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EPD-1800

PUPILLOMETER

# User's Manual

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E<sup>Z</sup>ER

# Contents

|                                                       |    |
|-------------------------------------------------------|----|
| 1. Uses and Characteristics .....                     | 1  |
| 2. Main Technical Indexes .....                       | 2  |
| 3. Description of the Structure.....                  | 3  |
| 3.1 Description of the Front Panel.....               | 3  |
| 3.2 Description of the Rear Panel .....               | 5  |
| 3.3 Viewing from Measuring Window.....                | 6  |
| 3.4 Viewing from Observed Window .....                | 7  |
| 4. Operational Instructions .....                     | 8  |
| 4.1 About Battery .....                               | 8  |
| 4.2 Initiation of theStart-Up System .....            | 8  |
| 4.3 Measurement of Binocular Pupillary Distance ..... | 8  |
| 4.4 Measurement of Monocular Pupillary Distance ..... | 11 |
| 4.5 LED and automatic power-off settings.....         | 11 |
| 5. Maintenance .....                                  | 12 |

# **1. Uses and Characteristics**

## **1.1 Uses**

PD Meter is a precision optical instrument used to measure distance between pupils in the process of optometry for spectacles.

## **1.2 Characteristics**

This device is a scientific and reasonable design, consisting of measurement system, optical system, ESS and computer software system into a whole.

- Using mechanical hairspring to level at the reflecting point of human cornea to realize the consecutive measurement. It features direct point-sampling and high accuracy of orientation.
- Adopting high-precision line-shaped sensors, advanced intellectualized electronic systems and digital display which allow the testing results more visible, legible and accurate.
- The design of LED lamp-house and low-power consumption ensure the prolonged service life of batteries.
- It offers the +2.00D compensation for the visual degree.
- The brightness of LED lamp-house is adjustable.

## 2. Main Technical Indexes

### 2.1 Effective range of measurement:

Binocular pupillary distance: 45~82 mm

Left or right pupillary distance: 22.5-41 mm

### 2.2 Absolute value of indicated error: $\leq 0.5$ mm

### 2.3 Absolute value of asymmetrical error: $\leq 0.5$ mm

### 2.4 Absolute value of rounding error: $\leq 0.5$ mm

### 2.5 Distance of target: 30 cm~ $\infty$

### 2.6 Power source: Voltage: DC 3.7V

Specification: A A battery

Quantity: 1 pieces

### 2.7 Time for automatic shut-off:

About 0.5 minute after stopping operation, or turn it off manually.

### 2.8 Size: 221mm(L) x 167mm(W) x62mm(H)

### 2.9 Weight: 0.53kg

## 3. Description of the Structure

### 3.1 Description of the Front Panel(as shown in Fig. 1)

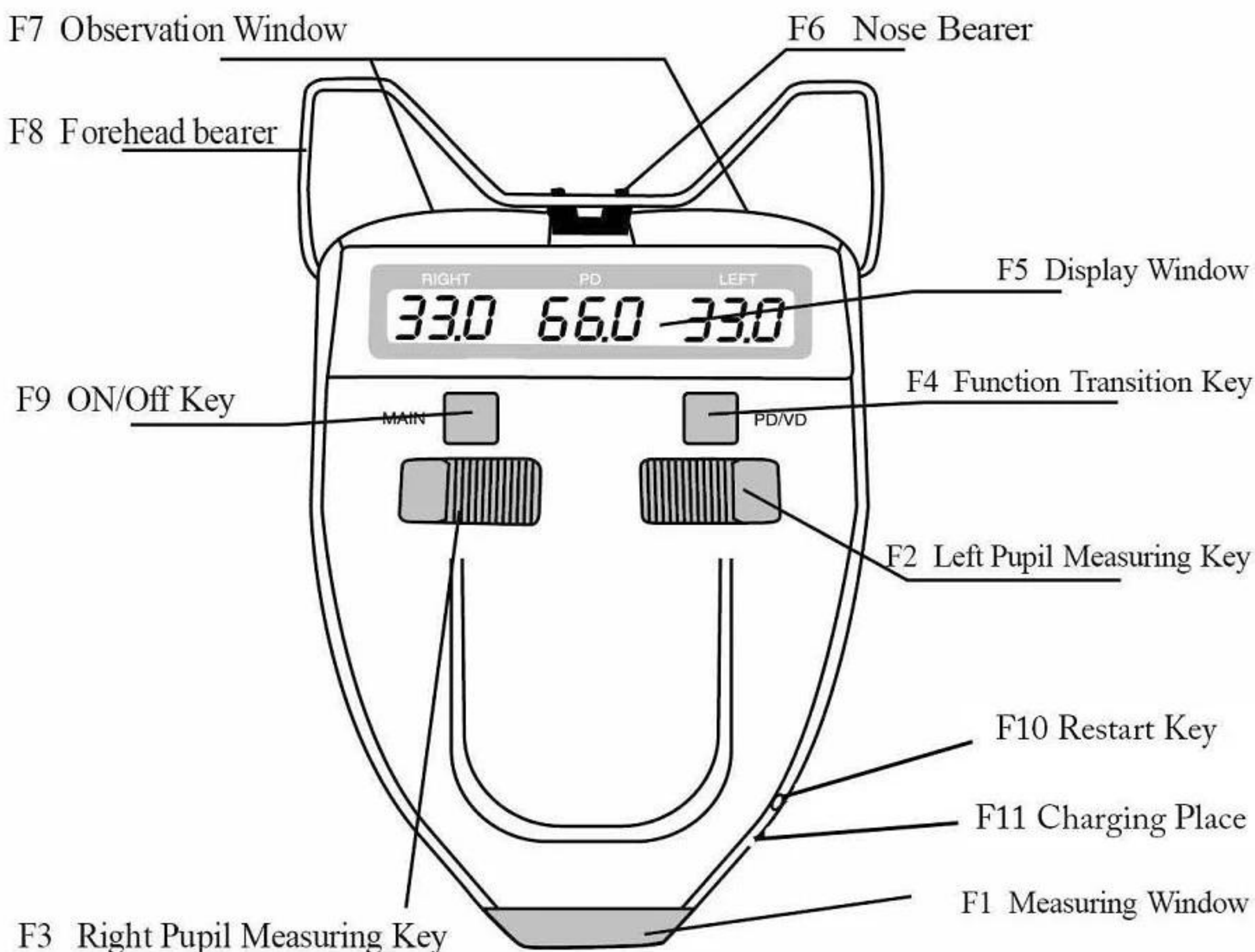


Fig.1

#### F1 Measuring Window

The working window for opotometrist

#### F2 Left Pupil Measuring Key

It is used to measure left pupillary distance. Sliding the key to the outer side ,the numerical value of the left eye and binocular pupillary distance will rise gradually. Sliding the key to the inner side,now numerical value of the left eye and binocular pupillary distance will decrease gradually

**F3 Right Pupil Measuring Key**

It is used to measure right pupillary distance. Sliding the key to the outer side ,the numerical value of the right eye and binocular pupillary distance will rise gradually. Sliding the key to the inner side,now numerical value of the right eye and binocular pupillary distance will decrease gradually

**F4 Function Transition Key**

- a. Pressing the key when it's used will be into the mode of measnirig the height of PD.
- b. Function Transition Key is used to set the brightness of LED, automatic power-off time and measurement precision.

**F5 Display Window (as shown in Fig.2)**

It displays the measured numerical value of PD, and some other relevant information.

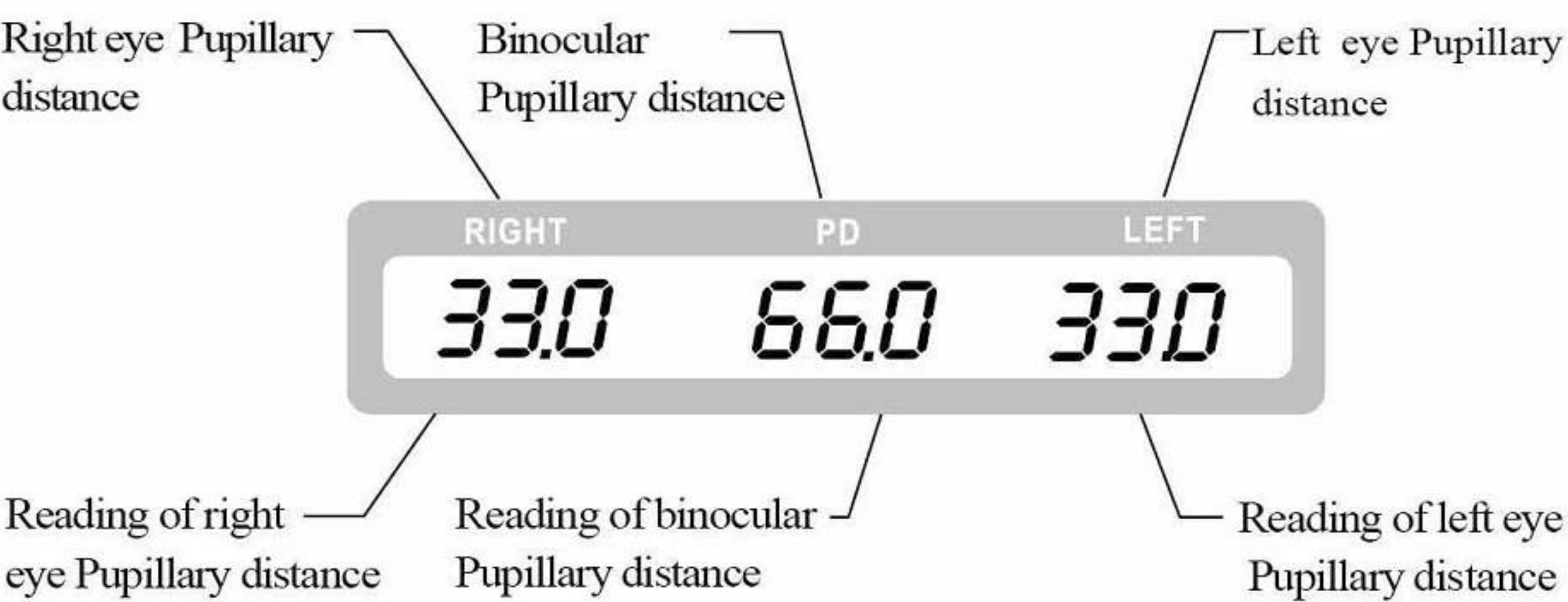


Fig.2

**Note ►** When reading information on the display window, the Right reading denotes the distance between center of nose and right eye pupillary, and the Left reading denotes the distance between center of nose and left eye pupillary. PD value stands for the distance between left eye pupil and right eye pupil. The unit is mm.

### **F6 Nose Bearer**

The testee's nose rests on the nose bearer in order to fix the PD and the position of the testee's pupils.

### **F7 Observation Window**

Two windows are provided for a testee to stare at the target with his (her) eyes.

### **F8 Forehead bearer**

The testee's forehead rests on the forehead bearer to assist orientation of pupils.

### **F9 ON/Off Key**

Press this key to turn on the device, and press it again to turn off.

### **F10 Restart Key**

Once the machine cannot work, press the key and then it will work again.

### **F11 Charging**

When you charge the battery, pls connect the charger with charger position

## **3.2 Description of Rear Pane (as shown in Fig.3)**

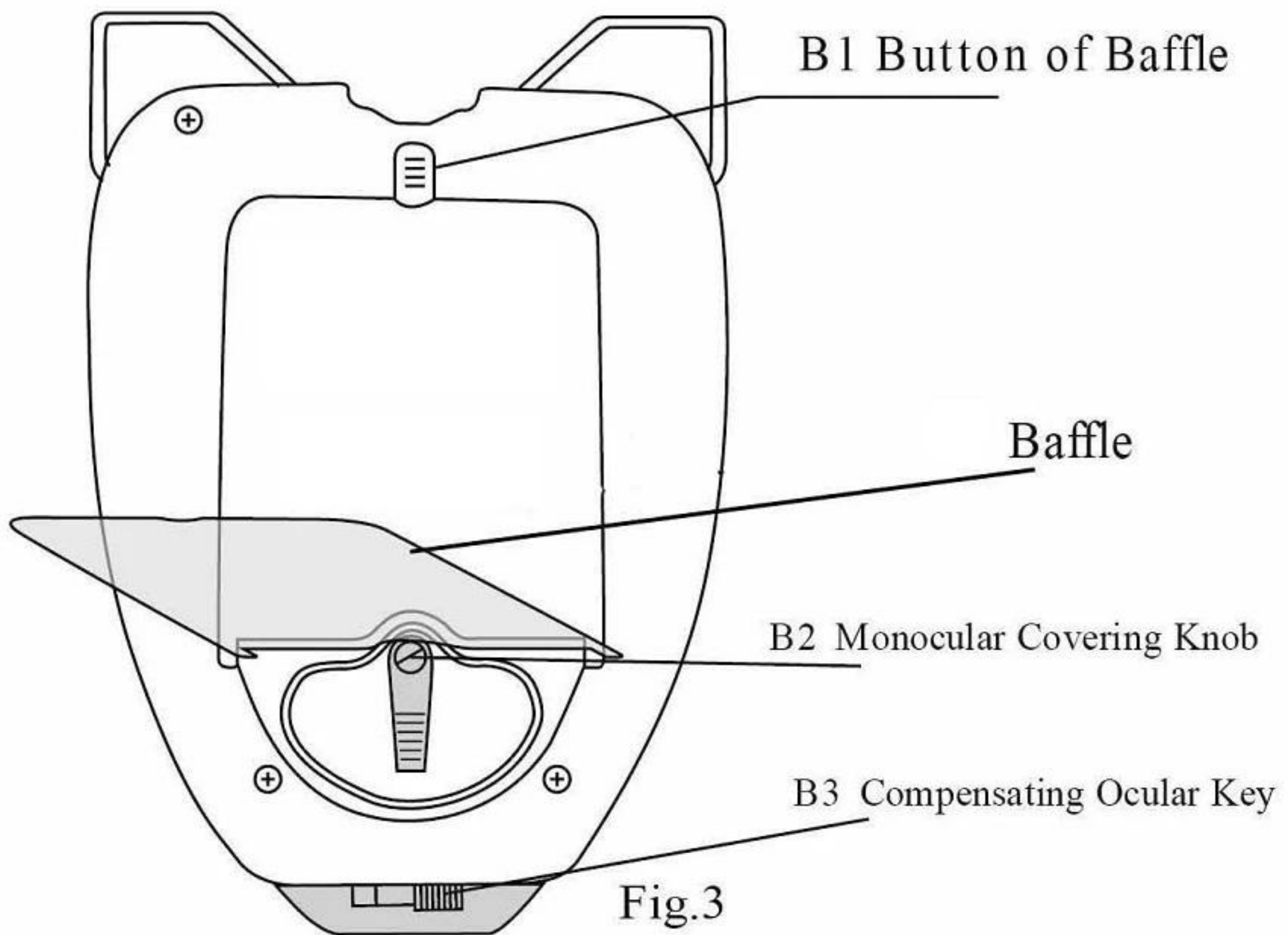
### **B1 Button of Baffle**

### **B2 Monocular Covering Knob**

To separately cover testee's right or left eye by turning the knob.

### **B3 Compensating Ocular Key**

Sliding the key can make a +2.00D compensation for the diopter of eyes.



### 3.3 Viewing from the Measuring Window (as shown in Fig.4)

#### C1 Benchmark Hairspring

When the optometrists use the device, they can slide the key and make the benchmark hairspring level at the reflecting light spot of the testee's pupils.

#### C2 Measuring Window

It's used to observe the green target for testee.

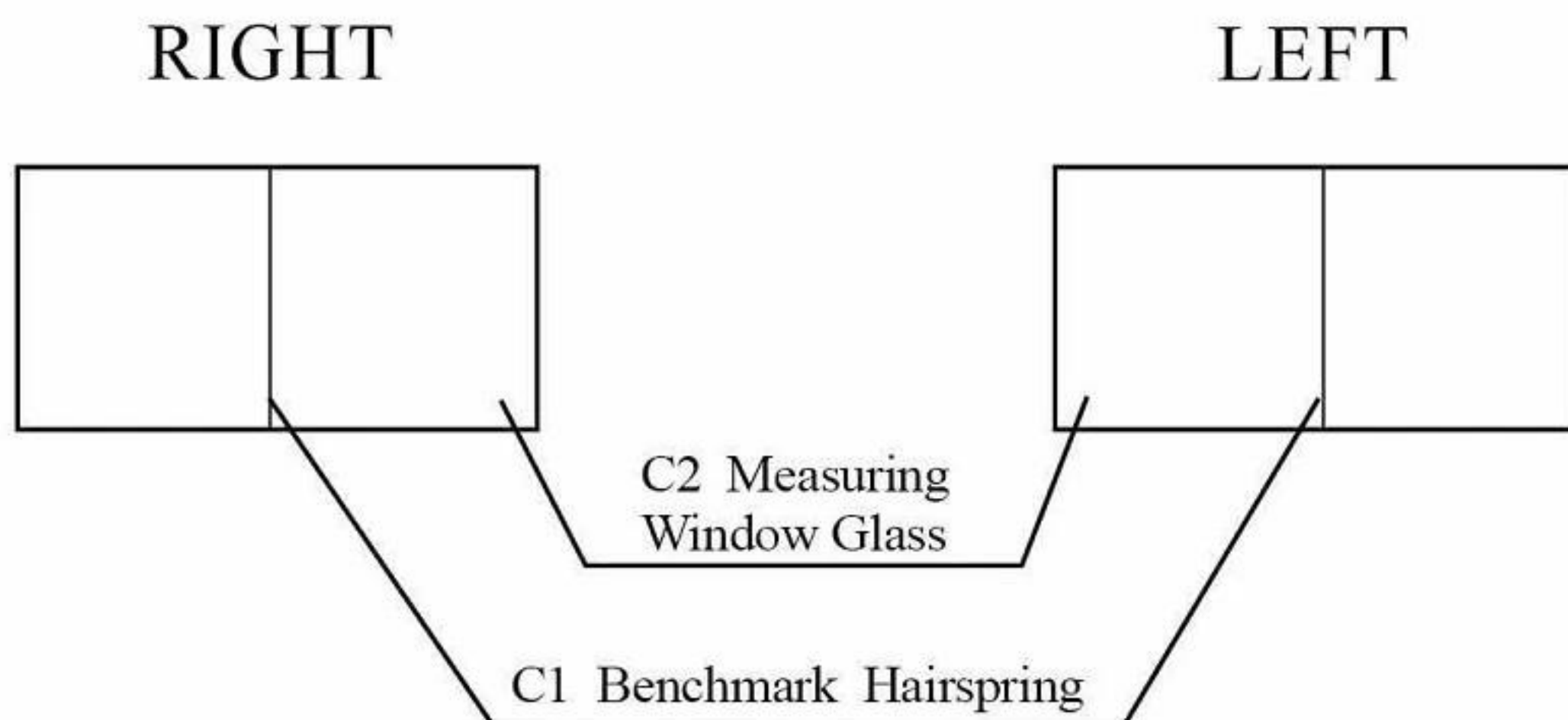


Fig.4

### 3.4 Viewing from the Observation Window (as shown in Fig.5)

Staring at the target

In the center of the device's inner visual field, an eyeball-shaped circle can be seen. It is a green target surrounded with a bright ring. A testee should stare at the target with two eyes when measuring. To adapt to the testee's eyes, the device sets an adjustable function of LED brightness.

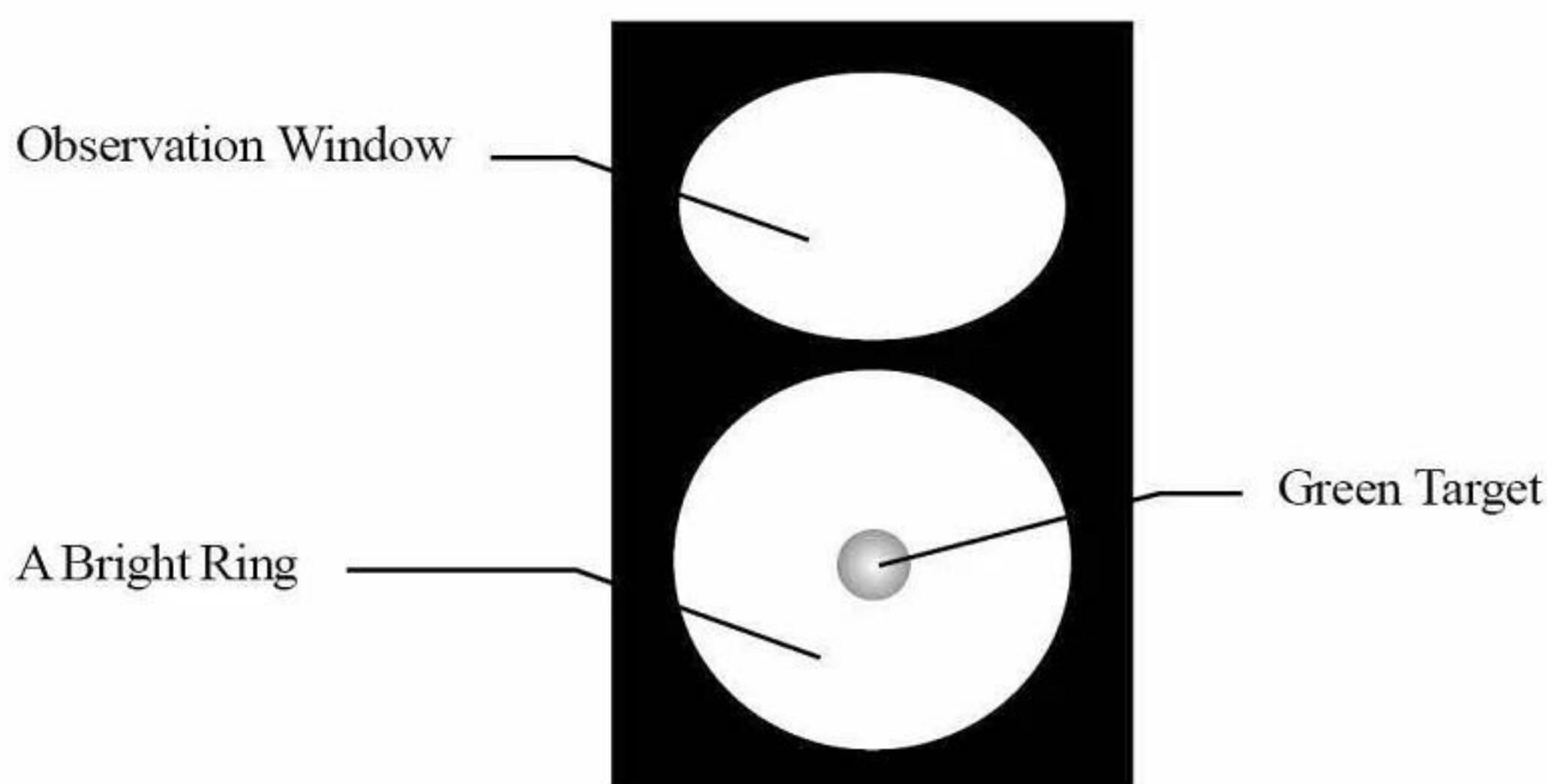


Fig.5

## **4. Operational Instructions**

This is a high-tech intellectual instrument, which is very easy to operate. Please operate it according to the following procedures, thus you can get measuring data easily and rapidly.

### **4.2 Start-Up**

Press ON/OFF key to make the start-up of the device. When the data is displayed on the corresponding LED window, now you can make the measurement.

### **4.3 Measurement of Binocular Pupillary Distance**

**4.3.1** Start-up. The initialized setting of the device for the binocular pupillary distance is  $\infty$  optic distance.

**4.3.2** Put the forehead bearer lightly on the testees's forehead and nose bearer lightly on testee's nose, then keep the device in a horizontal state(as shown in Fig.6).

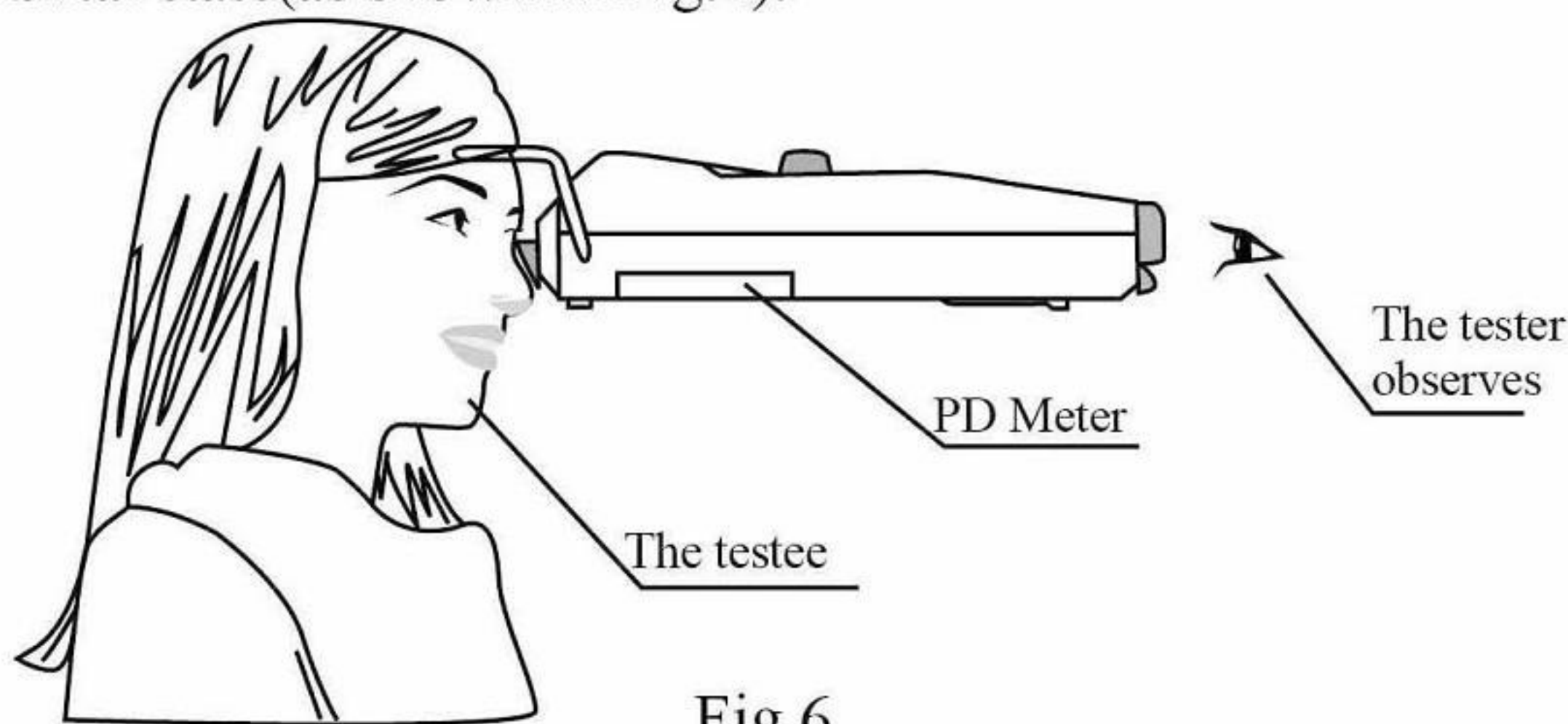


Fig.6

**4.3.3** Let the testee stare at the green target inside of the device.

**4.3.4** The tester observes the reflecting light spot on the testee's pupil through measuring window. Side the Left and Right Pupils Measuring Keys, the left and right pupillary distance pointers will coincide with the reflecting light spots of the testee's left and right pupils, respectively(as shown in Fig.7a and Fig.7b ). The data shown in the display window is the measured pupillary distance.

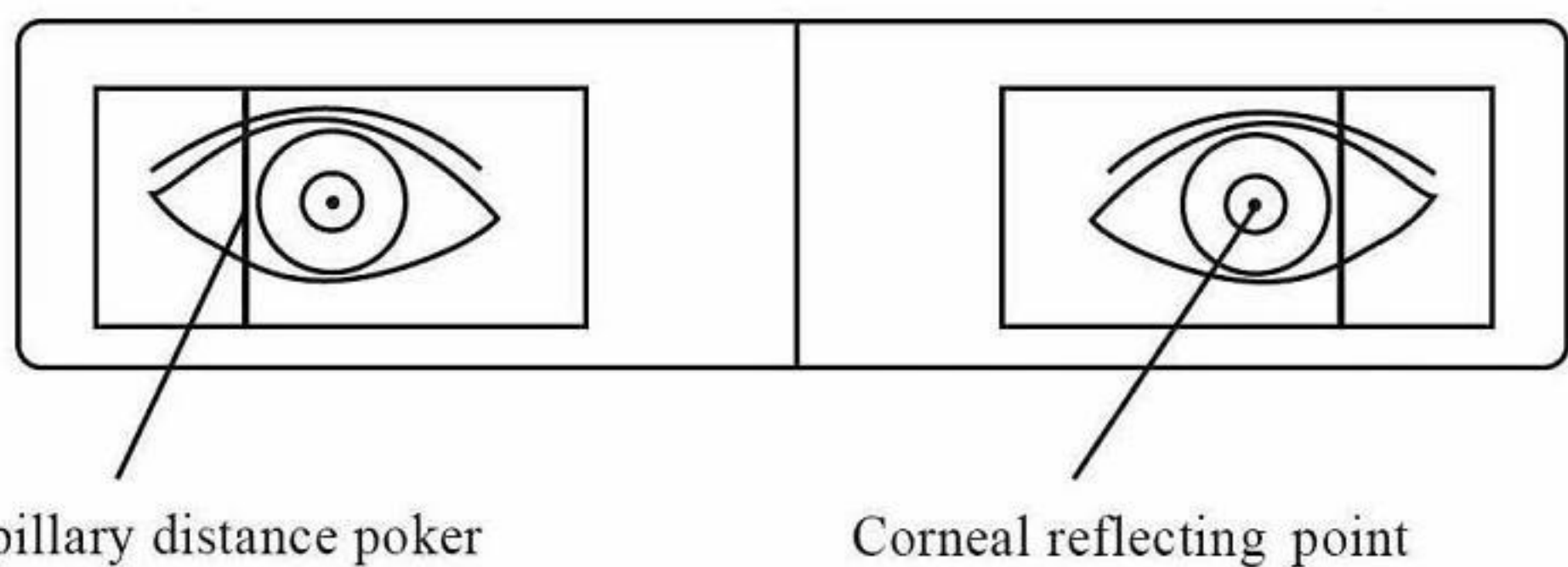


Fig.7a (The sight is what the tester observes through measuring window)

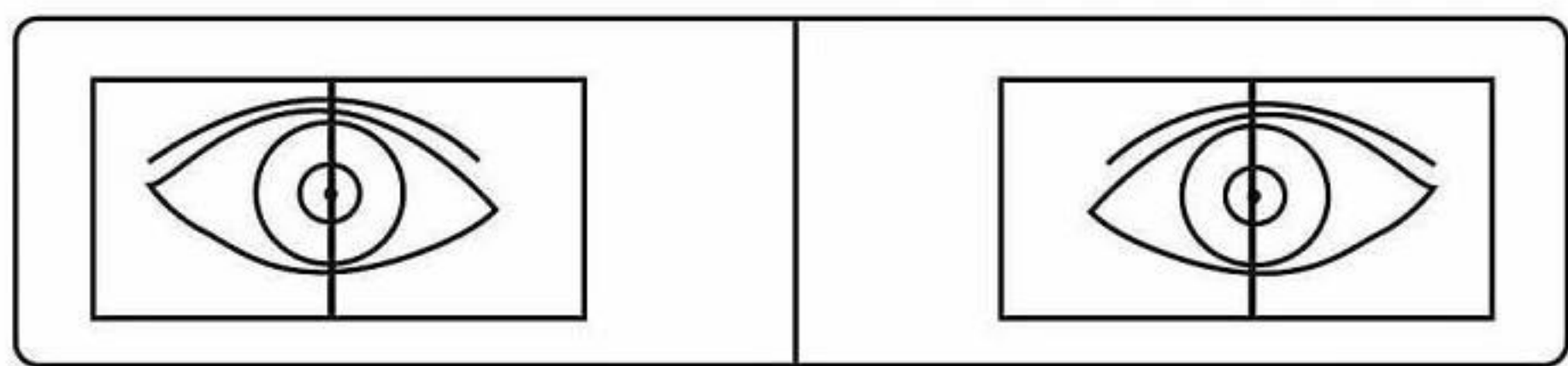
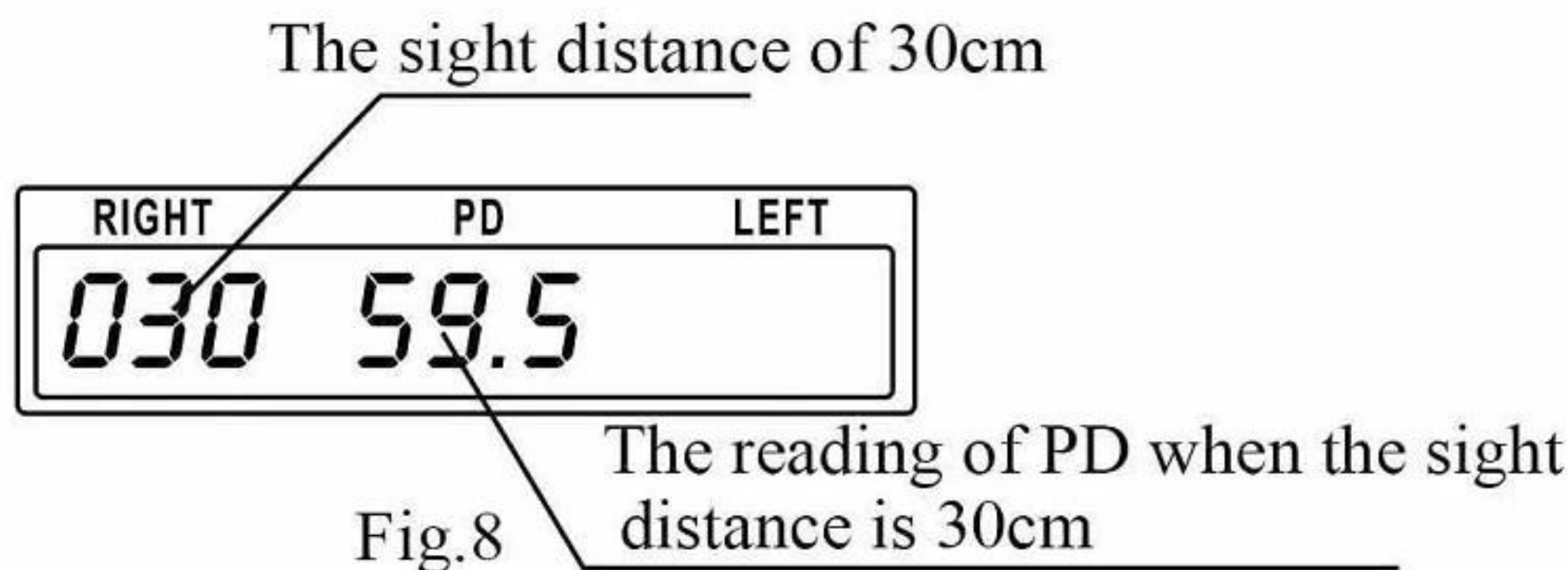


Fig.7b (The left and right pointers coincide with the reflecting bright dots)

**4.3.5** Related information about conversion of myopia on display window(Fig.8)



The Function Transiton key can be called PD conversion key . After finishing the measurement of hypermetropia, pressing the key the numerical value of optic distance can be converted into the sight numerical value at 30cm, 40cm,50cm,1m, 2m oneby one (Fig8) indicates the sight distance is 30cm and the pupil distance is 59.5cm.

**4.3.6** Under the measuring when the data in display window shows that the right pupil distance is 41.0mm and the left pupil distance is 22.5mm, then pressing the key will be into the mode of measaring the height of pupil.

**Important Matters ►**

In the process of measurement (and the measurement of monocular pupillary distance described in the following section), to achieve precise data of measurement and make process of measurement easily and quickly, the tester should remind the testee to always stare at the green target in a level state without moving his (her) eyeballs.

## 4.4 Measurement of Monocular Pupillary Distance

**4.4.1** When needing to measure the left or right pupillary distance, please turn the Monocular Covering Knob (as shown in Fig.3 NO.2) which can cover the other eye completely(as shown in Fig.9a and Fig.9b).

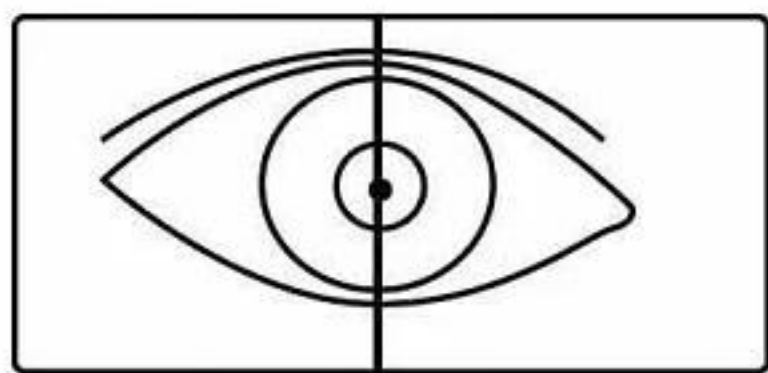


Fig.9a (Measuring right pupillary distance)

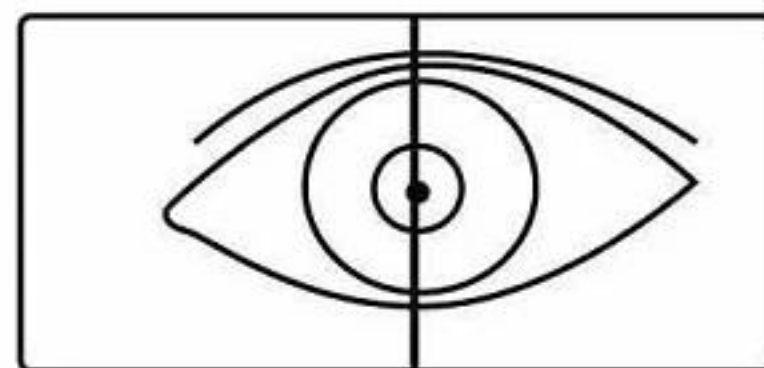


Fig.9b (Measuring left pupillary distance)

**4.4.2** The tester observes the reflecting bright dot on the testee's pupil through measuring window. Slide the Left or Right Pupils Measuring Keys, the left or right pupillary distance pointers will coincide with the reflecting bright dots of the testee's left or right pupils, respectively. The data shown in the display window is just the measured pupillary distance.

## 4.5 LED and automatic power-off settings

**a.** Put left pupil measuring keys to the left end and the right key to the right end and keep them there, then press F4 (Function Transition Key) continuously 5 times till the screen shows image of “.....” ..After this, move the right measuring key to the other side or press Function Transition Key again, then it will be into the Led brightness and automatic power-off setting mode.

- b.** Under the mode, moving left measuring key is to adjust automatic power-off time, and the corresponding data will be shown on the screen (time range: 0.5-3minutes with an interval of 0.5minutes.)
- c.** Moving right measuring key is to adjust LED brightness and the corresponding LED current value (the bigger the LED current value, the brighter the LED lamp shines) is shown on the screen, (current value range: 0.5-5 mA with the interval of 0.5mA)
- d.** When the above two sets are done, pressing the Function Transition Key can save the set values and the device returns to measuring mode.
- e.** Under measurement precision setting mode, sliding Left Pupil Measuring Key can set precision display to be 0.1. 0.2 or 0.5. When the precision is done, press Function Transition Key to save again , then the machine returns to the measurement mode.

## **5. Maintenance**

- 5.1** It has been precisely adjusted before delivery. Please do not dismantle it so as to keep it precise.
- 5.2** It shall be stored and used in an airy and dry indoor place.
- 5.3** As a high-tech product, the device shall be prevented from vibrating or crashing.
- 5.4** Keep it clean and do not touch surface of the vision window glass. Fingerprint, dust or stain should be cleaned with absorbent cotton dipping the mixed liquid of alcohol and ether.
- 5.5** Any corrosive chemical is forbidden to clean it.
- 5.6** In case of malfunction, do not dismantle it by yourself. Please contact the local sales agent or the manufacturer for help.



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