

1.Overview：

1.1 Product name：Portable slit lamp

1.2 Product model：S150

1.3 Product composition：S150 is composed of illuminator and a magnifier.

1.4 Expected Use of Products：S150 can be only used for the general Screening of the anterior segment of the eye, can not be used for diagnosis.

1.5 Product Category：According to the classification standard of medical electrical equipment of IEC60601-1-2005 standard, S150 belongs to the Class II equipment with internal power supply, continuous operation Medical equipment It cannot be used in a mixture of flammable anesthetic gas and air, neither oxygen or nitrous oxidemixture.

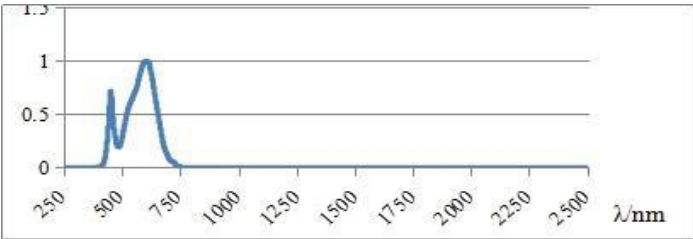
1.6 Operating Environment：The S150 is suitable for use in all establishments, including domestic establishments and those directly connected to the public low voltage power supply network that supplies buildings used for domestic purpose.

2. Precautions：

- Do not touch the lens surface with hands or hard objects.
- The portable slit lamp is only used for observing patient's eye and is not applied to diagnosis.The diagnosis depends on the judgment of the physician.
- The portable slit lamp is illuminated by light bulb. When the power is turned on, a slight amount of heat will be generated in the lamp cap. This is a normal phenomenon. Please turn off the power switch when not in use.
- Other medical instruments and equipment that must be installed at the same site must comply with the same electromagnetic compatibility principles. Equipment that does not comply with or is known to have poor electromagnetic compatibility must be installed at a distance（no closer than 12 inches）from the equipment.
- Do not disassemble or attempt to perform operations that are not described in this instruction manual. If the operation is not performed properly, excessive mechanical force may cause damage to the machine or personal injury.
- Do not store and use in the inflammable, explosive, high temperature, high humidity and dusty environment; use it in a clean room, keep the product clean and dry.
- Please carefully read the safety signs and other graphic symbols used on this instrument for the safe use of this equipment.
- When the patient is observed with the portable slit lamp, there will be a bundle of light shine on the eye. The long-term illuminating may temporarily affect the patient's vision. If the patient feels uncomfortable, please inform the operator or actively seek medical attention in time. So try to avoid illuminating the patient's eyes for a long time.
- The portable slit lamp has use rechargeable li-ion battery batteries. Please turn off the power switch when not in use to save power. If you do not use it for a long time, please remove the battery.
- Please deal with waste generated by machines according to relevant laws and regulations, such as waste batteries.
- Please use this product strictly in accordance with the requirements and precautions of the manual.
- The device can only use the battery provided or recommended by Shanghai MediWorks. The battery specification is 3.7V，3400mAh and Panasonic 3400mAh battery is recommended. If the user uses other batteries, Shanghai MediWorks won't be liable for any loss caused by this.
- Warning——The light emitted by S150 is potentially dangerous. The longer the exposure time, the greater the risk of eye damage. The instrument will exceed the safety guideline when used to 358s at the maximum light intensity.
- Spectrogram

The relative spectral output between 250nm and 2500nm

Light source: Light relative spectra of illumination



3.Packing List

Name	Quantity	Name	Quantity
Body of portable slit lamp	1	magnet	3
Portable packing box	1	User manual	1
Charger	1	USD CABLE	1
Lens cloth	1		

4.Specification Parameter：

Magnification：6×；

Slit width: 0-12mm continuously adjustable (maximum slit width ≥ 12mm)

Slit length: ≥12mm

Filter: cobalt blue

Power: rechargeable li-ion battery 3.7V/3400mAh

Light source: Led light bulb(3V/1W)

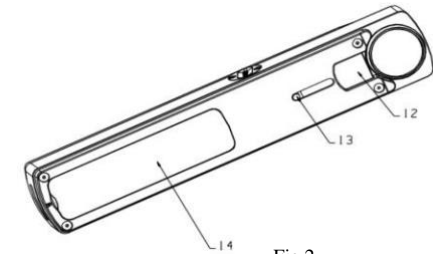
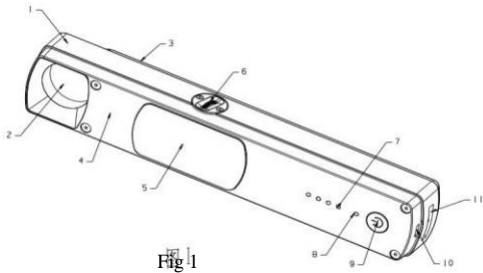
Battery life: more than 6h (continuous work)

Charging time: 3.5h

Net weight: 240g

5.Instructions for use：

5.1 S150 portable slit lamp schematic



1.central frame 2.magnifier 3. front cover 4.back cover

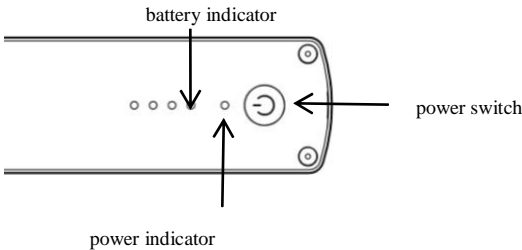
5. suction disc area 6.slit adjustment thumb-wheel 7.battery indicator 8.power indicator

9.power switch 10.USB charging mount 11.hanging rope hole

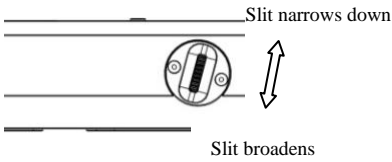
12.slit projection window 13.cobalt filter rod 14.battery compartment

5.2 Operation Method

1.The power switch is right ahead (in the schematic diagram 9), the finger is pressed once to display the power, and automatically turned off after 2 seconds; long press for 3 seconds to turn on the power, and the power indicator is on; The brightness of power supply is divided into two levels (the default low level). Short press the button once to adjust the brightness to the high level (recommended for use in the slit state). Press once again to lower the brightness (recommended for use under the full lighting spot). Long press for 3 seconds to turn off.

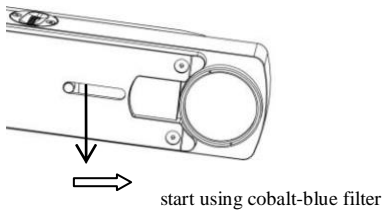


2. The width of the slit can be adjusted by thumb-wheel(Fig. 6).:



3. The portable slit lamp should be kept at an appropriate distance from the patient's eyes (reference distance 31.2mm).

4. Gently push the cobalt-blue switching lever (Figure13 in the illustration) toward the magnifier to switch to the cobalt-blue filter. When not in use, push it back in the opposite direction.

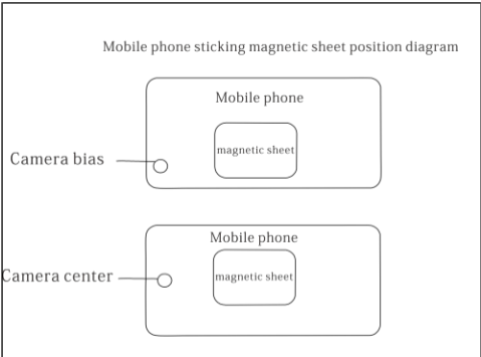


5. Open the battery compartment cover (Figure14 in the illustration) to replace the battery, or use the charger or mobile power to plug into the USB mount (Figure10 in the illustration) to charge.

5.3 Extended Digital Function

1.According to the following figure, stick the magnetic sheet to the back of the mobile phone. (Because the size of the mobile phone is different, please stick the magnetic sheet to the appropriate position according to the actual situation. Note that the position of the camera is placed in the center of the magnifier, and the magnetic sheet is completely attracted to the magnetic platform)

Note: Please do not absorb more than 400g items on the magnetic platform to avoid accidental injury.



2.Point the phone camera at the center of the magnifying glass, then stick the phone to the magnetic disc area. The camera function of the phone can take pictures of the observed images for later diagnosis and archiving.

S150 working with central setting camera moible phone.

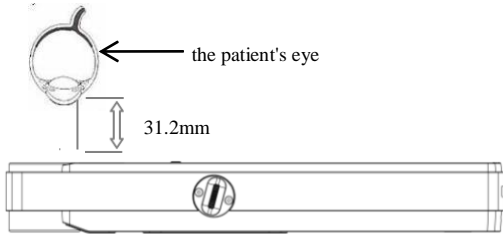


S150 working with Bias setting camera mobile phone.



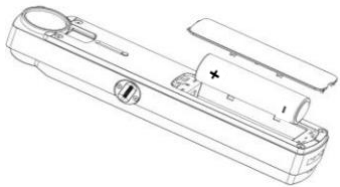
5.4 Use Reference

Under normal circumstances, when the distance between the front end of portable slit lamp and the patient's eye is 31.2mm (refer to the figure below), and the effect is ideal;



6. Replace the Battery

Under normal circumstances, the battery does not need to be removed, you can directly take the charging method, if you need to remove or install (see the figure below), please remove the battery compartment cover then remove or install the battery, pay attention to the positive and negative.



Battery specifications: rechargeable li-ion battery 3.7V

Note: 1: The positive pole of the battery corresponds to the front end of the slit lamp, and the negative pole corresponds to the end of the slit lamp.

2: Please deal with the used batteries in accordance with local laws.

7.Mark Description

Serial number	Mark	Schematic description
1		Note! View random files
2		On/off (long press 3s - long press 3s)
3	+/-	Positive/ Negative

8.Cleaning and Maintenance :

Daily cleaning: Please wipe the magnifier and dust-proof lens with alcohol;

Note: Do not touch sharp objects or hard objects on the lens to prevent damage.

Warning: Forbidden high pressure or boiling.

9.Storage and Usage environment:

Usage Environment	Temperature	+5℃~+40℃
	Relative Humidity	≤90%
	Air Pressure	860hPa~1060hPa
Storage Environment	Temperature	−40℃~+55℃
	Relative Humidity	≤90%
	Air Pressure	860hPa~1060hPa
Transportation Environment	Temperature	−40℃~+55℃
	Relative Humidity	≤90%
	Air Pressure	860hPa~1060hPa

10. After-sales service commitment: This product is guaranteed for 1 year.

11. Trouble Shooting

Troubleshooting	Possible Causes	Solution
light is not on	Battery is out of power	Recharge or replace a battery
	The slit is closed	Adjust the thumb-wheel to open the slit
Slit is blur	Dirty dust-proof lens	Clear dust-proof lens
	Dirty magnifier	Clear magnifier

12. EMC (Electromagnetic Compatibility)

The S150 complies with the International Electrotechnical Commission standards (IEC 60601-1-2: 2014) for electromagnetic compatibility as listed in the tables below. Follow the guidance in the tables for use of the S150 in an electromagnetic environment.

Guidance and manufacturer's declaration- electromagnetic emissions		
The S150 is intended for use in the electromagnetic environment specified below. The customer or the user of the S150 should assure that it is used in such an environment.		
Emissions test	Compliance level	Electromagnetic environment-guidance
RF emissions CISPR 11	Group 1	The S150 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The S150 is suitable for use in all establishments, including domestic establishments and those directly connected to the public low voltage power supply network
Harmonic emissions IEC 61000-3-2	N/A	

Voltage fluctuations/ Flicker emissions IEC 61000-3-3	N/A	that supplies buildings used for domestic purposes.
---	-----	---

Guidance and manufacturer's declaration -electromagnetic immunity			
The S150 is intended for use in the electromagnetic environment specified below. The customer or the user of the S150 should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environmentguidance
Electrostatic Discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floor should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30% .
Electrical fast transient/ burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/ output lines	± 2 kV for power supply lines ± 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV differential mode ± 2 kV common mode	± 1 kV differential mode ± 2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage, dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% UT (>95% dip in UT) for 0.5 cycle 40% UT (60% dip in UT) for 5 cycles 70% UT (30% dip in UT) for 25 cycles < 5% UT (> 95% dip in UT) for 5 sec	<5% UT (>95% dip in UT) for 0.5 cycle 40% UT (60% dip in UT) for 5 cycles 70% UT (30% dip in UT) for 25 cycles < 5% UT (> 95% dip in UT) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the S150 requires continued operation during power mains interruptions, it is recommended that the S150 be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment
NOTE: UT is the a.c. mains voltage prior to application of the test level.			

Guidance and manufacturer' s declaration -electromagnetic immunity			
The S150 is intended for use in the electromagnetic environment specified below. The customer or the user of the S150 should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms (V1=3)	Portable and mobile RF communications equipment should be used no closer to any part of the FC160, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d=1.2 \sqrt{P}$ 50 kHz to 80 MHz
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m (E1=3)	$d=1.2 \sqrt{P}$ 80 MHz to 800 MHz $d=2.3 \sqrt{P}$ 800 MHz to 2.5 GHz Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).

			Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey ^a should be less than the compliance level in each frequency range ^b . Interference may occur in the vicinity of equipment marked with the following symbol:
NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the S150 is used exceeds the applicable RF compliance level above, the S150 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the S150. b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.			

Recommended separation distances between portable and mobile RF communications equipment and the S150.			
The S150 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the S150 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the S150 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 /m		
	150 kHz to 80 MHz $d=1.2 \sqrt{P}$	80 MHz to 800 MHz $d=1.2 \sqrt{P}$	800 MHz to 2.5 GHz $d=2.3 \sqrt{P}$
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 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 separation distance for the higher frequency range applies. NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.			

■ Essential Performance

Designation	Description
Proper Functioning	Slit lamp brightness is normal

■ List of Cables

No.	Designation	Cable Length
1	USB TERMINAL WIRE	1. 0m

Version: 1. 0

20181128