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User's Guide for Rebound-Tonometer

SW-500



Applanation Tonometer

SW-500



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1.Introduction

Dear User:

Thank you for purchasing SW-500 Ophthalmic A scan. This user manual is designed for mainly introducing interface and operation method. We recommend you carefully read and follow the steps in this guide to ensure that the machine would have optimum performance.

If you need more information, please contact with after-sales.

2.Theory and Function

1. Theory

A raise in intraocular pressure in human's eye will lead to an increase in the hardness of surface of the eyeball. Therefore, Rebound-Tonometer has used the probe to hit onto different angle of the surface of object to measure intraocular pressure for the principle based on different reaction when probe rebounds back within a certain velocity. The Rebound-Tonometer has adopted the principle to use multi-circle drive for multi-section or single section of the magnetic probe to accelerate the probe to a certain speed in the direction to assess corneal movement, and then record down the reaction between the time when probe touches and leaves the surface of eyeball, the Rebound-Tonometer software system will finally work out the relevant intraocular pressure according to different surface of hardness of eyeball that probe has touched on.

2.Function

- 1) SW-500 Rebound-Tonometer is a handset device
- 2) The probe has very less contact with patient, avoiding discomfort reaction
- 3) automatic exist function of probe

3.Performance Index

- Measure Range :3mmHg~70mmHg。
- Measure Error:
 - $\pm 1.5\text{mmHg}$ ($3\text{mmHg} \leq \text{intraocular pressure} \leq 25\text{mmHg}$);
 - $\pm 2.5\text{mmHg}$ ($25\text{mmHg} < \text{intraocular pressure} \leq 70\text{mmHg}$);

4.Environment Requirement

Transport and Storage:

- Ambient temperature: $-20^{\circ}\text{C} \sim +55^{\circ}\text{C}$
- Relative moisture: $\leq 95\%$
- Atmosphere pressure: $500\text{hPa} \sim 1060\text{hPa}$

Running:

- Ambient temperature: $+5^{\circ}\text{C} \sim +40^{\circ}\text{C}$
- Relative moisture: $\leq 80\%$



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- Atmosphere pressure: 700hPa~1060hPa
- Rating voltage: DC3V (2 AA Batteries)
- Rating input power: 1VA

5.Application Range of Product

The product is provided to hospital for measuring intraocular pressure of the human eyeball.

6.Contraindication

- Device should not be used when:
 1. Cornea pathological changes, such as oedema, inflammation, scar and so on.
 2. Increased thickness of cornea or un-smooth of cornea.
 3. Children under 10 years old that could not cooperate with the examination.

7.Safety Classification

Interior power supply, Type B  application, normal devices

8.Symbol



Warning, May cause hurt or damage



Hint, how to use it better



Type B



Warning! Refer to attached



Power



Attention: May cause harm to machine and accessories.

9.Precaution

1. Allocation, Transportation and Installation

Process for allocation, installation and transportation should meet following requirements:



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- ➡ The device should avoid both direct sun radiation and ultraviolet radiation;
- ➡ Avoid water or any other liquid running into the keyboard or shell;
- ➡ Avoid contact with chemical and corrosive medicament;
- ➡ Avoid in the environment of high content in salt, sulfur, toxic gas and airborne dust;

- ⚠ Avoid sun radiation and other dispersion of rays when install and use of device;
- ⚠ Keep away from strong magnetic or electric field or other strong disturbance sources when installation and using device.

2. Use

- ⚠ The forehead-stand should be sterilized by 75% of alcohol tampon before measurement.
- ⚠ Always keep the measuring display window clean.
- ➡ The probe for measuring intraocular pressure are one-off use, regard as basic expendable.
- ➡ We suggest before using the device, use the product in the market of nursing liquid of cornea contact lens to sterilize the probe or apply previous method for sterilization.
- ➡ The built-in software has been installed before leaving the factory, for upgrading, please contact after-sales department.
- ➡ Take out the batteries when not intend to use the device within a certain period.

Other Instruction

- Keep away from strong magnetic or electronic field.
- The temperature limits of internal battery $\leq 60^{\circ}\text{C}$
- others: low dust



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10.Product composition

Rebound tonometer is composed of probe.measurement system and display system.

1. close-up view



Picture 1



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2.Display on screen

Measure interface:



eye group

result of three measurement

average

Picture 2

Browse interface



No.

Right eye result

Left eye result

time/date

Picture 3

11.Install and Connection

1. Check the package to see if anything missing.
2. Install the batteries into the container refer to the picture below.
3. Press the power switch, to enter into measure state



Picture 4



+ Picture 5



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See picture 4: remove the battery lid of the tonometer, according to the direction of the arrow.

See picture 5: put two AA batteries into the battery box, battery anode facing the battery lid.

12.SOFTWARE OPERATION

1. INTERFACE SWITCH AND SELECTION

Press key L and key R at the same time, you can enter the interface of main menu, begin operation under the main menu interface

short press key L OR R, you can switch five interface in turn: MEASURE, BROWSE, TIME,DELDATE,BACKLIGHT)

short press “enter” and enter into the relevant interface

press “L” and “R” at the same time ,turn back to the main menu.

2. MEASURE INTERFACE

enter into the right eye measure interface by default

short press “R” at the right eye measure interface, and measure the pressure of right eye

short press “L”, switch to the left measure interface at the right eye measure interface;

after finished, short press “enter” to display the result of right eye, press “enter” again to save the result of measure.

long press “enter” when display or save the result of left and right eye, the measure result can be printed and it display “print” on the screen.

 **short press “L”** when measure the pressure of left eye at the left eye measure interface.

short press “R”,switch to the right measure interface at the left eye measure interface;

3. BROWSE INTERFACE

short press“ R” o check the measured values in order

short press“ L” to check the measured values in reverse.

long press “enter”, print all the saved result, “print” was displayed on the screen

4. SET TIME INTERFACE

Short press “R” to switch the location which need to be modified.

Short press “L” to modify the number at current position

Short press “enter” to save the time which was modified



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5. DELETION OF DATA INTERFACE

Short press “enter” to delete all the saving result, and display “no data”.

6. BACKLIGHT ECT. INTERFACE

Short press “enter”, to turn on or off the backlight

7. TURN ON OR OFF THE MACHINE

Hold down the switch, boot, then you can release the button
short press the switch, turn off, and you could hear two “beep”.

If the device is idle for 3 minutes, then it is automatically shutdown



Note: when the key is invalid, the buzzer beep twice

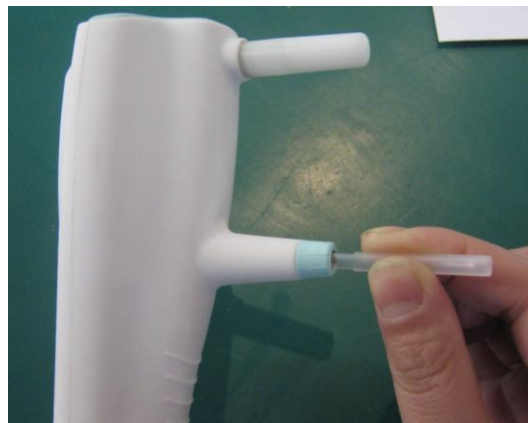
Switch machine for less than 5 seconds interval

13.MEASUREMENT

1. Instore probe



Open the plastic tube which have probe



Aim the tube mouth to the probe mouth

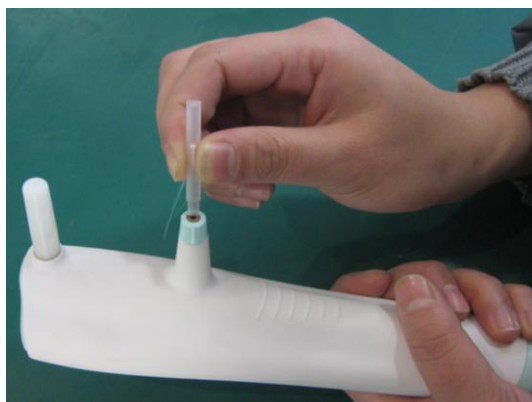


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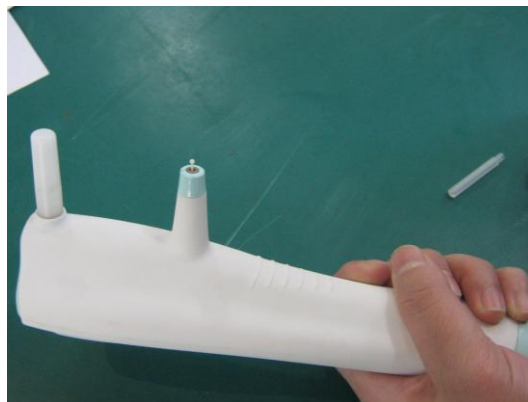
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Rotating the tonometer, keep the mouth-pin vertically upward , sliding probe needle freely



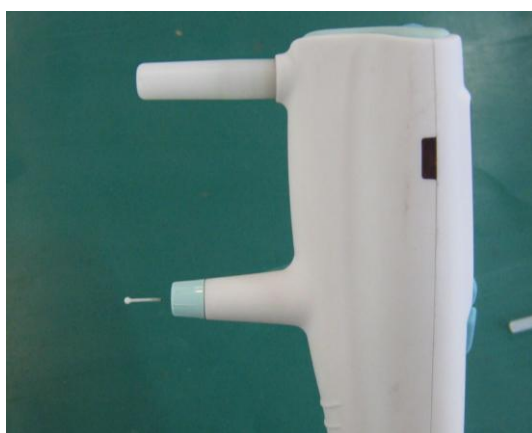
Removal the plastic pipe installed probe



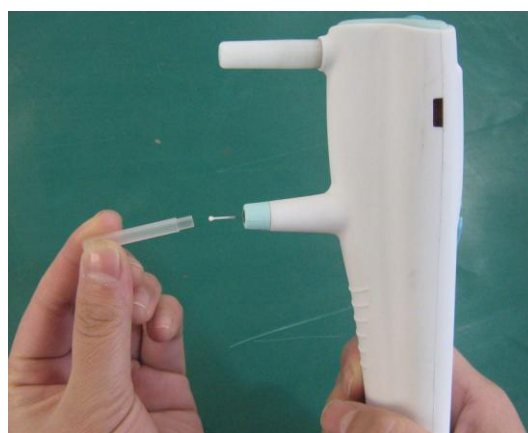
- Notice 1:The first time to use the probe should seek for the image by pressing the measure key, which to make sure the parts of the probe or the magnetic part and the circus to keep within the certain range. To keep the probe lateral and be far away from the eye when using the probe to seek for the image.
- Notice 2:The corneal contact lens on sale is preferred to disinfect the probe head, or the equivalent method is also available.

2. QUIT THE PROBE

long press “R” at the measure interface, tip: “QUIT PROBE”



Short press “enter”, pop-up pin, display "NO PROBE"



Move the plastic pipes in parallel, put the pin into plastic tube into plastic tube



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Reverse the tonometer, keep the out of the pin mouth vertically downward, the probe sliding into plastic pipe

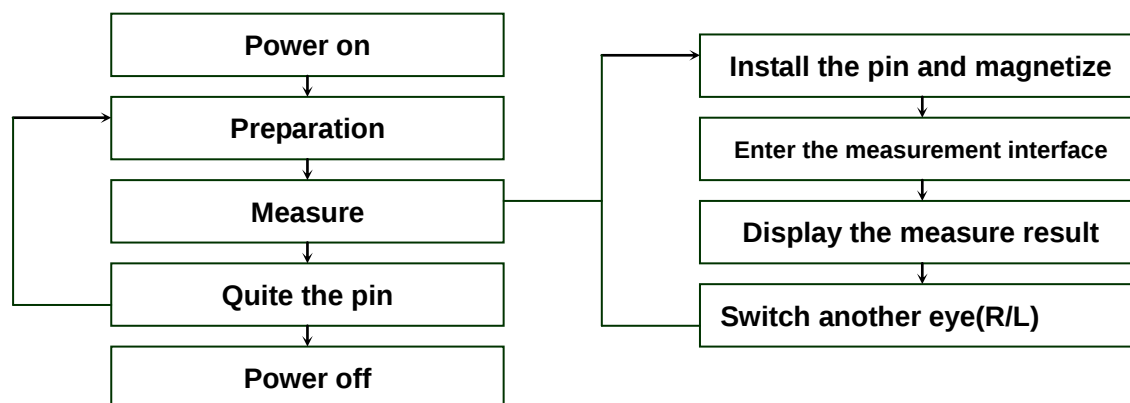
Install the pin into the plastic tube



Note: the operation of withdraw the pin must be completed at the measurement interface

3. MEASUREMENT

1) Operational processes of Tonometer measurement



2) Patients' preparation:

To select the proper posture to take measures according to the patients' conditions, and explain to patients the process of the measurement to help them relax.

3) Measurement:

A、To enter the measurement interface;

B、To handhold tonometer's handle and contact the forehead closely, and properly adjust the forehead transducer to make the probe and the central cornea keep vertical, the distance of the probe and the central is 4mm-9mm.

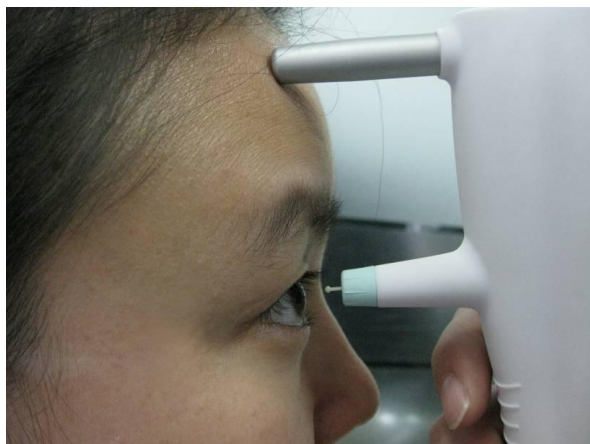


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picture 6

C. Press L to measure the left eye, and the probe rebound and contact with the cornea slightly and recovered quickly. TO measure the effective data three times and the computer will work out and show the average automatically. Press R to measure the right eye, and the process is the same with the left.

D. In the process of the measurement, if the measurement data changes a lot, the measurement data will be cleared.

E. To measure 5 times continuously, if the effective measurement stays the same, the measurement data will be cleared automatically.

 In the process of measurement, the eyes of the measured should keep level; the posture should cooperate with the operators.

4) Hints for measurement errors:

-  Failure of detecting the probe after start, to display "NO PROBE"
-  Unsatisfactory image, to display "POOR PROBE"
-  The probe is too close to the central cornea, to display "NEAR";
-  The probe is too far from the central cornea, to display "FAR";
-  The velocity of the probe without no obvious moves, to display "NO MOVE"
-  The velocity of the probe is fast, to display "SPEED HIGH";
-  The velocity of the probe is slow, to display "SPEED LOW";
-  The object is too soft, to display "SOFT";
-  The object is too hard, to display "HARD";



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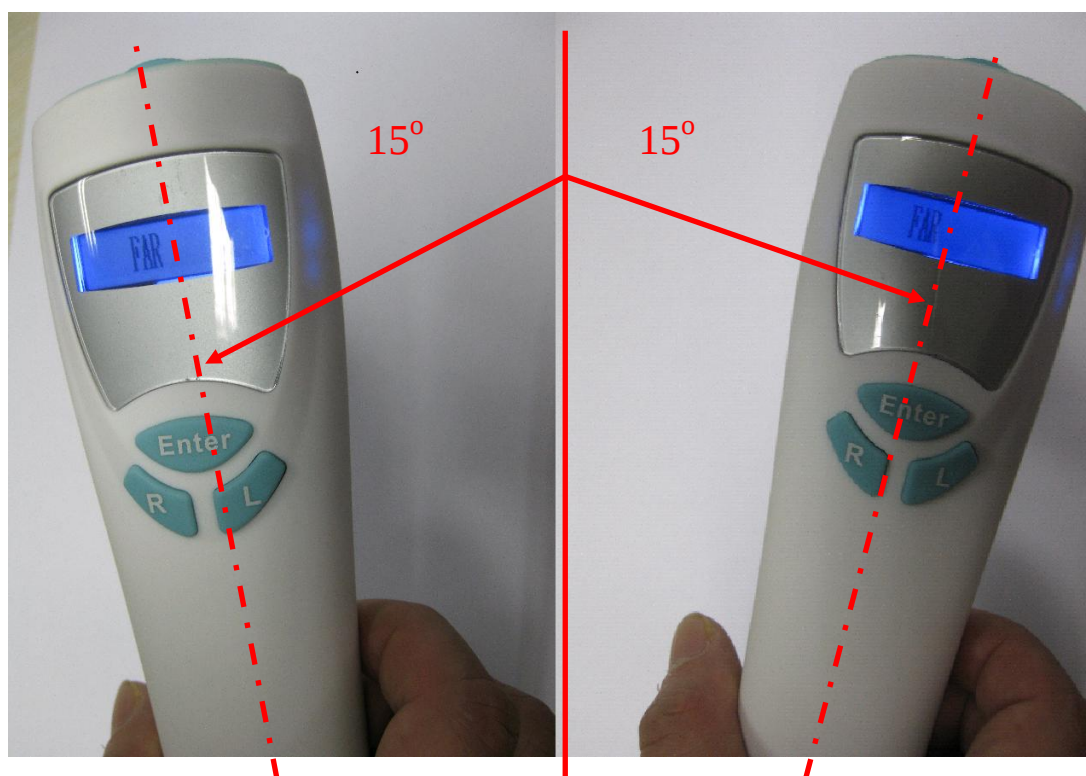
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5) Precautions and common problems in the measurement

- ➡ To keep the probe and the central cornea vertical
- ➡ To support the eyelids with hands is available, but don't sneeze the cornea
- ➡ In the measurement process, the flashing of the battery symbol in the screen, it means the battery is in low power, and to change a new one
- ➡ The handle and the vertical angle aren't more than 15 degrees no matter to the left (to the right). Referenced as the picture.



Picture 7

14. Products maintenance

1.Maintenance of the products

- 1.The instrument should be installed indoors with good ventilation and avoid direct sun radiation
- 2.Don't use any causticize cleanser when cleaning the device. Otherwise it is possible to



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erode the surface of the instrument. Avoid water or any other liquid running into the keyboard or shell. Turn off the power before cleaning.

3.The instrument is key, delicate and expensive. Do not stress it, knock it or fall it from high place.

4.To check the battery whether it is in corrosion; if the instrument is not in use for a long time, please take off the battery:

5. It is not permitted that user himself disassembles the main unit or probe. If there are any problems, please send it to our company and the distributor.

6. No strong magnetic or electric field or other high-frequency equipment



The waste battery will pollute the environment, please don't litter casually



To dispose the toxic and hazardous components of the obsolete equipment as required, to avoid environmental pollution.

2.Cleaning and disinfections

1.After the measurement of the patient, to clean the forehead support contacting with the patient's skin with 75% alcohol cotton ball

2.To clean and disinfect the surface of the testing system every week(to wipe with 75% alcohol cotton ball), after using the tonometer, it should be placed in a clean box to avoid the dust falling to make sure the exact measurement.

3.to clean the screen of the tonometer with the specific paper to avoid the scuffing.

3. Calibration

1. To calibrate the tonometer according to the standard of the imitation to measure the internal pressure of the eye on the application of the tonometer

2. To calibrate the tonometer according to the standard of the imitation to measure the internal pressure of the eye after its repair

4.package and transportation

The packed instrument can be transported by transportation vehicles. It must not be transported together with goods that are easy to burn, explode, or corrode. Also it should be protected from shock and moisture.

The instrument should be stored in the environment with ambient temperature from -20°C to 55°C , with the relative humidity under 95%, where there is no corrosive gas, strong mechanical vibration, shock or magnetic effect. The room in which the instrument stored should be with good ventilation and avoid direct sun radiation.

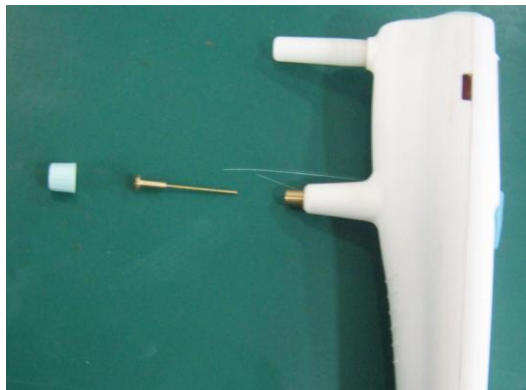
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5. To change the probe set assembly

The instrument is not in use for a long time, which will make the inner wall of probe set stocked, the probe will not work or work less effectively, if it is not the problem of the probe slanting or the shortage power of the battery, it need to change the probe set.



Unscrew the lock cap



Pull the probe

- To change the probe sets assembly and screw the lock cap

15. Trouble shooting

If the instrument doesn't work properly, please refer to the following table. If the problems are still not solved, please contact our company or the distributor.

PHENOMENA	REASONS	METHODS
Blank screen	Bad connection of the power plug The battery is out of power	Re-insert the plug to connect it well with the socket To change a new battery
Display on the stating scene	To start less than 10s	To wait until 10s later
	Disturbance of the software	Note down the details and contact us
Probe can not stuck	The battery with low power The probe is slanting The probe sets assembly is plugged	To change a new battery To change another probe To change the probe sets assembly



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16.Statements

1.Warranty Description

All the accessories should be well kept. If anything is missing, the warranty will not be available. Please don't open the instrument seal.

The device receives rigorous manual inspection and testing before leaving the factory. Free repair or replacement of device is supplied in the warranty period, but such repairs are unavailable out of the warranty period.

The damage caused by the users' improper operation is out of the scope of the warranty.

2. Statements:



1. Pictures in the instructions are only for reference, all products as per the material subjects.



2. Users can purchase the printer equipped with infrared interface

Packing List of SW—500 Rebound Tonometer

No.	Name	Account
1	Main unit	1 set
2	Suitcase	1 piece
3	Probe	1 case
4	Probe tube assembly	1 piece
5	Belt	1 piece
6	Wrist strap	1 piece
7	Users' manual	1 piece
8	Certificate	1 sheet
9	Maintenance Card	1 sheet