

Handhold Auto Refractometer

easyRef

User Manual



Shenzhen CERTAINN Technology Co., Ltd

Please read the manual carefully before using the device

Handhold Auto Refractometer

User Manual

Revision Control Copyright

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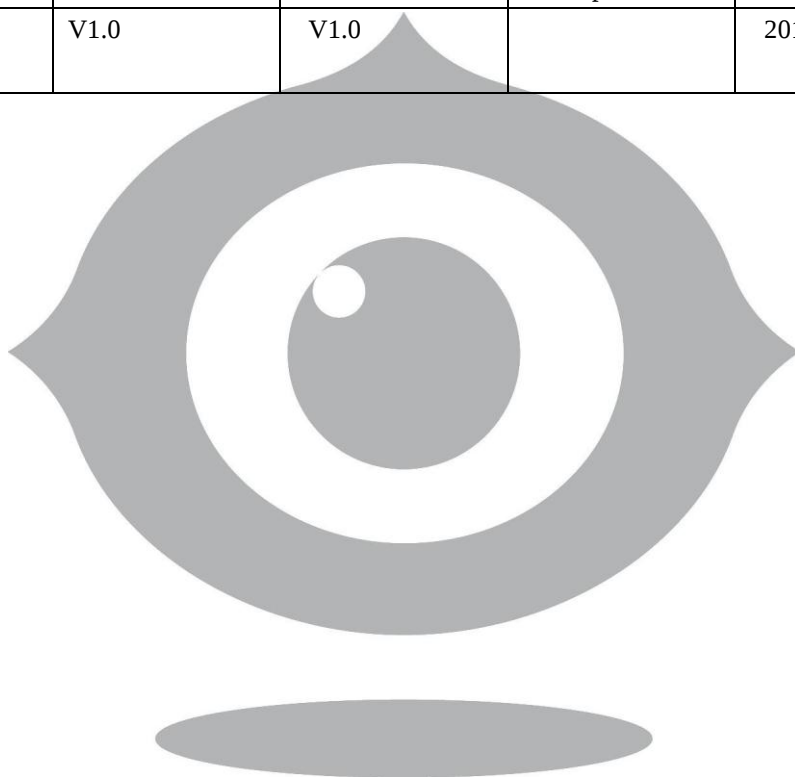
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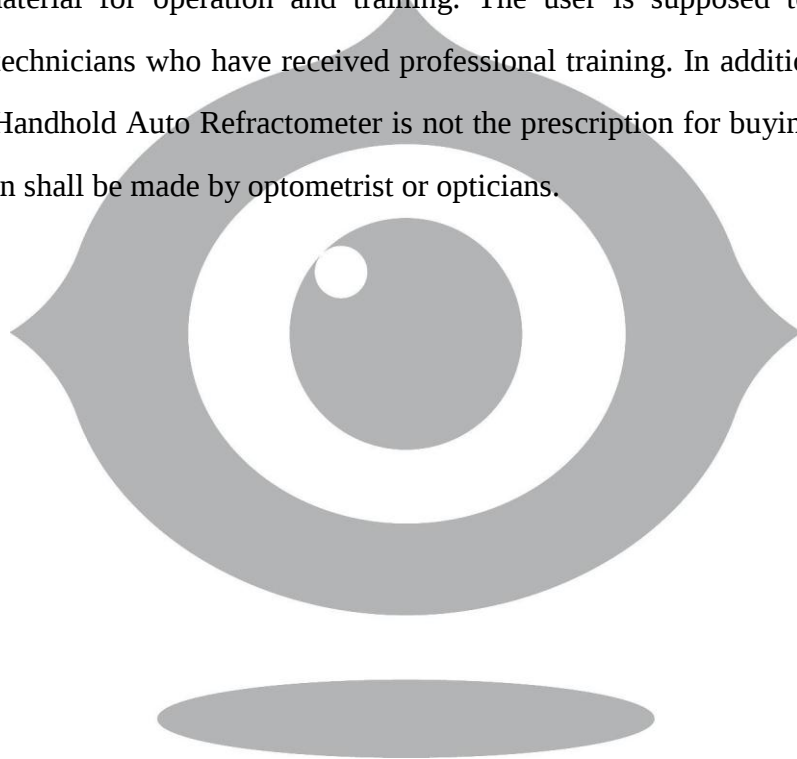
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Preface

We appreciate your purchase of our product easyRef Handhold Auto Refractometer. easyRef Handhold Auto Refractometer mainly used for the preliminary measurement and screening of human eye diopter, And compared with other Handhold Auto Refractometer, its biggest advantage is portability and unique inspection method.

This operation instructions manual is designed by Certainn and only applies to easyRef Handhold Auto Refractometer. It may cause damage or inaccurate inspection results if it is used in an inappropriate way. This manual is recommended to be used as reference material for operation and training. The user is supposed to be medical workers or technicians who have received professional training. In addition, the results of easyRef Handhold Auto Refractometer is not the prescription for buying glasses, the final decision shall be made by optometrist or opticians.



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Chapter1. Important Representation

1.1 Important Representation

Before using, please read this manual carefully. And please pay more attention to the security guidance. Other uses of this instrument are illegal.

- Only be used and operated strictly according to this user manual.
- Only the person authorized by Certainn can maintain the instrument.
- Since we will constantly improve our production, Certainn reserves the right to change the technical specifications without the prior notice.
- The model number, manufacturing number, accession designation number, registered standard, manufacturing year are indicated on nameplate of the instrument.

1.2 Symbol Description

1.2.1 Explanation of warning symbols on the instrument



Caution: consult accompanying documents.

Note: There are important operating and maintenance instructions found in the manual.



Type B Applied parts.



Medical device



Serial number

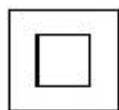


batch number



Class 1 laser product

Note: This label indicates that there is a laser nearby, please pay attention to safety



Class II equipment



European Conformity



Manufacturing Date



Please read the manual prior to any operation.



No Sitting



No Pushing.



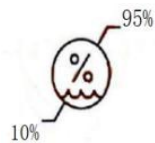
Fragile, Handle with care



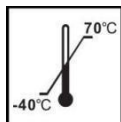
Keep Dry



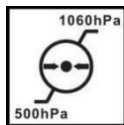
This way up



Humidity limitation (10% to 95%, including condensation)



Temperature limit (-40deg. C to 70 deg. C)



Atmospheric pressure limitation (500 hPa to 1060 hPa)



Note: No Roll over



manufacturer

1.2.2 Position of the product label and serial number

The product label is attached on back cover of the equipment:

1.2.3 Explanation of symbols in the user manual



The symbol warns that violation of operating procedures may cause malfunctions and personal injury. Violation of the handling procedures will damage the instrument or accessory equipment!



The part that identifies this symbol in the manual must be executed!

1.3 Security Requirements

1.3.1 Safety Notes

This product complies with the requirements of EU medical device regulations

According to IEC 60601-1-2 :2014 EMC classification, this instrument is categorized as following:

Class II devices 、 (Internal power supply equipment) , Handheld ordinary equipment

B type –Degree of protection against electric shock of applicable parts (Forehead pad)

Degree of protection against liquid immersion: IPX0.

Class of operation: Continuous.

1.3.2 Light radiation safety



According to IEC 60825-1 -2014, this instrument is a class 1 laser product.



Operation of the product must be carried out in accordance with the user manual, unauthorized or disassembly of the instrument may lead to radiation hazards.



When using this product, we should avoid long direct light exposure window

which may cause retinal injury.

 Please Do not open the instrument enclosure without permission, which may cause accidental light radiation hazard.

 The light source used in this product is the specified accessories. If it needs to be replaced and returned to the factory for processing, any unauthorized customer service personnel or agents shall not disassemble the equipment without permission to replace and repair the light source, otherwise it may cause damage to the instrument and/or Light radiation hazard.

1.3.3 Electromagnetic Compatibility

Notes: easyRef Handhold Auto Refractometer conforms to IEC60601-1-2:2014 EMC requirements.

User must install and operate the device based on the provided EMC information.

Portable or mobile RF communication device might influence the performances of easyRef Handhold Auto Refractometer , please avoid strong electromagnetic disturbance.

Instructions for use:

The ME EQUIPMENT or ME SYSTEM is suitable for healthcare environments and so on.



Warning: Don't near active HF surgical equipment and the RF shielded room of an ME system for magnetic resonance imaging, where the intensity of EM disturbances is high.

Warning: Use of this equipment adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this equipment and the other equipment should be observed to verify that they are operating normally.

Warning: NOTE The EMISSIONS characteristics of this equipment make it suitable for use in industrial areas and hospitals

(CISPR 11 class A). If it is used in a residential environment (for which CISPR 11 class B is normally required) this equipment might not offer adequate protection to radio-frequency communication services. The user might need to take mitigation measures, such as relocating or re-orienting the equipment.

Warning: Use of accessories, transducers and cables other than those specified or

provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result in improper operation.”

Warning: Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the Handhold Auto Refractometer (easyRef), including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.

Warning: Only the power adapter and battery approved by Certainn can be used. In order to avoid damage to the instrument, please do not change the charging parts

Even if other devices meet the emission requirements of the corresponding national standards, the easyRef Handhold Auto Refractometer may still be interfered by other devices.

Warning: Do not approach active high-frequency surgical equipment and magnetic resonance imaging systems in radio-frequency shielded rooms, where the intensity of EMI disturbances is high.

Warning: Make sure that all electrical accessories connected to the easyRef Handhold Auto Refractometer must comply with IEC 60601-1,. if in doubt, consult the technical service department or your local representative

Warning: No unauthorized modification allowed of the ME EQUIPMENT

Caution: Please do not connect a removable storage device to the equipment without permission, in order to avoid potential computer virus. Computer virus may affect equipment performance, damage patient database, even void the warranty.

Warning: Any non-medical peripheral devices equipment connected to the interface ports must be certified according to the respective IEC standards (for example, IEC 60950 for data processing equipment and IEC 60601-1 for medical equipment) Also, all configurations shall comply with the system standard IEC 60601-1. Any person who connects or installs accessories to the system has the responsibility to verify the compliance.

1.3.3.3 : If any: a list of all cables and maximum lengths of cables (if applicable), transducers and other ACCESSORIES that are replaceable by the RESPONSIBLE ORGANIZATION and that are likely to affect compliance of the ME EQUIPMENT or ME SYSTEM with the requirements of Clause 7 (EMISSIONS) and Clause 8 (IMMUNITY). ACCESSORIES

may be specified either generically (e.g. shielded cable, load impedance) or specifically (e.g. by MANUFACTURER and EQUIPMENT OR TYPE REFERENCE).

If any: the performance of the ME EQUIPMENT or ME SYSTEM that was determined to be ESSENTIAL

PERFORMANCE and a description of what the OPERATOR can expect if the ESSENTIAL

PERFORMANCE is lost or degraded due to EM DISTURBANCES (the defined term “ESSENTIAL PERFORMANCE” need not be used).

The following cables should be used to meet the requirements of electromagnetic emission and anti-interference:

No	Cable name	Manufacturers	INPUT	Output
1	switching power adaptor	Dongguan Shilong Fuhua Electronic Co., Ltd.	100-240V~50/60Hz,500mA	5.0V  2.0A

RF transmitter equipment and system requirements:

No	Types	Launch frequency	Modulation type	Frequency characteristics	Radiated power	Remark
1	Bluetooth	2402MHz-2480MHz	FHSS,GFSK,D PSK,DQPSK	2.4G	≤ 20dBm	

Battery information

No	Types	Model	Ratings	Remark
1	Rechargeable Li-ion Battery	PL113565	3.8Vd.c.,3800mAh	

EMC (IEC 60601-1-2: 2014)

The ME EQUIPMENT or ME SYSTEM is suitable for Professional healthcare environment and so on.

1. all necessary instructions for maintaining BASIC SAFETY and ESSENTIAL PERFORMANCE with regard to electromagnetic disturbances for the expected service life.
2. Guidance and manufacturer's declaration -electromagnetic emissions and Immunity.

If any: a list of all cables and maximum lengths of cables (if applicable), transducers and other ACCESSORIES that are replaceable by the RESPONSIBLE ORGANIZATION and that are likely to affect compliance of the ME EQUIPMENT or ME SYSTEM with the requirements of Clause 7 (EMISSIONS) and Clause 8 (IMMUNITY). ACCESSORIES may be specified either generically (e.g. shielded cable, load impedance) or specifically (e.g. by MANUFACTURER and EQUIPMENT OR TYPE REFERENCE).

If any: the performance of the ME EQUIPMENT or ME SYSTEM that was determined to be ESSENTIAL PERFORMANCE and a description of what the OPERATOR can expect if the ESSENTIAL PERFORMANCE is lost or degraded due to EM DISTURBANCES (the defined term “ESSENTIAL PERFORMANCE” need not be used).

Table 1

Guidance and manufacturer's declaration - electromagnetic emissions	
Emissions test	Compliance
RF emissions CISPR 11	Group 1
RF emissions CISPR 11	Class A
Harmonic emissions IEC 61000-3-2	Class A
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies

Table 2

Guidance and manufacturer's declaration - electromagnetic Immunity		
Immunity Test	IEC 60601-1-2 Test level	Compliance level
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±2 kV, ±4 kV, ±8 kV, ±15 kV air	±8 kV contact ±2 kV, ±4 kV, ±8 kV, ±15 kV air

Electrical fast transient/burst IEC 61000-4-4	Power supply lines: ± 2 kV input/output lines: ± 1 kV 100 kHz repetition frequency	Power supply lines: ± 2 kV 100 kHz repetition frequency
Surge IEC 61000-4-5	line(s) to line(s): $\pm 0.5, \pm 1$ kV line(s) to earth: $\pm 0.5, \pm 1, \pm 2$ kV	line(s) to line(s): $\pm 0.5, \pm 1$ kV
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	0% 0.5 cycle At $0^\circ, 45^\circ, 90^\circ, 135^\circ, 180^\circ,$ $225^\circ, 270^\circ$ and 315° 0% 1 cycle And 70% 25/30 cycles Single phase: at 0 0% 300 cycle	0% 0.5 cycle At $0^\circ, 45^\circ, 90^\circ, 135^\circ, 180^\circ,$ $225^\circ, 270^\circ$ and 315° 0% 1 cycle And 70% 25/30 cycles Single phase: at 0 0% 300 cycle
Power frequency magnetic field IEC 61000-4-8	30 A/m 50Hz/60Hz	30 A/m 50Hz/60Hz
Conducted RF IEC61000-4-6	150KHz to 80MHz: 3Vrms 6Vrms (in ISM bands) 80% Am at 1kHz	150KHz to 80MHz: 3Vrms 6Vrms (in ISM bands) 80% Am at 1kHz
Radiated RF IEC61000-4-3	3 V/m 80 MHz – 2,7 GHz 80 % AM at 1 kHz	3 V/m 80 MHz – 2,7 GHz 80 % AM at 1 kHz
NOTE U_T is the a.c. mains voltage prior to application of the test level.		

Table 3

Guidance and manufacturer's declaration - electromagnetic Immunity							
Radiated RF IEC61000-4-3 (Test specifications for	Test Frequency (MHz)	Band (MHz)	Service	Modulation	Modulation (W)	Distance (m)	IMMUNITY TEST LEVEL (V/m)

ENCLOSURE PORT IMMUNITY to RF wireless communication s equipment)	385	380 –390	TETRA 400	Pulse modulation 18 Hz	1,8	0.3	27
	450	380 –390	GMRS 460, FRS 460	FM ± 5 kHz deviation 1 kHz sine	2	0.3	28
	710	704 – 787	LTE Band 13, 17	Pulse modulation 217 Hz	0,2	0.3	9
	745						
	780						
	810	800 – 960	GSM 800/900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation 18 Hz	2	0.3	28
	870						
	930						
	1720	1 700 – 1 990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3, 4, 25; UMTS	Pulse modulation 217 Hz	2	0.3	28
	1845						
	1970						
	2450	2 400 – 2 570	Bluetooth WLAN, 802.11 b/g/n, RFID	Puls e mod ulati on	2	0.3	28

			2450 , LTE Band 7	217 Hz			
	5240	5 100 – 5 800	WLAN 802.11 a/n	Pulse modulation n 217 Hz	0,2	0.3	9
	5500						
	5785						

Recommended separation distances between portable and mobile RF communications equipment and the easyRef handhold auto refractometer

The easyRef handhold auto refractometer is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the easyRef handhold auto refractometer can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the easyRef handhold auto refractometer as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter		
	150 kHz to 80 MHz	80 MHz to 800 MHz	800 MHz to 2,5 GHz
	$d = 1.17\sqrt{P}$	$d = 1.17\sqrt{P}$	$d = 2.33\sqrt{P}$

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 transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

Note 1: At 80 MHz and 800 MHz, the higher frequency applies.

Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

1.3.4 Transport and Installation

- Keep the product upward during transportation.
- Caution: The instrument is allowed to be transported by general means of transportation, but the severe impact, vibration, rain and snow splashing during transportation shall be prevented. The transportation requirements shall be specified in the order contract
- Do not work in inflammable, explosive and strong electromagnetic interference place!
- Only the power adapter and battery recognized by Certainn can be used. In order to avoid any damage, please do not change the charging parts.

1.3.5 Operation Forbiddance



- The operation of easyRef must follow the operating instructions, or it may cause stoppage and damage.
- This instrument may ignite combustible gas or steam. Do not use this instrument in the environment with combustible and anesthetic gas (for example: nitrous oxide) or pure oxygen.
- Do not disassemble optical system and components unless the operating instructions indicated.
- It is forbidden to refit or add accessories! Only the accessory produced or recognized by Certainn can be used in this instrument.
- If there is any errors, it must be repaired by professionals trained by Certainn Technology Co., Ltd.. In order to avoid damage, it is forbidden to tear down by oneself.
- Do not use chemical reagent wiping the instrument surface and accessories.
- If there is damage or destroy caused by inobservance to the user manual, improper maintenance, incorrect use and violent collisions reasons beyond we can guarantee, the user will responsible for these. Please reference the details in the quality guarantee terms about maintenance, calibration and warranty.
- This are not included in the warranty scope: artificial damage, break, thump, bump, inundation, teardown without authorization or other force majeure reasons.
- Please do not put the instrument or battery into water or fire.

- The battery is an explosive product, please do not try to open the battery, hit or drop the battery, the internal structure of the battery is not covered by the warranty
- Do not attempt to short-circuit the positive (+) and negative (-) batteries. Do not use the battery on other devices.
- Do not use batteries that have leaked, discolored, or have changed appearance
- It is forbidden to directly solder anything on the battery
- If the battery fluid leaks into your skin, clothing or even your eyes, immediately wash with plenty of water and then seek medical attention.
- Please do not storage the battery in high temperature, inflammable and explosive environment.
- When the equipment reaches the expected life and is scrapped, it should be disposed of in accordance with local laws and regulations, and it is forbidden to discard it at will.
- To completely disconnect the power, unplug the adapter

1.3.6 Instructions

- When you need to move the instrument elsewhere, please refer to the installation instructions in the previous section.
- Please ensure the battery power of the instrument, so as not to exhaust the battery during use and delay the inspection
- When the instrument needs to charge, please follow the safety instructions and operating methods of this user manual.
- When the patient is next to the instrument, do not perform maintenance or replace parts, otherwise they may be injured.

Chapter2 .System structures and functions

1.1 Fundamental principle

The key technique used in the easyRef Handhold Auto Refractometer is based on principle of hartmann wave-front sensing .

Light is emitted from the light source system inside the device, and then focuses on the bottom of the eye through the spectroscope and exit port, then the light is reflected back to the device, and beam through lens system and received by CCD camera. It is possible to calculate the diopter of the human eye by detecting the offset between the relative calibration light and the spot array formed by the light spot of each sub-aperture.

1.2 Product structure and constitution

The product consists of main easyRef hardware and Power Adapter



1.3 Runtime environment

Operating environment: Android 5.1.1

Host configuration: RK3288、2G+8G

Display screens: 1.54" touch screen

Resolution :320*320

1.4 Function

As an effective instrument for detecting the refractive power of the human eye, the easyRef Handhold Auto Refractometer can quickly perform the refractive power detection, which solves the influence of the medical staff's command and judgment on the test results, making the test results more objective and reasonable.

1.5 Intended use

Applicable to the preliminary determination of the diopters of adults and infants.

1.6 Contraindications

There are no absolute contraindications.

Chapter3. Specifications

Product Series		easyRef	
mode		Infant mode	Adult mode
Spherical power range		-10.0D～+10.0D	
Spherical power interval（Cell value）		0.25D	
Spherical power tolerance		±0.5D	
Cylindrical power range		-5.0D ～+5.0D	
Cylindrical power interval（Cell value）		0.25D	
Cylindrical power tolerance		±0.5D	
Axial range		1 °～180 °	
Axial interval		1 °	
Axial view tolerance	-3D≤DC<-0.5D, 0.5D<DC≤3D,	±5 °	
	DC> 3D, DC<-3D	±3 °	
Note: DC represents the cylindrical power			

Chapter4 . Installation and maintenance

4.1 Installation



- Before unpacking, please check carefully whether the external package is complete. If there is obvious damage, please don't open and contact the forwarding agent.
- Installation by professional personnel of our company or professional personnel authorized by our company;
- If the power of the instrument is insufficient, please use the original charger to charge the instrument;
- For transportation safety, we may remove the battery from the instrument before leaving the factory. Before use, please install the original battery of the easyRef Handhold Auto Refractometer.
- If the instrument is still to be transported in the future, in case unnecessary losses, we recommend that you keep the original packing material or adopt another proper transport packaging way.

4.2 Cleaning



- Before cleaning, please turn off the power. It is forbidden to clean the instrument while using.
- While cleaning the mainframe, do not use the solvents containing acetone or xylene, and never use abrasive cleaners. Only use common detergent.
- While cleaning, it is forbidden to let any liquid enter the interior of the device
- Clean with a soft clean wet cloth to the surface of the instrument.
- Keep the optical components clean. If the lens is dusty or smudged, use Ear blowing ball to blow it, and then wipe it gently with degreased gauze dipped in absolute alcohol or lens cleaning paper.
- The forehead rest is where the instrument often contacts the patient. After the inspection is completed, the patient's sweat or cosmetics may remain on the forehead rest , Therefore, the forehead rest needs to be cleaned after each inspection.



Note: Before examining each patient, use a clean gauze or cloth moistened with disinfectant alcohol to clean the forehead rest. For stubborn stains, use a cloth dampened with disinfectant alcohol to wipe, instead of repeatedly wiping the forehead rest with a dry cloth.

4.3 Maintenance and environment conditions

4.3.1 Maintenance



If the instrument needs to be opened for maintenance or repair purposes, this work can only be performed by qualified professionals authorized by Certainn or under the guidance of professionals.

- If it exceeds warranty period, we suggest that you buy a service contract from Certainn, please contact Certainn for service details.
- It is forbidden for any solution to enter the instrument to avoid damage to the components, and no internal components of the instrument can be disinfected

4.3.2 Environmental Conditions

Transport

Temperature: -40 °to +70 °C

Relative Humidity: 10% to 95%

Atmospheric Pressure: 500hPa to 1060hPa

Storage

Temperature: -10 °to +55 °C

Relative Humidity: 10% to 95%

Atmospheric Pressure: 700hPa to 1060hPa

Non-corrosive Gases, Ventilated Room

Operation

Temperature: +10 °to +35 °C

Relative Humidity: 30% to 90%

Atmospheric Pressure: 800 hPa to 1060 hPa

Chapter5. The Function and Operation

5.1 Preparation before inspection

1. Fully charge the battery
2. Prepare sufficient thermal paper and turn on the Bluetooth printer.
3. Check the environment

Strong sunlight will affect the normal operation of the instrument, so it is best to check in a dark room. You can take the following measures to adjust the ambient light.

Close curtains: do not operate near windows without curtains;

Turn off the light: The darker light helps to check the small pupils of adults (without mydriatics). However, when the light is too dim and the iris of the subject is dark, the operator will not be able to see clearly, resulting in the cross target can not be aimed at the pupil.

Prepare the seats of the operator and the examinee, and adjust the height of the seats so that the eyes of both sides are basically on the same horizontal line.

5.2 Inspection steps

5.2.1 Starting up

Long press the power button, the instrument will turn on and enter the main interface, as shown in the figure.



5.2.2 Switch inspection mode

Click the (Infant) icon to switch between adult mode and infant mode, as shown in the figure



Note :

The cut-off age of infant and adult examination mode is 6 years old, that is, children who have reached 6 years old (including 6 years old) should choose the adult mode. In infant mode, the results displayed by the instrument are the results of the objective examination plus the estimation of ciliary muscle regulation (+ 2.0d). Therefore, the examination results can reflect the visual condition of infants when the eye muscle is relaxed.

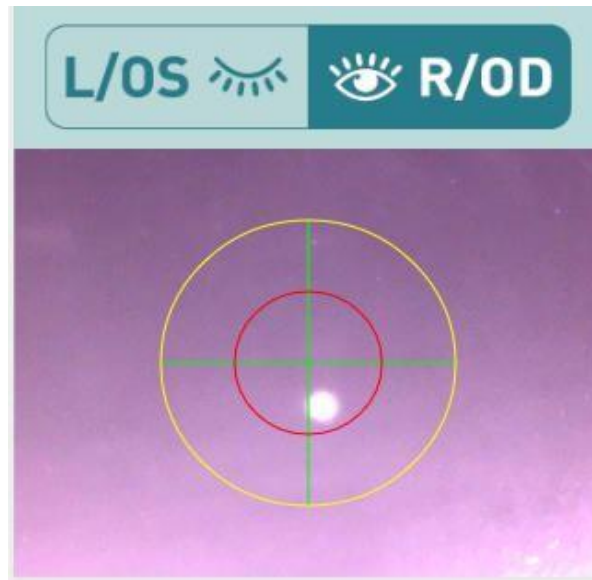
The adult is suitable for emmetropia, hyperopia or myopia.

5.2.3 Adjust the posture

Fix the position of the subject so that their eyes and the instrument are at the same level (it is recommended that the operator sit opposite the subject)

5.2.4 Start inspect

Press the test key to enter the alignment interface, as shown below:

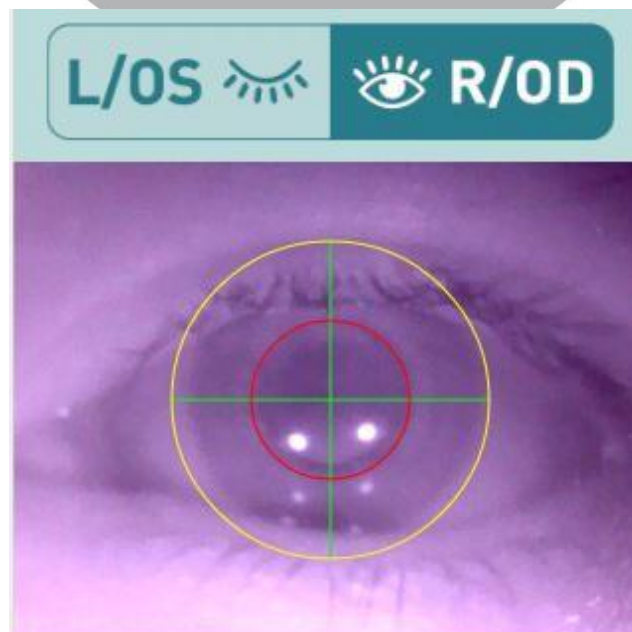


5.2.5 Choose left eye or right eye

In the alignment interface, tap the screen to switch between the left and right eyes.

5.2.6 Aim at the pupil

The operator holds the instrument and gently touches the forehead rest to the subject's forehead; the operator can observe the cross-shaped target in the alignment interface of the software. During operation, move the instrument up, down, left, and right until the cross-hair is aimed at the pupil of the eye to be measured. As shown below:



5.2.7 Data capture

When the cross-hair is aimed at the pupil of the eye under test, press the acquisition button to collect data. At this time, the instrument emits a "beep-beep-beep" sound. When the sound stops, the test is completed, and the software displays "S (spherical degree)" "C (column Mirror)" "A (axis position)" and other measurement results, as shown below. (If you need to interrupt the inspection, press the capture button to exit and return to the main interface.)



	L/OS	R/OD
S	-5.25D	-5.0D
C	-2.0D	-2.0D
A	101°	83°

Operation tips: When the cross target has been correctly aligned with the pupil, but the instrument does not output the data, you can take the following measures:

Turn the cross-bullseye slightly along the edge of the pupil to make the instrument capture successfully;

Make sure the instrument is facing the subject and aligns with the patient eye;

Instruct the subject to look down;

Make sure that the eyelid of the subject does not cover the pupil;

5.2.8 Query the records

Swipe left on the main interface to view recent inspection records.

5.2.9 Print

Click the print icon on the main interface to print the inspection results displayed on the current screen.

5.3 System Troubleshooting

- 1: If the system starts up abnormally (system crash or pending on the boot screen) and it cannot be resolved after resetting,
please contact the after-sales department of the local authorized distributor.
- 2: If the system keeps rebooting, please contact the after-sales department of the local authorized distributor.
- 3: If bluetooth works abnormally, please switch off the bluetooth and restart it and if it still can not work please reboot the system.
- 4: If the Touch screen does not work please reboot the system.
- 5: If APP does not respond, please wait for the App self-recovery or reboot the system.

Chapter6. Battery and charger

Battery and charger

The easyRef Handhold Auto Refractometer is powered by a rechargeable battery, but the battery and charger are not part of the instrument, When the standby time and test time of the instrument are significantly shortened, please contact Certainn to replace the battery and recycle the old battery.

Only the batteries and chargers approved by Certainn can be used. For approved batteries and chargers, please consult your local distributor

If the instrument is not used for a long time, the battery of the instrument should be fully charged every three months during storage (the battery must be fully charged before storage)

Permanent failure of the battery will be caused if the battery is in 0 power state for a long time.

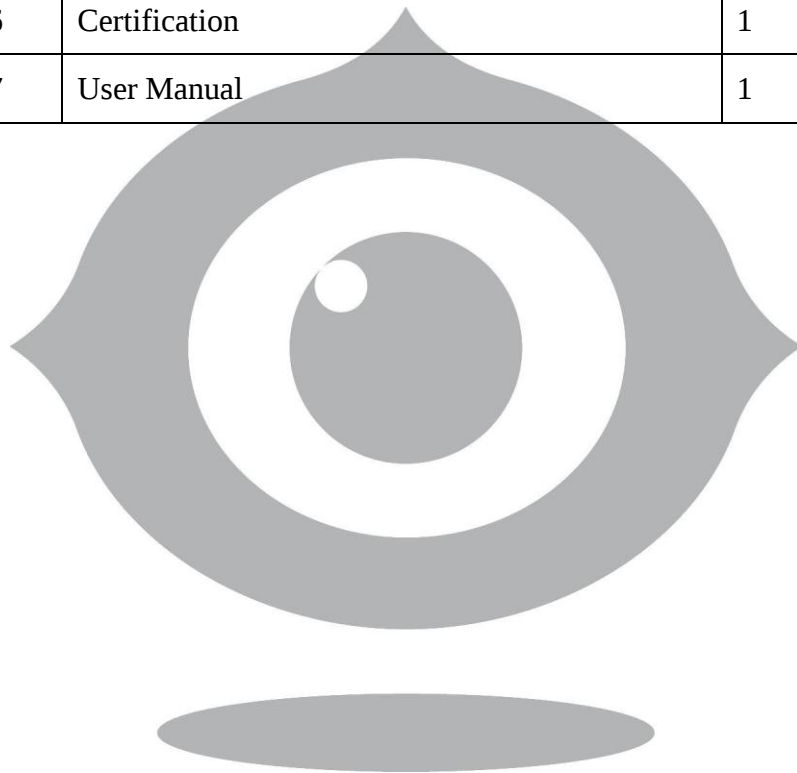
When the charger is not in use, please disconnect it from the easyRef Handhold Auto Refractometer and unplug the charger wire from the power socket. Do not connect the fully charged battery to the charger for a long time, as overcharging can shorten the battery life.

The instrument in the charging process should pay attention to the charger wire to prevent tripping caused accidental injury

If it is not in use for a long time, please take off the battery to prevent battery leakage.

Chapter7. Packing List

Item	Name	Qty
1	Device	1
2	Base	1
3	Power Adapter	1
4	USB Cable	1
5	Warranty Card	1
6	Certification	1
7	User Manual	1



Chapter8. Service Commitment

Thank you very much again for purchasing our easyRef Handhold Auto Refractometer. Certainn has established a set of strict quality control system, to engineer excellent quality of products, but because it is a complex high-tech equipment, fail to follow operating procedures may cause errors, even damage to instrument. Therefore, we have to remind you: please read and comprehend this manual before use, and operate strictly in accordance with our rules.

If you have any questions while using our equipment, please contact us.

If you feel that our instruments have any room for improvement, please contact us.

If our instrument has any trouble, please call us.

If you have good suggestions or criticism for our products or work, please feel free to tell us.

If you no longer use our instruments, dispose them according to the local and national laws.

Our staff will welcome your call with full enthusiasm, and answer your questions in the most sincere attitude, solve your problem as soon as possible, and sincerely accept your criticisms and suggestions.

§ 15.19 Labeling requirements.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

§ 15.21 Information to user.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

§ 15.105 Information to the user.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a

residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The device has been evaluated to meet general RF exposure requirement.

The device can be used in portable exposure condition without restriction.

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