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1 Introduction

1.1 Uses

Auto Lensmeter is used to measure the vertex power, prism degree of glasses lens(including the cornea contact lens), to fix the cylinder axial direction of cylindrical lens, to print the marking on the uncut lens, to check whether the lens are stalled in the frames correctly.

1.2 Characteristics

- ◆ Delicate & modern products appearance and moulding with simple design
- ◆ 7 inch colorful big touch screen
- ◆ Simple & convenient operation interface, brand-new human-machine interaction
- ◆ Using hartman multipoint area measurement method to measure the progressive lens rapidly and accurately
- ◆ No need for ABBE constant, Operation more convenient and measurement more accurate
- ◆ Based on extensible integrated high-speed processing system
- ◆ Support for ultra-low transmittance and low dispersion lens measurement
- ◆ The upper limit of a prism is as high as 20 delta
- ◆ Automatic identification of lens type
- ◆ Support for PD,PH, UV measurement result printout(applicable only some models)

1.3 Working environment

The instrument should be installed and used under the below conditions.

- ◆ Environment temperature: + 5°C ~ + 40°C
- ◆ Environment humidity: 30% ~ 85%
- ◆ Barometric pressure: 700hPa ~ 1060hPa
- ◆ In a clean, clean room without strong light
- ◆ The place there is no vibration or collision

1.4 Main technical index

1.4.1 Spherical power (spectacle lens): - 25 m⁻¹ ~ + 25 m⁻¹

1.4.2 Cylindrical power: - 9.99 m⁻¹ ~ + 9.99 m⁻¹

1.4.3 Progressive ADD power: - 9.99 m⁻¹ ~ + 9.99 m⁻¹

1.4.4 Spherical power (contact lens): - 20 m⁻¹ ~ + 20 m⁻¹

1.4.5 Vertex power step measurement: 0.01 m⁻¹ , 0.06 m⁻¹ , 0.12 m⁻¹ ,
0.25 m⁻¹ selectable

1.4.6 Cylindrical lens astigmatism axis angle measurement scope:
0° ~ 180° , step 1°

1.4.7 Prism base angle measurement scope: 0° ~ 360° step 1°

1.4.8 Prism degree measurement scope: Horizontal 0 ~ 20 △ , step 0.01 △
Vertical 0 ~ 20 △ , step 0.01 △

1.4.9 Measurable lens diameter: φ 10mm ~ φ 100mm

1.4.10 Measurable lens center thickness: ≤ 20mm

1.4.11 Lens PD measurement scope: 40mm ~ 82mm , step 0.25mm
(applicable only some models)

1.4.12 Lens PH difference △ PH measurement scope: 0mm ~ 50mm ,
step 0.25mm(applicable only some models)

1.4.13 Measurable lens frame leg length: 0mm ~ 160mm

1.4.14 Measurable anti-uv transmittance rate : 0~100% , step 1%

1.4.15 Main engine power supply: direct current 12V , 48W

1.4.16 Power adapter : Input AC 100V-240V , 50Hz-60Hz ; Output DC 12V , 48W

1.4.17 Body size: 413mm*170mm*217mm

1.4.18 Weight :3.8 kg

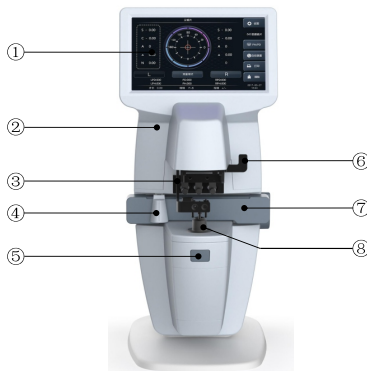
1.4.19 Screen: 800x480 color screen, full screen touchable

1.4.20 Printer: thermal printing, printing paper width 57mm(applicable only some models)

1.4.21 External connector: power connector , USB connector

2 Configuration

2.1 Front view



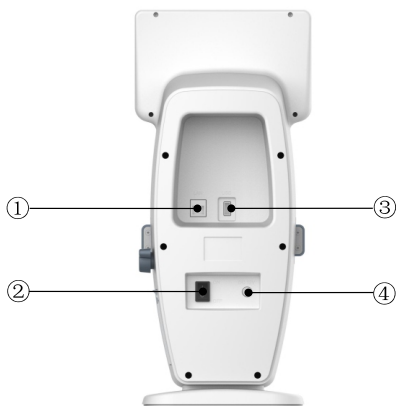
① Display screen, ② Body, ③ Lens pressing unit, ④ Nose pad(applicable only some models), ⑤ Read key, ⑥ Marking unit, ⑦ Lens pushing board, ⑧ Lens support

2.2 Side view



① Handle, ② Printer cover

2.3 Back view

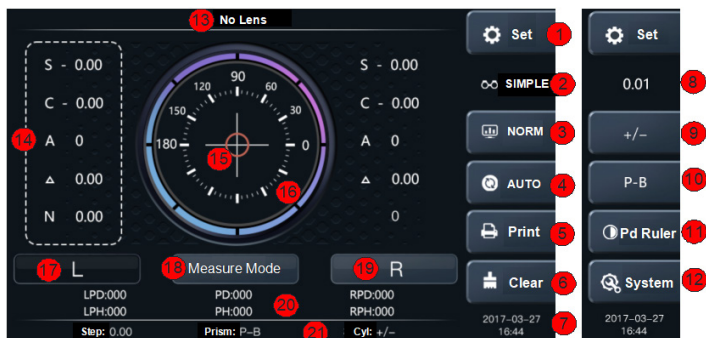


① RJ-45 connector, ② Power switch, ③ USB connector, ④ Power connector

3 Interface

3.1 Main measurement interface

Main interface includes: ordinary measurement interface, progressive multifocal lens measurement interface, cornea contact lens measurement interface, PD& PH measurement interface and Anti-UV parameter measurement interface .



main measurement interface

Measurement interface detailed explanation

① Setting button

The setting button is designed by the drop-down list method. Press the button and then let it go . Then the initial button ②→⑥ skipped to ⑧→⑫, then press the setting button again , it will return to the initial status.

② Measurement mode shortcut key

The key is shift key of measurement mode, including " automatic identification", "normal lens" and " progressive multifocal lens" .

③ Function mode shortcut

This is the switch button of function mode, including " NORM which is with no additional function mode", " PH/PD which is additional PD/PH mode", and " UV which is additional anti-uv parameter mode" .

④ Reading mode shortcut tab

This is the switch button of reading mode, including " auto reading" , " manual reading"

⑤ "printing" button

Press this button ,it can show the measurement result immediately and print out the data.

⑥ "clearance" button

Press this button, it can eliminate all the finished measurement data on the screen.

⑦ Date&time display area

Date&time display" "YYYY--MM--DD" and "HH : MM"

⑧ Step length switch shortcut .

Choose the measurement result display method of step, including 0.01 m^{-1} , 0.06 m^{-1} , 0.12 m^{-1} , 0.25 m^{-1}

⑨ Choose cylindrical lens (astigmatism) display mode, including "+", "+/-"and"-"

⑩ Prism display mode shortcut key

Choose prism result display mode, including"OFF"、 "UD/IO"and"P-B".

⑪ PD Ruler key

This key is PD Ruler shortcut key.

⑫ System setting key

Press this key, switch to parameter setting interface.




⑬ Measurement status prompt area




During the measurement process, it will remind the measurement status ,such as " no lens " , " in measurement" , " measurement finished " etc.

⑭ Measurement data display area

During the measurement process, it shows the related parameter of the measured lens .

⑮ Target

The target on the dial indicates the distance and direction of the measured lens deflected from the optical center. When the target moves towards the optical center ,the shape changes as :  →  → 

	The lens focus away from optical center
	The lens focus near the optical center The measurement data can be read directly by locking the key
	The lens focus on the optical center When setting automatic readings, the measurement data is automatically determined. When manual reading, the measurement data is read by locking the key.

⑯ Alignment circle

The center of the alignment circle represents the position of the optical center. The angle indicator and target are displayed on the focal ring during the lens focusing process

⑰ Left lens selection key

Selecting the key means measuring the left lens. The measuring activity area is on the left side of the display screen, and the measurement results are also shown in the left area of the display screen.

⑱ Measurement mode(L/R)selection key

Select the key to measure the left and right lens, first test the right lens, after locking and then automatically switch to the left lens.

⑲ Right lens selection key

Selecting the key means measuring the right lens. The measuring activity area is on the right side of the display screen, and the measurement results are also shown in the right area of the display screen.

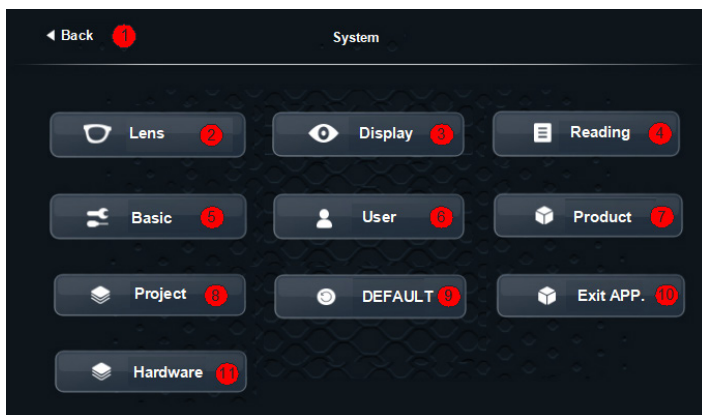
⑩ Function mode display area

This area is displayed according to the choice of function mode. Selecting "PH/PD", the measurement result of PD/PH is shown in the region; Select "UV", and the region shows the measurement result of UV parameter (UV). Select "NORM" and the area is blank.

⑪ Status bar area

Includes: step, cylindrical lens, prism, the current selection type of three modes.

3.2 Parameter setting interface



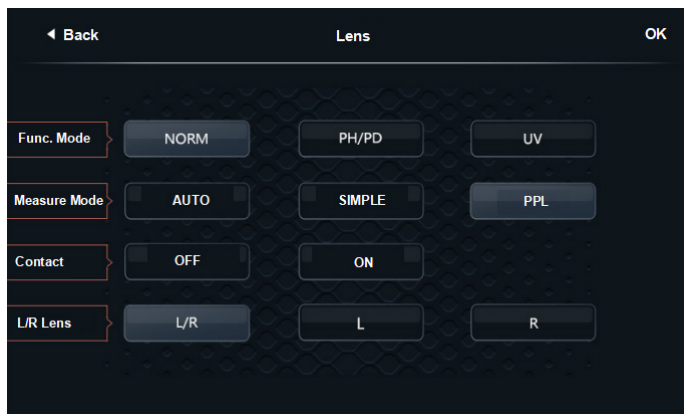
parameter setting interface

① "Back" button

The key is returning to the main measurement interface.

② Lens setting

Enter the lens setting interface, as below:



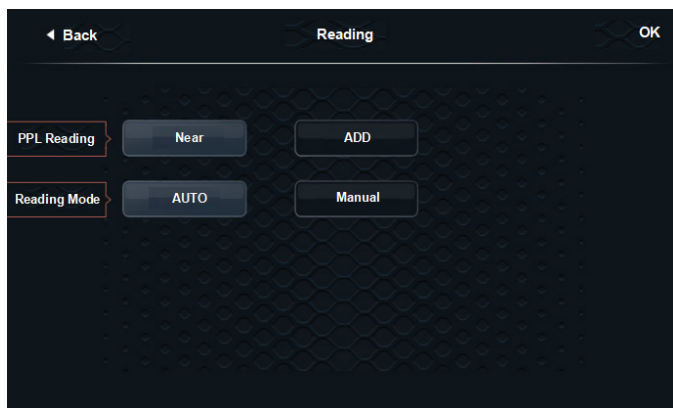
③ Display setup

Enter into the display setting interface, as below:



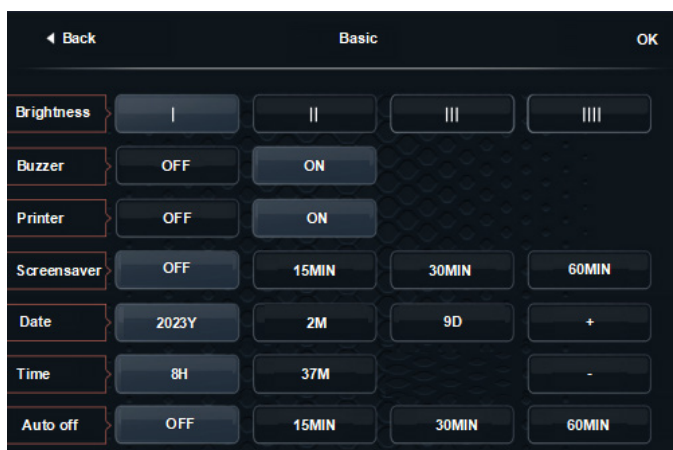
④ Reading setting

Enter into the reading setting interface, as below:



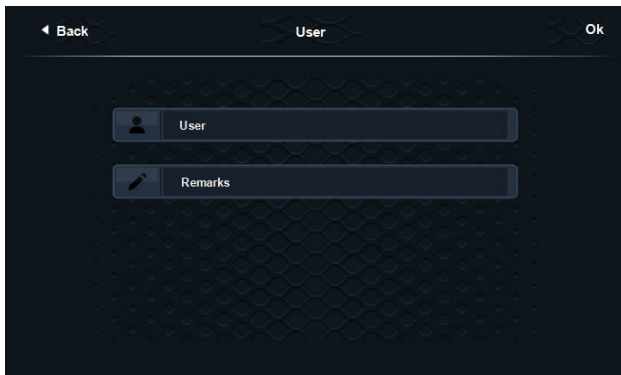
⑤ Basic setting

Enter into the basic setting interface, as below:



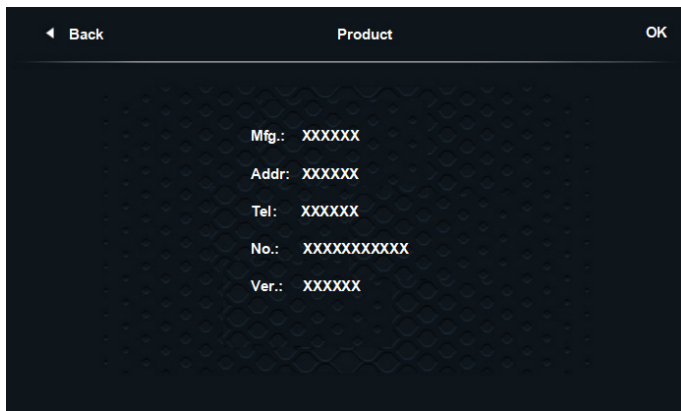
⑥ User information

Enter into the user information editing interface, as below:



⑦ Product information

Enter into the product information interface, as below:



⑧ Project setting

Enter into the project setting interface.

⑨ DEFAULT setting

Reset button for factory setting.

⑩ Exit APP.

Enter into the language setting and network setting interface .

⑪ Hardware check

Enter into the hardware check interface.

4 Operating procedures

4.1 Start the instrument

4.1.1 Switch on the power

Insert the power cord of the power adapter into the 220V power socket and then connect the dc output of the power adapter to the instrument.

4.1.2 Turn the power on

Press the power switch for seconds to the starting animation , wait for the animation finished, the instrument will automatically enters into main measurement interface.

4.2 Setting lenses

4.2.1 Set uncut lens

1) Set lens on lens support

Place the lens center on the lens support with convex side up



2) Fix the lens to lens support

Raise the lens pressing unit ,then lower it slowly to fix the lens.

Remark: lens pushing board is no needed to fix the uncut lens.

4.2.2 Set framed lens

1) Set framed lens



Place the framed lens on the lens support with convex side up

2) Move lens pushing board

Turn the lens pushing board lever until it touches and parallel the bottom of the lens.

3) Fix lens with lens pressing unit.

Raise the lens pressing unit ,then lower it slowly to fix the lens.



4.3 Normal lens measurement

On the automatic measurement mode or normal lens measurement mode, the procedure is as below:

4.3.1 Specify lens side

Specify lens side by pressing R/L shortcut tab.If it is the automatic R/L switch mode, the instrument automatically identify the first measured lens as right lens.After the measured data fixed, it goes automatically to the left lens.

Remark:if lens side is only specified after measurement,the measured data will be cleared.

4.3.2 Perform lens alignment

Move the lens to bring target close to the center of alignment circle. If it is framed lens, move the lens pushing board along with the frames. When the alignment is finished, make sure the bottom of the frames is touched with lens pushing board.

4.3.3 Fix measured data

When alignment is finished, the measured data is fixed by pressing the read key in manual read mode or automatically read under auto read mode.

Remark: cylinder indication shortcut tab still works in terms of changing the indication mode of cylinder value even after measured data is fixed.

4.3.4 Change lens

If you need to change to another lens, just follow the above steps for measurement.

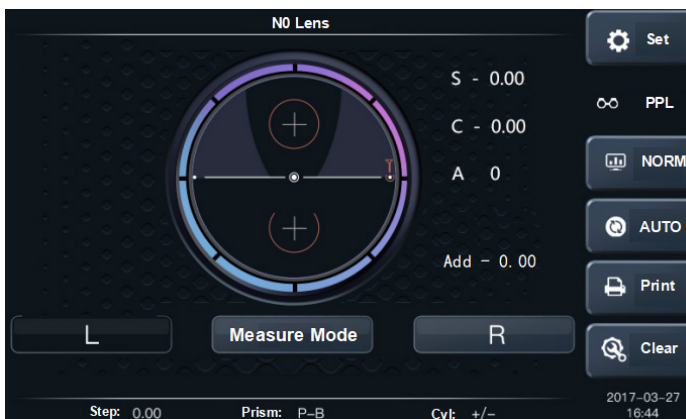
4.3.5 Print the measurement result

After measurement finished, press the printing key and record the

measurement data.

4.4 Progressive multifocal lens measurement

4.4.1 Measure uncut lens



Under auto measurement mode or progressive multifocal lens measurement mode, the procedures is as below:

1) Set lens

2) Measure distance power

a) When measuring distance portion, the target indicating distance portion is displayed and the message bar displays "now measuring distance ..."

b) Measuring the alignment

Move the lens in the horizontal direction to align the target with the vertical line of the cross. And then move the lens in vertical direction to align the target with horizontal line of the cross. The process is as below:



(Remark: the arrow indicates the direction the lens should move towards. When aligning, move the lens towards the arrow .)

(*The lens should always contact with the lens support.)

c) Move the lens in vertical and horizontal direction slightly until the alignment is finished. Then lock the key or set the auto read mode to fix the data. Then the message bar displays "now measuring near.." It indicates the distance power is finished and now measure the near power part.

3) Measure near ADD power

a) When the distance power is complete, the target indicates the near portion appears, the message bar shows " now measuring the near..." at the same time the add power begins to change.

b) perform alignment

Move the lens in the horizontal direction to align the target with the vertical line of the cross. And then move the lens in vertical direction to align the target with horizontal line of the cross. The process is as below:



(Remark: the arrow indicates the direction the lens should move towards. When aligning, move the lens towards the arrow .)

(The lens should be always contact with support.when move the lens, keep the frame adjoin the pushing board.)

c) Move the lens in vertical and horizontal direction slightly until the alignment is finished and lock the data. Then the message bar shows " measurement finished " .

4) Change the lens

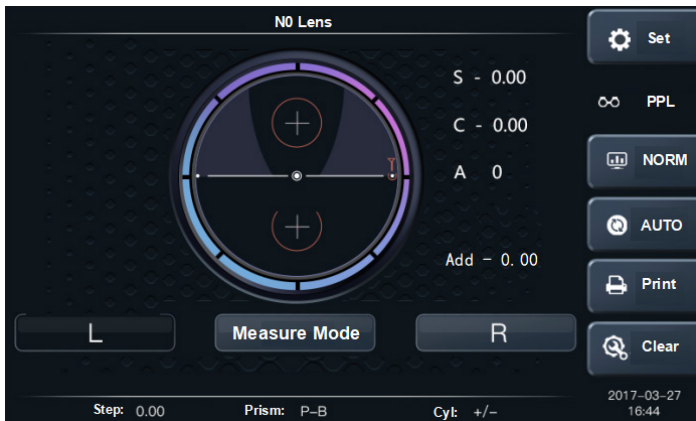
If you need to measure another lens, follow the above steps.

5) Print the measurement result data

(After measurement finished, press the printing key and record the measurement data.

(Remark: when place the lens ,keep the horizontal direction parallel with the pushing board.

4.4.2 Measure framed lens



Under auto measurement mode or progressive multifocal lens measurement mode, the procedures is as below:

- 1) Change to Progressive multifocal lens mode
 - 2) Specify lens side if necessary
 - 3) Set the lens, place the portion lower than the center of the lens on the support .
 - 4) measure distance power
 - a) When measuring distance portion, the target indicating distance portion is displayed and the message bar displays“now measuring distance ...”
 - b) Perform alignment
- Move the lens in the horizontal direction to align the target with the vertical line of the cross. And then move the lens in vertical direction to align the target with horizontal line of the cross. The process is as below:



(*Remark: the arrow indicates the direction the lens should move towards. When aligning, move the lens towards the arrow .)

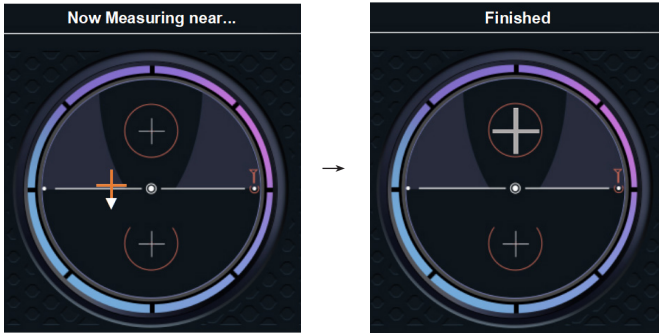
(*The lens should be always contact with support.when move the lens, keep the frame adjoin the pushing board.)

c) Move the lens in vertical and horizontal direction slightly until the alignment is finished. Then lock the key or set the auto read mode to fix the data.Then the message bar displays“now measuring near..”It indicates the distance power is finished and now measure the near power part.

5) Measure near ADD power

a) When the distance power is complete,the target indicates the near portion appears,the message bar shows “ now measuring the near...”at the same time the add power begins to change.

b) Move the lens in the horizontal direction to align the target with the vertical line of the cross. And then move the lens in vertical direction to align the target with horizontal line of the cross. The process is as below:



(* Remark: the arrow indicates the direction the lens should move towards. When aligning, move the lens towards the arrow .)

(* The lens should be always contact with support.when move the lens, keep the frame adjoin the pushing board.)

c) Move the lens in vertical and horizontal direction slightly until the alignment is finished and lock the data. Then the message bar shows " measurement finished " .

6) Change lens if you need to measure another lens, follow the above steps.

7) Print the measurement result data

After measurement finished, press the printing key and record the measurement data.

(* Remark:after the ADD power is measured,the automatic L/R selection function begins to work.)

4.5 PD & PH measurement(applicable only some models)



Under auto measurement or normal lens measurement mode, the detailed step to measure framed lens PD/PH

4.5.1 Press measurement function shortcut selection tab, choose "PD/PH" measurement function.

4.5.2 Set framed lens.

Set the framed lens, keep the bottom of the frame horizontally adjacent with the edge of the pushing board.



4.5.3 Right lens measurement

Move the right lens, when the alignment and measurement finished,

Auto Lensmeter

press the lock key or "auto read" mode, then the PD/PH of right lens can be confirmed.

4.5.4 Left lens measurement

Move the left lens, when the alignment and measurement finished, press the lock key or "auto read" mode, then the PD/PH of right lens can be confirmed.

4.5.5 Measurement finished

After PD/PH of both lens are confirmed, the difference of both eyes are confirmed and displayed.

(* Remark: it is also OK to measure the left lens firstly and then right lens.)

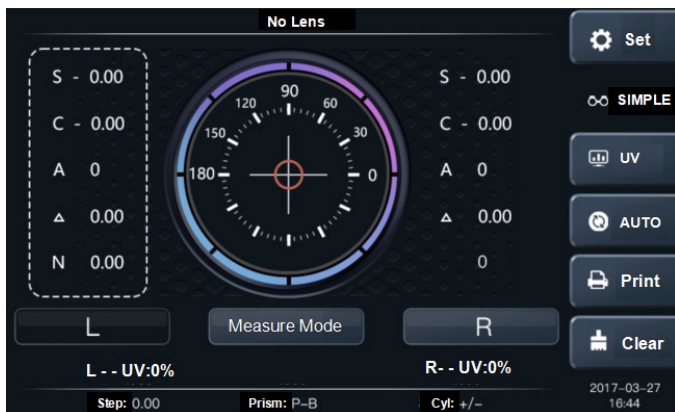
4.5.6 Print the measurement data

After the measurement finished, press the printing key and record the measurement data.

4.5.7 Change lens

If it is needed to change another lens, press the "eliminate" key and follow the above steps.

4.6 Anti-UV parameter measurement(applicable only some models)



Under auto measurement or normal measurement mode,the detailed steps to measure the anti-UV parameter is as below:

4.6.1 Press the measurement function switch shortcut tab and select UV transmittance measurement function.

4.6.2 Set the lens

4.6.3 Alignment

(*Remark: when measure transmittance, the result may be not accurate if alignment is not done well.)

4.6.4 UV transmittance measurement

After alignment, press read key or "auto read" mode and you get measured result, the UV transmittance, in the form of percentage.

4.7 Lens marking

Detailed step of optical center and axis lens marking are shown as below:

4.7.1 Set the lens

4.7.2 Move the lens .Align the lens and then do the marking.

4.7.3 After alignment is finished,fix the lens with lens pressing unit.

4.7.4 Mark lens

After the lens is fixed, mark the lens with marker.



4.7.5 Remove the lens from the support

Remove the lens by uplifting lens pressing unit.

(*Remark: do not touch the marked dots.or the unclear dots will make the axis not able to be read.)

4.8 Printout

4.8.1 Example in R/L state and single "R"or "L"state

NO. 00000 2017. 3. 9 <SINGLE>	19:52	NO. 00000 2017. 3. 9 <SINGLE>	19:52	NO. 00000 2017. 3. 9 <SINGLE>	19:52
RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT
+ 0.00 SPH	+ 0.00	+ 0.00 SPH	+ 0.00	+ 0.00 SPH	+ 0.00
+ 0.00 CYL	+ 0.00	+ 0.00 CYL	+ 0.00	+ 0.00 CYL	+ 0.00
0° AXS	0°	0° AXS	0°	0° AXS	0°
Δ 0.00 PSM	Δ 0.00	Δ 0.00 PSM	Δ 0.00	Δ 0.00 PSM	Δ 0.00
0° BAS	0°	0° BAS	0°	0° BAS	0°

4.8.2 Example of progressive multifocal lens measurement result printout

NO. 00000 2017. 3. 9 <PROGRESSIVE>	19:53
	LEFT
	+ 0.00
	+ 0.00
	0°
	Δ 0.00
	0°
	+ 0.00

4.8.3 Example of contact lens measurement result printout

NO. 00000 2017. 3. 9 <SINGLE>	19:52
RIGHT	LEFT
+ 0.00 SPH	+ 0.00
+ 0.00 CYL	+ 0.00
0° AXS	0°
Δ 0.00 PSM	Δ 0.00
0° BAS	0°

4.8.4 Example of PD/PH measurement result printout

NO. 00000 2017. 3. 9 <SINGLE>	19:53
RIGHT	LEFT
+ 0.00 SPH	+ 0.00
+ 0.00 CYL	+ 0.00
0° AXS	0°
Δ 0.00 PSM	Δ 0.00
0° BAS	0°
- - - -	PD - - - -
- - - -	41.0
- - - -	PH - - - -
- - - -	50.0

4.8.5 Example of anti-uv parameter measurement result printout

```

NO. 00000
2017. 3. 9 19:53
<SINGLE>
R I G H T      L E F T
+ 0.00        + 0.00
+ 0.00        + 0.00
0°            0°
Δ 0.00        Δ 0.00
0°            0°
---%          ---%
SPH
CYL
AXS
PSM
BAS
UV

```

5 Installment and calibration before usage

- 5.1 Place the instrument on the stable table.
- 5.2 Put it down gently and set upright the instrument screen.
- 5.3 Insert the power cord of the power adapter into the socket.
- 5.4 Connect the DC output of the power adapter to the instrument.
- 5.5 Turn on the power, the screens shows the starting animation.Start the instrument.
- 5.6 Enter into the interface.
- 5.7 If the brightness of the screen is not good, adjust the brightness.

6. Safety notice**6.1 Before use**

- 6.1.1 Never modify or touch the internal structure of the instrument.
- 6.1.2 Do not store the instrument exposed to rain or contains poisonous gas and liquid.
- 6.1.3 Avoid installing the device exposed to direct air-conditioning flow.
- 6.1.4 Avoid using the device in a place exposed to direct sunlight or near incandescent light.
- 6.1.5 Do not place heavy products on the power cord.
- 6.1.6 In installation or operation of the device, don't close to other high-power electric devices or use other high-power electric devices which may cause the electromagnetic interference.

6.2 Using

6.2.1 Immediately replace the power cord if the internal wires are exposed or the cord is too hot while working.

6.2.2 Never use other power cord or accessories other than the designated one.

6.2.3 When moving the instrument, don't place your hands on the frame of the display but hold the undersides and sides with both of your hands.

6.3 After use

6.3.1 When the instrument is not in use, turn the power off.

6.3.2 When the instrument is not in use for long time, please pluck the power cord.

6.4 Maintenance and check

Personal not trained by our company can not repair the instrument.

7 Maintenance

7.1 Trouble-shooting

If the instrument does not work properly, please find the related symptom and action according to the below table before contacting with the supplier.

symptom	action
The instrument can not be started.	Please check whether the power is well-connected.
The instrument can not print.	Check the printer paper. If the paper has been used up , set the new printer paper. The "printer"parameter may be set as off. Re-set the parameter.
The printer does work. But the printed result can not be obtained.	The printer paper may be set on the wrong side up. Set it with the correct side up. If the paper gets stuck,the paper may not be set correctly. Take it out and re-set the paper.

(Remark: if the above method can not solve the problem, please

contact with our after-sale service .)

7.2 Prompt message and countermeasures

If a message shows on the screen, please find the related symptom and action according to the below table.

symptom	action
OD initialization error	Check the lens support, press the restart button and restart the instrument.
Please remove the lens from lens support.	After removing the lens, press the restart button and restart the instrument.
Dust detection, please clean lens.	check the lens support. remove the dust and dirt from raster. Then press restart button and restart the instrument.
Do you want to use contact lens support?	Change to standard lens support. Press the restart button and restart the instrument.
UV initialization error	check the lens support. press the restart button and restart the lens.
Meas error	Check the lens support. Remove the one which interrupts the measurement beam.

7.3 Replacing printer paper

When a red line appears on the side of the printer paper, stop using the printer and replace a new one. Detailed steps are shown as below:

(Remark: Don't print without paper. That will reduce the printer lifespan. Don't pull the paper in the printer forcefully.)

7.3.1 Open the printer cover.



7.3.2 Put the printer paper into the printer housing.



(Remark:load the paper neatly. If the paper is set in wrong direction , it is impossible to print data on the paper.)

7.3.3 Close the printer cover.



7.3.4 Verify the printing paper is installed correctly.

Press "print"button on the interface. If the printer can not work properly, then check "2"and "3"until the printer works properly.

7.4 Cleaning the protective lens

Blow off the dust and dirt on the protective lens regularly.

7.4.1 Remove the lens support.

7.4.2 Blow off the dust on the protective lens with blower.

7.4.3 If it is still dirty, wipe the lens with cleaning paper moistened with alcohol.

(Remark:The dust on the protective lens may influence the measurement accuracy.Don't use sharp object to scrape the protective lens. The scratches on the protective lens will seriously affect the reliability of the measurement.)

7.5 Objective lens cleaning

7.5.1 Blow off the dust on the protective lens with blower.

7.5.2 Wipe gently with a lens cleaning paper moistened with alcohol.

(Remark: wipe the lens from center to outside clockwise.)

7.5.3 Check if the window is clean.if not, clean it again.

(Remark:Change the view angle to check whether the lens are cleaned completely.)

7.6 Others

7.6.1 Clean with soft cloth when the cover or dial becomes dirty. If there is dirt, wipe with cloth moistened with neutral detergent,and then dry it with dry soft cloth. (remark: Do not use organic solvents such as paint dilution which will damage the instrument surface. Wipe the screen softly ,otherwise it will scrape touch screen which will cause the damage.

Don't swipe with sponge or cloth moistened with water. The water may penetrate into the instrument inside. Then the instrument can not work properly.)

8. Transportation & storage

8.1 Transportation

8.1.1 Avoid sunshine,rain,heavy pressure and vibrant movement during transportation.

8.1.2 Hold and move instrument lightly during transport and loading. No

throw is allowed.

8.2 Storage

8.2.1 Store the instrument in dry, ventilated indoor place without corrosive gases.

8.2.2 Storage temperature: 0°C -35°C

8.2.3 Storage humidity:<70%RH