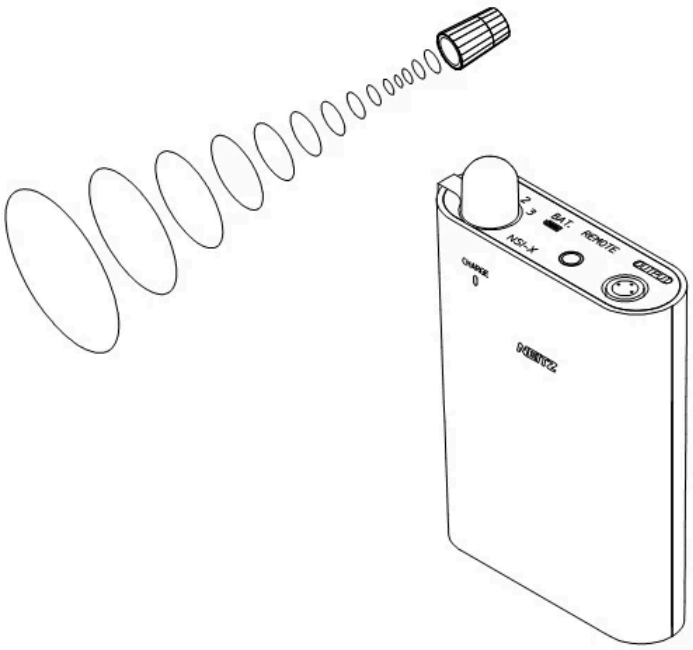
NEITZ

SPOT ILLUMINATOR NSI-X

User's Manual



NEITZ INSTRUMENTS CO., LTD.

CE

TD11-12820001E-8

Thank you for purchasing the **NEITZ SPOT ILLUMINATOR NSI-X**. This is a battery-powered lamp designed to be worn on the user's head to provide illumination during surgical, diagnostic, or therapeutic procedures, so that the affected part can be observed more brightly. The illumination may be powered by a charged battery pack or with the battery pack connected to the AC adaptor. Please read this instruction manual carefully before use to avoid unexpected accidents and store in a safe place for future reference.

This device has been designed for use with the NEITZ Binocular Loupe series and NEITZ Frame series. If necessary, please also refer to the NEITZ Loupe BL Series instruction manual.

Table of Contents

1. Important Information 1
   1-1 Intended Use 1
   1-2 Symbols 1
   1-3 Safety Information 2
      1-3-1 Precautions Common to All Devices 2
      1-3-2 Precautions for Battery Pack 4
   1-4 Labeling on Package 6
2. Checking Package Contents 7
3. Nomenclature and Function 8
   3-1 Illuminator 8
   3-2 Battery Pack 9
   3-3 Accessories 10
4. Preparation and Inspection 12
   4-1 Preparation 13
   4-2 Inspection of Illuminator 13
   4-3 Inspection of Battery Pack 13
   4-4 Inspection of AC Adaptor 13
5. Operation 14
   5-1 Mounting Illuminator on Frame 14
      5-1-1 Mounting Illuminator on BETA Frame, NEO Frame or Headband with Loupe 14
      5-1-2 Wiring Illuminator Cord for BETA Frame 14
      5-1-3 Wiring Illuminator Cord for NEO Frame 15
      5-1-4 Wiring Illuminator Cord for Headband 16
      5-1-5 Mounting Illuminator on Titanium Frame 16
      5-1-6 Wiring Illuminator Cord for Titanium Frame 17
   5-2 Wearing Frame with Illuminator 18
      5-2-1 Placing BETA Frame or NEO Frame Illuminator 18
      5-2-2 Placing Headband 19
   5-3 Setting up Illuminator 20

5-3-1 Battery Pack Illumination Mode 20
5-3-2 AC Illumination Mode 21
5-3-3 Using Remote Switch 22
5-3-4 Turning Illuminator Off 22
5-3-5 Other Options 23
6. Troubleshooting 24
7. Maintenance 25
7-1 Cleaning 25
7-2 Tightening Screws 25
7-3 Storage and Transport 25
7-3-1 Environmental Conditions 25
7-3-2 Safekeeping and Transport 25
7-4 Disposal 26
7-4-1 Illuminator and Accessories 26
7-4-2 Battery Pack 26
8. Specifications 27
9. Technical Support and Contact Information 29
ANNEX A 30
Alarm System 30
ANNEX B 31
EMC Guidance for Spot Illuminator NSI-X 31

1. Important Information

For the U.S. Market;

CAUTION: Federal law restricts this device to sale by or on the order of a medical or dental professional; associated healthcare professionals; medical, dental and associated healthcare students.

1-1 Intended Use

The Spot Illuminator NSI-X (hereafter referred to as “NSI-X”) is a battery-powered device intended to be worn on the user's head to provide illumination to aid visualization during surgical, diagnostic, or therapeutic procedures.

Do not use this device for purposes other than the intended use.

1-2 Symbols

The following symbols are used on the device or packaging to assist you in the proper handling and use of this device, and to warn and caution you of potential hazards to yourself and others.

⚠WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠CAUTION	Used with the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices that may cause property damage.
CE	The "CE" mark indicates that this product complies with the European requirements for safety, health, environment and customer protection. CE-marked products are for sale in Europe.
SN	Serial number
	Manufacturer
	Upper and lower temperature limits during transport and storage
	Upper and lower humidity limits during transport and storage
	Upper and lower pressure limits during transport and storage
	Fragile, handle with care
	Keep dry

	Certification symbols demonstrating product has passed the corresponding safety tests
	Class II Equipment
	Alternating current, AC
	Direct current, DC
	For indoor use only
	Consult instructions for use
	Products bearing this symbol must be recycled separately from other household wastes under the WEEE directive
	ESD (Electrostatic Discharge) susceptible device
	Nickel-metal hydride rechargeable battery (must be recycled)
	Barcode for traceability purposes. The figure to the left is an example.
	Authorized representative in Europe

1-3 Safety Information

1-3-1 Precautions Common to All Devices

WARNING	
 Prohibited	Do not leave the illumination on for prolonged periods or cover the device during illumination. Doing so may cause the device to reach high temperatures, resulting in burns, fire or device failure.
 Prohibited	Do not shine light directly into the eye. Doing so may cause damage to the eye.

 Prohibited	Do not attempt to insert foreign objects into the device. Doing so may cause fires or device failure.
 Prohibited	Do not dispose of items used during the cleaning of the device with household wastes.
 Prohibited	Do not attempt to disassemble or modify the device. Electrical shock, fire or device failure may result.
 Prohibited	Do not touch the device, its parts or power sources with wet hands. Doing so may result in electric shock.
 Instruction	Be sure the illuminator unit is fixed to the frame by means of the hinge before lighting.
 Instruction	Be sure to disconnect the illuminator unit from the battery pack during transport or storage. Failure to do so may lead to accidental illumination inside the casing, resulting in high temperatures which could cause burns, fires or device failure

⚠CAUTION	
 Prohibited	Do not use with parts other than the standard accessories included in this package. Doing so may result in device failure.
 Prohibited	Do not apply strong impact or direct force to device. Doing so may damage the device.
 Prohibited	Do not expose the device to direct sunlight or harmful radiation. Doing so may lead to unexpected heating and result in device failure.
 Prohibited	Do not sterilize the device. Doing so may cause device deformation or failure.
 Prohibited	Do not immerse in cleaning detergents or rinse with water. Doing so may cause device damage.
 Prohibited	Do not place heavy objects on, apply excessive tension to, or fold cables, cords and connectors. Doing so may result in damage and electric shock or fire.
 Prohibited	Do not use in places where cords or straps may become entangled or caught up.
 Prohibited	Do not bend hinges in unintended directions.
 Prohibited	Do not use in excessively humid or saline environments, or places where the device may be sprayed with water. Doing so may result in electric shock.
 Instruction	Make sure that all screws are firmly tightened before use. Failure to do so may result in injury or damage to the device.

Instruction	Make sure that the device is turned off and the original packaging is used during transport or storage.
Instruction	Be sure to allow the device to return to room temperature before opening the packaging. Failure to do so may result in condensation and device failure.
Instruction	Be sure the frame or headband is firmly in place before use.
Instruction	When disconnecting cables, be sure to hold the plug. Never pull the cable.

1-3-2 Precautions for Battery Pack

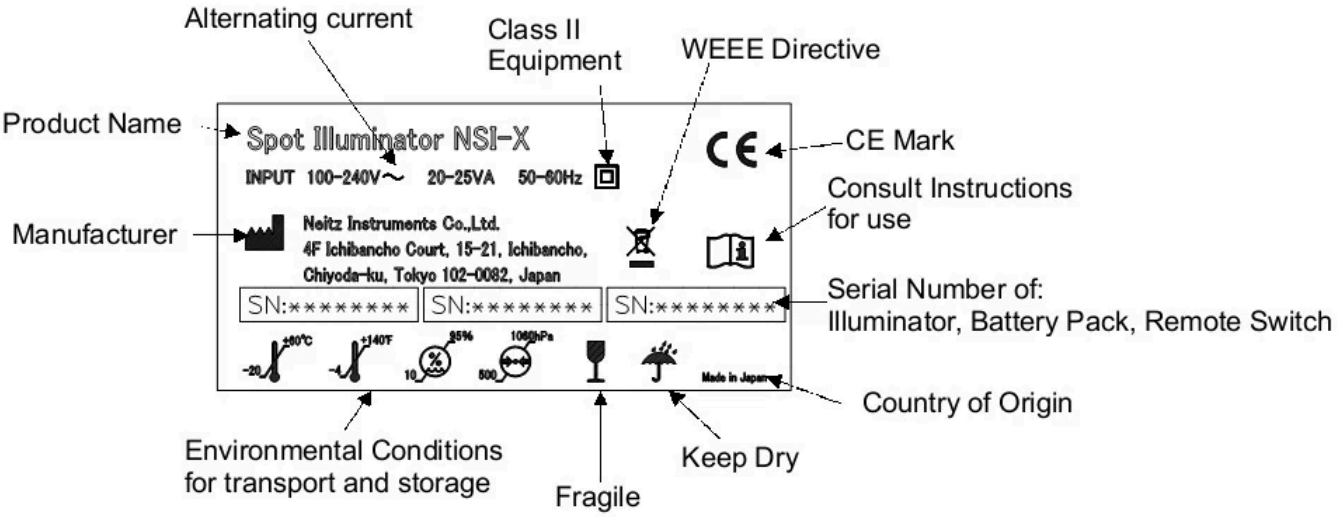
⚠WARNING	
Prohibited	Do not use in oxygen rich environments, in the presence of propane, gasoline or other combustible gasses, or near dust and debris. Doing so may cause explosion.
Prohibited	Do not use if dust or other foreign matter is adhered to the power plug. Doing so may result in fire.
Prohibited	Do not use if cables are damaged. Doing so may result in fire, electric shock or device failure.
Prohibited	Do not dispose of the Battery Pack in fire. Doing so may cause the Battery Pack to explode.
Prohibited	Do not use the device with accessories other than those included in this package. Doing so may cause fire or device failure.
Prohibited	Do not connect the AC power cable to an outlet with too many other devices. Doing so may cause injury or fire.
Prohibited	Never touch liquid which may have leaked from the Battery Pack. In case of contact with the eye(s), flush with clean water without rubbing, and consult a physician immediately. If leaked liquid gets on skin or clothing, wash with clean water immediately.
Prohibited	Do not short circuit power connectors or touch with bare hands. Doing so may cause electric shock or device failure.
Prohibited	Use of the NSI-X 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.
Prohibited	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.

Prohibited	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 NSI-X including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.
Instruction	Connect only to power sources which meet specifications.
Instruction	When the Battery Alarm Lamp lights, connect to the enclosed AC Adaptor for charging or operation in the AC Illumination mode promptly.
Instruction	Unplug the AC power cable from outlet for cleaning. Failure to do so may cause electric shock, fire or damage.
Instruction	Unplug the AC power cable from outlet promptly when water or liquid enters the Battery Pack or AC Adaptor. Not doing so causes electric shock, fire or damage.

⚠CAUTION	
Prohibited	Do not install the device in a place where difficult to plug in/out to/from the wall outlet since the plug-out from the outlet is one of the separation methods between the power and the device.
Prohibited	Do not charge the Battery Pack under direct sunlight or when it is covered. Doing so may prevent proper charging.
Prohibited	Do not charge the Battery Pack under conditions other than those specified in this manual. Doing so may cause the battery to leak or rupture.
Prohibited	Do not attempt to charge the device when wet. Doing so may cause excessive heating, fire or rupture.
Instruction	Unplug the power plug from wall outlet during prolonged periods of disuse. Not doing so may cause fire or device failure.
Instruction	Make sure illumination is turned off during charging. Not doing so may prevent the battery from fully charging.
Instruction	Always attach the Jack Cover when disconnected from the AC Adaptor to prevent damage from electrostatic discharge (ESD) or ingress of foreign matter.
Instruction	Always attach the Cover Cap when disconnected from the remote switch to prevent damage from ESD or ingress of foreign matter.
Instruction	Do not touch the center pin inside of the DC Jack with metal objects or finger. This may cause damage of device from ESD. Pay attention to use an antistatic mat or strap for grounding to prevent from electrostatic discharge when the Extension DC Cable is plugged into the DC Jack.

1-4 Labeling on Package

The following label has been adhered on the package of the Illuminator.

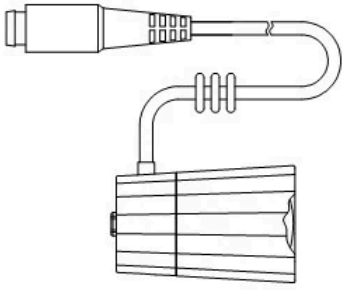


2. Checking Package Contents

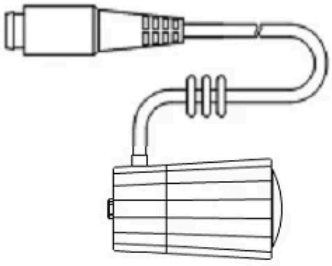
Make sure to match all items in the package with the components shown below. Inspect each item for damage. If any items are missing or damaged, do not use the device and immediately contact your local dealer.

Before using this device for the first time, clean it according to the instructions given in this manual.

- Illuminator 100 mm Type (x1) Note 1



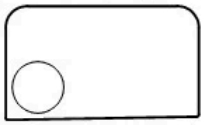
- Illuminator 80 mm Type (x1) Note 1



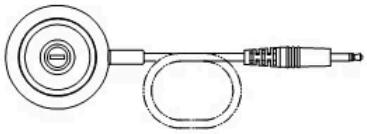
- Battery Pack (x1)



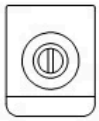
- Stand for Battery Pack (x1)



- Remote Switch (x1)



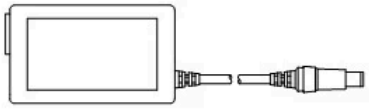
- Belt Hook (x1)



- Cover Cap (x1)



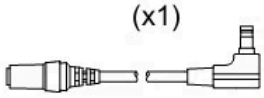
- AC Adaptor 1.2 m (x1)



- AC Power Cable 2 m (x1)



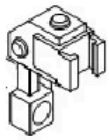
- Extension DC Cable 2 m (x1)



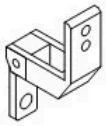
- Wiring Band (x2)



- Hinge for BETA Frame or Neo Frame (x1) Note 2



- Hinge for Titanium Frame (x1) Note 2



- User's Manual (x1)

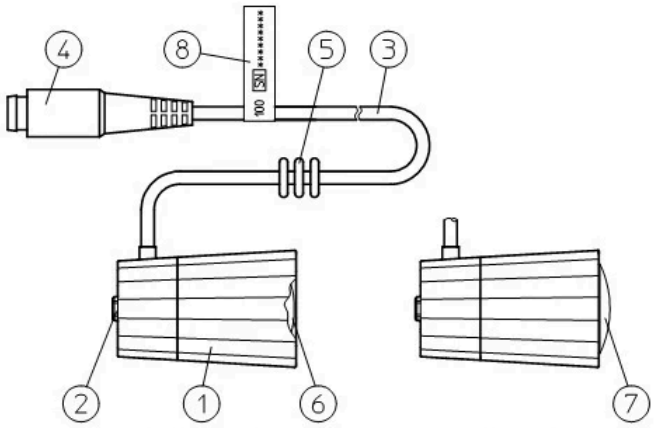


Note 1: Two types of Illuminators are available, either the 100 mm type or the 80 mm type. The type of Illuminator is enclosed as per your order.

Note 2: Two types of Hinges are available, one is for the BETA Frame, NEO Frame or Headband, and the other is for Titanium Frame. Either one has been mounted on the Illuminator at factory setting as per your order.

3. Nomenclature and Function

3-1 Illuminator



100 mm type　　80 mm type

① Illuminator: Generates light.
- 100 mm Type: Illuminates an area with diameter of 100 mm at 40 cm distance.
- 80 mm Type: Illuminates an area with diameter of 80 mm at 40 cm distance.

② Female Fixing Nut: Mounts the Hinge.

③ Illuminator Cord: Supplies power to the Illuminator via connection of Light Plug to the Battery Pack

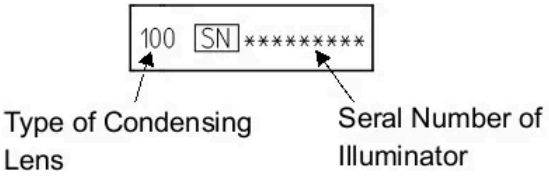
④ Light Plug: Connects to Light Jack on Battery Pack.

⑤ Wiring Ring: Fixes the Cord on the temple.

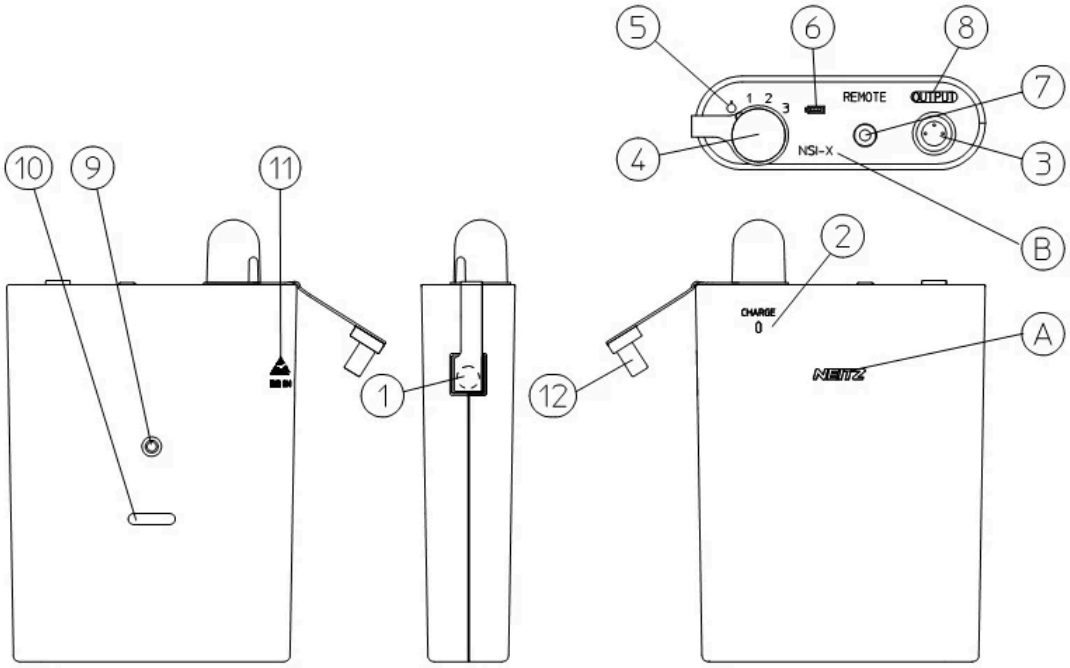
⑥ 100 mm Condensing Lens: Converges transmitted light to an area with diameter of 100 mm.

⑦ 80 mm Condensing Lens: Converges transmitted light to an area with diameter of 80 mm. (The lens for the 80 mm type protrudes more than the lens for the 100 mm type.)

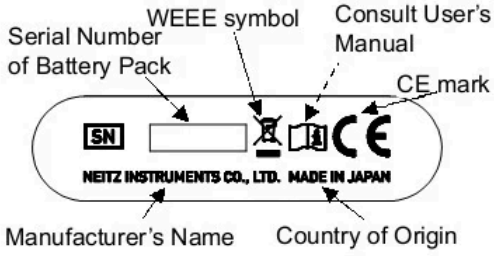
⑧ Identification Tag: As shown below:



3-2 Battery Pack



A:	NEITZ	Manufacturer's Logo
B:	NSI-X	Model Name
①	DC Jack (DC in)	Connects to the DC Plug from the AC Adaptor
②	CHARGE 0	Charging Indicator Lamp: Will light cyan while charging and green when fully charged
③	Light Jack	Connects to the Light Plug of the Illumination Unit
④	Adjustment Knob	Turns illumination ON/OFF and allows for adjustment in 3 levels
⑤		OFF Position
⑥		Battery Alarm Lamp (See Section 5-3-1(3))
⑦	Remote Jack	Connects to the Remote Plug of the Remote Switch
⑧	OUTPUT Lamp	Illuminates green when the Illuminator Unit is lit
⑨	Belt Hook Nut	Receives the coin screw of the Belt Hook
⑩	Hook Guide	Receives the positioning bar of the Belt Hook
⑪		Symbol representing susceptibility to electrostatic discharge
⑫	Jack Cover	Cover for protection from ESD or ingress of foreign matter

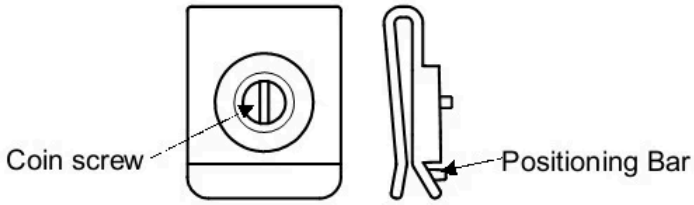


Note: This Battery Pack contains rechargeable batteries. Do not discard but recycle in accordance with your local regulations or direction.

3-3 Accessories

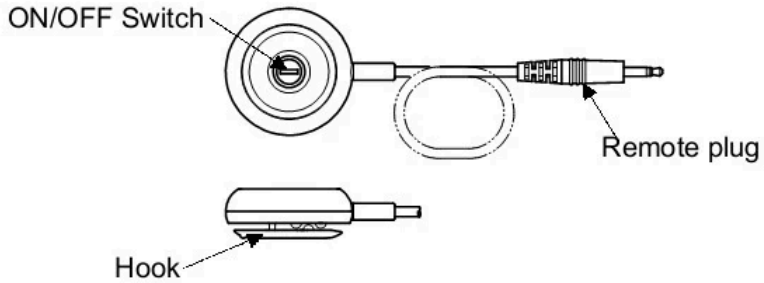
(1) Belt Hook

To be used to attach the Battery Pack to your belt or the like. (See Section 5-3-5 (1))



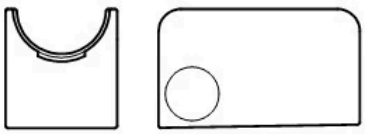
(2) Remote Switch

Turns the illumination on/off by gently depressing the On/Off switch when the Adjustment Knob has been set to “1”, “2”, or “3.” It provides a Hook for attachment of the Remote Switch at a point where it is easy to operate. The Remote Plug is provided to connect with the Remote Jack on the Battery Pack. (Refer to Section 5-3-3.)



(3) Stand for Battery Pack

Positions the Battery Pack upright on a table or horizontal surface. (Refer to Section 5-3-5 (2).)



(4) Wiring Band (x2)

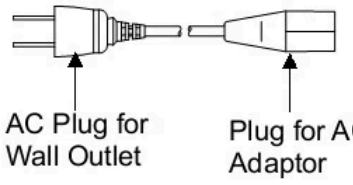
To be used to fix the Illuminator Cord.



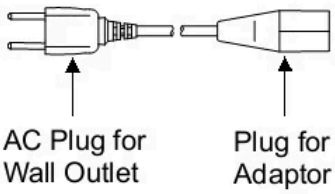
(5) AC Power Cable 2 m

Connects to the AC Adaptor and a power outlet. Either one is provided as per your order.

For AC 120 V Input

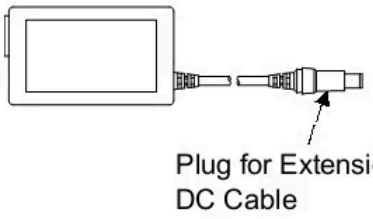


For AC 230 V Input



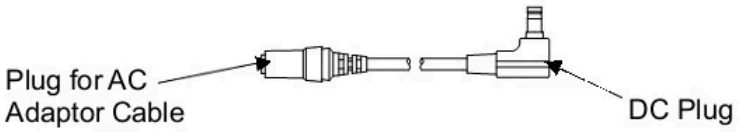
(6) AC Adaptor with 1.2 m Cable

AC to DC converter



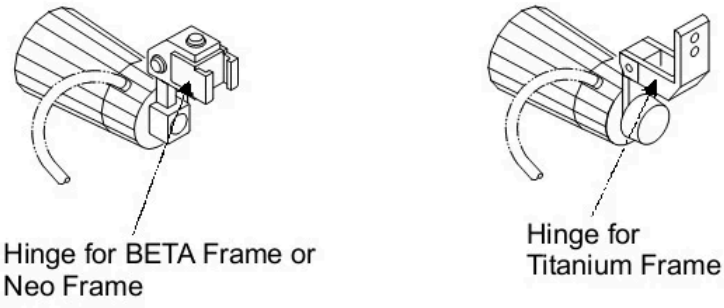
(7) Extension DC Cable 2 m

Connects to AC Adaptor cable and DC Jack (DC IN) of Battery Pack.



(8) Hinge

The Hinge has been mounted on the Illuminator at the factory as shown below.



(9) Cover Cap

Cover for protection from ESD or ingress of foreign matter.

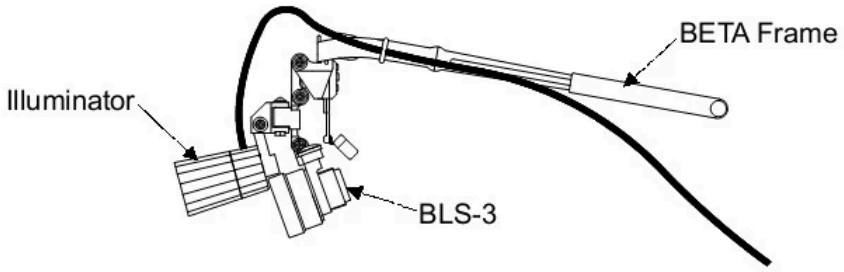


4. Preparation and Inspection

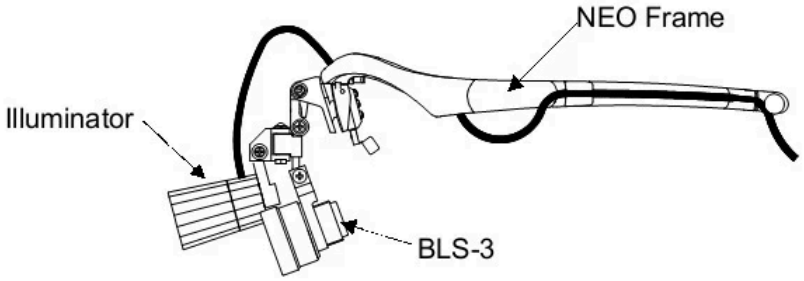
This device has been designed for use with the NEITZ Frame and NEITZ Binocular Loupe. Combinations with various Loupes and various Frames are available. (See below for examples.) If necessary, refer to the instruction manual for the specific Loupe with Frame purchased.

【Examples of Illuminator Mounted on Frame with Loupe】

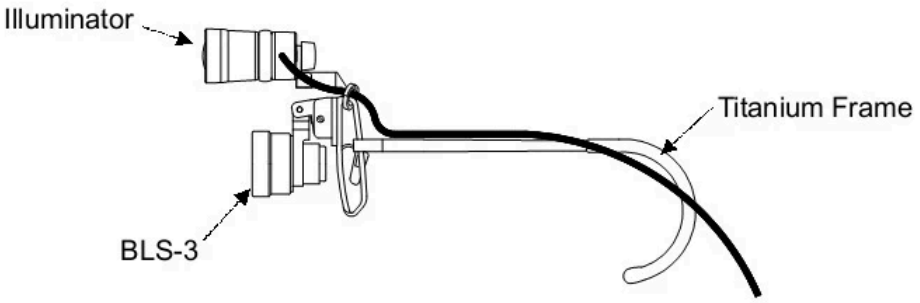
(1) Illuminator on BETA Frame with Binocular Loupe BLS-3



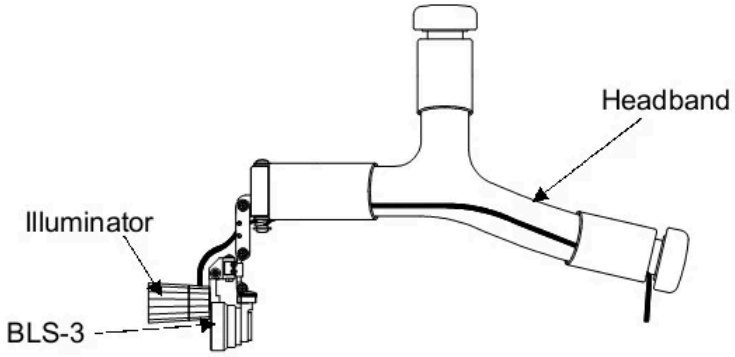
(2) Illuminator on NEO Frame with Binocular Loupe BLS-3



(3) Illuminator on Titanium Frame with Binocular Loupe BLS-3



(4) Illuminator on Headband with Binocular Loupe BLS-3



4-1 Preparation

To prepare, start with NEITZ Binocular Loupe with Frame, dry lint-free cloth, lint-free soft cloth slightly moistened with diluted neutral detergent, and cotton swabs for cleaning.

4-2 Inspection of Illuminator

Clean the surface of Illuminator in accordance with the Section 6.1 before inspection. If necessary, disinfect it as well.
Confirm that there is no damage on the Illuminator including Lens, Cord, Light Plug, including other parts as well as the Battery Pack. If any items are damaged, do not use the Illuminator and immediately contact your local dealer.

4-3 Inspection of Battery Pack

Confirm that the Battery Pack does not leak electrolyte which is contained in the battery. If electrolyte leakage occurs, do not make contact with leakage and clean up with absorbent cloth and move the Battery Pack away from any fire. Actions described below are required if anyone comes in contact with electrolyte leakage.

Eye contact:	Flush eyes immediately with plenty of clean water for at least 15 minutes, without rubbing. Obtain medical treatment. If appropriate procedures are not taken, eye irritation and injury may develop.
Skin contact:	Wash the contacted areas off immediately with plenty of water and soap. If appropriate procedures are not taken, injury and sever irritation to skin may develop.
Inhalation:	Move to fresh air immediately. Obtain medical treatment.

4-4 Inspection of AC Adaptor

Confirm that the body and cables of the AC Adaptor including the Extension DC Cable are not damaged and that each plug connection is smoothly implemented without any problems.

5. Operation

5-1 Mounting Illuminator on Frame

Since mounting methods vary by frame types, make sure of the type to be used and follow the procedure as described below as well as referring to the instruction manual of the Binocular Loupe BL Series used.

5-1-1 Mounting Illuminator on BETA Frame, NEO Frame or Headband with Loupe

(1) Loosen two screws mounted on the Hinge of Illuminator, shown in Fig. 5-1, approximately 3 mm. Do not remove them from the Hinge.

(2) Put the Hinge of Illuminator onto the Hinge of the Loupe and firmly tighten the loosened two screws.

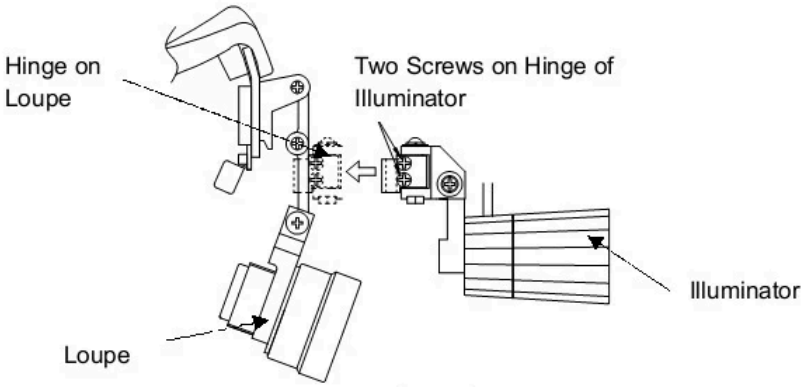


Fig. 5-1

5-1-2 Wiring Illuminator Cord for BETA Frame

(1) For wiring the Illuminator Cord, if a frame strap is previously attached, remove it temporarily.

(2) Insert a Wiring Ring from end of the left temple (bow) and fix it near the position A shown in Fig. 5-2. Loosely attach the Illuminator Cord along the temple (bow) in order to allow the Illuminator smoothly to move up and down (vertically) and right and left (horizontally) as well as to prevent the Cord from tightening when the temple (bow) is folded. Handle the Cord with care. Never pull it hard nor bend it sharply.

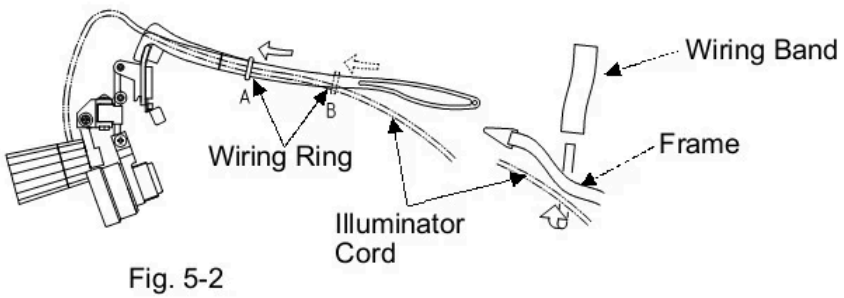


Fig. 5-2

(3) If necessary, use an additional Wiring Ring near the position B and/or a Wiring Band to fix the Cord, as shown in Fig. 5-2.

(4) Be sure that the Illuminator can move up and down (vertically) and right and left (horizontally) freely and smoothly without any tension.

(5) Replace the removed strap to the frame.

(6) After wiring the Illuminator Cord, adjust the positions of Illuminator and Loupe. When changing the angle of the Illuminator up and down and/or right and left, keep the Illuminator turned on.

5-1-3 Wiring Illuminator Cord for NEO Frame

(1) For wiring the Illuminator Cord, if a frame strap is previously attached, remove it temporarily.

(2) Take the Forehead Cushion off at the center as shown in Fig. 5-3 and set the Illuminator Cord inside of the Cushion, then put back the Cushion again. Loosely set Illuminator Cord as shown in Fig. 5-4, so that the Illuminator can move up and down (vertically) and right and left (horizontally) freely and smoothly without any tension as well as to prevent the Cord from tightening when the temple (bow) is folded.

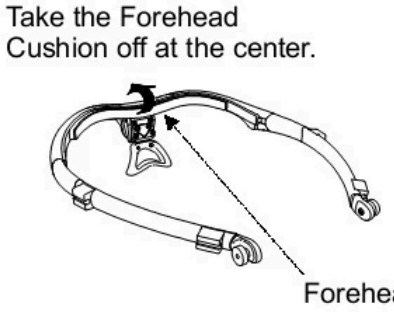


Fig. 5-3

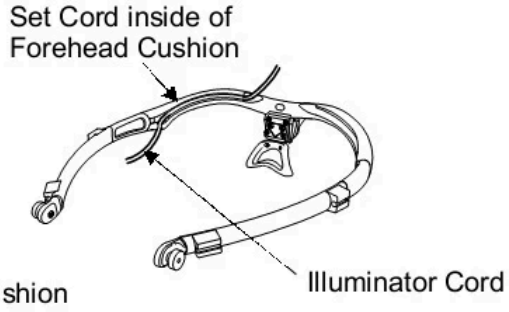


Fig. 5-4

(3) Pass the Illuminator Cord through the Cable Guide in two places and fix with the Wiring Ring at the position shown in Fig. 5-5. Handle the Illuminator Cord with care. Never pull it hard nor bend it sharply. If necessary, fix the Cord with the Wiring Band as well.

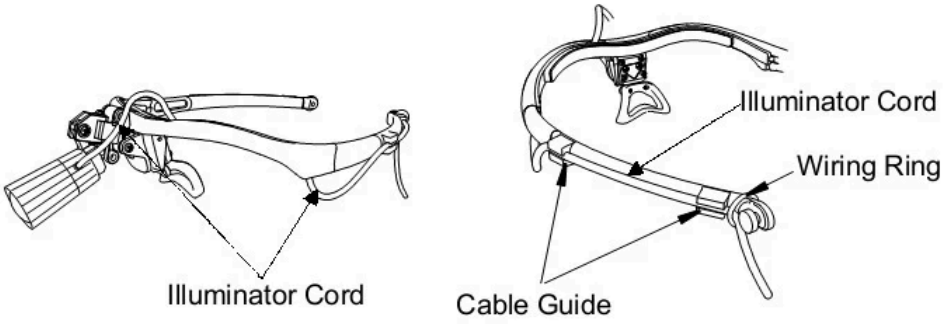


Fig. 5-5

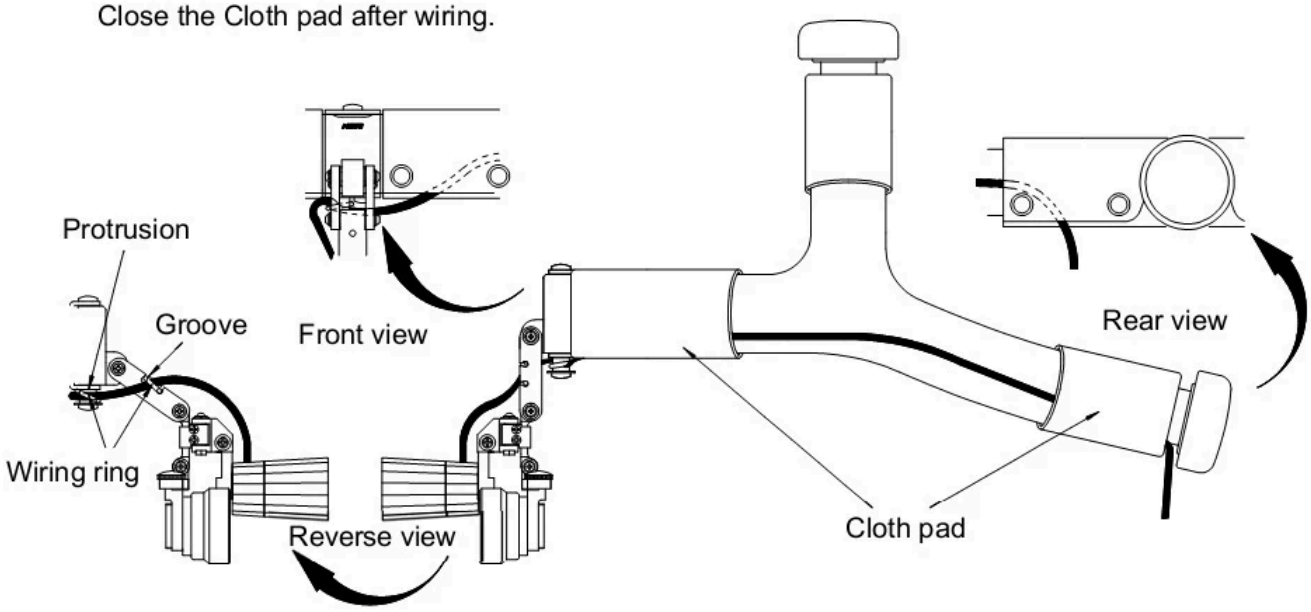
(4) Be sure that the Illuminator can move up and down (vertically) and right and left (horizontally) freely and smoothly without any tension.

(5) Replace the removed strap to the frame.

(6) After mounting the Illuminator Cord, adjust the positions of Illuminator and Loupe. When changing the angle of the Illuminator up and down and/or right and left, keep the Illuminator turned on.

5-1-4 Wiring Illuminator Cord for Headband

Put the Illuminator Cord on the groove of the Hinge and the protrusion of the Headband by using the Wiring ring. Open the Cloth pad and pass the Illuminator Cord through the Cloth pad. Close the Cloth pad after wiring.



5-1-5 Mounting Illuminator on Titanium Frame

(1) Remove the Large Screw and the Washer that fixes the Loupe to the Frame in the center (shown in Fig. 5-6).

Note: The removed Washer will be reused when the Illuminator is mounted onto the Frame, do not throw away. The Large Screw will not be used.

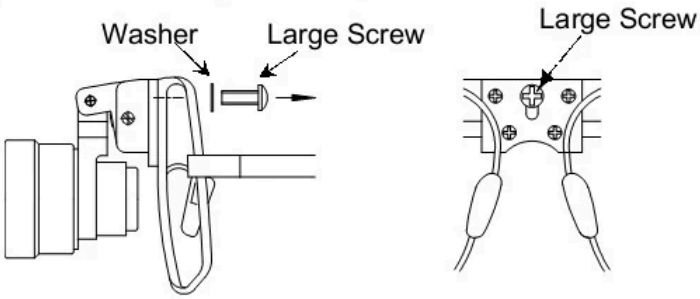


Fig. 5-6

(2) Affix the Hinge on the Illuminator to both the Frame and Loupe together by using the Long type Screw provided with the Frame and the Washer removed in the above step (1). In case of using the Illuminator closer to the Loupe (underneath of the Loupe), tighten the screw with the Washer as shown in Fig. 5-7.

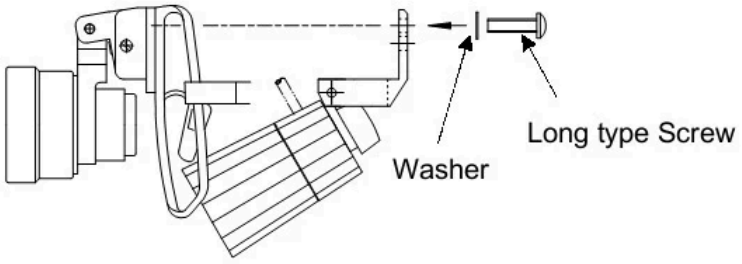


Fig. 5-7

(3) User may mount the Illuminator above the Loupe, 1) if the Illuminator obstructs user's view or 2) if user adjusts the Pupillary Distance to a narrow distance. In this case, affix the Hinge on the Illuminator to the both Frame and Loupe together as shown in Fig. 5-8.

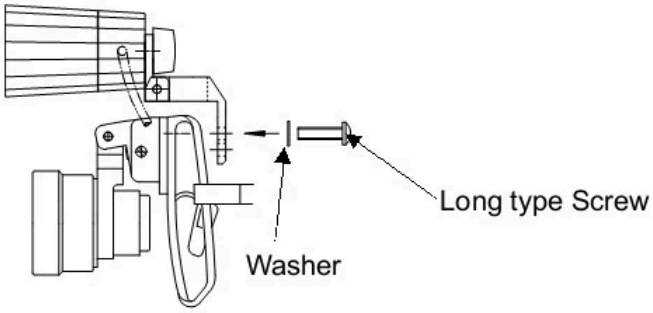


Fig. 5-8

5-1-6 Wiring Illuminator Cord for Titanium Frame

(1) Loosely attach the Illuminator Cord along the left temple (bow) by using the supplied Wiring Band as shown in Fig. 5-9 in order to allow the Illuminator smoothly to move up and down (vertically) and right and left (horizontally). Handle the Cord with care. Never pull it hard nor bend it sharply.

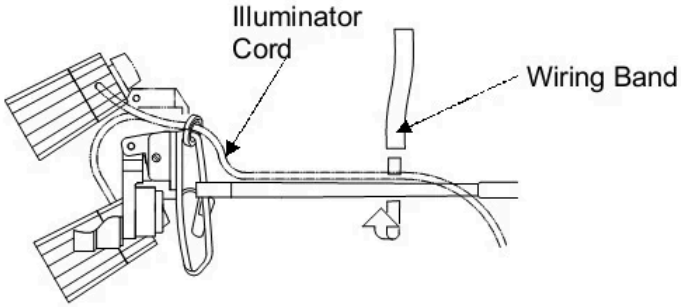


Fig. 5-9

(2) After mounting the Illuminator H, adjust the positions of Illuminator and Loupe. When changing the angle of the Illuminator up and down and/or right and left, keep the Illuminator turned on.

5-2 Wearing Frame with Illuminator

In case, only the Illuminator has been mounted beforehand on the BETA Frame, NEO frame or Headband:

5-2-1 Placing BETA Frame or NEO Frame Illuminator

(1) Position the Frame in place on your head after loosening the Strap, then adjust for optimum positions of the Forehead Pad and Nose Pad. The Nose Pad position is adjustable by sliding up and down and also forming the Nose Pad to match your nose shape. Since 2 types of Nose Pads are provided with the Frame, choose either one for your comfort and convenience, according to your preference and the procedure to be performed. Refer to the Instruction Manual of the NEITZ Binocular Loupe Series with BETA Frame (or NEO Frame) since the contact area on Nose Pad can be formed by slightly bending it so as to fit the shape of the nose.

(2) Squeeze the Stopper of Strap to position the main body section of Frame to your head securely.

(3) Adjust the position of Illuminator by moving it up and down and/or right and left and/or back and forth to obtain the optimum position. The position of Illuminator can also be adjusted with the Hinge. If necessary, refer to the Instruction Manual of the NEITZ Binocular Loupe Series with BETA Frame (or NEO Frame). When the Illuminator is not required it can be flipped-up with the Hinge.

(4) If the Loupe has been supplied, adjust the position of Loupe at the same time when adjusting the position of the Illuminator, referring to the Instruction Manual of the NEITZ Binocular Loupe BL Series.
In order to observe with less shadow, bring the Illuminator closer to the Loupe's optics.

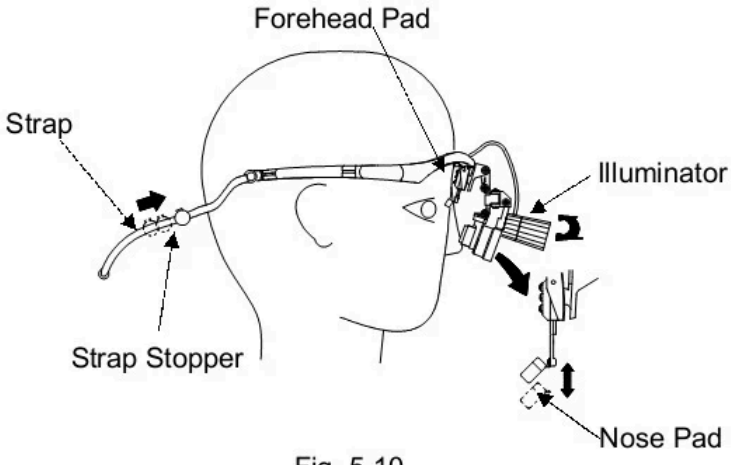
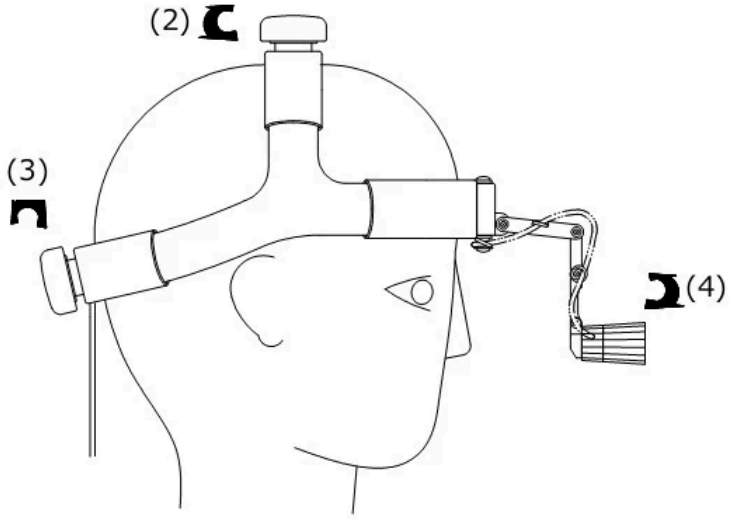


Fig. 5-10

5-2-2 Placing Headband

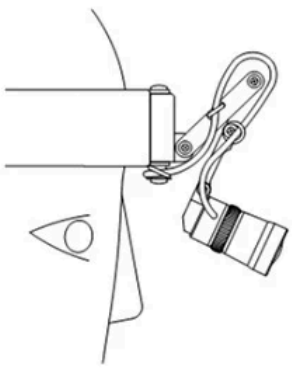
(1) Place the Headband on your head so that the Lens Barrel will be situated at the center of your face.
(2) Adjust the height by turning the Adjustment Knobs located at the top of the Headband to place the band above your eyebrows.
(3) Turn the Adjustment Knobs located at the rear of the Headband to tighten and fix the Headband.
(4) Adjust the position of Illuminator by moving it up and down and/or right and left to obtain the optimum position. The position can be freely adjusted by bending the hinges.



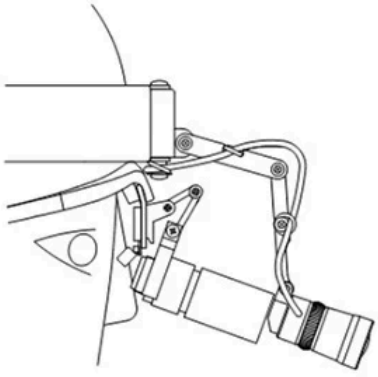
When the Illuminator is not necessary to use, you can keep the Lens Barrel flipped up.

Adjustment examples

By bringing the Illuminator close to the visual axis, you can observe with less shadow.



Adjustment close to the visual axis.



Adjustment fully extended to the loupe (when used with a binocular loupe).

5-3 Setting up Illuminator

There are two methods to setup Illuminator for use: a) one method is connecting to a fully charged Battery Pack; and, b) connecting to the Battery Pack which is directly connected to the AC Adaptor. The method b) above supplies the Illuminator with constant power without concern about a residual quantity of charge.

5-3-1 Battery Pack Illumination Mode

(1) Charging Battery Pack

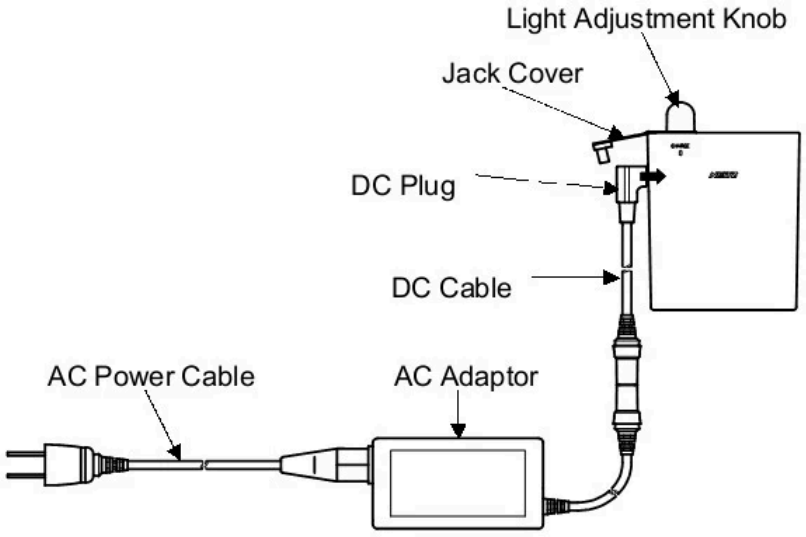
Connect the AC Power Cable, AC Adaptor, and Extension DC Cable to each other. First, plug the Extension DC Cable into the DC Jack (DC IN) of the Battery pack then connect the AC Power Cable to an AC outlet.

Note: To charge the battery, the Battery Pack should be turned off by setting the Light Adjustment Knob to "○" position (Off position). If it is not set at "○" position the battery cannot be charged.

The Battery Pack should be charged within a location that is below 35 °C (95 °F). Battery Pack may not sufficiently be charged in an area of high temperature.

The Charging Indicator Lamp will light cyan while the battery is being charged. When charging is complete, the Charging Indicator Lamp will turn green. Full charging of the battery takes approx. 2.5 hours from a fully depleted condition.

Be sure to cover the DC Jack after charging.



(2) Connecting Illuminator to Battery Pack

Connect the Light Plug of Illuminator Cord to the Light Jack (OUTPUT) of Battery Pack. Match the three pins in the Light Plug with the three holes in Light Jack and push inward until it is fixed firmly, that is, the silver metal part of the Light Jack is not showing. When removing the Light Plug, pull upwards without turning.

(3) Illuminator Lighting

Turn the Light Adjustment Knob from the "⏻" position (Off position) to the Level "1", "2", or "3" for lighting. The OUTPUT Lamp will light when the NSI-X is in use.

The effective operational illumination time, the state of the Battery Alarm Lamp and the corresponding remaining illumination time are as follows.

Illumination Level	Approximate Illumination Time at Full Charge	State of Battery Alarm Lamp and Remaining Illumination Time
Low (Level 1)	13.5 hours	The lamp will light orange with 20 minutes of operational illumination remaining. The lamp will blink orange with less than 10 minutes of illumination remaining.
Medium (Level 2)	7.5 hours	The lamp will light orange with 20 minutes of operational illumination remaining. The lamp will blink orange with less than 10 minutes of illumination remaining.
High (Level 3)	3.5 hours	The lamp will light orange with 20 minutes of operational illumination remaining. The lamp will blink orange with less than 10 minutes of illumination remaining.

Note: When the Battery Alarm Lamp starts blinking orange, the light intensity is decreased to approximately half, and illumination will be fully depleted after 10 more minutes of use. Charge the Battery Pack immediately or connect the AC Adaptor to continue use.

5-3-2 AC Illumination Mode

(1) Connecting the AC Adaptor

Connect the AC Power Cable, AC Adaptor and Extension DC Cable to each other. First, plug the Extension DC Cable into the DC Jack (DC IN) of the Battery pack then connect the AC Power Cable to an AC outlet.

(2) Connecting the Illuminator to the Battery Pack

Connect the Light Plug of Illuminator Cord to the Light Jack (OUTPUT) of Battery Pack. Match the three pins in the Light Plug with the three holes in Light Jack and push inward until fixed firmly. When removing the Light Plug, pull upwards without turning.

(3) Illuminator Lighting

Turn the Light Adjustment Knob from the "○" position (Off position) to the Level "1", "2", or "3" for lighting.

The illumination levels are the same as when the power is supplied with the Battery Pack. When using the AC Adaptor, the Charging Indicator Lamp lights cyan, and the Battery Alarm Lamp will turn off.

Note: When using the AC Illumination Mode, the Battery Pack will not fully charge. To charge fully, refer to Section 5-3-1(1).

5-3-3 Using Remote Switch

The Illuminator can be turned on/off remotely by the Remote Switch when it is connected to the Remote Jack (REMOTE) on Battery Pack. Remote Switch operates by pushing the On/Off Switch when the Light Adjustment Knob has been set at the level 1, 2, or 3. Each time the Remote Switch is depressed the Illuminator is turned on and off repeatedly.

After connecting the Remote Switch, hang it on the point where easy to operate by using the Hook of Remote Switch.

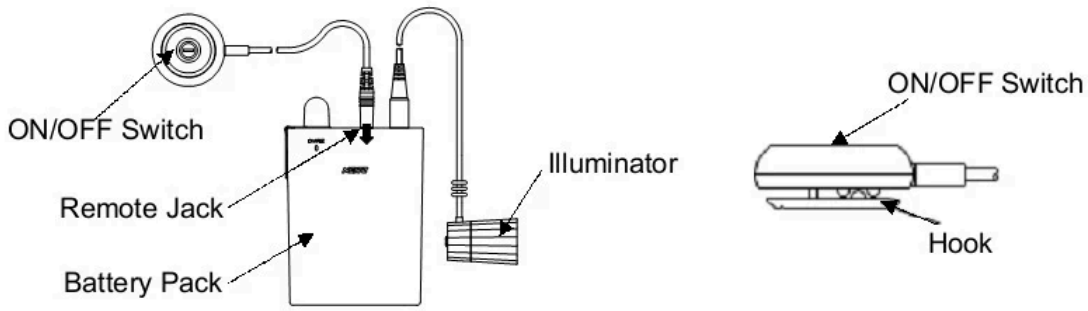


Fig. 5-12

5-3-4 Turning Illuminator Off

Turn the Light Adjustment Knob on the Battery Pack to the "○" position (Off position) to turn the Illuminator off. Even if the Illuminator is turned off by Remote Switch, be sure to turn the Light Adjustment Knob to the "○" position (Off position) to avoid the Illuminator from being powered on accidentally.

5-3-5 Other Options

(1) Cover Cap

A cover cap is provided to protect the Remote Jack from ESD or ingress of foreign matter. When using the Remote Switch, make sure to unplug the cover cap and store the cover cap in an easily accessible place. Always be sure to re-plug the cover cap when disconnecting the Remote Switch.

(2) Belt Hook

Set the Coin Screw of Belt Hook to the Hook Nut of Battery Pack and match the Positioning Bar of Belt Hook to the Hook Guide of Battery Pack, then tighten the Coin Screw vertically with a coin or the like to fix the Belt Hook on the Battery Pack. Do not tilt the Belt Hook and keep it vertical.

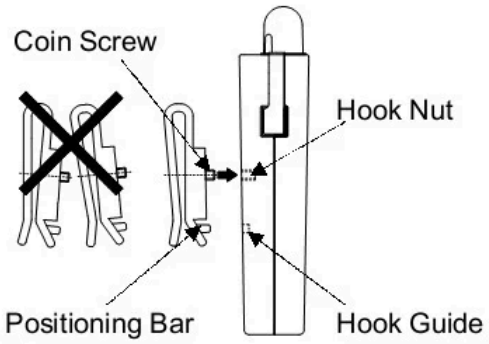


Fig. 5-13

(3) Battery Pack Stand

The Battery Pack Stand may be used to steady the Battery Pack during charging. To set the DC Plug to the Stand, insert the groove on the DC Plug to the Stand along the inside protrusion of the Stand as shown in Fig. 5-14.

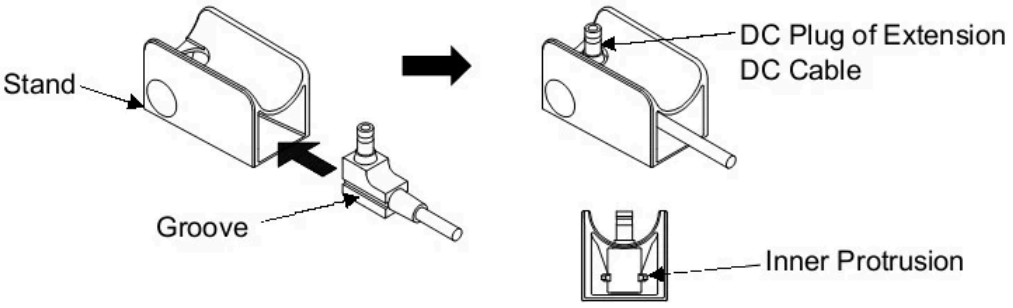


Fig. 5-14

Use example of Battery Pack on the desk

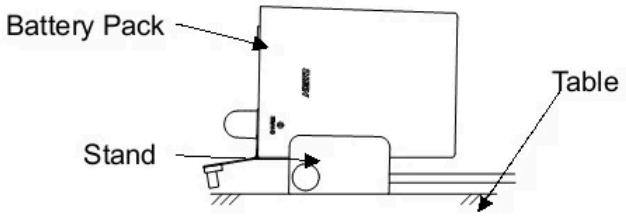


Fig. 5-15

(4) Wiring Band

Use the Wiring Band to bundle or fasten cables as necessary.

6. Troubleshooting

If the Illuminator or the Battery Pack does not function properly, some problems may be solved by referring to the following chart. If the problem cannot be resolved, stop and contact your local dealer or Neitz immediately.

The following table shows the possible causes and troubleshooting solutions.

Problem	Possible Cause	Solution
Charging Indicator Lamp does not light.	The cables and cords are not connected correctly.	Connect correctly.
Battery Pack does not charge fully	The Light Adjustment Knob is not set to "⏻" (Off position).	Set the Light Adjustment Knob to "⏻" (Off position).
	Temperature is too high (a sensor is incorporated to detect high temperatures)	Charge the Battery Pack within the ambient temperatures specified in this manual.
Illuminator cannot be used for a long time even though Battery Pack is fully charged.	The Battery Pack lifetime has expired.	Replace the Battery Pack with a new one (see Section 7-4-2 for proper disposal of the Battery Pack).
Remote Switch does not work correctly.	The Light Adjustment Knob is set to "⏻" (Off position).	Turn to the "1," "2," or "3" position for power on.
Illumination is dark	The battery power is too low (the Battery Alarm Lamp will blink orange).	Charge the Battery Pack immediately or connect to the AC Adaptor.
Illuminator light field is uneven.	The lens of Illuminator is dirty.	Clean the lens.
	The Illuminator is obscured with a cord/cable or other objects.	Fix the position so that illuminator is not obscured.
Illuminator flickers	The Light Plug is not connected to the Light Jack properly.	Connect properly.
Illuminator becomes hot.	This is normal. The internal LED generates heat and the temperature may rise so that it may feel warm or hot to the touch.	
Battery Pack becomes hot while charging	This is normal. Heat is produced while charging and the temperature may rise so that it may feel warm or hot to the touch.	
Illumination turns off when switching from AC Illumination Mode to Battery Pack Illumination Mode	Turn the Light Adjustment Knob to "⏻" (Off position) once and re-adjust the illumination level.	

7. Maintenance

7-1 Cleaning

(1) Disconnect the Illuminator from the Battery Pack and other connections before cleaning.
(2) Wipe the surface with dry lint-free cloth or lint-free soft cloth slightly moistened with diluted neutral detergent, and then dry all surfaces completely.
(3) Wipe electrical contacts with cotton swabs.
(4) Safely dispose of used cleaning materials in accordance with local regulations and/or environmental guidelines to avoid bodily injury or infection since the cleaning materials may contain infectious matter.
(5) Do not operate the Illuminator until thoroughly dry.
(6) Do not touch the lens with finger(s) at any time and always keep lens clean. Fingerprints on the optical surface may increase the scatter of light on the area being viewed.
(7) If lens cleaning is required, first blow or dust off the surface of lens and wipe with lens tissue or pure cotton moistened with optical grade cleaning solution.

7-2 Tightening Screws

When movement of a Hinge part moves too freely or any connection part is loosened, tighten screw(s) with Phillips (+) screwdriver. Especially, tighten simultaneously the two screws on the hinge that fixes the Illuminator to the Frame. Fasten the screws slowly while observing the connection parts carefully. Be sure to tighten the Coin Screw of Belt Hook with a coin or the like if loosened.

7-3 Storage and Transport

7-3-1 Environmental Conditions

	Ambient Temperature	Relative Humidity	Atmospheric Pressure
Operation	+ 10 °C to + 35 °C (+ 50 °F to + 95 °F)	30 % to 90 %	800 hPa to 1060 hPa
Storage	- 20 °C to + 60 °C (- 4 °F to + 140 °F)	10 % to 90 %	500 hPa to 1060 hPa
Transport	- 20 °C to + 60 °C (- 4 °F to + 140 °F)	10 % to 90 %	500 hPa to 1060 hPa

7-3-2 Safekeeping and Transport

Disconnect the Illuminator Cord from the Battery Pack. Keep the Illuminator and all accessories in the original package to avoid direct pressure or impact during storage and transport. Accidental illumination may result in device damage or fire.

7-4 Disposal

7-4-1 Illuminator and Accessories

Safely dispose of the Illuminator and its accessories, excluding the Battery Pack, in accordance with local regulations and/or environmental guidelines. See the Section 7-4-2 for directions for disposal of the Battery Pack.

Materials used to clean the NSI-X must be disposed of in accordance with local regulations and/or environmental guidelines to avoid bodily injury or infection, as cleaning materials may contain infectious matter.

7-4-2 Battery Pack

The Battery Pack contains rechargeable batteries that contain precious resources that can be reused. Do not discard but recycle used rechargeable batteries in accordance with your local rules, regulations and/or guidelines.

The figure to the right is representative of Nickel-Metal Hydride Secondary Batteries which must be recycled.



Nickel-Metal Hydride Secondary Battery

8. Specifications

Illuminator			
Light Source	White LED (Color Tone: Cool White)		
Illumination Field Diameter (at 40 cm distance)	100 mm (100 mm type) or 80 mm (80 mm type)		
Dimensions (Main body)	ø 23.0 mm × 34.6 mm (ø 0.9 in × 1.36 in)		
Weight	100 mm type	Approx. 18 g (0.63 oz.)	
	80 mm type	Approx. 19 g (0.67 oz.)	
Light Intensity (approximately) (at 40 cm distance)	Low (Level 1)	100 mm type	12,000 lx
		80 mm type	14,000 lx
	Medium (Level 2)	100 mm type	19,000 lx
		80 mm type	22,000 lx
	High (Level 3)	100 mm type	32,000 lx
		80 mm type	38,000 lx
Light Color	White		
Illuminator Cord Length	1.7 m (66.93 in)		
Battery Pack			
Dimensions (excluding protrusions)	88.5 mm (H) × 68 mm (W) × 22 mm (D) (3.48 in × 2.68 in × 0.87 in)		
Weight (excluding batteries)	170 g (6.0 oz.)		
Illumination Level	3 levels (Low/Medium/High)		
Operation Time (approximately)	13.5 hours at Low (Level 1) 7.5 hours at Medium (Level 2) 3.5 hours at High (Level 3)		
Built-in Rechargeable Battery	Nickel-Metal Hydride (Ni-MH) battery (AA size, 4 pcs.)		
Output Voltage	DC 3 V, 2 VA		
Full Charging Time	Approx. 2.5 hours		
AC Adaptor			
Input Power	AC 100 V to 240 V, 47 Hz to 63 Hz, 0.25 A to 0.5 A		
Output Power	DC 9 V, 2.3 A Double Insulation Type (or its equivalent)		
Cable Length	1.2 m		
Extension DC Cable			
Cable Length	2 m		

Classification	
Degree of protection against electric shock	Battery Pack Illumination Mode: Internally Powered ME Equipment AC Illumination Mode: Class II ME Equipment
Applied Parts	No Applied Parts
Degree of protection against harmful ingress of water or particulate matter	IPX0
Method(s) of sterilization	Do not sterilize
Suitability for use in an oxygen-rich environment	Do not use in oxygen-rich environments
Mode of operation	Continuous operation

Safety Standards	
Electric Safety	IEC 60601-1:2005+AMD1:2012 IEC 60950-1:2005+AMD1:2009+AMD2:2013 IEC 60601-1-8:2006+AMD1:2012 IEC 62366-1:2015
EMC	IEC 60601-1-2:2014

9. Technical Support and Contact Information

If you have any questions or need technical support, contact your local dealer or NEITZ located at the following address.

[LOCAL DEALER]



Neitz Instruments Co. Ltd.

4F Ichibancho Court, 15-21, Ichibancho, Chiyoda-ku,
Tokyo 102-0082, Japan
Phone: +81-3-3237-0552; Fax: +81-3-3237-0554
e-mail: neitz-global@neitz.co.jp
URL: https://www.neitz.co.jp/en/



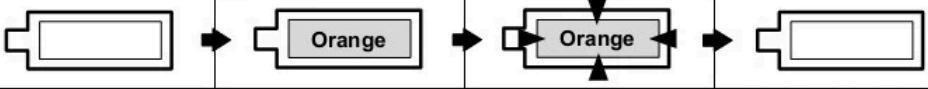
Medical Device Safety Service GmbH

Schiffgraben 41, D-30175 Hannover, Germany

ANNEX A

Alarm System

The NSI-X incorporates a Battery Alarm Lamp system as illustrated below to call attention to the user of the remaining battery capacity. When the Battery Alarm Lamp lights, refer to the instructions below to take the appropriate measures.

Condition of the Battery Alarm Lamp	Operational Illumination		Depleted Illumination	
				
	Lamp Unlit	Orange Lamp	Orange Blinking	Lamp Depleted
State of Battery Pack	Operational	20 minutes remaining	10 minutes remaining	Battery Depleted
Alarm Condition Priority		Low Priority	Medium Priority	
Required Operator Action	N/A	Charging advised*	Charge the Battery Pack promptly*	

*Note: Switching to AC Illumination Mode will not reset the Alarm Lamp. To reset the Alarm Lamp, turn the NSI-X off and charge the Battery Pack in accordance with Section 5-3-1(1).

ANNEX B

EMC Guidance for Spot Illuminator NSI-X

The NSI-X is a medical device and requires special precautions regarding EMC. Refer to the following EMC information for appropriate installation and putting into service.
Take care when using portable and mobile RF communications equipment in proximity of the NSI-X, as they can affect performance.

(1) Environments of intended use:
Professional healthcare facility environments and home healthcare environments

(2) Replaceable cables, transducers or accessories likely to affect compliance of the RX-3 or RX-3A with the applied EMC Standard:
- (a) Power supply cords: HVCTK2x0.75 2P CORD SET (1.9 m)
  AC15WNA-R (1.9 m)
  KP419CKS15FLTCE2Fx0.75 (1.9 m)
  WS004B/WS027/CCC (1.9 m)
- (b) LED harness: 202MCW-3P-2000/T-130227 (2.0 m)
- (c) DC cable: 2823003 (3.3 m, including DC cable of the AC adaptor)
- (d) Remote switch cable: 2823408 (0.8 m)

(3) Applied EMC Standard: IEC 60601-1-2:2014
Applicable port(s): Enclosure port, Input AC power port, Signal input/output parts port

Electromagnetic Emissions		
Phenomenon	**Applied Standard**	**Emission Test Levels**
Conducted and radiated RF emissions	CISPR 11	Class B Group 1
Voltage changes, voltage fluctuations and flicker emissions	IEC 61000-3-3	230 V 50 Hz

Electromagnetic Immunity		
Phenomenon	**Applied Standard**	**Immunity Test Levels**
Electrostatic discharge	IEC 61000-4-2	± 8 kV contact ± 2 kV, ± 4 kV, ± 8 kV, ± 15 kV air
Radiated RF EM fields / Proximity fields from RF wireless communications equipment	IEC 61000-4-3	10 V/m 80 MHz – 2.7 GHz 80 % AM at 1 kHz 385 MHz – 5785 MHz
Electrical fast transients / bursts	IEC 61000-4-4	Input AC power: ± 2 kV (100 kHz) Signal input/output part: ± 1 kV (100 kHz)
Surges	IEC 61000-4-5	Line-to-line: ± 0.5 kV, ± 1 kV Line-to-ground: ± 0.5 kV, ± 1 kV, ± 2 kV

Conducted disturbances induced by RF fields	IEC 61000-4-6	3 V 0.15 MHz – 80 MHz 6 V in ISM and amateur radio bands between 0.15 MHz and 80 MHz 80 % AM at 1 kHz
Rated power frequency magnetic fields	IEC 61000-4-8	30 A/m 50 Hz or 60 Hz
Voltage dips, short interruptions and voltage variations	IEC 61000-4-11	0 % U_T: 0.5 cycles At 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°
		0 % U_T: 1 cycle and 70 % U_T: 25/30 cycles Single phase :at 0°
		0 % U_T: 250/300 cycle
Note: U_T is the AC mains voltage prior to application of the test level		

(4) Effect of electromagnetic disturbances on essential performance

Essential Performance	**Outcome if Essential Performance is Lost or Degraded**
Continuous steady illumination	Flickering illumination



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