YZ11D

OPHTHALMOSCOPE

INSTRUCTION MANUAL

Thank you for purchasing our YZ11D Ophthalmoscope. Please read this manual carefully for the sake of your best use.

General Requirements for Safety

Please read carefully the following precautions to avoid unexpected personal injury as well as the product being damaged and other possible dangers.

Precautions

1. Do not use this instrument in the environment prone to fire and blast or where there is much dust and with high temperature. Use it indoors and keep it clean and dry.
2. Make sure all ports operated under the rating condition. Check all the wires correctly and firmly connected before use. Make sure the instrument is well grounded.
3. Only use fuse according to the specifications and ratings stipulated by our product. Turn off the main power first before changing the bulb and fuse.
4. Don't pull out the plug from the outlet by drawing the power cable.
5. The brightness should be as low as possible when you operate the instrument. Please turn off the light after operating.
6. Shut down the light power first before changing the bulb.
7. Don't touch the surface of the lens and prism with hand or hard objects.
8. Take out battery out of the instrument if not using it for a long time.
9. In case there is any trouble, please first refer to the trouble shooting guide. If it still can't work, please contact the authorized distributor or our Repair Department.

THE SAFETY MARKS USED IN THIS INSTRUMENT:

Attention:

Please Refer to This Manual

Class II

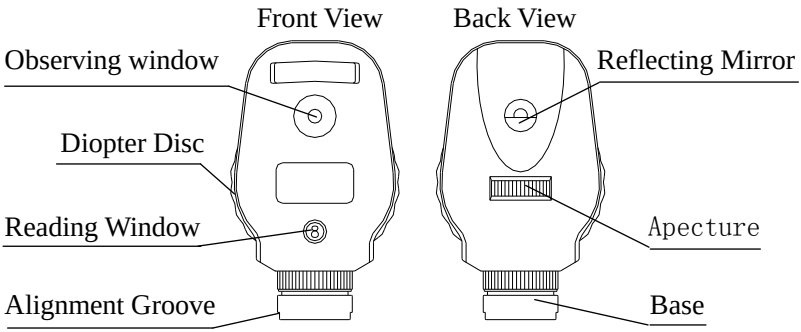
Contents

1. Usage

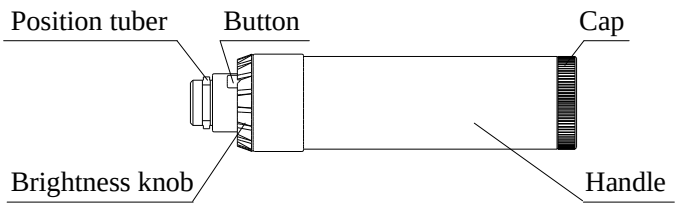
The Model YZ11D ophthalmoscope is a medical instrument used in the examination of the fundus in physic.

2. Construction:

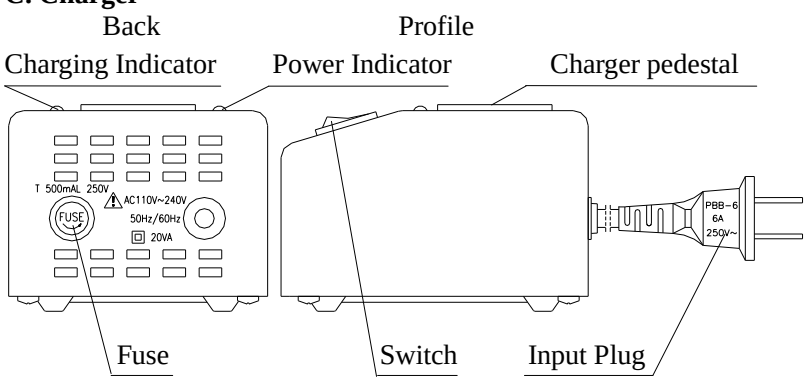
A. Head



B. Handle



C. Charger



There is no potential electromagnetic or other interference between this instrument and other instruments.

3. Assembly

All parts should be taken out with great care from the packing case before assembling.

Align the position tuber on the handle with the alignment groove in the head, then push the handle into the head and rotate clockwise. The handle and the head are then connected firmly.

Attention: Power Supply must be cut off before assembly.

4. How to use

4.1 The Selection of the Viewing Lenses

There are 24 viewing lenses in the viewing track as follow:

0、+1、+2、+3、+4、+5、+6、+8、+10、+12、+15、+20D. Clockwise, black color.

0、-1、-2、-3、-4、-5、-6、-8、-10、-15、-20、-25、-35D. Anticlockwise, red color.

Please select the right viewing lens. The numbers of them are illuminated by light and can be read from the reading window.

4.2 The selection of the Spot, Slit, Central net and Red-free Filter

There are five spots or marks which can be selected for this instrument, the functions are as follows (the projective values of each diaphragm and each watch mark on the eye ground are shown in the table 1).

1) Big spot: to check the fundus with turbid media. For example, it will help search for the seam of the retina. In a mydriatic condition, a wider vision can be obtained.

2) Small spot: for general examination.

3) Red-free filter: absorbs the red light and let light with its wave length range from yellow to blue go through, to examine the blood vessels in the fundus and its bleeding.

4) Central net: to measure the position of the foreign body and the field of the nidus. Also help to examine whether the inspected eyes are out of center while watching.

5) Slit: for examining the pathological changes such as the depressed

optic nerve head and retinal edema.

The diagrams of the central net and the slit are shown below:

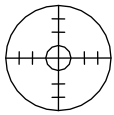


Table 1

Name		The diameter of spot(mm)	The diameter of the image of the spot on the fundus(mm)	The angle of the filed
Big spot		Φ2	Φ3.2	10°33′36″
Small spot		Φ1	Φ1.6	5°18′
Red free filter		Φ1.6	Φ2.56	8°36′
Central dark Network	interior	Φ0.4	Φ0.64	2°9′36″
	Circle 1	Φ0.8	Φ1.28	4°19′12″
	Circle 2	Φ1.2	Φ1.92	6°27′36″
	exterior	Φ1.6	Φ2.56	8°36′
Slit	length	2	3.2	10°33′36″
	wide	0.2	0.32	1°3′21″

4.3 Button switch and brightness adjustment

Press the button switch with thumb, at the same time rotating the Brightness knob clockwise till reach the maximum brightness. The brightness will be gradually brighter. After use, anticlockwise rotate the Brightness knob till the spring button bounced up, the light bulb will be turn off.

 Means button switch

 Means rotating clockwise then the brightness is increasing.

Attention:

1) In nonuse, make sure the spring button bounced back, which means the bulb is off.

2) In order to keep the life-span of bulb, please don't keep the maximum brightness when the battery is fully charged.

4.4 Battery charge

Put the handle into the charger pedestal, connect the power cable and turn on the switch. If the power indicator is green, it means the power is on. If the charging indicator is yellow, it means the battery is charging. After fully charged, the charging indicator will turn green. Please turn off the power supply when charger is not in using.

Attention:

1) The charging unit is intelligent controlled with the specialist structure. No overcharge will take place.

2) The battery for lighting is lithium rechargeable battery. If the Ophthalmoscope is not used for a long time, fully charge the battery and preserve it well.

3) The shell of the handle is the connector, it must be kept clean.

4) Ensure that the on/off button is bounced up (off) when the Ophthalmoscope is being charged.

5) Please put the Ophthalmoscope slightly soon after use for the sake of shaking the hot filament into sectors.

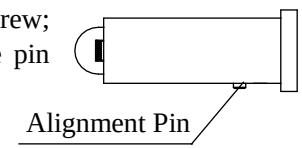
6）The product is hit when using, the Lamp could be dead ,if the filament of Lamp is whole, turn off the Electrical Source Swith then turn on, the Lamp should be work on (overage-current safeguard).

5. Maintenance

5.1 Replacing the Illumination Bulb

1) Turn off the lighting power. After the bulb is cool, snap the head with one hand and hold the handle with the other, rotate the handle anticlockwise and pull the head out of the handle.

2) Pull out the used bulb with watch screw; insert the new one with the grove and the pin fixing position pin (see right).



3) Fit the handle (refer to the Part 3).

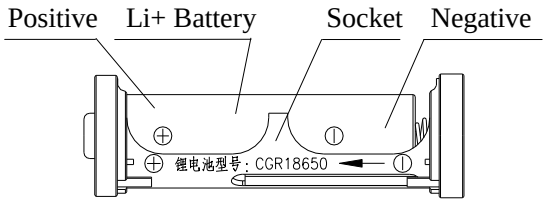
5.2 Replacing the Battery

1) Take off the handle bottom and take out the Battery Module.

2) Hold the Socket with one hand, pinch the Positive Pole with the other and push the battery to the end in Negative Pole direction, then pull it outside, the battery will be got out from the socket.

3) Use one hand to hold the Socket, the other hand hold the new battery's Positive Pole and push the battery to the Negative Pole to insert the battery into the Socket.

4) Put the battery into the handle and make sure that positive pole faces to inside and negative pole will connect with handle bottom. Mount the handle bottom.



Battery Module

Attention:

1) Please use the same battery with specification：CGR18650。

2)Make sure that positive and negative poles are right corresponded.

3) If the ophthalmoscope is not use for a long time, please take out the battery after fully charged.

5.3 Replacing the Fuse

Cut off the power supply. Screw off the cover of fuse box and replace the new fuse. The fuse specification：T 500mAL 250V

⚠ **Attention: Please use the fuse with the same specifications.**

5.4 Cleaning

Please keep the equipments clean and dry. If there is dust on the cover, please clean it with soft cloth. If there is dust on the optical lens, whisking gently with a small brush or clean the lens by absolute alcohol tampon.

Attention:

1) Do not use any hard object to clean or touch the optical lens.

2) Do not use any corrosive detergent in order not to damage the surfaces.

5.5 Protection

1) The ophthalmoscope has been well checked before leaving factory. Please do not dismantle unbendingly.

2) The ophthalmoscope should be used in clean and dry condition. If

he ophthalmoscope is not use for a long time, please pull out the battery and keep the ophthalmoscope in the packing box.

3) The ophthalmoscope should not be shaked, striked and fell down.

4) In order to make the battery be well charged, please do not jam the charger heat dispelling holes.

5) Please keep the handle bottom clean for better charging.

5.6 Consumables

Please specify quantities when ordering consumables (bulbs, fuses).

6. Waste disposal

The replaced bulb and fuse can be regarded as normal industry waste, no special treatment required. The battery disposal should follow the local government regulations.

7. Trouble Shooting

In case of any trouble, please check the following table for reference. If it still cannot work, please contact the authorized distributor or Customer Service Department of our company.

No.	Trouble	Possible cause	Remedy
1	The bulb is not on	The button is not been pressed or not been rotated	Press the button and rotate clockwise
		The bulb is burnt	Replace the bulb
2	Brightness is not enough	The capacity of the batteries is not enough	Replace the batteries or charging them
		The bulb is used	Replace the bulb
3	The green indictor of the charging unit is not on	The switch of the charging unit is on “off”	Place the switch on “on”
		The fuse is melt	Replace the fuse
4	The fuse is melt	The fuse specification is not correct	Replace the fuse according to spec.

8. Responsibility

We will supply the circuit diagram of the instrument, electric component list, drawings and calibration details according to the customer's need for repair.

If there is any need for inquiry of relative information and relative service or some questions, please contact us directly or authorized distributors.

9. Transportation and Storage

1) When transport this instrument, be careful to prevent tide and turning upside down, avoid shake violently.

2) The instrument should be stored in the ventilated room without corrosive gas. The relative humidity should be 10% to 80%, environment temperature -40℃ to 50℃ and atmospheric pressure 500hpa～1060hpa.

10. Safety use and storage of battery

1) Do not mix different types of battery, otherwise it will cause exploding or other sever outcome.

2) Lithium battery does not have memory effect. Incomplete discharge will not decrease the capacity of the battery.

3) Lithium battery does not allow over discharge. After discharge protection takes effect, recharge before use the battery.

4) Lithium battery does not allow over charge. The instrument includes the over charge protection function.

5) The battery has the max charge-discharge limits. Do not charge and discharge repeatedly.

6) Lithium battery is best used under 25℃-40℃. The performance level will be decreased in high or low temperature. It is not suggested to use the product below 0℃ or above 40℃.

7) If the Ophthalmoscope is not to be used for a long period, fully charge the battery and preserve it well.

8) When battery is broken, replace them with same type of battery. Make sure that positive and negative poles are right corresponded.

9) Do not place battery and metal parts together in the pocket, it may cause short-circuit.

10) Do not use broken battery or battery with surface peeled off.

11) Do not short circuit the battery, or put into the fire.

11. Specifications

Illumination: *3.5V, 2.8W mini halogen bulb*

Power: *Charger: AC110V～240V，50Hz/60Hz*

Ophthalmoscope: Li+ battery module DC:3.7V

Input Power: *20 VA*

Li+ battery spec: *CGR18650*

Fuse spec: *T 500mAL 250V*

Operating mode: *Continuous*

Product safety class: *II class, inside power, IPXO, No AP or APG device*

Viewing Lenses: *0*、*±1*、*±2*、*±3*、*±4*、*±5*、*±6*、*±8*、*±10*、*+12*、*±15*、*±20*、*-25*、*-35D*

Illumination form: *Large Spot, Small Spot, Slit, Central net and Red-free Filter*

12. Normal Working Condition

Temperature: *50℃～400℃*

Relative humidity: *30%～75%*

Atmospheric pressure: *700hPa～1060hPa*

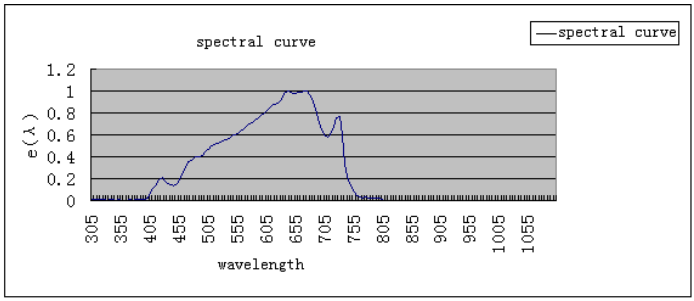
Power: *Charger: AC110V～240V，50Hz/60Hz*

Ophthalmoscope: Li+ battery module，DC: 3.7V

13. Safety Considerations

The relative spectral output of the YZ11D between 305 nm and 1100 nm indicates that this device is comparable with other

ophthalmoscopes:



$$L_A = \sum_{305}^{700} L_\lambda(\lambda) \cdot A(\lambda) \cdot \Delta\lambda = 21.2 \text{ mW/(cm}^2 \cdot \text{sr)}$$

$$L_B = \sum_{380}^{700} L_\lambda(\lambda) \cdot A(\lambda) \cdot \Delta\lambda = 18.1 \text{ mW/(cm}^2 \cdot \text{sr)}$$

Spectrally weighted photochemical radiance L_B and L_A give a measure of the potential that exists for a beam of light to cause photochemical hazard to the retina. L_B gives the measure for eyes in which the crystalline lens is in place. L_A gives this measure either for eyes in which the crystalline lens has been removed (aphakes) and has not been replaced by a UV-blocking lens or for the eyes of very young children.

The value stated for this ophthalmic instrument gives a measure of hazard potential when the instrument is operated at maximum intensity and maximum aperture. Values of or over 80 mW/(cm^2 • sr),are considered high for beams which wholly fill a delated pupil.

The retinal exposure dose for a photochemical hazard is a product of

the radiance and the exposure time. For instance, at a radiance level of 80 mW/(cm^2 • sr),3 min irradiation of the dilated (8 mm diameter)pupil would cause the retinal exposure dose level to attain the recommended exposure limit. If the value of radiance were reduced to 40 mW/(cm^2 • sr),twice that time (i.e.6min) would be needed to reach the recommended limit. The recommended exposure dose is based on calculations arising from the American Conference of Governmental Industrial Hygienists(ACGIH)—Threshold Limit Values of Chemical Substances and Physical Agents (1995-1996 edition).

While no acute optical radiation hazards have identified for ophthalmic instruments, it is recommended that the intensity of light directed into the patients's eye be limited to the minimum level which is necessary for diagnosis. Infants, aphaks and persons which diseased eyes will be at greater risk. The risk may also be increased if the person being examined has had any exposure with the same instrument or any other ophthalmic instrument using a visible light source during the previous 24 h. This will apply particular if the eye has been exposed to retinal photograph.

★ **Subject to change in design or specification without notice in advance.**