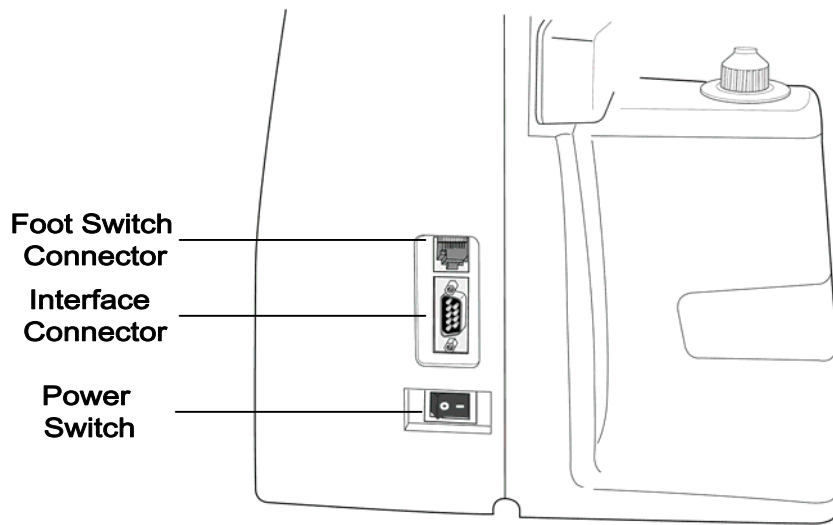
Figure 2. Component Names (II)

Power
Conncentor
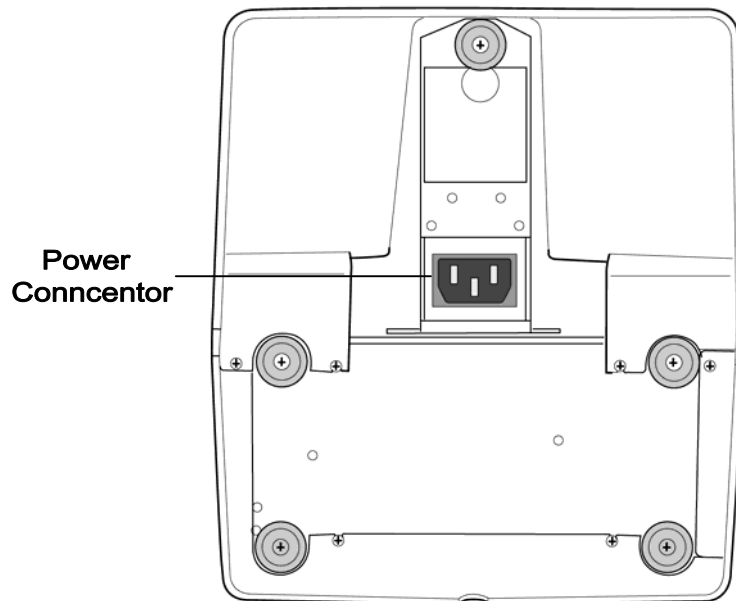
Figure 3. Component Names (III)

3.2 Accessories
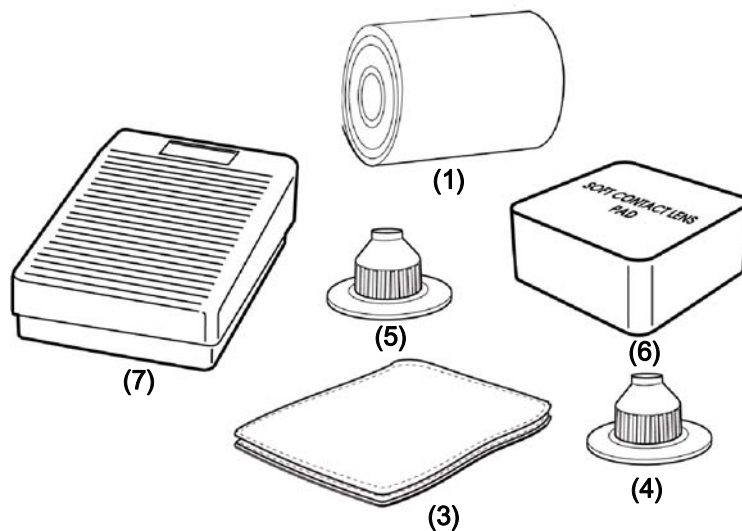
Figure 4. Accessories

(1) Printing Paper

Printing paper --1 roll

(2) Protection Cover

Plastic cover for protection against dust-------------------------1

(3) Soft Cloth for a Lens

A cloth for removing dust on a lens----------------------------1

(4) Lens Support

General lens support--------------------------------------1

(5) Contact Lens Support

Lens Support for contact lens--------------------------------1

 The spherical radius of the contact lens' cap support is equal with

the average radius of hard contact lens.

(6) Soft Lens Pad

The Pad for measuring soft lens: tweezers, lens towel -------------1

(7) Foot Switch(Optional)

The foot switch which replaces MEM button----------------------1

(8) User's Manual--1

4. Settings and Preparation for Operating

Step 1. Checking accessories.

Open the box and make sure that all the accessories (printing paper, protection

cover, soft cloth for a lens, contact lens support, user's manual) are in it.

Step 2. Removing the protection tape.

Remove the protection tape from the lens holder, lens support, marking lever and

the UV cover.

Step 3. Connecting the power cable.

Connect the cable into the power receptacle on the bottom of the body.

Step 4. Checking 0D.

Turn on the power switch and make sure that this instrument is functioning properly.

5. Buttons For Operations

5.1 Switching Screen According To the Button Selection

Basic Display1	MODE	PROG	S->R	CLEAR	PRINT

Basic Display2	EXIT	TRANS	PRGA	UV	D-SUN

UV Display	EXIT	TRANS	S->R	CAL	PRINT

Setup Display	⇧	⇩	⇧	⇩	END

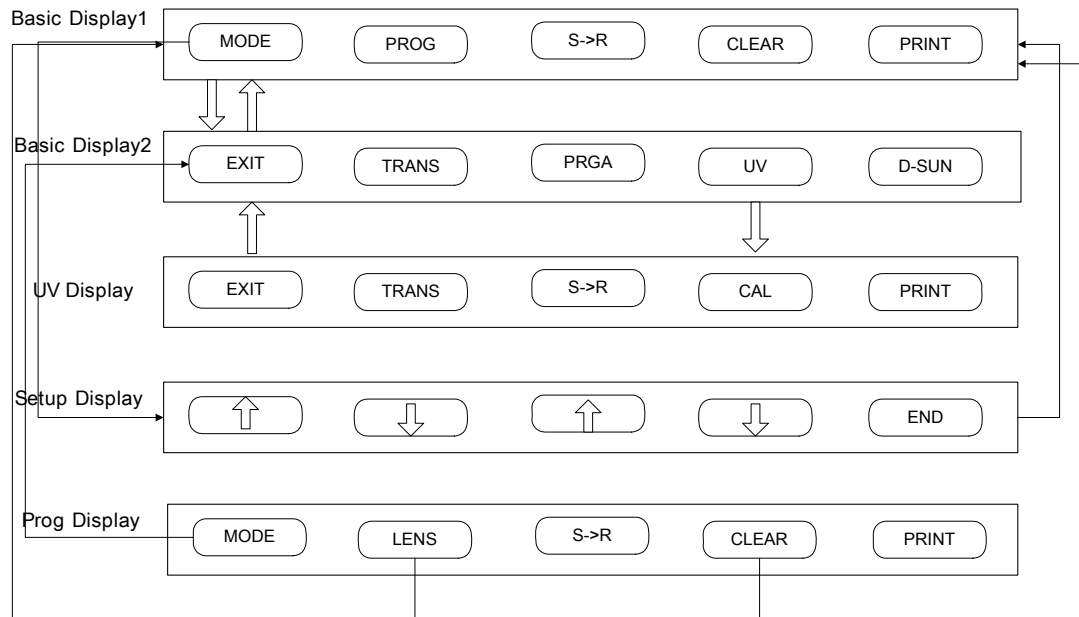| Prog Display	MODE	LENS	S->R	CLEAR	PRINT

Figure 5. Switching Screen According To the Button Selection

5.2 Usage of buttons

MODE

① Select the basic display 1 or 2.

② If you press this button longer than 1 minute, Setup Screen will be shown.

PROG

① Enter the Progressive Multi-Focal Screen.

S>R

① In case of single lens, you can switch between left and right selection of the

framed lens or you can select left /right lens.

CLEAR

① To Initialize data and convert screen into the basic display 1. You can

initialize data and screen by using this button.

PRINT

① To print the current memorized data.

TRANS

① To highlight the sign of the cylinder value to checks it.

PRGA

① To turn on/off temporarily the function of auto-detection for the progressive

lens.

UV

① To Enter the UV Measurement Screen.

D-SUN

① To measure the heavy dark sunglass lens.

CAL

① To set the current state of transmission into 100%.

MEM button

① To memorize the current measured-value.

6. Screen Layout and Descriptions

6.1 Measurement Screen
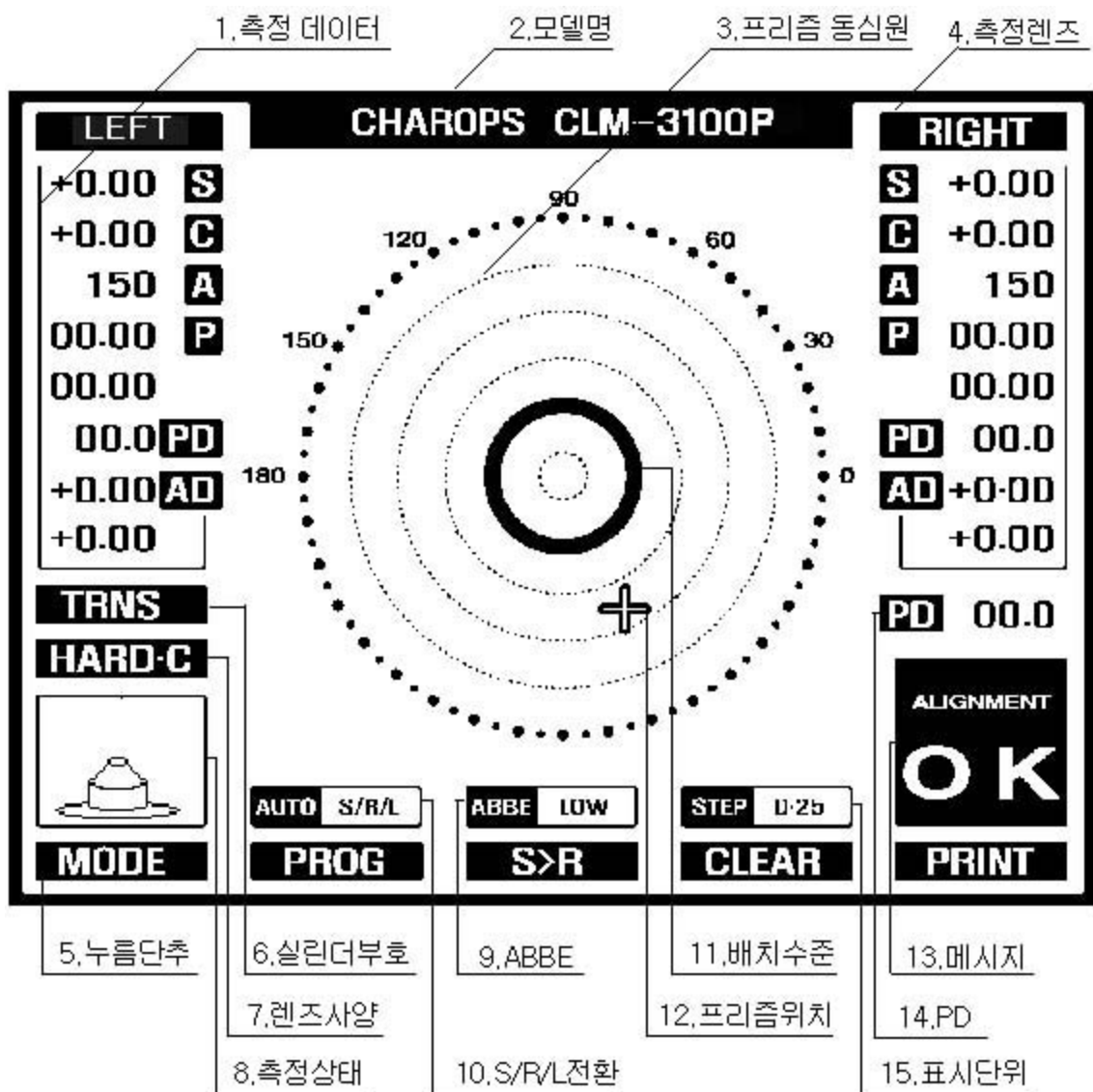
Figure 6. Screen Layout

1. Measured Data

   Box for displaying the measured data. Each meaning of the content is as

   shown below.

   - S : basic power

   - C : cylinder power

   - A : cylinder axis

   - P : prism X, prism Y

   - PD : RPD or LPD

   - AD : progressive power 1 and 2

2. Model Name

   CHAROPS CLM-3000

3. Concentric Circles Of Prism

   Each concentric circle represents prism 0.5, 1, 2, 3, and 4.

4. Lens In Measuring

Tells whether current lens is a single or a left/right lens.

5. 'Press' Button

Name of the press button at lower part of the screen. See 'Usage of buttons'.

6. Sign Of Cylinder

When the highlighted 'TRNS' is displayed on the screen, the sign of cylinder is also displayed inversion.

7. Specification Of Lens

Tells whether the current lens in measuring is a general lens, a hard contact lens or a soft contact lens.

8. State Of Measurement

Represents that there is no lens inserted on the left-bottom of the screen. If you insert a lens, a figure will be shown, which illustrates lens on the lens support.

9. ABBE

Displays ABBE value applied.

10. Switching R/L

When the 'PD' is off after measuring the right lens, inserting the new lens

yields converting into the left lens mode automatically.

11. Level of Arrangement

Shows the degree to which the center of lens in measuring matches with the

axis. Black circular belt will be shown in case you adjust under 0.5 prism.

12. Position Of Prism

The Cross mark indicates the current position in measuring.

13. Messages

Notifies states of measurement and warnings and so on.

- ALIGNMENT OK : is displayed when the optical center falls within 0.5 prism.

- MARKING OK : is displayed when the optical center is precise. And it tells that you can mark focus and cylindrical axis after you adjust the angle using the marking lever.

- PP EMPTY : apprears when there is no printing paper.

14. PD

Represents the length of binocular PD. binocular PD is the sum of the 'right PD' and the 'left PD'.

15. Display Unit

Displays the unit of data. We support unit 0.25/0.12/0.01.

In 'Basic Display 2', 'PRGA' button temporarily toggles the function of the progressive auto-detection.

 Especially the heavy dark sun-glass can't be properly measured.

In this case, press the 'D-SUN' button in 'Basic Display 2'

6.2 About the progressive display

1. Maximum additive value

2. Horizontal guide line

3. Vertical indicator

4. criteria for near focus

5. Target for far focus

6. Object
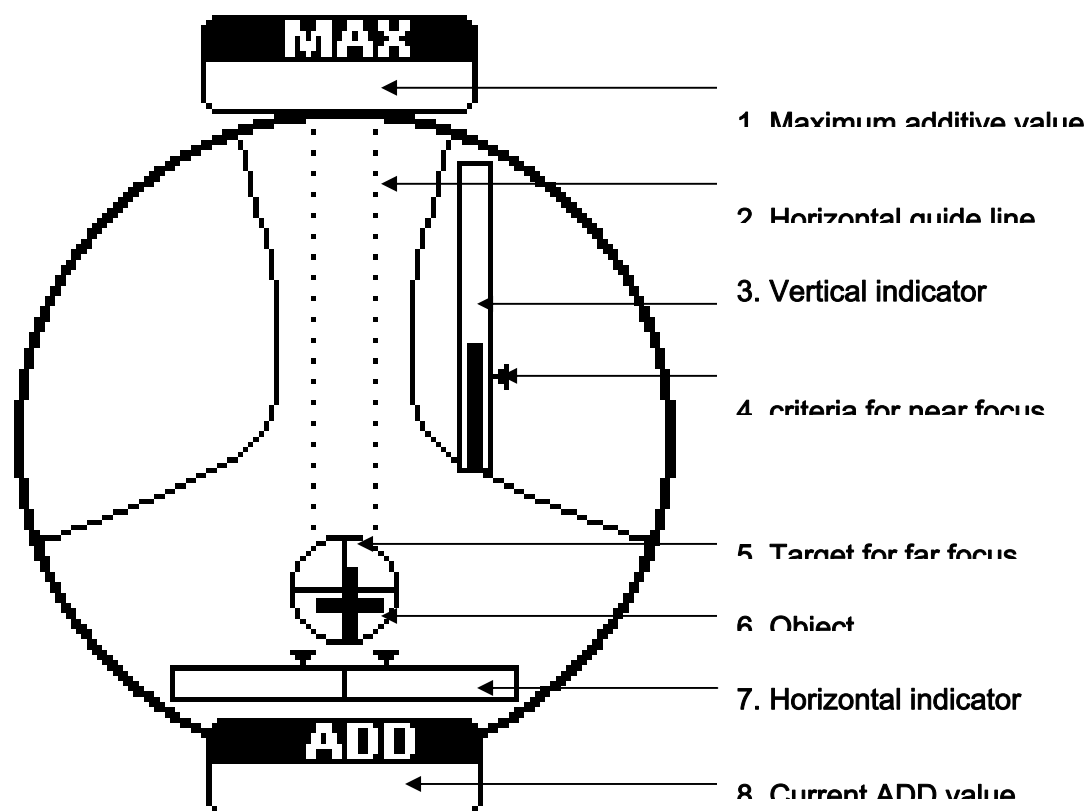
7. Horizontal indicator

8. Current ADD value

Figure 7. The display for the progressive powered lens

1. Maximum ADD value

   The maximum additive value after detecting the far vision focus.

2. Horizontal guide line

   This line is a guide for moving the cross marker while finding the near focus.

3. Vertical indicator for near focus

   This vertical bar graph describes how far the current measuring point is from the

   near focus.

4. Criteria for near focus

   If the height of bar is less than triangular indicator, that's the near focus.

5. Target for far focus

   You should move the cross marker to the center of the target for far focus.

6. Object(=Cross marker)

   This cross marker displays the current measuring point while finding the far

   focus.

7. Horizontal indicator for near focus

   This indicator describes how far the current measuring point is from the horizontal

   optical center.

8. Current ADD value

This rectangle shows the current ADD value.
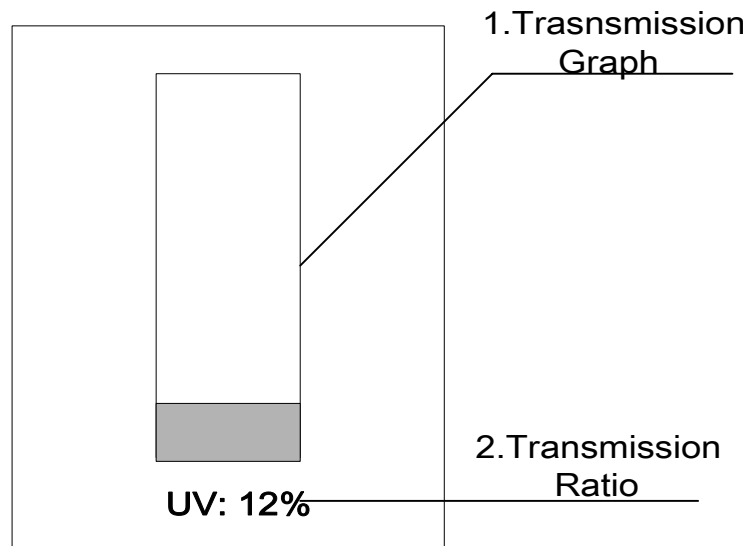
6.3 UV Screen

Figure 8. UV Screen Layout

1. Transmission Graph

Displays the transmission ratio in a bar graph form.

2. Transmission Ratio

Transmission ratio (%) is displayed in numerical value.

6.4 Setup Screen

```
┌─────────────────────────────────────────────────────────┐
│  MENU _____ │
│  ┌────────────────────────┐      ┌────────────────────────┐ │
│  │ EXIT                    │      │ OFF                    │ │
│  │ DISPLAY                 │      │ AUTO                   │ │
│  │ PROGRESSIVE             │  ➡  │ PROGRESSIVE  ONLY      │ │
│  │ FAR  MEMORY             │      │                        │ │
│  │ AUTO  R/L               │      │                        │ │
│  │ BEEP                    │      │                        │ │
│  │ STEP                    │      │                        │ │
│  │ PRISM                   │      │                        │ │
│  │ CYLINDER                │      │                        │ │
│  │ ABBE                    │      │                        │ │
│  │ AUTO  OFF               │      │                        │ │
│  │ RS-232C                 │      │                        │ │
│  │ SEQ. NO.                │      │                        │ │
│  └────────────────────────┘      └────────────────────────┘ │
│   ⬆      ⬇        ⇧       ⇩        ↵                        │
└─────────────────────────────────────────────────────────┘
```
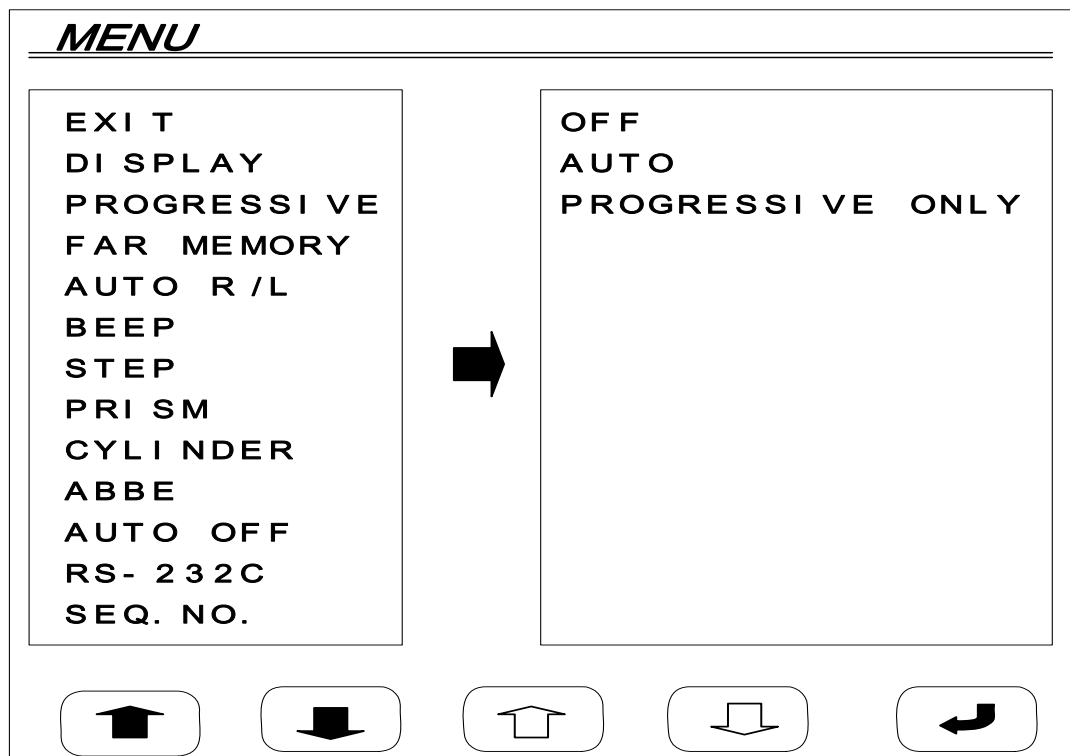
Figure 9. Setup Display

EXIT

Escapes without saving.

LENS

- NORMAL   : normal lens

- NORMAL(PAD)   : the situation that is used in the protection pad

- SOFT CONTACT   : soft contact lens

- HARD CONTACT   : hard contact lens

DISPLAY

- NORMAL   : normal display

PROGRESSIVE

- OFF   : turns off the progressive function.

- AUTO   : auto detection of progressive lens.

- PROGRESSIVE ONLY   : uses progressive function only.

FAR MEMORY

- ON   : turns on auto storing function.

- OFF   : turns off auto storing function.

AUTO R/L

- ON-R/L   : turns on auto decision of right or left lens.

Initially, this system is ready for measuring the

right lens.

- ON-S/R/L   : turns on auto decision of right or left lens.

Initially, this system is ready for measuring the

single lens.

- OFF   : turns off auto decision of right or left lens.

BEEP

- ON   : turns on the beep sound function.

- OFF   : turns off the beep sound function.

STEP

- 0.25   : display unit 0.25

- 0.125   : display unit 0.125

- 0.01   : display unit 0.01

PRISM

- NO DISPLAY   : will not display the prism information.

- X-Y   : displays the prism information in X-Y

                                        coordinates.

- P-B   : represents the prism information with absolute

                                     distance and angle.

- mm   : displays the center difference in (x, y) coordinate

                                     by millimeter (mm).

CYLINDER

- MIX   : displays the cylinder value with (+) sign when the

                                     power has (+) value and with (-) sign when the

                                     power has (-) value.

- +   : always displays the cylinder value with (+) sign.

- -   : always displays the cylinder value with (-) sign.

ABBE

- NORMAL   XX   : value applied ABBE constant

- MID   XX   : value applied ABBE constant

- LOW   XX   : value applied ABBE constant. This can be applied

to the high-refractive lens.

NORMAL

　　　　- XX　　　　　　　　　　: designated value for NORMAL ABBE(=50~60)

MID

　　　　- XX　　　　　　　　　　: designated value for MID ABBE(=40~49)

LOW

　　　　- XX　　　　　　　　　　: designated value for LOW ABBE(=30~39)

WAVELENGTH

　　　　- e-Line　　　　　: displays the refractive power according to e-Line

　　　　- d-Line　: displays the refractive power according to d-Line

AUTO OFF

　　　　- YES　　　　　　　　　: turns on the auto power saving mode.

　　　　- NO　　　　　　　　　　: turns off the auto power saving mode.

RS-232C

    Selects the protocol of RS-232C

      - OFF   : turns off the external communication

      - LMTORK   : turns on the protocol between CLM-3000

                               Model and MRK, CDR series.

BPS

    Selects the speed of the external communication

      - 9600   :

      - 19200   :

      - 38400   :

      - 57600   :

      - 115200   :

SEQ. NO.

      - RESET   : set the customer No 0

PRINTER

        - On   : turns on the printing.

        - Off   : turns off the printing.

AUTO PRINTER

        - On   : turns on the auto printing.

        - Off   : turns off the auto printing.

 If you take out the test lens from the lens cap after finishing the measurement, the measured data is automatically printed out.

 Using 'FAR MEMORY', 'AUTO PRINTER', 'RS-232C', and 'PRINTER', you can achieve the full automatic measurement.

FOOT S/W (optional)

        - Off   : turns off the foot switch.

        - On   : turns on the foot switch.

NAME

You can input the company name here. The company name will be displayed at the upper part of the printing paper.

 Select the input string by using the first and the second buttons from the left side and select the displaying position by the third and the forth button. After determining the input string and the displaying position, press the last button (Enter Key) to confirm. Pressing the Enter Key at the EXIT causes escape without saving and pressing the Enter Key at the End yields saving the changes.

PD

- ON(Default)   : turns on the PD function

- OFF   : turns off the PD function

- ON(Mean Style)   : turns on the special PD function that makes the RPD and LPD even in case that the difference between RPD and LPD is less than 3mm

UV

To turn ON/OFF the UV function.

TIME

To configure date and time.

 Select the input position by the left two buttons and increase/decrease the number by the third and the forth button. Pressing the Enter Key at the EXIT causes escape without saving and pressing the Enter Key at the End yields saving the changes.

6.5 Printout Format

Printout format is as follows
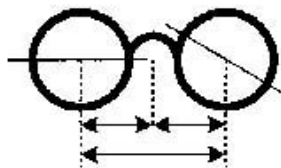

```
Name:_____
Date :

RPD:32.5        LPD:32.0
        PD:64.5
     Right          Left
   S:-3.00        S:-3.00
   C:-1.00        C:-1.00
   A:  180        A:  135
   ADD: 0.75      ADD: 0.75
   PSM: 0.00      PSM: 0.00
        0.00           0.00
   UV : 100%
        CLM-3100P
        Charops-LM
```

Figure 10. Printout Format of Framed Glass

7. Measurements

7.1 Normal lenses
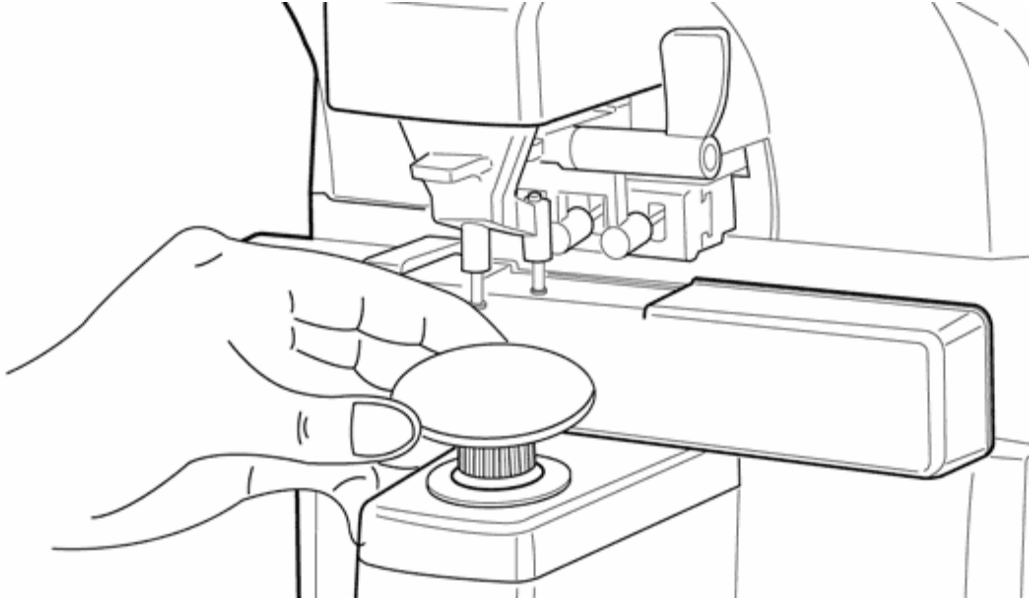
Figure 11. How To Measure a Normal Lens

Step 1 Press ' CLEAR' button to initialize the state of measurement.

' SINGLE' must appear on the upper-left part of the screen.

Step 2 Place the lens on the support and lower the lens holder.

Step 3 Move the cross mark of prism over the center of the concentric circles.
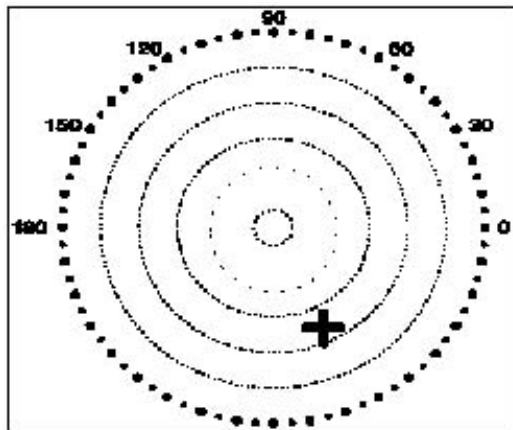
촛점이 맞지 않은 상태
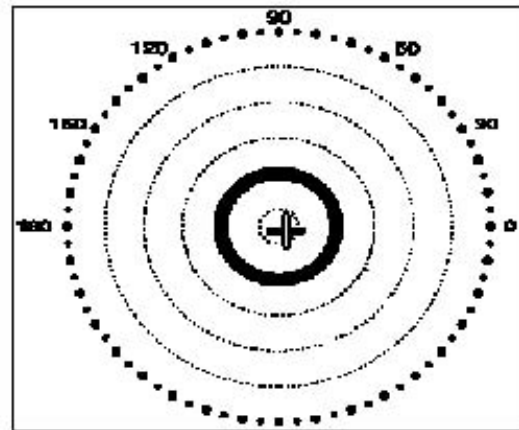
ALIGNMENT OK
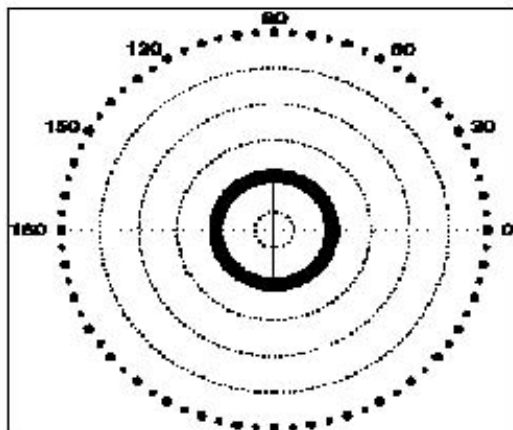
MARKING OK

Figure 12. Order for Focusing

Step 4 If the lens has astigmatism power, turn the lens so that the astigmatism

angle become 180°.

 You don't have to control astigmatism power to 180°if there is no astigmatism power or you have no plan to mark astigmatism focus and cylindrical axis.

Step 5 Press 'MEM' or 'Foot' button to store the measured data. If the memorizing function is working, outer box enclosing data will be thicker and the data will be fixed. If you press the 'MEM' button again, updated value will be memorized.

 If 'Far Memory' function is turned on in 'SETUP' mode, 'MARKING OK' will be shown. And if you keep the state without any action more than 1 minute, the measured data will be memorized automatically.

Step 6 Press the 'PRINT' button to print the measured data.

 You will see one of the following figures on the left-bottom of the screen according to whether there is no lens on the

lens support or there is one.
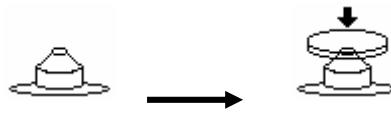
without lens   with lens

Figure 13. Display the State of Measurement

 When there is no lens, you will see the figure on the left-

bottom of the screen displaying lens support with no lens.

If the figure displays lens support with lens but there is no

one actually, consult your agent. It might be mechanic

disorder.

 In case of a lens with power, the figure on the left bottom
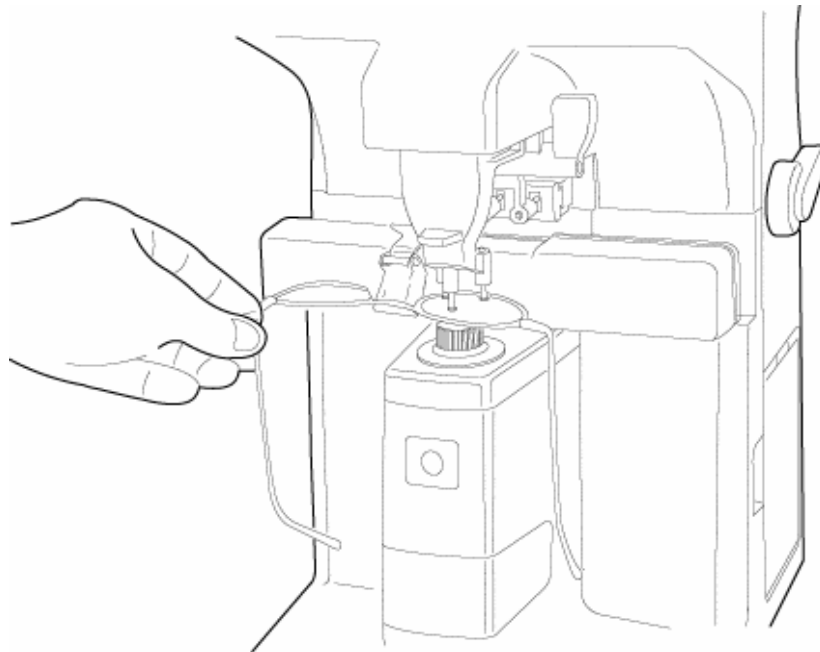
of the screen will display lens support with lens.

 Move lens gently and softly with care. After placing the

lens on the lens support, Lower-directed impact or sudden

moving might result in the scratch of the lens.

7.2 Framed lenses

Figure 14.

Measurement of Framed Lens

Step 1 Press [S>R] button to enter the measuring framed lens environment.

Then, 'LEFT' and 'RIGHT' will be shown on the upper-left and

upper-right of the screen.

Step 2 Place the right lens on the support and lower the lens holder.

Step 3 Place the PD location sensor in the middle of the frame when PD function is on.

Step 4 Press the 'MEM' button to store the measured data.

Step 5 Lift the lens holder and place the left lens.

(option) is not supported, PD function is off, or ' AUTO

R/L' function is off.

Step 6 Move the lens so that the ' MARKING OK' appears (focusing). And

place the PD location sensor in the middle of the frame when PD

function is on.

Step 7 Press the ' MEM' button to store the measured data and press the

' PRINT' button to print them.

![info icon] If you don' t want the PD value, you can use the lens table as the

horizontal support without using the PD location sensor. In this

case, completely turn the PD location sensor downward by 180°.

Otherwise, it can result in the interference between the PD

location sensor and the lens.

![caution icon] Before you turn on the power, you have to locate the PD sensor at

the origin position. Otherwise, the measured value with PD sensor

is meaningless. So, It is necessary to locate the PD sensor at the

origin position before turning on the power.

 In case that 'Auto R/L' function is on and PD function is off, after the right lens is completed you should identify the 'No lens' icon in the left bottom display. And then locate the left lens. In that case 'Auto R/L' function is properly operated.

7.3 Progressive Multi-Focal Lenses

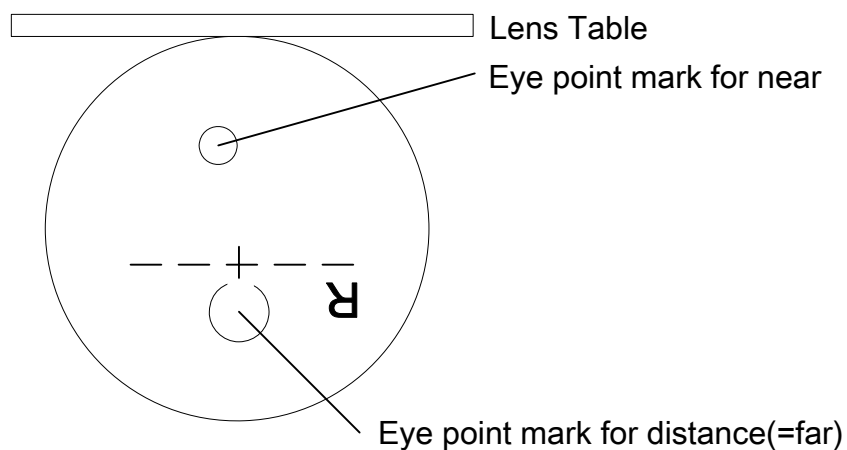### 7.3.1 The structure of progressive powered lens

The Uncut Lens

Lens Table

Eye point mark for near

R

Eye point mark for distance(=far)

Figure 15. The structure of single lens

[info] The lens should be placed with its horizontal marks parallel to the lens table.

[info] Initially the lens should be placed as shown in the picture. The near vision area is beside of the lens table.
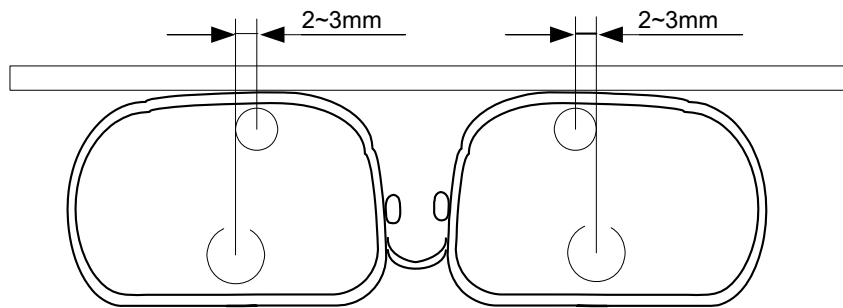
The Mounted Lens

Figure 16. The structure of the framed lens

(i)info The dimension of progressive powered lens depends on the specification of manufacture.

(i)info The old type progressive lens may not observe the 2~3mm shift toward the frame center.

(i)info Do not lift up the lens by hand at the time of measurement. Place the lens holder over the lens in order to hold the lens by foot. Then move the lens forward/backward or left/right for Measurement. Lifting up the lens may cause the error in the measurement.

7.3.2 Judging progressive lens

Step 1 Make sure that the icon in the left bottom of display is in the

standard mode as picture.

Step 2 Place the lens over the lens cap and wait 2~3 seconds.

It is recommended to place the lens holder over the marked
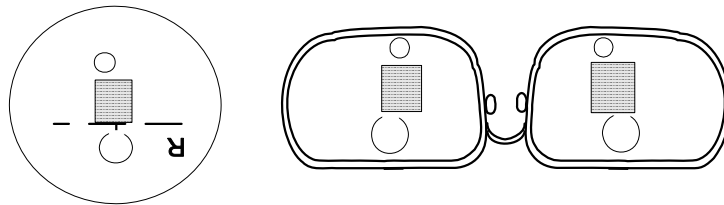
(   ) area (progressive powered band).

Figure 17. The progressive area for the automatic detection

Step 3 The icon in the left bottom of display will be changed as below (Standard

→ Progressive icon). The display will be automatically changed to
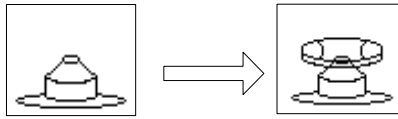
progressive mode.

Figure 18. The changes of state icon

 Automatic Detection may not be available in case the progressive power is less than 1D. If so, press " PROG" button for progressive measurement.

 If the lens is not properly placed in Step 2, the normal lens icon (as picture) will be displayed in step 3. In this case, move the lens to the progress for progressive measurement.

 " PROG" button is also available for the convenience.

7.3.3 Measuring a progressive lens for far vision power

Step 1 Move the lens to the far vision area. In case of framed lens, move the lens

till the foot of lens holder reaches to the upper frame.

Step 2 Adjust the lens left/right (horizontal) or forward/backward (vertical) in order

to place the cross marker (+) at the center of target for far focus.

Step 3 The power of far focus will be automatically detected and memorized with

the beep sound in case the cross marker (+) is placed at the center

properly.

![info] Automatic detection may not be available if the progress

area is expanded into the far vision focus. In this case,

placed the cross marker (+) at the close point to the center

and press " MEM" button to set the focus of far vision.

![info] Do not lift up the lens by hand at the time of measurement.

Place the lens holder over the lens in order to hold the

lens by foot. Then move the lens forward/backward or

left/right for measurement. Lifting up the lens may cause

the error in the measurement.

ⓘ info The single Lens or the framed lens should be parallel to

the lens table.

7.3.4 Measuring a progressive lens for near vision power

Step 1 Move the lens to the near vision area. In case of framed lens, move

the lens till the foot of lens holder reaches to the lower frame.

ⓘ info In case the framed lens, pull the lens using the lens

table in order to maintain the horizontal position.

ⓘ info Make sure the horizontal indicator for near focus is

located within the range of tolerance (No. 7 of figure

7.).

ⓘinfo In case the horizontal indicator is out of the tolerance

range, move the right lens to right (left lens to left),

since the near focus is located at 2~3mm toward the

center of frame.

Step 2 Pull the lens till the vertical indicator for near focus reaches to the

criteria for near focus. Then, the add value will be automatically detected

and memorized with the beep sound.

ⓘinfo As for small framed lens (case 1), the near focus is

very closed to the lower frame. In this case, pull the

lens a little bit more while lifting up the lens holder in

order to detect the near focus.

ⓘinfo There may be the smallest framed lens in which the near

focus is cut-out (case 2). In this case, adjust the lens to

make the level of vertical indicator minimized while

securing the tolerance range of horizontal indicator. Then

press " MEM" button to set the focus of near vision. (Measurement date may be a little bit different from the actual data).
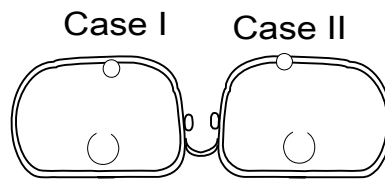
Case I   Case II

Figure 19. The small framed lens

Do no lift up the lens by hand at the time of measurement. Place the lens holder over the lens in order to hold the lens by foot. Then move the lens forward/backward or left/right for measurement. Lifting up the lens may cause the error in the measurement.

7.3.5 Troubleshooting

1) Do not detect the progressive lens automatically

    Cause 1 : Lens holder is not located in the progressive area (Normal lens

        icon will be displayed in the left bottom of display.)

    Solution : Move the lens to the progressive area for progressive

        measurement.

    Cause 2 : The progressive power is less than 1D.

    Solution : Move the lens to the close point of near focus and then press "MEM"

        button for progressive measurement.

2) Detect the normal lens as the progressive lens

    Cause 1 : Lens is not properly manufactured (enormous deviation in the

        lens)

    Solution : Cancel the progressive function temporarily. Press "MODE" button

        in the normal display and then press "PAUTO" button. (ON/OFF of

        "PAUTO" button indicates the ON/OFF of automatic detection of

        progressive lens). Or you can cancel the progressive auto-detection

function in set-up display for system variable(Refer to Section 6.4).

3) Difficult to detect the far vision focus

    Cause 1 : The progressive area is expanded into the far vision focus

    Solution : Place the cross marker(+) at the close point to the center and press

        "MEM" button to set the focus of far vision

    Cause 2 : The far focus is close to the upper frame

    Solution : Push the lens a little bit more while lifting up the lens holder in order

        to detect the far focus

4) Difficult to detect the near vision focus

    Cause 1 : The near focus is close to the lower frame

    Solution : Pull the lens a little bit more while lifting up the lens holder in order

        to detect the near focus.

    Cause 2 : The near focus is cut out because of small framed lens

    Solution : adjust the lens to make the level of vertical indicator minimized

whiling securing the tolerance range of horizontal indicator. Then press "MEM" button to set the focus of near vision in case the add power is maximized. (Measurement date may be a little bit different from the actual data).

5) Error in the measurement data (especially the lens over -4D of near vision power)

Cause 1 : Lift up the lens by hand at the time of measurement

Solution : Place the lens holder over the lens in order to hold the lens by foot. Then move the lens forward/backward or left/right for measurement.

6) Difficult to maintain the horizontal position in case of near vision measurement

Cause 1 : Wrong measurement of far vision focus

Solution : Retry the measurement of far vision focus

7) The marker (O,⊙) is displayed more than two times

Cause 1 : The lens is not properly manufactured (more than to points with the deviation of progressive power)

Solution : Detect the maximized add value of the points.

7.4 General Multi-focal Lenses

7.4.1 Measuring at The Normal Display

Step 1 Press the 'MEM' button after placing the lens over the first focus.

Step 2 Press the 'MEM' button after placing the lens over the second focus.

The first 'ADD' value will be shown.

Step 3 At this time, ADD value isn't frozen. Therefore if you guess the value

correct, press the 'MEM' button once more.

Step 4 Press the 'ADD2' button to enter the measurement mode for the

second ADD value.

Step 5 Press the 'MEM' button after placing the lens over the third focus.

The second 'ADD' value will be memorized.

7.4.2 Measuring at The Progressive Display

Step 1 Press the 'PROG' button to activate the progressive display.

Step 2 Place the lens over the first focus. The measurement is done

automatically.

Step 3 Move the lens over the second focus. And then the measurement is

done automatically.

Step 4 If you want to check one more additional power, after moving the lens

over the third focus area, press the 'ADD2' button. At that time,

the measurement is done automatically.

 At every step, in case that automatic measurement isn't

done or you want a manual decision, please press the

'MEM' button.

7.5 Hard Contact Lenses

Step 1 Select the 'HARD CONTACT' after choosing the 'LENS' item in

the setup screen.

Step 2 Remove the lens support and install the contact lens suppport.

Step 3 Wipe off the water and place the lens with its convex surface up.

Step 4 Move the lens right/left and back/forth to focus.

Step 5 Press the 'MEM' button to store the measured data and press the

'PRINT' button to print them.

7.6 Soft Contact Lenses

Step 1 Select the 'SOFT CONTACT' after choosing the 'LENS' item in

the setup screen.

Step 2 Remove the lens support and install the contact lens support.

Step 3 Clear the moisture on contact with lens toil. And then wait about in

30sec to make its shape rounded.

Step 4 Press the 'MEM' button after focusing.
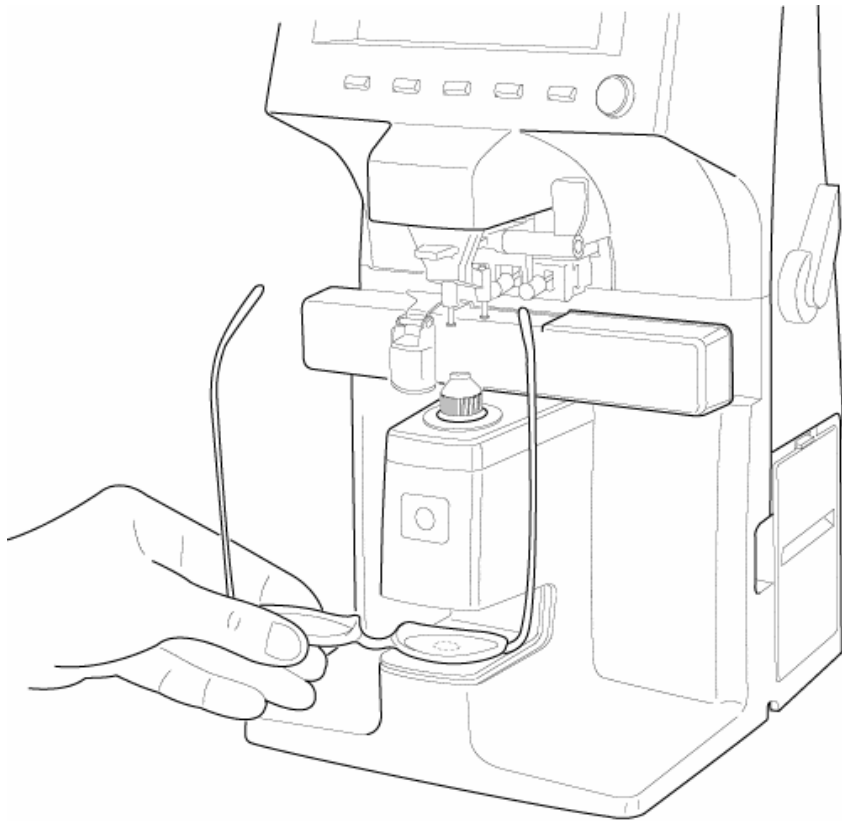
7.7 Transmission Ratio of UV Light

Figure 20. How To Measure Transmission Ratio of UV Light

Step 1 Enter the UV Measurement Screen to press the 'MODE' and the

'UV' button continuously.

Step 2 Pull and extract the UV cover.

Step 3 Press the 'CAL' button to calibrate the transmission ratio into 100%

if it is not.

Step 4 Place the lens on the UV detector.

Step 5 Press the 'MEM' button to memorize the transmission ratio and

press the 'PRINT' button for printing the measured data.

7.8 Marking Focus and Cylindrical Axis

7.8.1 When there is no astigmatism

Step 1 Place the lens and control the lens so that it becomes 'MARKING

OK'.

Step 2 Turn the Marking lever, which is vertical, by 90° to make it horizontal.
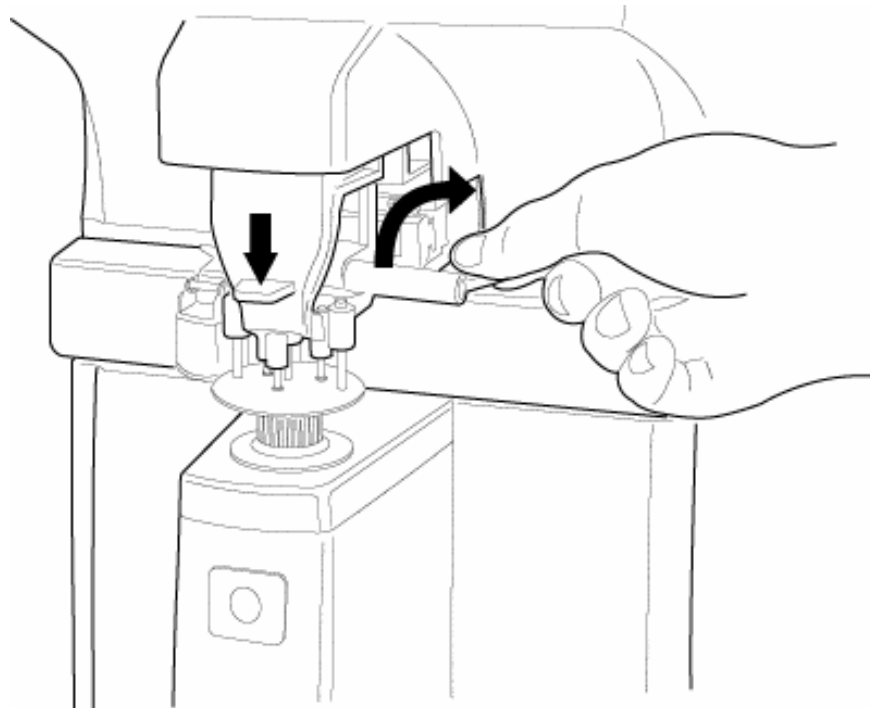
And then, mark focus and cylindrical axis.

Figure 21. How To Mark Focus and Cylindrical Axis

7.8.2 When there is astigmatism

Step 1 Place the lens and control the lens so that it becomes ' MARKING

OK' .

Step 2 Keep ' MARKING OK' and control lens up to the angle of

prescription slip.

Step 3 Turn the Marking lever, which is vertical, by 90° to make it horizontal.

And then, make marking focus and cylindrical axis.

7.9 Prism

Step 1 Change the display format as the form (X-Y, P-B, mm) in the

prescription slip. You can do this on the setup screen.

Step 2 Control the lens so that the display value on the screen coincides with

the prescribed prism value.

Step 3 Mark focus and cylindrical axis by using the marking lever.

8. Maintenance
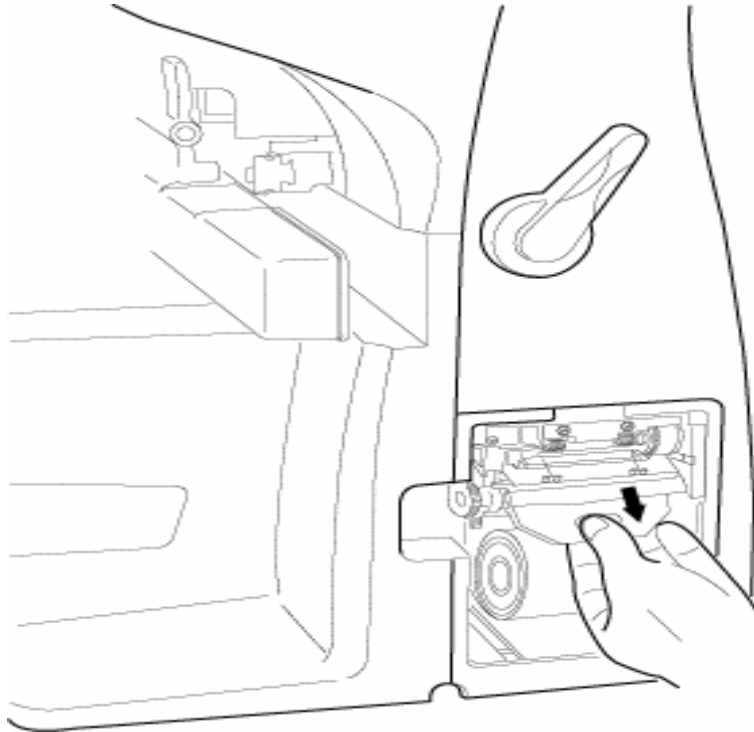
8.1 Replacing Printing Paper

Figure 22. How to Replace the Printing Paper

Step 1 Open the printer cover.

Step 2 Insert the paper into the printer shaft and put the shaft into the predefined position.

Step 3 Lift the printer lever and insert the shaft with paper.

Step 4 Lower the printer lever and turn the feeding velvet to roll the paper.

Step 5 Close the printer cover.

Step 5 Advance the paper out of the printer cover.

8.2 Various Messages

Message box shows information when you are measuring or this instrument is out of

order.

Here is the description on messages that appear in measuring.

ALIGNMENT OK   : When the optic center falls within 0.5 prism.

MARKING OK   : When the optic center is correct.

OFF CENTER   : When the optical center of lens is off too much.

Following messages are on out-of-working problem.

INITIAL ERR   : when there is no image in the predefined position on

                                starting.

PP EMPTY   : when there is no printing paper in the printer.

9. Power Saving Function

When the instrument is not used for mere than 5 minutes, power saving function works

automatically. In power saving mode, company symbol and product name will be

enlarged/reduced dynamically. If you press any button on this mode, it will return to the

measurement screen.

10. Specifications

Specification Table

Measurement Range	
Sphere Power	0 to ± 25D
Cylinder Power	0 to ±10.00D
Cylinder Axis	0° – 180° degrees(1° Step)
Add Power	0 to +10D
Prism Power	0 to 10Δ(270° 방향) 0 to 4Δ(나머지 방향)
Precision	
Diopter Steps	0.01 / 0.125 / 0.25D
Prism Power	0.01 / 0.125 / 0.25Δ
Measurement Modes	
Cylinder	+ , ±, -
Prism	Rectangular / Polar/Displacement
Sampling Speed	0.016 seconds
LED Wavelength	630 nm
Measurable Lens Diameter	15 - 100 mm

Contact Lenses	Hard and soft
Abbe Values	Manual Compensation
Wavelength	e-Line, d-Line
Display	LCD Display (320X240 LCD Backlight)
Data Output	RS-232C
BPS	9600,19200,38400,57600,115200
Dimensions	230 x 245 x 426 mm 9.05 in. x 9.64 in. x 16.77 in.
Weight	5Kg
Power Supply	AC 100 - 240 V, 50~60Hz

Options

	Internal Printer	Pupilary Dist.	UV Lignt(UV)
CLM-3100PA	O	X	X
CLM-3100PB	O	O	X
CLM-3100PC	O	O	O
CLM-3100PD	O	X	O