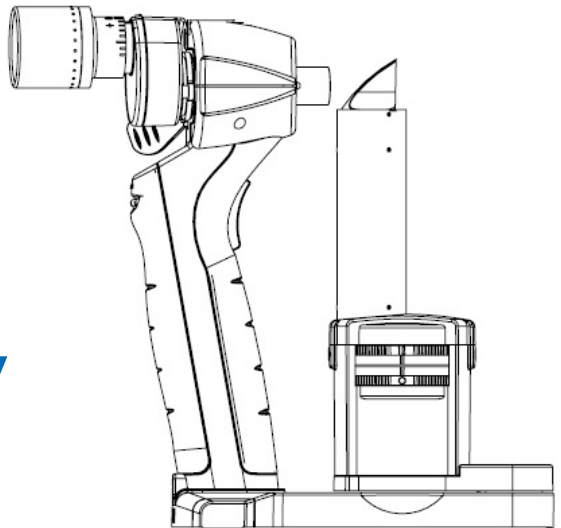


# Instruction For Use

Portable Slit Lamp

LS-1 Series



File No.: IFU- EN-PSL

Version: V190827

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# Preface

Dear User:

Thank you very much for choosing LS-1A/LS-1B Portable slit lamp Microscope. For your security and benefit, please read the operation instruction as well as the datum of the instruments carefully before using it.

Please check following before your using:

- 1.Please check the instrument accessories are consistent with the packing list or not.
- 2.Please read accompanying files carefully and keep properly.

The pictures in instructions only for reference purpose . If you have any questions please feel free to contact with your local agents.

# 1. Summary

## 1.1 Machinery description.

This instruction apply to : LS-1A/LA-1B

Contraindication: No

Products structure and components : The optical body, movement mechanism, illumination system, Portable handle, power supply.

Products application: Anterior segment and internal eye lesion examination.

**Indication for use:** AC-powered slit lamp Biomicroscopes intended for use in eye examination of the anterior eye segment, from the cornea epithelium to the posterior capsule. It is used to aid in the diagnosis of diseases or trauma which affects the structural properties of the anterior eye segment.

## 1.2 Product features

1.2.1. High brightness white LED cold-light lamp, maximum brightness not lower than 300,000lux, work life can be 50,000 hours.

1.2.2. Sharp images you can get, Frequently-used slit width design meet regular clinical needs.

1.2.3. Telescopic forehead-rest ,easier to observe and adjust diopter.

1.2.4. Magnification transfer with lever, Coordinated pupil distance adjustment with good hand-feeling.

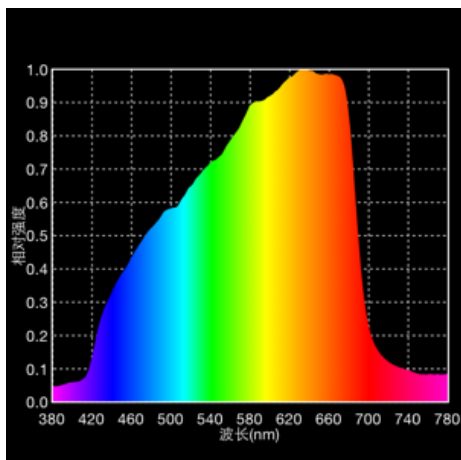
1.2.5. Small and lightweight.

1.2.6. Different filters: Heat-absorption, red-free, cobalt blue.

1.2.7. Full power supplied by AA Dry Battery or rechargeable AA battery.

1.2.8. All lens were processed with prevent reflection, moisture proof and mildew-proof coating, always maintain good optical quality.

## 1.2.9. The spectrum of light source used in slit lamp



### 1.2.10 Cautionary Statement

Caution-The light emitted from this instrument is potentially hazardous. The longer the duration of exposure, the greater the risk of ocular damage. Exposure to light from this instrument when operated at maximum intensity will exceed the safety guideline after 70 seconds.

1.2.11 The Maximum brightness of LS slit lamp is 300000lux, and its continuously brightness control.

Brightness controller	0	25%	50%	75.00%	100%
Brightness (Unit: Lux)	8959	64096	178447	271833	300000
Permissible error	±5%	±5%	±5%	±5%	+10%

1.2.12 This device conforms to following standards:  
IEC60601-1: 2005 Medical Electrical Equipment-Part 1: General requirement for safety;  
IEC60601-1-2 Medical electrical equipment - Part 1-2: General requirements for basic safety and essential performance – Collateral standard: Electromagnetic compatibility - Requirements and tests, Edition 3:2007; ISO 15004-2:2007 Ophthalmic Instruments - Fundamental requirements and test methods Part 2: Light hazard protection and ISO 10939:2007 Ophthalmic Instruments- Slit Lamp Microscopes

Note: The PSL can working normally if direct charger inserted even without battery. If need to use



wireless working mode, customer need to buy AA dry battery or rechargeable AA battery locally, be sure the battery purchased meet the requirement of IEC 62133 standards. For PSL's longer service time, please bought reliable and qualified battery.

### **1.3 Applicability**

For inspecting the illness of anterior segment and intraocular part.

### **1.4 Points for attention**

Caution: Federal law restricts this device to sale by or on the order of a physician or licensed professional practitioner.

### **1.5 Product features**

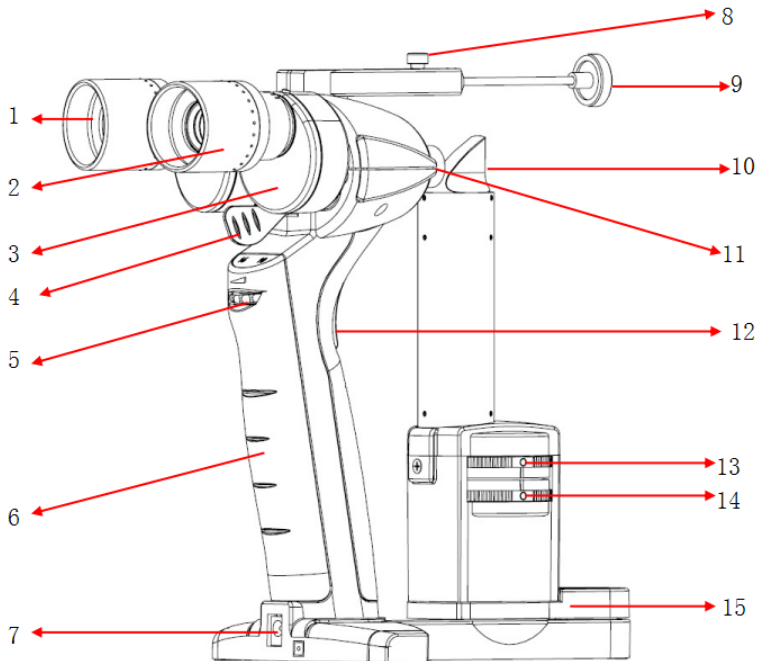
Equipment safety class I

Application part Type B

The instrument is continuous operation working

form

## 1.6 Product structure



### The hardware structure diagram

1. Eyepiece
2. Diopter adjustment: Adjust the diopter to get the clear image.
3. Adjust the pupil distance
4. Objective magnification changer : 10x,16x (For

LS-1B only)

5. Brightness adjusting knob: From left to right, the brightness brightens up.

6. Handle

7. Charging power supply socket

8. Forehead-rest bracket screw

9. Forehead-rest bracket

10. Reflector

11. Indicator

12. Power switch

13. Aperture and slit width adjusting knob

14. Filters adjusting knob

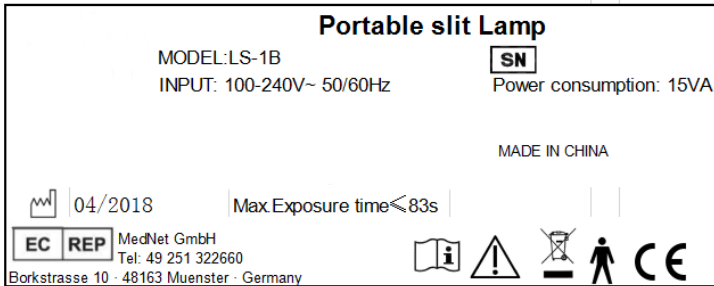
15. Slit angle adjusting track

## 1.7 Models difference

Model	Hardware structures	Magnification	Visual field diameter
LS-1A	Optical body, movement mechanism, illumination system,	10X	10X: 15 mm 16X: 10 mm

	Portable handle, power supply.		
LS-1B	optical body, movement mechanism, illumination system, Portable handle, power supply.	10X、 16X	

## 1.8 Product label



## 2. Technical parameter

### 2.1 Basic parameter

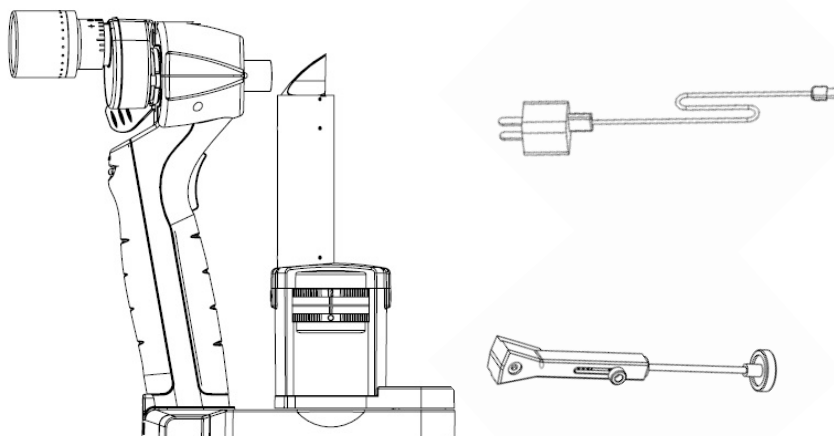
item \ model			
		LS-1A	LS-1B
Slit type		Rotating slit wheel selection slit lamp	
Optical	type	Binocular hand held Biomicroscope slit lamp	
	eyepiece	Converging binocular at 13°	
	Magnification	10X	10 X、16X lever change
	Work distance	80mm	
	Pupil distance	45mm~78mm	
	Diopter compensation	-8D~+8D	
	Resolution of visual center	16 X : N A =0.0448, 10 X : N A =0.0402	
	Nominal diameter of visual field	10X: 15mm	10X: 15mm 16X: 10mm
Illumination	Slit width	0.1mm, 0.2mm, 0.8mm, $\phi$ 1mm, $\phi$ 5mm, $\phi$ 12mm,	
	Slit length	12mm	

	Slit angle	Horizontal $\pm 60^\circ$
	Filters	Neutral density Red-free, Cobalt blue
	Lighting bulb	High brightness white LED
	brightness	$\geq 300000$ Lux
Power supply	LED work voltage	DC 3.0V (1.5V AA battery X 2)
	Direct power supply	Direct charger
	Battery (Optional)	Wireless working mode AA Dry battery, or AA rechargeable battery
Weight and size	Size	169.5mm×109.5mm×228.5mm
	Weight	$\leq 900$ g (with battery)

## 3. Installation and debugging

### 3.1 Un-packing checking

Open the package, take the slit lamp and other accessories out.



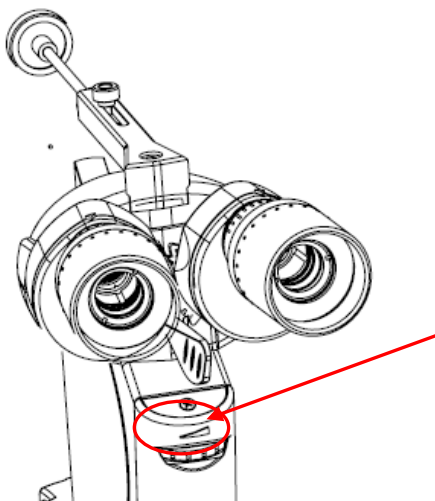
- 1.Portable slit lamp
- 2.Power line (For international delivery, there will be no battery and plug, please purchase it locally)
- 3.Forehead-rest bracket : support patient forehead, and fixed the position between slit lamp and patient to avoid shaking.

## 3.2 Installation

### 3.2.1 Install the AA dry battery or rechargeable one

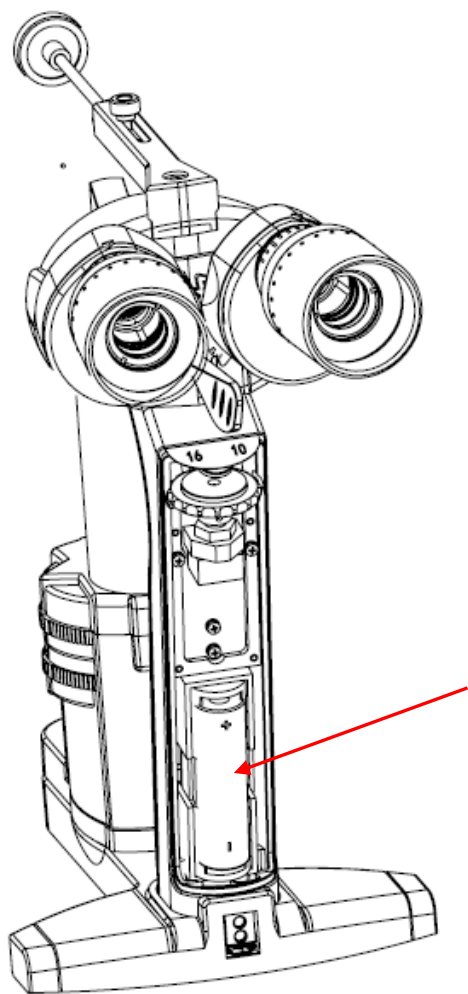
(1) Tools needed: Cross screwdriver, AA dry battery or rechargeable AA battery

(2) Use the screwdriver to lose the screw as arrowed which is under the magnification sticker, keep the screw well

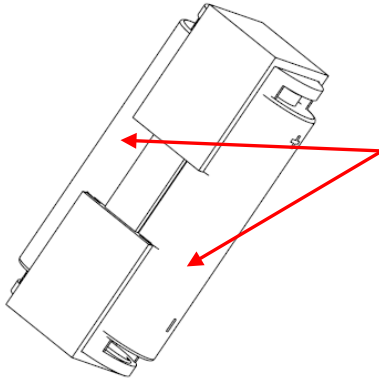




(2) Take off the front cover of Portable slit lamp.



(4) Take out the vessel for AA battery and put the AA battery on.

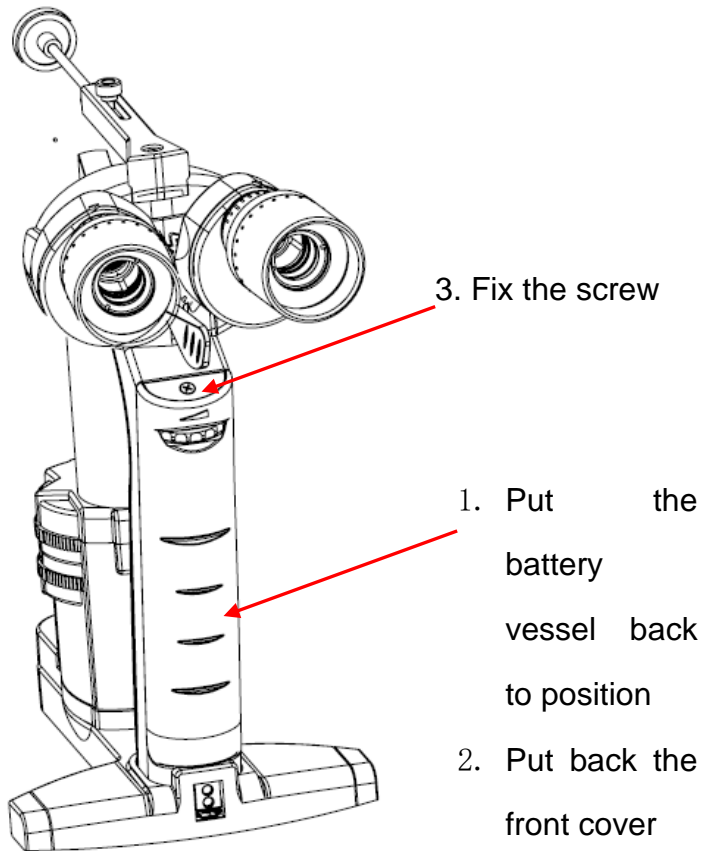


NOTE: 1 pair of battery needed, please be care of battery's positive and negative poles when install.

DO NOT mixing use AA battery and rechargeable battery together.

DO NOT charging the normal AA battery, or it will risky to destroy the machine.

(5) Put the battery vessel back to position, put back the front cover, and fix the screw.



### 3.2.2 Forehead-rest bracket.

Take out the forehead-rest bracket , align the mounting hole on the optical body, and tighten the fixed screw. (Figure 3)

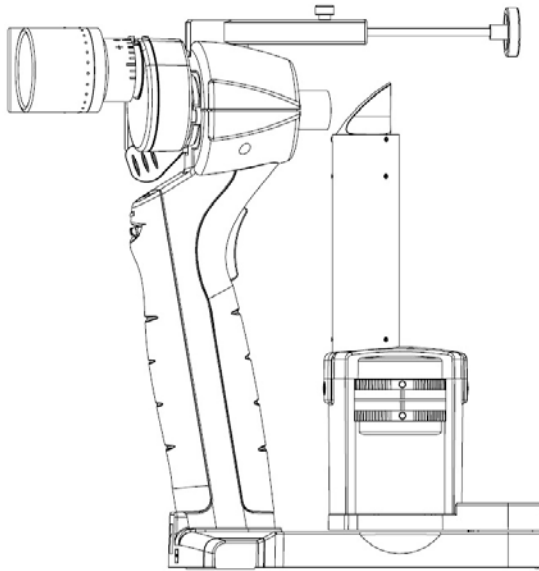
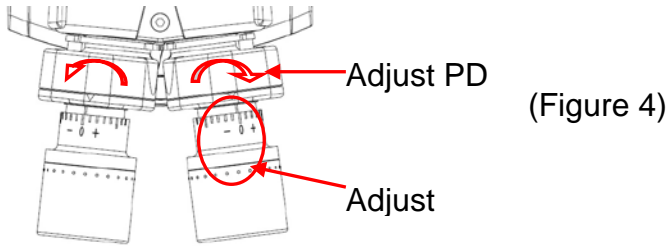


Figure 3

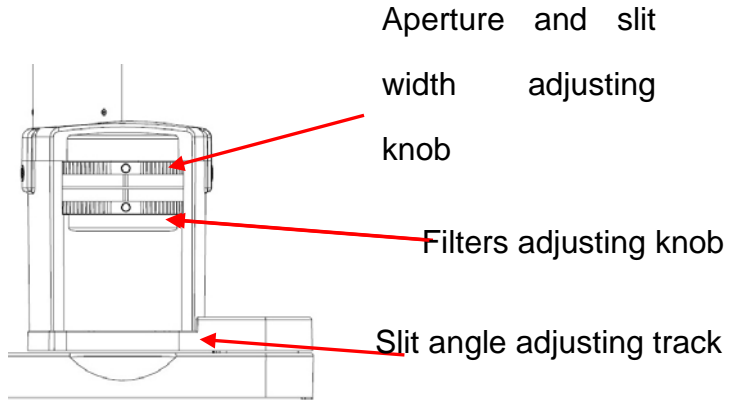
## 3.3 Debugging

### 3.3.1 Adjust the pupil distance and diopter ring

Adjusting the eyepiece diopter ring according to operator's diopter, for example: emmetropia, adjust to 0 degree (as figure 4 show) and adjust the pupil distance well.



(Figure 4)



(Figure 5)

### 3.3.2 Adjusting aperture, slit width, filter

Adjusting aperture and slit width knob to get the largest spot. Adjust the filter to the white position.

(figure 5)

### 3.3.3 Check the spot position and uniformity:

Pressing the power switch, adjust the brightness knob to largest. (Figure 6), the light will project from optical body, adjust the focus distance to put the spot in the central of focal plane, brightness

uniformity and boundaries clear.

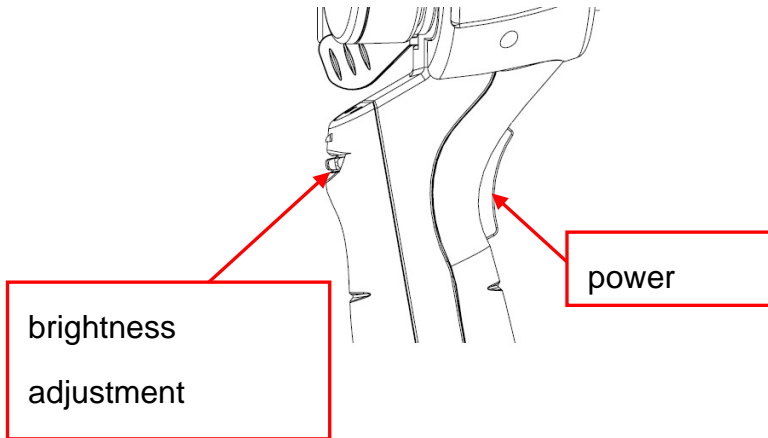


Figure 6

3.3.4 After debug finished, installing the forehead -rest bracket and start to use. (Installation method please refer to 4.2.3)

## **3.4 Replace battery and battery charging**

(1) Replace the battery, please turn to clause 3.2.1 and operate accordingly

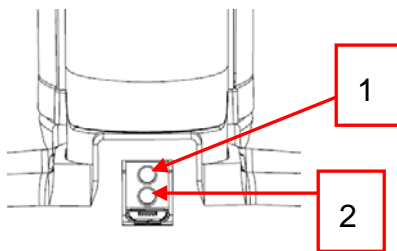
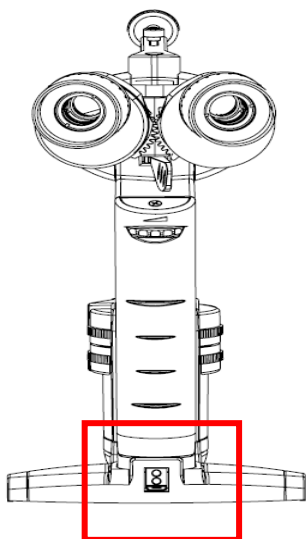
(2) Battery charging

Requirement: The battery used is rechargeable one

Tools: Power adaptor, power line (One side is mini-USB, another side is USB port)

Connect the power supply cable to Portable slit lamp connecting port.

Insert the USB side to computer USB, or Power bank, or direct power supply. When adaptor indicator No.1 in follow image changes to be red, it means it's in charging. When adaptor indicator No.1 in follow image changes to be green, it means charging finished and battery is full charged.



When adaptor indicator No.2 turn to be red, it's means low battery, and user need to charging immediately.

Attention: User cannot charge the portable slit lamp when they use AA Dry battery, or it will destroy the device.



## **4. Usage and requirements**

### **4.1 Requirements**

1) Use in darkroom.

2) Working environment conditions :

Temperature : 5°C ~ 40°C ; Relative humidity :

≤80%; Atmosphere pressure: 760hPa~1060hPa。

3) Running mode: intermittent service.

4) This instrument is internal power unit, B-type application part.

### **4.2 Usage**

1) Rotating the slit width adjusting knob and filter adjusting knob to right place , and rotate the illumination arm to right place. (also can adjust it when checking)。

2) Put forehead-rest bracket against the patient forehead slightly. turn on the power supply and adjust the brightness. then the light will project to patient eye.

3) observing from eyepiece and press the slit lamp slightly, gain clear image via forehead bracket shrinking, then tighten the screw to fix distance to keep the image in focus.

## **5. Maintenance and preventive inspection**

### **5.1 Maintenance**

- 1 Conduct a full charge process for the portable slit lamp battery at least once a month.
- 2 Disinfect the whole instruments with 75% alcohol wipes at least once a month.

### **5.2 Preserve**

- 1 After finishing the examination, please put the portable slit lamp in where is flat and not easy to reach. (avoid drop and break) .
- 2 No use for long period of time, please put the portable slit lamp back to package and store in ventilated, dry place.
- 3 When long time in no use, please charge it every half month to prolong the battery service time.

## **5.3 Preventive inspection**

1, Check if there are foreign body on the surface of portable slit lamp, if has, please clean it with alcohol swab.

2, Check if the illumination system can move smoothly, if not, please clean deposition on the slit angle adjusting track with 75% alcohol wipes, and smear some lubricating oil.

3, Check the brightness: compare to the illuminometer or same portable slit lamp to observe the brightness whether get darker.

## 6. Transportation and storage

The instrument which was prepackaged can transport by usual vehicle. Please avoid heavy load , shaking, free from exposure to the sun and rain.

The well-packaged portable slit lamp should be stored in dry, well-ventilated ,no corrosive gas indoor where environment temperature at  $-5^{\circ}\text{C}\sim 55^{\circ}\text{C}$ , relative humidity lower than 80% , and the atmosphere pressure between 500 HPa  $\sim$  1060 HPa

If the installed instrument needs long distance transport, it should put back to original package and then transport it.

# 7. Graphic symbol interpretation

## 7.1 Graphic symbol on instrument interpretation



Check the instruction manual



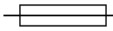
B Type application part



Caution! Consult accompanying documents



Direct current



Fuse protector



Brightness adjusting

10X

16X

Change magnification


1.6  0.8  0.5  0.15



Size of light spot

B.F  N.D  R.F


Filter


 Manufacturer

 Date of Manufacture

  
 Recyclable

 European certificate of conformity

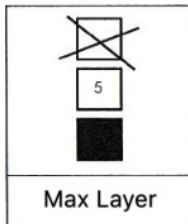
 Series Number of products

 Authorized representative in the  
European Community

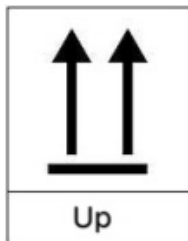
## 7.2 Graphic symbol on outer package interpretation



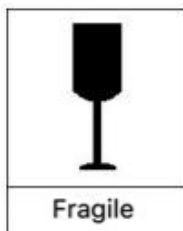
The package transport must avoid rain.



The package transport piece stacks up to max 5 layers.



The package transport piece should be vertically up when transported.



The transport package contains fragile items and should be handled with care.



## 8. Common faults

Fault Phenomenon	Solutions
No light	Check whether the power switch on (By press the button)
	Check whether the slit width adjust to largest.
	Check whether the filter is on right position.
	Check the chargeable battery
Unsharp images	Adjust the diopter ring to compensate the diopter
	Enhanced brightness
	Clean the lens surface with alcohol wipes

If you meet any other problem, or cannot debug according to above table, please contact with your local authorized distributor or to SK MED.

## 9. Precautions

1. Disinfect the forehead rest bracket which directly contact with patient with 75% alcohol wipes after and before every examination to avoid cross infection.
2. The instrument can be used by hand held and put it on the flat as well.
3. The instrument is precise instrument, please handle gently.
4. If there is long period time in no use, please it back to package carton.
5. Do not use in the inflammable, hot, dusty and oxygen-enriched environment and pay attention to keep it clean and dry; To avoid being damaged by the environment (Damp, Dusty, Liquid, under the sun and so on). Do not let the liquid or any other small objects run into the instrument, otherwise these objects may make the inner parts of the instrument short-circuit, and even make the users get an electric shock or even cause a fire hazard.

6. If the instrument goes wrong, please refer to Common fault's solutions firstly, if can solve it, please contact your local distributor or contact Manufacturer directly.

7. Electromagnetic compatibility: please do not put it with other high-power machine, keep at least 1 meter away from other electromagnetic equipment (mobile phone, heart pacemaker).

8. Environmental protection clause: It will pollute the environment if you discard the equipment and the accessories which is breakdown, recall or disposal according to the local laws and regulations.

9. Use the instruments in dark room, keep clean and dry, do not use in inflammable, high-temperature, dusty environment. do not open the instruments.

10. Do not contact the lens with hand and hard thing.

11. Do not light the patient eye with high brightness in a long time.

12. Strictly prohibit charge the battery with

unmatched battery charger.

13. After charge complete, one should take out the battery to avoid charging too long time, damage the battery or caused other dangerous.

14. Strictly prohibit put the battery into fire, or beat it.

15. Strictly prohibit the battery contact with liquid. If the battery contacted liquid, one should disposal recycle immediately, can't use anymore.

16. After a full charge, the battery can use about 3 hours, one should charge when the slit brightness gets darker.

17. Waterproof grade IPX0. Durable life of 6 years.

18. 18. Without the permission of us or our authorized distributor, do not open the box of the instrument or we will not take the consequences.

19. Do not touch the surface of lens with hand or hard objects.

## 10. Warranty Statement

The factory can provide the material of repairable parts

Manufacturer will provide lifelong maintenance and free consultation.

Since the date of purchase, Manufacturer provide free warranty for one year on the condition one follow the instructions.

The followings are not listed in the free warranty:

- Damaged caused by not following the Operation Instruction Manual.
- Take apart or re-configure without the permission of Manufacturer.
- Damaged caused by accidents, or irresistible natural factors.
- All parts only can be provided by Manufacturer; the components and parts can't use in the instruments without the permission of Manufacturer.

Please forgive us for not informing you if the design or the assigned type changes!