

## **Instrument Introduction**

- Wz-981 /WZ-981KR computer optometry instrument: it is a kind of optometry instrument for objective measurement of the refractive parameters of human eyes. It can measure various parameters of human eye diopter (myopia, farsightedness, astigmatism, astigmatism axial position and pupil distance, etc.). Wz-981kr can also measure corneal radius of curvature, corneal diopter, corneal divergence, corneal divergence axis direction. These results provide reference data for the diagnosis and treatment of visual acuity and the allocation of glasses. The instrument is suitable for ophthalmic hospital, optician shop, optometry center and so on.
- Contraindications: No contraindications.
- Machine features: Computer optometry adopts rotating prism technology.
- The scope of application: it is suitable for objective measurement of human eye diopter and corneal curvature parameters, including spherical lens diopter, column lens diopter, scattered axis, pupil distance, corneal radius of curvature, main meridian axis, corneal diopter, corneal diameter.
- Computer optometer WZ-981 can measure spherical diopter, column mirror diopter, axial position of scattered light, pupil distance. Computer optometer WZ-981KR model can measure spherical diopter, column diopter, scattered axis, pupil distance, corneal radius of curvature, main meridian axis, corneal diopter, corneal diameter.

### **Note**

- Before using the machine, please read this operation and technical maintenance manual carefully and keep it for reference.
- The notes and diagrams in this manual may be different from those in the real kind, please take the real kind as the standard.
- All wires (including grounding wires) must be correctly connected before use using rated voltage power supply.
- When the instrument is not used for a long time, the power supply should be cut off and the rubber hole plug and dust bag cover. For accurate measurement results, please keep the inspection window clean to avoid finger marks, dirt and dust.
- Please follow the warning instructions of the machine and user's use and technical maintenance manual

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## 1. Use and environment

### 1.1. Operators

- Avoid electric shock. Do not open the instrument shell at will. If there is any problem, contact professional personnel to handle it. Electric shock may cause burns or fire.
- Before replacing the fuse, turn off the power switch and unplug the power cord. Replace the fuse of the same type as marked on the instrument.
- Avoid hazards during operation. Do not touch the patient's eyes or nose when using the device.

### 1.2. Work environment

- Temperature: 10°C ~ 40°C
- Humidity: 10% RH to 90%RH
- Atmospheric pressure range: 760hPa ~ 1060hPa
- Power supply voltage: ~ 220V; 50Hz;
- Input power: 60VA

### 1.3. Storage requirements

When storing the instrument, ensure the following conditions:

(1) Keep the instrument dry and prevent the damp instrument from contacting water.

(2)The place where the instrument is stored to ensure that air pressure, temperature, humidity, ventilation, light, dust, etc., will not cause damage to the instrument.

(3) Do not store the instrument on the unstable or even vibrating ground, which may cause damage to the instrument.

(4)The place where the instrument is stored should be far away from electronic equipment or near chemicals and flammable gases.

### 1.4. Transportation and storage environment with packaging

- Temperature: -10°C ~ 55 °C
- Humidity: 10% RH to 90% RH
- Atmospheric pressure range: 760hPa ~ 1060hPa

## 2. Product Overview

### 2.1. Security Categories

- Classification by shock protection type: Class I
- According to the degree of anti-shock classification: TYPE B
- Classification according to the degree of protection against liquid intake: common equipment

- Classification by degree of safety when used with flammable gas mixed with air or with oxygen or nitrous oxide: non-AP or APG equipment
- Classification by operation mode: continuous operation

## 2.2. Safety precautions

Please avoid using and storing the device in the following environments

|    |  |
|----|--|
| 1  | Do not place the instrument in a place where it is easy to get wet. Do not operate the instrument with wet hands                     |
| 2  | Do not place the instrument in direct sunlight   |
| 3  | Do not place the instrument in the place where the temperature and humidity change greatly   |
| 4  | Do not place the instrument near the heating equipment   |
| 5  | Do not place the instrument in places with high humidity and poor heat dissipation/ventilation                                       |
| 6  | Do not place the instrument in areas of excessive shock and vibration  |
| 7  | Do not place the instrument on uneven surfaces and do not place anything on the instrument   |
| 8  | Do not place the instrument in a corrosive or flammable area   |
| 9  | Mainly do not let dust and metal hard objects into the instrument  |
| 10 | Do not disassemble or open the instrument without permission. The manufacturer is not responsible for any problems arising therefrom |
| 11 | Do not connect the external power supply until the instrument parts are connected properly   |
| 12 | Do not pull the cord when unplugging it. Hold the plug   |

## 2.3. Registration Information

**Medical device production license number:** Zhejiang Food and Drug Administration equipment production xu no. 20200318

**Medical device Registration Certificate No. :** Zhejiang Instrument Note License 20212160313

**Product technical requirement Number:** Zhejiang Instrument note standard 20212160313

**Production date:** see label

**Manufacturer and after-sales service unit:** Zhejiang Weizhen Medical Technology Co., LTD

**Production and after-sales service address:** No. 124, Front Road, Shanhou Pancun Town, Hengjie Town, Luqiao District, Taizhou City, Zhejiang Province

**Measuring instrument Production License No. :** 20210373-33

**Product standard number of measuring instruments:** 20210373-33

**After-sales service telephone:** 4008081112

**Telephone:** 0576-82788886

## 2.4. Working principle

The precision measurement beam is projected onto the patient's eye by an optical projection system. The refractive error of the patient's eye was then measured by capturing the reflected light beam in the form of a circular image.

## 2.5. Structural composition

Computer optometer is a digital display optometer, including optical imaging system, electronic system and software, mechanical system and shell composition.

2.6. According to yy0579-2016 standard, the curvature radius measurement standard of computer optometry is as follows:

The measurement range is type 2. The radius reading is a digital indicating instrument. The measurement deviation is type 2.

## 2.7. Product Description

It usually consists of a vision, an optical imaging system, a sensor, a display screen and a control system. Project light into the subject's eye. Examine the concentration and dispersion of light reflected from client's retina. Measure the refractive state of the subject.

## 2.8. Expected use

The product is suitable for objective measurement of human eye diopter and corneal curvature parameters, including spherical diopter, column diopter, scattered axis, pupil distance, corneal radius of curvature, main meridian axis, corneal diopter and corneal diameter.

## 2.9. Contraindications

Not found yet.

## 2.10. Adverse event contact information

**Contact:** Vergent Customer Service Center

**Contact number:** 0576-82788886

## 2.11. Use period



With regular maintenance, the service life is 5 years.

## 3. Warning for safe use









Please read this operation and technical maintenance manual carefully before using the machine. In order to ensure the safe use of the instrument and avoid injury to the operator and loss of property, the terms indicating the degree or level of safety alarm in the manual are defined as follows.

### 3.1. Safety identification

| Signal | Explanation |
|--------|-------------|
|--------|-------------|

|  |   |
|--|---|
|   | Warning: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury |
|   | Note: Improper handling or ignoring this warning may cause serious injury or damage to the facility.                |
| Under certain conditions, even caution can lead to serious injury. So safety precautions must be strictly observed at all times. |   |

### 3.2. Icon meaning

| Signal  | Explanation   |
|---|---|
|    | To avoid potential hazards to the environment and human health, dispose and recycle in accordance with local regulations. |
|    | Type B application section.   |
|    | Please read the meaning of the safety warning signs in the instructions.  |
|    | Alternating current (ac)  |
|  | Respectively represent ON and OFF of the power switch.  |
|  | Measure the button  |
|  | Protective grounding mark   |
|  | Lock release  |
|   |   |

**Signal****Safety precautions and warnings**

Please fully insert the power plug into the socket, improper connection may cause a fire.

Do not install the device where there is water. Contact with liquid may cause electric shock or device failure.

To avoid electric shock, do not insert metal objects into the holes or seams of the instrument.

Do not place heavy objects on the power cord. Damaged power lines may cause a fire or electric shock.

A short circuit may cause a fire. Please turn off the power supply and unplug the fuse before replacing it. Please replace the required fuse.

Please turn off the power and unplug any abnormal phenomena, such as smoke/odor. Long-term use of the instrument under abnormal conditions may lead to fire, please contact the seller for repair.

To avoid the danger of electric shock, the device must be connected to the power supply under the condition of protection grounding.

To avoid electric shock, do not plug and unplug the power supply with wet hands.

Handle the instrument with care to avoid potential injury or damage.

When moving the instrument, make sure that there are no other obstacles that may hurt or malfunction people or other objects.

Be sure to use a socket that meets the voltage parameter requirements of the device. If the voltage is too high or too low, the device cannot operate properly. A malfunction may result in a fire.

Understand the safety precautions and operating procedures thoroughly before using the equipment. Unintended use can lead to unexpected failures or poor results.

Do not move equipment to another location alone. Risk of back injury or equipment slipping.

Do not use solvents or strong cleaning solutions on any part of the instrument, otherwise the instrument may be damaged.

Remove the fixture before using the instrument.



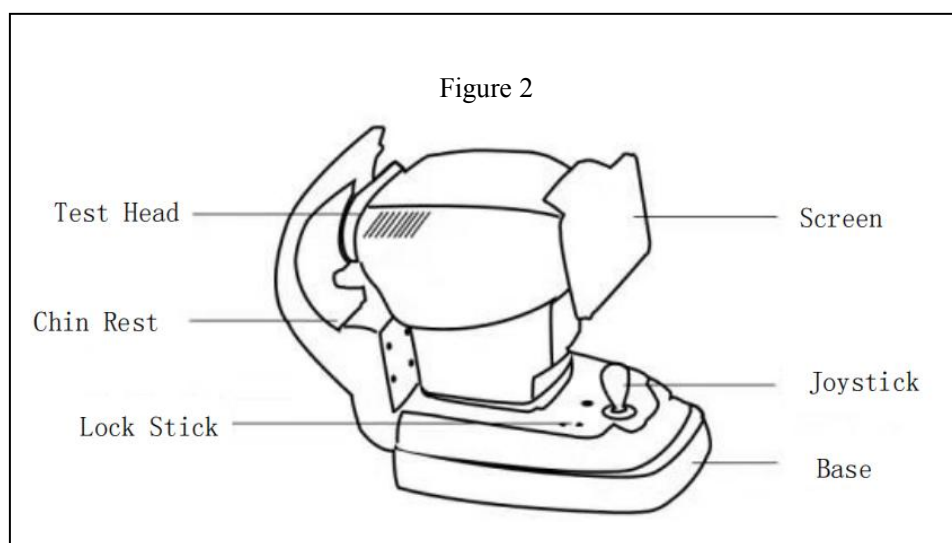
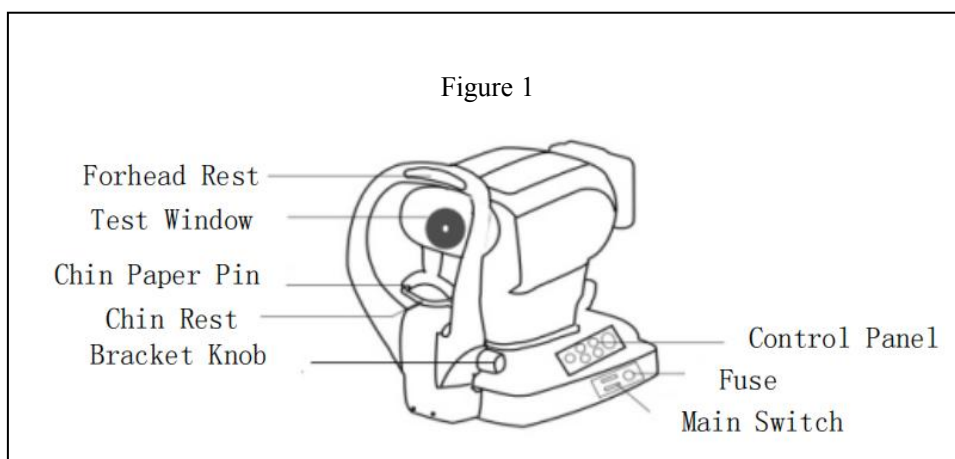
**3.3. Performance indicators**

The diopter given in the performance index shall be the reference wavelength  $\lambda=587.56\text{nm}$  as required by ISO 7944:1998.

| Features                                      |                      |                                |   |
|---|----------------------|--------------------------------|---|
| Category                                      |                      | Test Range                     | Tolerance                               |
| Diopter                                       | Vertex Distance (VD) | 0mm, 12mm, 13.75mm, 15mm       | --                                      |
|   | Sphere               | -20.00D ~ +20.00D              | 0 ~ ±10.00D: ±0.25D                     |
|   |                      |                                | >±10.00D(绝对值): ±0.50D                   |
|   | Cylinder             | 0D ~ 6D                        | ±0.25D                                  |
|   | Axis                 | 0° ~ 180°                      | 0.25D~0.50D: ±10°                       |
|   |                      |                                | 0.50D~3.00D: ±5°                        |
|   |                      |                                | >3.00D: ±3°                             |
| PD  | 45mm ~ 85mm          | --                             |   |
| Minimum Measurable Diameter                   | Φ2.0mm               | --                             |   |
| Corneal Test (only applied to model WZ-981KR) | Kerato Radius        | 6.5 ~ 9.5mm                    | ≤8: ±0.02mm                             |
|   |                      |                                | >8: ±0.03mm                             |
|   | Axis                 | 0° ~180°                       | curvature radius difference ≤0.3mm: ±4° |
|   |                      |                                | curvature radius difference >0.3mm: ±2° |
|   | Corneal Diopter      | 35.00D~52.00D                  | Measuring range ≤43.00D                 |
| Measuring range >43.00D                       |                      |                                | ±0.25D                                  |
| Corneal Diameter                              | 2.0~12.0mm           | ±0.2mm                         |   |
| Machine Movable Range                         | Front and Back       | Beforeafter: not less than44mm | --                                      |
|   | Left and Right       | About:not less than86mm        | --                                      |
|   | Up and Down          | Notless than13mm               | --                                      |

## Instrument Introduction

### 3.4. Airframe components



**Forehead support:** used to test the forehead against the rest.

**Detection window:** window for detecting the eye.

**Jaw pin:** a plastic pin used to secure a disposable paper pad.

**Jaw rest:** bracket for holding the chin.

**Bracket lifting knob:** controls jaw lifting. Rotate clockwise to go up and counterclockwise to go down.

**Control panel:** set the control panel of operation keys.

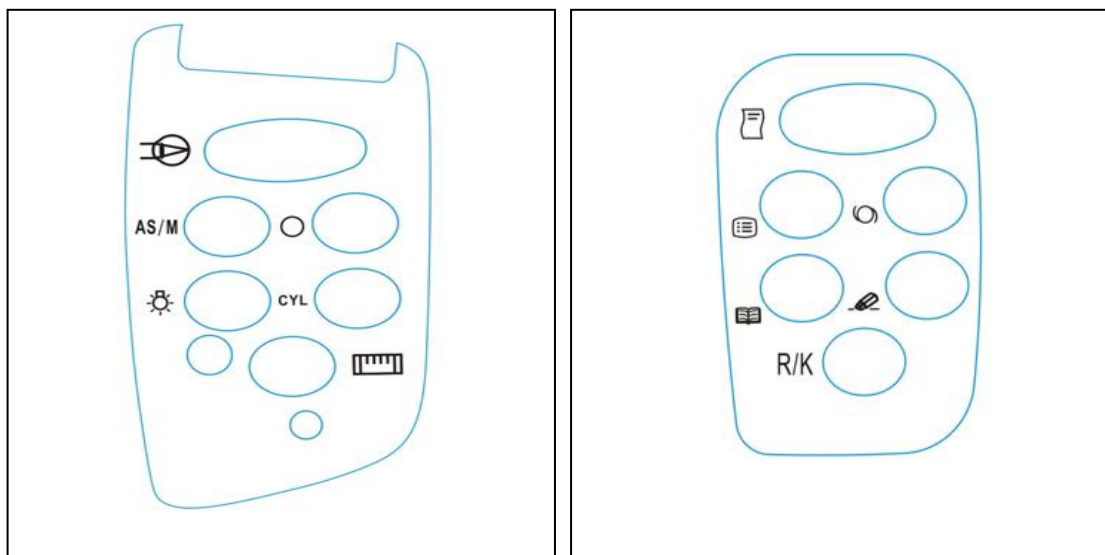
**Fuse:** 2XF 1.5AL250V.

**Power switch:** main power switch.

**Control lever:** the control body moves forward and backward. Rotate the measuring head clockwise to rise, rotate the measuring head counterclockwise to fall.

**Locking button:** used for fixing during measurement. Tighten it clockwise and loosen it counterclockwise.

### 3.5. Control panel composition

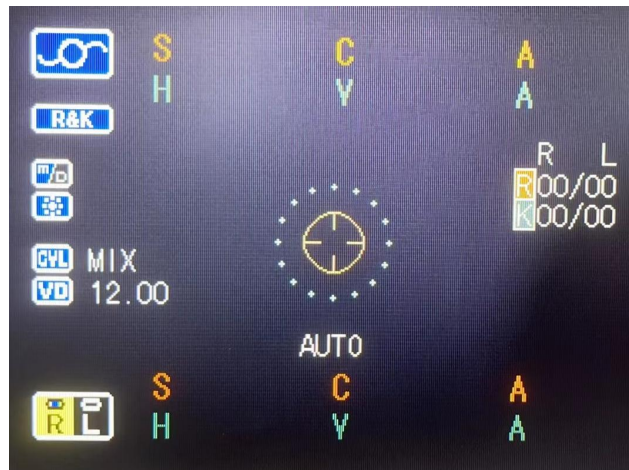


| No. | Icon        | Function                              | Effect  |
|-----|-------------|---------------------------------------|---|
| 1   |             | Print button                          | Print test results  |
| 2   |             | Menu button                           | Enter menu screen   |
| 3   |             | Intraocular lens button               | Press this switch when something goes wrong, such as an iOL eye |
| 4   |             | Data button                           | Look at the last 10 measurements                                |
| 5   |             | Remove button                         | Clear measurement data  |
| 6   | <b>R/K</b>  | Measurement mode button               | Cutting of different measurement modes (limit WZ-981kR)         |
| 7   |             | Graphical button                      | Refraction pattern  |
| 8   |             | Image button                          | Shows rings of retinal fundus image                             |
| 9   |             | Fixed view beacon brightness button   | Change fixed beacon brightness                                  |
| 10  | <b>CYL</b>  | Column mirror symbol selection button | Change the column mirror display mode                           |
| 11  |             | Corneal diameter button               | Measurement of corneal diameter (limited to WZ-981kR)           |
| 12  | <b>AS/M</b> | Manual automatic button               | Select manual or automatic measurement mode                     |

### 3.6. Measurement screen display



Measurement Style 1



Measurement Style 2

There are four measurement modes for wZ-981 /WZ-981KR. In the "Measurement interface", press [Measurement Mode Switch] to switch the measurement modes in turn, including R&K mode, REF mode, KRT mode and CLBC mode.




**R&K mode:** Measure diopter and corneal curvature

**REF mode:** Measure the diopter

**KRT mode:** Measure corneal curvature

**CLBC mode:** Measure contact lens base arc curvature

### 3.7.Installation

| Warning   | Matters needing attention  |
|---|--|
|  | Before moving the machine, tighten the locking button at the bottom of the machine to prevent the machine from moving. |
|  | To avoid accidents, please put the instrument in a stable place.   |
|  | Remove the fixture before using the instrument   |



(1) Hold the instrument and put it on the work table.

(2) After placing on work table, remove fixture.

① Loosen the fixing device (as shown in the figure).

② Remove the transportation fixtures.

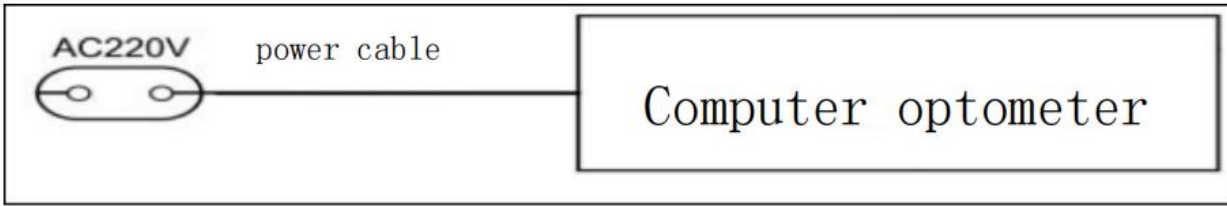
③ The fixed device must be removed when the instrument is used and installed when the instrument is moved.



(3) Release the locking lever, now the subject can be moved. If the instrument is not fully level, please adjust the 4 pads of the base.

(4) Remove the rubber plug on the detection window.

### 3.8. Line drawing installation




After installation, turn on the instrument switch. The installation is successful when the instrument starts up normally and enters the test working state.

### 3.9. Input and output of RS232C

Serial ports are for the manufacturer's exclusive use and do not connect to any other devices.

## 4. Basic operations

### 4.1. Preparation before measurement

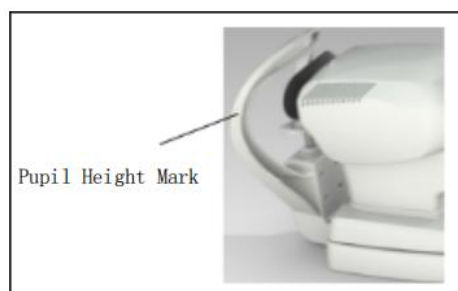
| Warning   | Matters needing attention  |
|---|--|
|  | To avoid electric shock, please do not pull the plug with wet hands! |

- (1) Plug in the power cord of the host.
- (2) Insert the power cord into a grounded three-pin socket. Could cause fire or electric shock if not grounded!
- (3) Please confirm that the power switch is in the OFF position.
- (4) Turn on the power switch.
- (5) Confirm that the screen is displayed properly.

### 4.2. The posture of the measured person should be correct during measurement

- (1) Adjust the height of the bench seat to make the measured comfortable.
- (2) The measured person's head is placed on the lower jaw rest. Rest your forehead on your forehead tray.
- (3) Adjust the height of the lower jaw to align the corner of the eye with the eye height mark. Chin rest mechanism is the application part (figure below).

When using the device, chin pads must be placed in accordance with local regulations.



(1) Use the control handle to adjust the instrument to the eyes of the measured. Position the eye in the focus frame by adjusting it horizontally or vertically.



1. The nose should be moved forward 2. Move the nose backward 3. Focus in the right position

(2) When the auxiliary focusing line turns into the state like (FIG. 3), it means that the auxiliary focusing is OK. If it is in automatic mode, the system starts automatic measurement and stops automatic measurement after three consecutive measurements. If in manual mode, press <Measurement button> Complete the measurement.

(3) After the test, press <Print button> to complete the measurement data printing.

(4) Turn off the power switch at the end of operation.

### 4.3. Clear measured values

(1) Press <Clear button> to clear button . A message is displayed.

(2) Press <Measurement button> to clear all measurements. The system returns to the initial state.

(3) Press again <Clear button> to Abort this operation.

### 4.4. View historical measurements

Press the "data button" to view the last 10 measurements. Press the "Measurement button" again to return to the measurement screen.

| REF | STEP | 0.25 | VD | 12.00  | CYL    | MIX |
|-----|------|------|----|--------|--------|-----|
| RL  | S    | C    | A  | S      | C      | A   |
| 1   |      |      |    | - 2.25 | - 0.25 | 176 |
| 2   |      |      |    |        |        |     |
| 3   |      |      |    |        |        |     |
| 4   |      |      |    |        |        |     |
| 5   |      |      |    |        |        |     |
| 6   |      |      |    |        |        |     |
| 7   |      |      |    |        |        |     |
| 8   |      |      |    |        |        |     |
| 9   |      |      |    |        |        |     |
| 10  |      |      |    |        |        |     |
| AVE |      |      |    | - 2.25 | - 0.25 | 176 |
| PD  |      |      |    |        |        |     |

Note: "Measurement mode button" toggles REF data and KRT data display. In REF mode, "Column mirror symbol Selection button" changes the column mirror symbol display. Change curvature units in KRT mode.

5. Print result

The diagram illustrates the layout of an optometry printout with labels for various data points. Red arrows connect these labels to the corresponding text in the printout.

**Printout Content:**

```

NO : 001      O1
2022.04.13   PM 22:06
WZ-981KR
REF. DATA
VD: 12.00   CYL: MIX
<R>  S      C      A
- 0.75 - 0.75 12
- 0.75 - 0.75 15
- 1.00 - 1.00 13
AVE - 0.75 - 1.00 14
S.E. - 1.25

<L>  S      C      A
- 1.25 - 0.25 19
- 1.50 - 0.25 25
AVE - 1.50 - 0.25 23
S.E. - 1.50
PD: 71

KRT. DATA  INDEX: 1.3375
<R>  MM      D      A
H    7.74   43.60   7
V    7.50   44.95   97
AVE  7.62   44.25
CYL  - 1.35   7
MM1  MM2   A1
[1]  7.74   7.53   5
[2]  7.73   7.47  11
[3]  7.74   7.52   6

<L>  MM      D      A
H    7.76   43.50   5
V    7.61   44.35  95
AVE  7.68   43.90
CYL  - 0.85   5
MM1  MM2   A1
[1]  7.75   7.60   4
[2]  7.75   7.59   9
[3]  7.77   7.63   3

WeiZhen Co.,LTD
0576-82788886
    
```

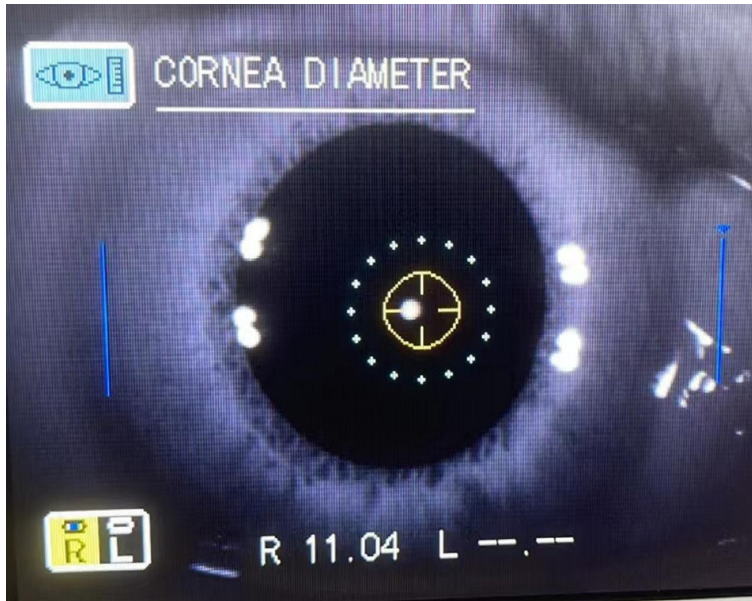
**Labels and their corresponding data points:**

- Patient no: NO : 001
- Machine: O1
- Date and time: 2022.04.13 PM 22:06
- Model no: WZ-981KR
- Vertex: VD: 12.00
- Cylinder symbol: CYL: MIX
- Right eye: <R>
- Average value: AVE (for right eye)
- Equivalent Sphere(R): S.E. (for right eye)
- Left eye: <L>
- Sphere: S (for left eye)
- near sighted + far sighted: S.E. (for left eye)
- axis: A (for left eye)
- cylinder: C (for left eye)
- PD: PD: 71
- Curvature coefficient: INDEX: 1.3375
- Horizontal: H (for right eye)
- Vertical: V (for right eye)
- Average value: AVE (for right eye)
- Cylinder: CYL (for right eye)
- Test times: [1], [2], [3] (for right eye)
- Corneal radius(mm): MM (for left eye)
- Corneal diopter: D (for left eye)
- Corneal dioptric angle: A (for left eye)
- Vertical Curvature: MM1 (for left eye)
- Horizontal curvature: MM2 (for left eye)
- Horizontal angle: A1 (for left eye)
- CKRNEA DIA: Corneal diameter: (bottom right)



## 6. Corneal diameter measurement (limited to WZ-981KR)

### 6.1. Graphic method



### 6.2. Measurement method :(static image measurement)

(1) Open control panel.

(2) Press the "corneal diameter button".

(3) The screen jumps from "Measurement interface" to "Corneal Diameter Measurement" interface (as shown above).

(4) Press the "Measurement button" after focusing the eyeball most clearly to record the eyeball images of the left and right eyes, which can be recorded multiple times. However, only the last image is retained. After recording, press the "corneal diameter button" to enter the stored static image.



- (1) Press the "manual automatic button" and the "image button" to move the positioning ruler left and right to the edge of the cornea (as shown in the picture).
- (2) After determining the position of the left positioning ruler, press the "Measurement button" to switch the positioning mark to the right to ensure that both sides are well positioned.
- (3) Press the "measurement button" to complete the measurement. Corneal curvature is shown at the bottom of the screen.
- (4) For monocular measurement, press the "Test button" again to complete the test and return to the "Measurement interface". For both eyes/test, press the "corneal diameter button" to switch to the measurement of corneal diameter in the other eye.

### **Tips:**

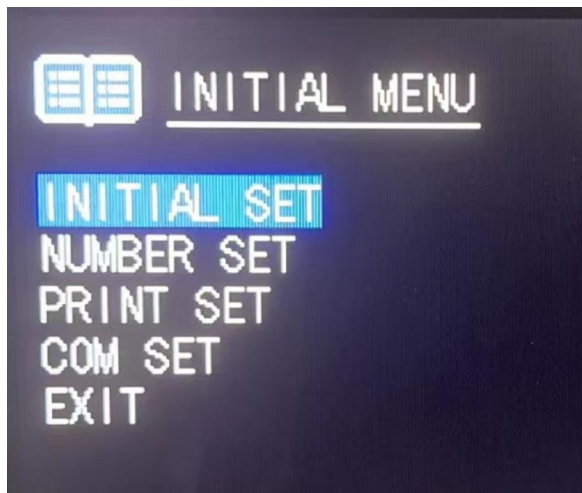
(1) If non-static image measurement is selected in the setting of "Initial menu", the measurement method is the same as above. Start operation directly from step 5. Switch between left and right eyes is selected by moving the nose. It is recommended to choose static image measurement to obtain more accurate value.

(2) During the test, pressing the "print button" at any time will interrupt the test and return to the "Measurement interface".

## **7. Settings**

### **7.1. Startup menu**

Press and hold the "menu button" and boot at the same time to enter the boot menu setting menu (as shown in the picture).



Press "measure button" to move the cursor up and down.

Press "Print button" to select.

#### **7.1.1. Buzzer on**

Buzzer can be set to "Yes" at factory setting to enable the buzzer.

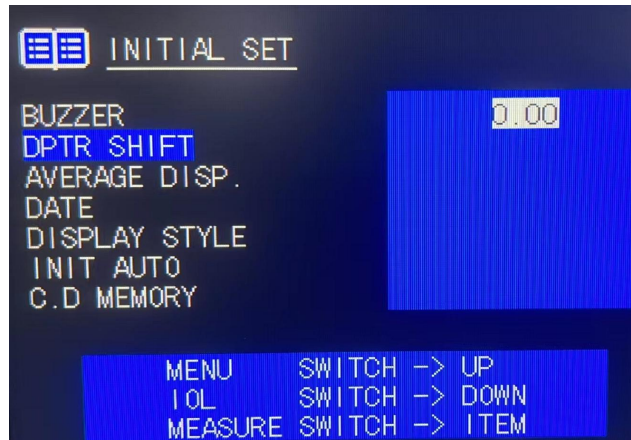
In the Boot Menu menu, select Initial Settings and press Print button to enter the Initial Settings interface. The first buzzer press "Print button" and select Yes or No.

Press "Measure button" to move the cursor to the next item.

### 7.1.2. Refractive compensation

The ball degree (S) value can be modified to 0.00 at factory setting.

In the "Boot Settings" menu, select the "Initial Settings" item, and then select "refractive Compensation" (as shown in the picture).



To correct the spherical lens value, press the "menu button" to increase the correction value: 0 0.12 0.25 0.37 0.50 0.62 0.75 0.87 1.00. Press the "lens button" to decrease the correction value: 0-0.12-0.25-0.37-0.50-0.62-0.75-0.87-1.00.

Press the "measure button" to move the cursor to the next item.

### 7.1.3. Standard values display

The standard value can be displayed on the screen and is set to "Yes" at the factory. From the "Boot Settings" menu, select "Initial Settings".

Press "Measure button" and move the cursor to "Standard value Display". Press print button and select Yes or No.

Press the "measure button" to move the cursor to the next item.

### 7.1.4. Date display

The display mode can be changed and is set to "Option 1" at factory. On the Boot Settings screen, select Initial Settings.

Press "Measure button" to move cursor to "Date Display". Press print button to select date display format.

Press the "measure button" to move the cursor to the next item.

### 7.1.5. Home screen style

Display style can be changed, and the factory setting is "Style 1". On the Boot Settings menu, select Initial Settings.

Press "Measure button" and move the cursor to "Home Screen Style". Press the print button and select Style 1 or Style 2.

Press "measure button" to set end and move the cursor to the next item.

**Note: Only "Style 2" can display standard values on the screen.**

### 7.1.6. Automatic measurement selection

Change the measurement mode, factory setting to "Yes". When the automatic measurement function is enabled, the focus ring captures the focus, and the software automatically measures. From the Boot Settings menu, select the Initial Settings item and press the Measurement button to move the cursor to Automatic Measurement Selection. Press print button and select Yes or No. Press the "measure button" to set the end and move the cursor to the next item.

#### Tips:

- (1) Automatic measurement and automatic printing function can be used together (limited to WZ-981KR)
- (2) Enable the automatic printing function in the print setting item in the boot setting menu.
- (3) The software will print the measurement results automatically after the automatic measurement of both eyes. If only one eye is measured or manual measurement is added during automatic measurement, the automatic printing function cannot be activated.

### 7.1.7. Still image selection (WZ-981KR only)

Corneal curvature measurement mode can be changed, factory setting is "Yes".

In the "Boot Settings" menu, select "Initial Settings" and press "Print button" to enter the "Initial Settings" menu.

Press "Measure button" and move the cursor to "Still Image Selection".

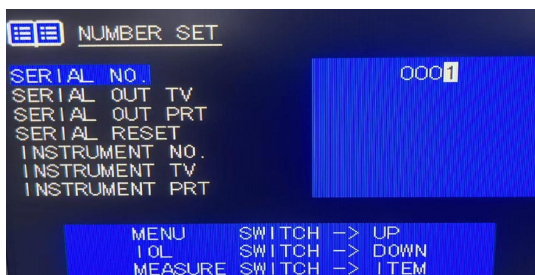
Press Print button and select Yes or No.

Press "Measure button" to set the end and move the cursor to the next item. The cursor jumps to the next item "Exit menu".

Press "Print button" to exit and return to the upper menu, if you choose to exit the system to return to the measurement interface.

## 7.2. Code Settings

In the "Code Settings" menu, you can set the patient code, choose whether to display the patient code, choose whether to print the patient code, reset the patient code, Set the instrument code, choose whether to display the instrument code, choose whether to print the instrument code.



In the Boot Setup menu, press Print button to move the cursor to Code Setup.

Press "Print button" to enter the "Code Settings" menu.

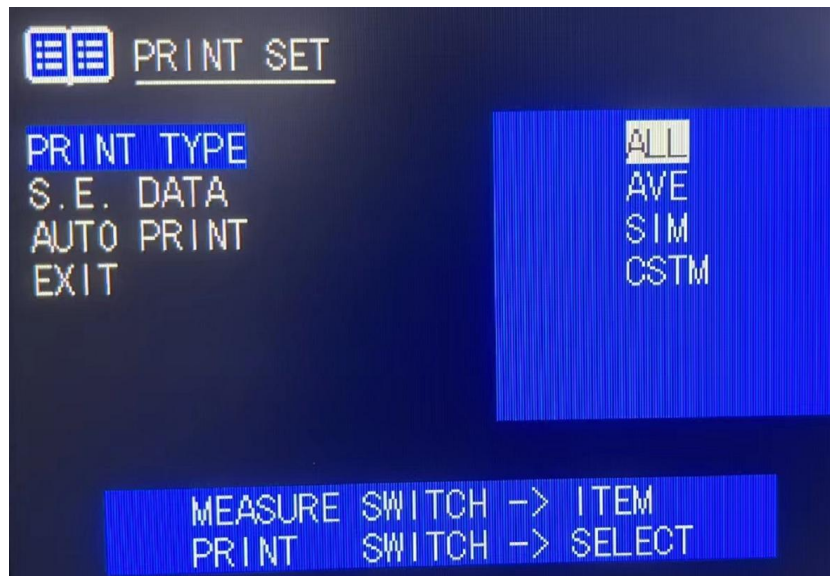
Press "Measure button" to move the cursor to exit code Settings.

Press "Print button" to return to the "boot menu" menu.

### 7.3. Print Settings

Can print equivalent spherical mirror. The default value is "Yes". In the "Boot menu" menu, select "Print Settings" and press "Print button" to enter the "Print Settings" menu.

In the "Print Settings" menu, select "Print Options" Select (all: print all data), (standard: standard format), simple: print only the date, setting and standard value of diopter), (Custom: customize the data format you want to print) press the "measure button" after selecting well. Set end and move the cursor to the next item.



#### 7.3.1. S.E print

Choose to print equivalent spherical dimensions. The default value is "Yes". Press "Measure button" and move the cursor to "S.E. Selected".

Press print button to select "Yes" or "No". Press the "measure button" to move the cursor to the next item.

#### 7.3.2. Automatic printing

Select Auto print for WZ-981KR only. Factory setting to "Yes" Press the "Measure button" and move the cursor to "Auto Select".

Press "Print button" to select "Yes" or "No". Press "Measure button" and move the cursor to the next item "Exit menu".

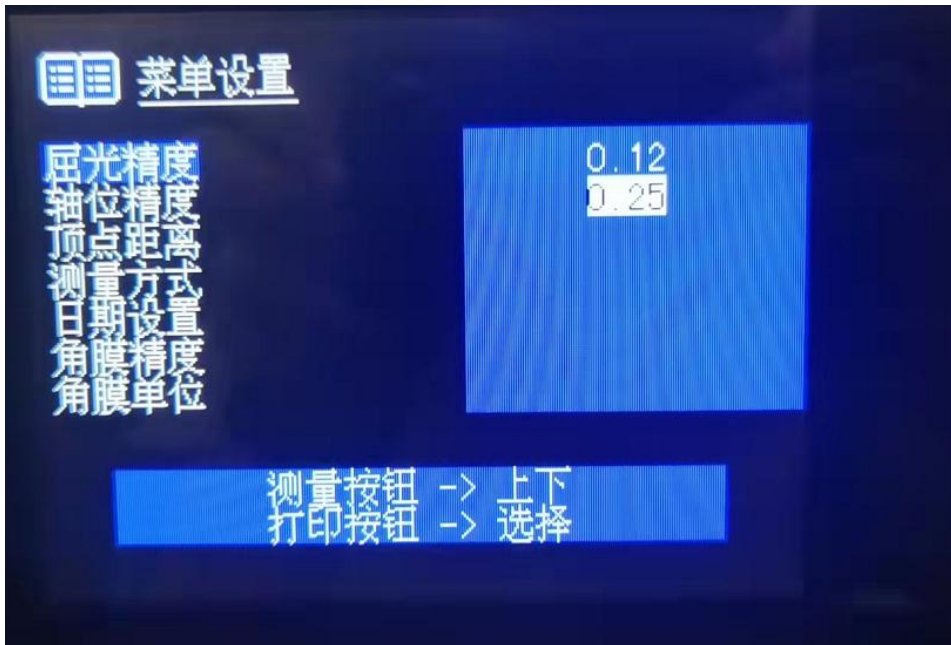
### 7.4. Communication Settings

Press "Measurement button", move the cursor to "communication Settings", press "Print button" to select "Yes" or "no", press "measurement button". Move the cursor to "Baud Rate Settings" and press "Print button" to select 2400, 4800, 9600, 19200, 28800 and press "Measure button". Move cursor to next item "Exit menu"

## 7.5. Menu Settings

In the menu setting, you can set refractive accuracy, axial accuracy, vertex distance, measurement method, date setting, corneal accuracy, corneal unit, corneal display setting, printing setting, screen saver setting, company information and name printing.

Enter the measurement interface. Press the "menu button" on the control panel to enter the "Menu Settings" menu.



Press "Measurement switch", move the cursor to "Exit menu", press "Print switch" to return to the measurement screen.

### 7.5.1. Refractive accuracy

Enter the measurement interface. Press the "Menu button" on the control panel to enter the "Menu Settings" menu. Press the print button to set the measurement step to 0.12 or 0.25. The factory setting is 0.25. Press "measurement button" to finish setting and move the cursor to the next item "axial accuracy". Or move the cursor to "Exit menu" to exit directly.

### 7.5.2. Precision of axis position

Enter the measurement interface. Press the "menu button" on the control panel to enter the "Menu Setting" menu, press the "measurement button" to move the cursor to "axis precision" to set the Angle step of the scatterlight axis to "1" or "5". The factory setting is 1. Press the "measure button" to set the end and move the cursor to the next item "vertex distance". Or move the cursor to "Exit menu" to exit directly.

### 7.5.3. Vertex Distance (VD)

Enter the measurement interface. Press the "menu button" on the control panel to enter the "Menu Setting" menu, press the "measurement button" to move the cursor to "vertex Distance" in VD setting, you can select contact lens "0" or glass lens "12mm, 13.75mm, 15.00mm". The factory setting is "12mm". Press the "measurement button" to finish setting and move the cursor to the next "measurement mode". Or move the cursor to "Exit menu" to exit directly.

#### 7.5.4. Measurement method

Enter the measurement interface. Press the "Menu button" on the control panel to enter the "Menu Settings" menu, press the "Measurement button" to move the cursor to the "measurement mode", press the "Print button", and select "Yes" continuous measurement mode, or "No" manual measurement mode. Press the "measurement button" to end the setting and move the cursor to the next item "date Setting". Or move the cursor to "Exit menu" to exit directly.

#### 7.5.5. Date setting

Enter the measurement interface. Press the "menu button" on the control panel to enter the "Menu Settings" menu, press the "Measurement button" to move the cursor to "date Settings", press the "menu button" to increase this value, press the "crystal button" to decrease this value. Press "print button" to complete the setting and move the cursor to the next item. Press "Measurement button" to complete the setting and move the cursor to the next item "corneal accuracy". Or move the cursor to "Exit menu" to exit directly.



#### 7.5.6. Corneal accuracy

(This function can only be used for one day for WZ-981KR model) Enter the measurement interface. Press the < on the control panel; Menu button >; Enter the "Menu Settings" menu, press "Measurement button" to move the cursor to "corneal accuracy", press "Print button", and aim the cursor at the item you want to select. 0.05\0.12\0.25, the factory setting is "0.05". After setting, press the "measurement button" to finish setting and move the cursor to the next item "corneal unit". Or move the cursor to "Exit menu" to exit directly.

#### 7.5.7. Corneal units

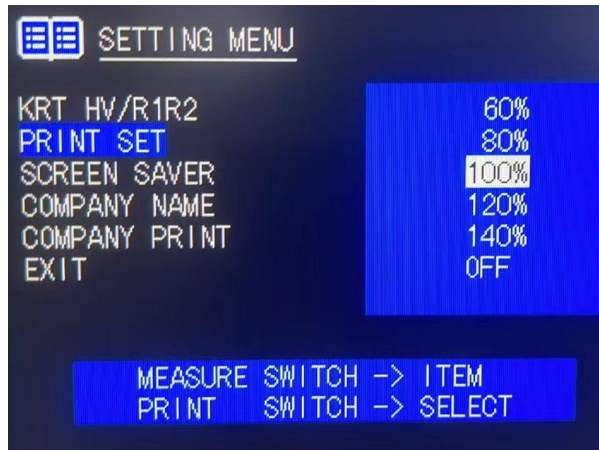
(This function can only be used for one day for WZ-981KR model) Enter the measurement interface. Press the < on the control panel; Menu button >; Enter the menu of "Menu Setting", press "measurement button" to move the cursor to "corneal unit", press "Print button" to select display single millimeter and diopter. After setting, press "measurement button" to finish setting and move the cursor to the next item "Corneal display Setting". Or move the cursor to "Exit menu" to exit directly.

#### 7.5.8. Corneal display Settings

(This function can only be used for one day for WZ-981KR model) Enter the measurement interface. Press the "Menu button" on the control panel to enter the "Menu Settings" menu, press the "Measurement button" to move the cursor to the "corneal unit", press the "Print button" to select the corneal display mode horizontal vertical or radius radius. After setting, press the "measurement button" to finish setting and move the cursor to the next item "Print Setting". Or move the cursor to "Exit menu" to exit directly.

### 7.5.9. Print Settings

Enter the measurement interface. Press the "Menu button" on the control panel to enter the "Menu Settings" menu, press the "Measurement button" to move the cursor to "Print Settings", press the "Print button" to select the printing paper display concentration 60%, 80%, 100%, 120%, 140%, or close. The factory default setting is 100%. After setting, press "measurement button" to finish setting and move the cursor to the next item "Screen saver Setting". Or move the cursor to "Exit menu" to exit directly.



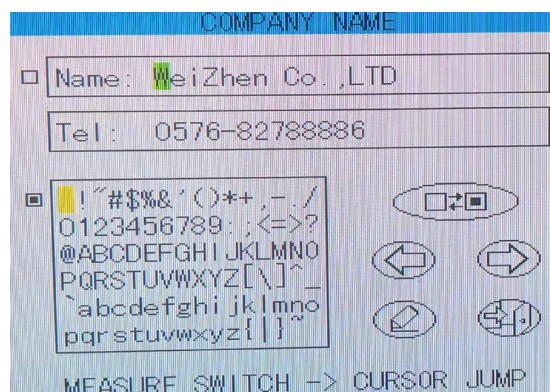
### 7.5.10. Screen saver Settings

Enter the measurement interface. Press the "Menu button" on the control panel to enter the "Menu Settings" menu, press the "measurement button" to move the cursor to "screen saver Settings", press the "Print button" to select screen saver time 5 minutes, 10 minutes, 30 minutes, 60 minutes. The factory default setting is 5 minutes. After setting, press the "measurement button" to finish setting and move the cursor to the next item "Company information". Or move the cursor to "Exit menu" to exit directly.

### 7.5.11. Company Information

Enter the measurement interface. Press the "Menu button" on the control panel to enter the "Menu Setting" menu, press the "Measurement button" to move the cursor to "Company information", press the "Print button" to enter, set the printing and display of the company name, the company name class capacity is 22 characters each, if too long, please shorten to 22 characters, phone number is 13 characters. Press the top or bottom of the left box of "Print button" to toggle the selected name column or character library. Press "menu button" to move the cursor left. Press "crystal button" to select the cursor to move to the right. Press "Measure button" to select jump between cursor lines. Press the Data button to determine the selected character. Press "Clear button" to save and exit after setting.

After exit, press "Measurement button" and move the cursor to the next item "Name print". Or move the cursor to "Exit menu" to exit directly.





### 7.5.12. Name Print

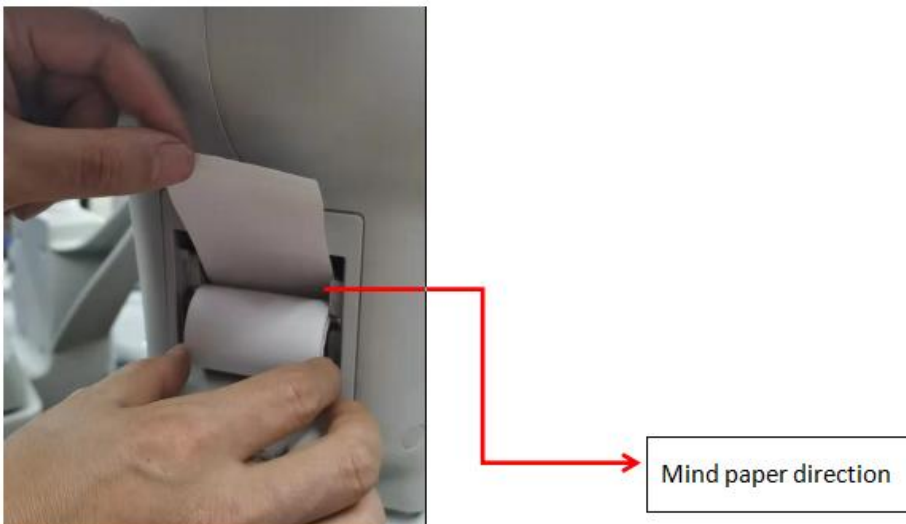
Enter the measurement interface. Press the "menu button" on the control panel to enter the "Menu Settings" menu, press the "measurement button" to move the cursor to the "Name Print" press the "Print button" to choose whether to print the company name. The factory default setting is Yes. After setting, press "measurement button" and move the cursor to "Exit menu" to exit directly.

## 8. Printer paper installation

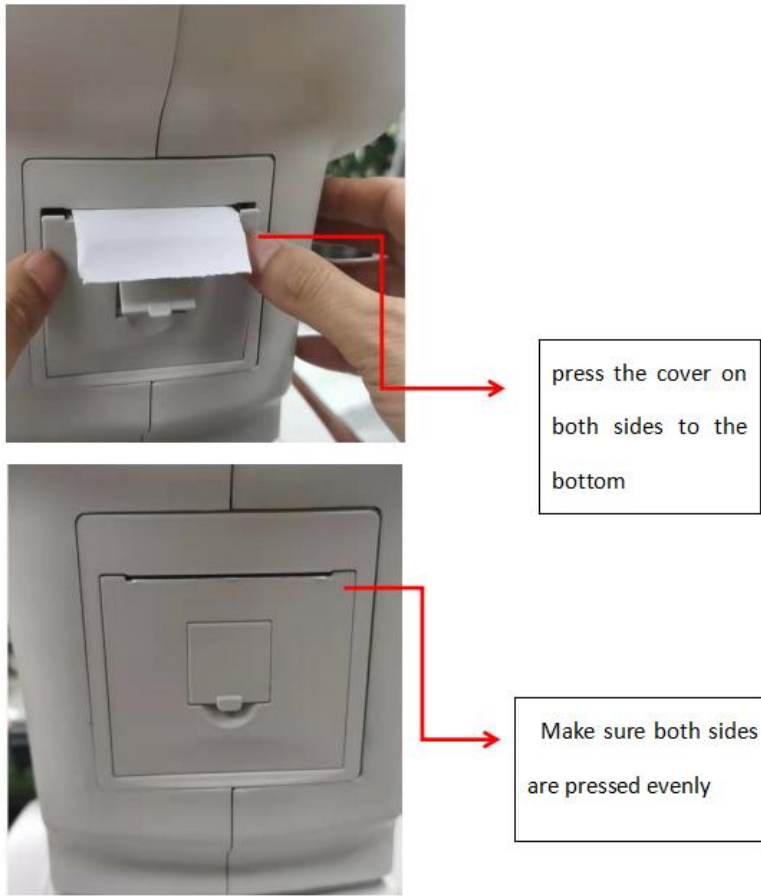
1. Open the cover with your finger. (as shown in figure)








2. Remove the printer drive shaft.
3. Install new printer paper.



Press the printer drive shaft with the cover.



| Warning   | Matters needing attention   |
|---|---|
|  | You can't print if the paper is turned upside down.   |
|  | The white pinion of the drive shaft faces right   |
|  | The paper must be 3~5cm beyond the drive shaft  |
|  | If there are extrusion marks or paper jam on the edge of the printing paper, replace the printing paper and drive shaft to adjust the distance between the two sides of the printing paper.             |
|  | If the printer is stuffed with paper, it will not print, and continued use may damage the printer. Open the cover of the printer, completely loosen the printer drive shaft, and remove the plug paper. |

## **9. Standard accessories**

Power cable: 1 PCS

Printing paper: 2 PCS

Mirror cloth: 1 piece

Dust cover: 1 PCS

Fuse (1.5A) : 2 PCS

Rubber plug: 1 piece

Instruction manual: 1 PCS

## **10. Maintenance instructions**

- (1) Check the instruments and components regularly.
- (2) It must be confirmed that the instrument can work safely and normally before being used again after long-term shutdown.
- (3) Check the window to avoid fingerprints, dirty spots and dust. Remove the dust with a balloon and gently wipe the surface with a clean gauze dipped in cleanser.
- (4) The instrument shell is dirty, use the attached cloth or dry soft cloth to wipe the surface, can not use chemical solvents.
- (5) Dust can damage the instrument, please cover with rubber plug and dust cover when not in use.
- (6) Repair and maintenance shall not be carried out when the user is in use.
- (7) The load of the jaw bracket is 3kg, please place the chin lightly on the jaw bracket when using.

## **11. Maintenance**

### **11.1. Routine inspection**

Check Windows for dust: Blow off dust with a mouthpiece

Check for handprints and grease stains on Windows: Blow off the dust with a mouthpiece and gently rub the surface with a clean cloth dipped in cleanser.



Dirty instrument case: wipe the surface with a cloth or dry soft cloth, do not use chemical solvents.

Cleaning application: wipe with a clean cloth.

### **11.2. Daily maintenance**

Dust can damage the instrument. Cover with rubber plug and dust cover when not in use.


Turn off the power when not in use.

| Warning   | Matters needing attention   |
|---|---|
|  | In order to avoid electric shock, do not open the instrument for repair without authorization. If you need repair, please contact the dealer. |
|  | To avoid electric shock, do not remove the top of the device, the base, the liquid crystal and the measuring head housing.                    |



If there is a fault, check it according to the following checklist.

Contact your vendor or manufacturer if the problem is not resolved after taking the following steps or if there is no such problem on the checklist.

| Fault                              | Situation   | Inspection   |
|------------------------------------|---|--|
| Nothing is displayed on the screen | The power lights don't work.<br>The fuse blew when the electricity was turned on. | Is the power source plugged in?<br>Is the instrument connected to the power cable?<br>Replace the fuse.  |
| The handle does not work           |   | Do not move the device. Contact the maintenance personnel.   |
| Can't print                        | Paper comes out instead of printing.<br>The paper won't come out.                 | Is the paper rolled in the right direction?<br>If you run out of printer paper, replace it with new printer paper.<br>Whether the paper is tilted. |

| Warning   | Matters needing attention   |
|---|---|
|  | The maintenance and calibration of computer optometry require professional equipment and personnel. Users are not allowed to maintain and calibrate independently. If you need to repair or calibrate, please contact the seller or manufacturer. |

### 11.3. Replace the fuse



| Warning   | Matters needing attention  |
|---|--|
|  | To avoid electric shock, pull out the power plug and then remove the fuse cover when replacing the fuse. Do not insert the power plug when the fuse cover is open. |
|  | Be sure to use the specified fuse (F1.5AL250V). Using other kinds of fuses may cause a fire.   |

(1) Turn off the power switch and pull out the power cable.

(2) Remove the fuse cover by gently pressing and turning counterclockwise with a screwdriver.

(3) Replace the old one with the attached fuse.


(4) After inserting the fuse cover, install the fuse in place by rotating it clockwise with a flat-head screwdriver.

| Warning   | Matters needing attention  |
|---|--|
|  | <p>The signal input and output parts of this instrument are only connected to the specified equipment required by the symbol GB9706.1</p>  |
|  | <p>Strictly follow EMC instructions during device installation and operation.</p> <p>① Do not use the device with other electronic equipment to avoid electromagnetic interference.</p> <p>② To avoid electromagnetic interference, do not place the device near other devices.</p> <p>③ Do not use the device in the same room with other life support equipment, other equipment that may cause serious imaging to the patient's life or treatment, low current measurement, or treatment equipment.</p> <p>④ Do not share the device with the portable mobile wireless communication system to avoid adverse effects on the operation of the device.</p> <p>Cables that do not conform to equipment specifications should not be used as it may lead to increased equipment or electromagnetic radiation, which can cause electromagnetic interference.</p> |

#### 11.4. Cleaning of products

- Usually to keep the product clean, can not use strong volatile solvents, diluents or benzene as cleaners.
- Buy a product by rubbing it down, either using a soft cloth dipped in soapy water and wringing it dry.
- To wipe your lenses and mirrors, you buy a ticket by blowing a balloon to remove foreign material on the surface and then wiping it down with a soft dry cloth.
- Costing patients to disinfect their forehead cushion and lower chin cushion after using the device. Method: Wipe with a soft cloth dipped in 75% medical alcohol.

#### 12. Scrap

| Warning   | Matters needing attention   |
|---|---|
|  | <p>In order to avoid potential hazards to the environment and human health, this instrument and accessories shall be disposed of (I) in accordance with the WEEE directive in eu Member States or (II) in accordance with local regulations in all other countries.</p> |

### 13. Electromagnetic compatibility

#### Instructions

- 1) Warning: Portable or mobile RADIO frequency communication equipment may image this product
- 2) Warning: This product should not be used close to or stacked with other devices. If it must be used close to or stacked with other devices, it should be observed and verified that it can operate normally in the configuration used.
- 3) Warning: Except transformers, motors and cables sold by our company as spare parts for internal components, the use of accessories (transformers, motors) and cables that are not specified may result in enhanced emission or reduced immunity of the equipment or system.
- 4) Special precautions concerning electromagnetic compatibility (EMC) must be taken for the equipment, and the EMC information specified in this manual must be installed and used.
- 5) Cables and accessories provided by the equipment must be used. The cable information is as follows:

| Name of the cable | Type                               | Length (m) |
|-------------------|------------------------------------|------------|
| Power cord        | 300V/500V<br>3*0.75mm <sup>2</sup> | 1.7m       |

1. Basic performance: The control function of the device is normal, and the printing operation can be normal.

Special precautions regarding electromagnetic compatibility (EMC) must be taken for the equipment, and the EMC information specified in this manual must be followed for installation and use.

Portable and mobile radio frequency communication equipment may affect the equipment.

With the exception of cables (transducers) sold as spare parts for internal components, the use of non-specified accessories and cables (transducers) may result in increased emission or reduced immunity of equipment or systems.

Equipment or systems should not be used in close proximity to or in combination with other equipment. If such proximity or combination is necessary, the equipment or system should be observed to verify that it works properly in the configuration in which it is used.

|   |                   |  |
|---|-------------------|--|
| Guide and Manufacturer's Statement - Electromagnetic launch   |                   |  |
| The purchaser or user shall ensure that the equipment is intended for use in the electromagnetic environment specified below: |                   |  |
| <b>Emission test</b>  | <b>Compliance</b> | Electromagnetic environments - A guide |


|  |              |  |
|--|--------------|--|
| Rf launch<br>GB 4824                               | 1 set        | The device uses RF energy only for its internal functions, so its RF emission is low and the likelihood of interference with nearby electronics is minimal             |
| <b>Rf launch</b><br>GB 4824                        | Class A      | <b>The equipment is suitable for use in non-domestic and all installations not directly connected to the public low voltage supply network of domestic residences.</b> |
| Harmonic radiation<br>GB 17625.1                   | Do not apply |  |
| Voltage fluctuation/flicker emission<br>GB 17625.2 | Do not apply |  |

| Guide and manufacturer's declaration - electromagnetic immunity   |  |  |  |
|---|--|--|--|
| The purchaser or user shall ensure that the equipment is intended for use in the electromagnetic environment specified below: |  |  |  |
| Immunity test   | IEC60601 Test level  | In line with the level   | Electromagnetic Environment Guide  |
| Electrostatic discharge (ESD)<br>GB/T 17626.2   | $\pm 6\text{kV}$ contact discharge<br>$\pm 8\text{kV}$ air discharge   | $\pm 6\text{kV}$ contact discharge<br>$\pm 8\text{kV}$ air discharge   | Floors should be made of wood, concrete or ceramic tiles, and if covered with synthetic materials, the relative humidity should be at least 30%  |
| Group of electrical fast transient pulses<br>GB/T 17626.4   | $\pm 2\text{kV}$ for power line  | $\pm 2\text{kV}$ for power line  | The grid power supply shall be of the quality typical for use in a commercial or hospital environment.   |
|   | $\pm 1\text{kV}$ for input/output lines  | Do not apply   |  |
| Surge<br>GB/T 17626.5   | Plus or minus 1 kv line to line<br>Plus or minus 2 kv line to ground   | Plus or minus 1 kv line to line<br>Plus or minus 2 kv line to ground   | The grid power supply shall be of the quality typical for use in a commercial or hospital environment.   |
| Voltage sag, short interruption and voltage change on the power input line<br>GB/T 17626.11                                   | < 5% UT, lasts 0.5 cycles (on UT, >95% drop-off)<br>40% UT, lasts 5 cycles (60% drop on UT)<br>70% UT for 25 cycles (30% drop on UT)<br>< 5% UT for 5s (On UT, > 95% drop-off) | < 5% UT, lasts 0.5 cycles (on UT, >95% drop-off)<br>40% UT, lasts 5 cycles (60% drop on UT)<br>70% UT for 25 cycles (30% drop on UT)<br>< 5% UT for 5s (On UT, > 95% drop-off) | The grid power supply shall be of the quality typical for use in a commercial or hospital environment. If the user needs to run continuously during the power interruption, it is recommended that the device be powered by an uninterruptible power supply or battery |

|   |       |       |  |
|---|-------|-------|--|
| Power frequency magnetic field (50Hz)<br>GB/T 17262.8                             | 3 A/m | 3 A/m | The power-frequency magnetic field shall have the horizontal characteristics of a typical site in a typical commercial or hospital environment |
| <b>注:</b> UT refers to the ac network voltage before the test voltage is applied. |       |       |  |

| Guide and manufacturer's declaration - electromagnetic immunity   |                                     |                        |   |
|---|-------------------------------------|------------------------|---|
| The purchaser or user shall ensure that the equipment is intended for use in the electromagnetic environment specified below: |                                     |                        |   |
| Immunity test   | IEC60601 Test level                 | In line with the level | Electromagnetic Environment Guide   |
| <b>Radio frequency transmission</b><br>GB/T 17262.6   | 3 V (valid value)<br>150kHz - 80MHz | 3 V (valid value)      | Portable and mobile RF communication equipment should not be used closer to any part of the equipment, including cables, than the recommended isolation distance. The distance is calculated by a formula corresponding to the transmitter frequency  |
| Radiofrequency radiation<br>GB/T 17262.3  | 3 V/m<br>80MHz - 2.5GHz             | 3 V/m                  | <p>Recommended isolation distance</p> $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P} \quad 80\text{MHz}-800\text{MHz}$ $d = 2.3\sqrt{P} \quad 800\text{MHz}-2.5\text{GHz}$ <p>式中:</p> <p>P -- In watts (W) according to the maximum output rating of the transmitter provided by the transmitter manufacturer;</p> <p>D -- is the recommended isolation distance in meters (m).</p> <p>The field strength of a stationary RF transmitter is determined by surveying the electromagnetic field (A) and should be b below the coincidence level in each frequency range.</p> <p>Interference may occur near the device marking the following symbols.</p> |



|  |  |  |   |
|--|--|--|---|
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Note 1: For 80MHz and 800MHz frequencies, the formulas for higher frequency bands are used.

Note 2: These guidelines may not be suitable for all situations. Electromagnetic propagation is affected by absorption and reflection from buildings, objects and human bodies.

A: Stationary transmitters, such as base stations for wireless (cellular/cordless) telephones and terrestrial mobile radios, ham radio, AM and FM radio broadcasts, and television broadcasts, have field strengths that cannot be accurately predicted in theory. In order to evaluate the electromagnetic environment of fixed radio frequency transmitter, the survey of electromagnetic field should be considered. If the field intensity at which the device is located is measured is higher than the applicable RF compliance level described above, the device should be observed to verify that it is operating properly. If abnormal performance is observed, supplementary measures may be necessary, such as reorientation or positioning of equipment.

B: In the whole frequency range of 150khz-80mhz, the field intensity should be less than 3V/ M.

**Recommended isolation distances between portable and mobile RF communication equipment and equipment**

The device is intended for use in an electromagnetic environment where rf radiation disturbance is controlled. Depending on the maximum rated output power of the communication equipment, the purchaser or user can prevent emi by maintaining the minimum distance between portable and mobile RF communication equipment (transmitter) and the equipment recommended below

| Maximum rated output power of transmitter<br>W | The isolation distance of different frequencies of corresponding transmitters /m |                                     |                                      |
|--|--|-------------------------------------|--------------------------------------|
|  | 150kHz - 80MHz<br>$d = 1.2 \sqrt{P}$   | 80MHz - 800MHz<br>$d = 1.2\sqrt{P}$ | 800MHz - 2.5GHz<br>$d = 2.3\sqrt{P}$ |
| 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 the maximum rated output power of the transmitter not listed in the above table, the recommended isolation distance D, in meters (m), can be determined by the formula in the corresponding transmitter frequency column, where P is the maximum rated output power of the transmitter provided by the transmitter manufacturer. In watts (W).

**Note 1: For 80MHz and 800MHz frequency points, the formula of higher frequency band is adopted.**

**Note 2: These guidelines may not be suitable for all situations. Electromagnetic propagation is affected by absorption and reflection from buildings, objects and human bodies.**